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A KNOWLEDGE-BASED APPROACH FOR AN INTERNATIONALIZATION DIAGNOSTIC FRAMEWORK FOR HIGHER EDUCATION INSTITUTIONS (HEID)

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RESUMO

Devido à Globalização e à necessidade de Inovação, a Internacionalização das organizações passa a ser um dos principais fatores da sociedade do Conhecimento. Nas Instituições de Ensino, o processo de Internacionalização é uma exigência em todos os processos e até mesmo a acreditação está envolvida. Mergulhar num processo de internacionalização, significa estabelecer motivações e começar - desta forma, o acompanhamento e o diagnóstico tornam-se vitais para o sucesso. A pergunta: Sob o prisma do conhecimento, que teorias, modelos e processos podem nortear o diagnóstico da Internacionalização das Instituições de Ensino Superior? A partir da abordagem do ciclo do Conhecimento (captura e extração; disseminação e compartilhamento; uso e otimização) quais teorias, modelos e frameworks podem contribuir diretamente para este tipo de Diagnóstico? Uma revisão delineou as áreas de (a) Conformidade e Governança que estabelecem os regulamentos internos e a estrutura de suporte; (b) a Auditoria que verifica se “o que está escrito” está sendo realizado de forma adequada e em conformidade com os regulamentos pertinentes e (c) a participação da Liderança e Alta Administração nas Mudanças que devem ser incorporadas à Cultura Organizacional. Tudo isso agrupado em uma atuação de Consultoria de especialistas com foco no Diagnóstico do Processo de Internacionalização em Instituições de Ensino Superior. Uma revisão da literatura identificou a lacuna que envolve esse tipo de diagnóstico, consolidando a proposta desta tese. Como resultado, as dimensões da estrutura foram analisadas, ajustadas e aprimoradas com seis validações e verificações de especialistas (pesquisa e entrevista). Devido ao controle normativo e externo direto, a dimensão Auditoria foi recusada. Todas as outras dimensões foram comentadas e vários problemas incluídos como uma lista de verificação. A estrutura aprimorada por especialistas foi traduzida em uma nova estrutura de diagnóstico com aplicação web funcional para Diagnóstico de Internacionalização de Ensino Superior (HEID) e uma prova de conceito foi realizada nele. Uma segunda lista de verificação foi implementada em planilha do Google e informa o estágio de implantação da IES (escala de quatro níveis). A nova estrutura permite um resultado diagnóstico para saber o foco desejado da IES e o status de implementação do processo de internacionalização. No que diz respeito à Internacionalização do Ensino Superior, esta característica simplifica o importante desafio de chegar ao Conhecimento Organizacional e incorporá-lo à cultura organizacional - o Conhecimento é a razão deste estudo.

Palavras-chave:
Quadro de diagnóstico de internacionalização do ensino superior; Foco na Internacionalização; Nível de Internacionalização do Ensino Superior; Ciclo de Gestão do Conhecimento para a Internacionalização do Ensino Superior.

RESUMO EXPANDIDO

Introdução

Universidades são base de conhecimento e formação. Inovação, empreendedorismo, globalização e internacionalização são temas recorrentes às instituições de ensino. A internacionalização embora já existente desde a Universidade de Bolonha (cultura ocidental -1088), assume nos dias de hoje requisitos não apenas de excelência, mas também de sobrevivência.

O moderno conceito de internacionalização deixa de ser prescritivo para apresentar uma Internacionalização Abrangente (Comprehensive Internationalization, Hudzik, 2015) onde cada Instituição faz suas escolhas em função de sua missão, visão, valores e resultados esperados (DeWit, Knight, 2020). Na atualidade, observa-se transversalmente em todos os focos da Internacionalização, os aspectos como inclusão, sustentabilidade, accountability, compliance, etc. relativos à Internacionalização Responsável (Responsible Internationalzation) de Stalivieri (2019). Não existe um "tamanho único para vestir a todos"!

Ao se apresentar à Sociedade, as Universidades sofrem processos de ranqueamento por diversas entidades, onde são computados desde o impacto das publicações até prêmios Nobel de cada Instituição. O processo de Internacionalização abrangente significa bem mais que um ranqueamento, pois vai adiante ao considerar a missão, visão e valores da organização. A internacionalização por se tratar de um processo, deve permitir avaliações, revisões e ajustes. A possibilidade de se estabelecer um diagnóstico, é fator fundamentar ao identificar onde estamos e aonde queremos chegar. Para obter um diagnóstico e poder avançar célere na otimizando recursos e resultados, a contratação de consultores e expertos permite direcionar os caminhos a serem trilhados, mitigando os problemas decorrentes de tentativa e erro. Assim surge a interrogante de como construir este diagnóstico: Quais teorias, modelos e processos podem direcionar o diagnóstico da Internacionalização da Educação Superior?

Sob a égide do Programa de Pós Graduação em Engenharia do Conhecimento este trabalho identifica, representar este conhecimento, visando disseminá-lo para sua utilização e inclusão na Cultura Organizacional. Oferece às Instituições de Ensino superior (IES) uma resposta à pergunta de pesquisa, ao estabelecer o objetivo de: "sob a perspectiva do Conhecimento, propor um framework conceitual para o diagnóstico da Internacionalização na Educação Superior, considerando a escolha de seus próprios objetivos e focos e com o auxílio da visão de papéis de consultoria a serem desempenhados".

Objetivos

A presente tese parte da perspectiva do conhecimento para a proposição de um framework conceitual para ao Diagnóstico da Internacionalização das Instituições de Ensino Superior - HEID (sigla do inglês Higher Education Institutions Diagnositc) e considera seu enfoque no que se refere a:

- Identificar os modelos e frameworks relacionados com a Internacionalização do Ensino Superior;
- Identificar estruturas, rotinas, processos e procedimentos relacionados às boas práticas de auditoria, governança, gestão de mudanças e gestão do conhecimento;
- Construir e sugerir uma estrutura conceitual envolvendo as 5 regras da consultoria de diagnóstico.

Metodologia

A classificação metodológica desta pesquisa apresenta de um lado a natureza básica ao representar e disseminar o conhecimento gerando novos aportes, mas destaca-se natureza prática ao apresentar soluções e produtos. Quanto aos objetivos trata-se de uma pesquisa descritiva e explicativa, ao buscar descrever processos e fatos e estabelecer causas e explicações à luz das teorias. Embora utilize recursos estatísticos elementares, trata-se de pesquisa qualitativa ao interpretando fenômenos e atribuir significados (VIANNA, 2014; LAKATOS & MARCONI, 2004). Quanto aos procedimentos foram efetuadas: pesquisa bibliográfica, documental, estudo de caso com uso de questionário e entrevistas (VIANNA, 2014; YIN, 2001; GIL, 2010). Utilizou-se também de prova de conceito para validar instrumento de software construído. O caminho percorrido nesta pesquisa em termos metodológicos iniciou com a busca do arcabouço teórico, frameworks e modelos envolvidos, determinando-se papéis a serem desempenhados no diagnóstico. Para o diagnóstico estabeleceu-se um framework inicial que a partir das dimensões básicas, foi submetido a sete especialistas sendo verificado e ajustado conforme indicações. Após seu aperfeiçoamento, com o prazo extra da pandemia foi possível construir instrumentos tecnológicos, com programação web que facilitam sua aplicação e obtenção de diagnóstico. Novamente avaliado através de prova de conceito o software encontra-se operacional, sendo amigável ao usuário e com rápida curva de aprendizado.

Resultados e Discussão

O estudo teórico levou a estabelecer papéis relevantes a serem executados para a construção destes diagnósticos e ao tratar de mudanças e cultura organizacional torna-se relevante explicitar estes conhecimentos.

Várias abordagens foram estudadas e após detida análise, harmonização, eliminação, uma foi eliminada, outros aspectos ajustados e quatro dimensões foram estabelecidas como imprescindíveis ao sucesso do processo e da Instituição:

- Internacionalização Abrangente é o ponto central e objeto de estudo, que compreende a seis focos e a internacionalização responsável;
- O Conhecimento que é razão de existir deste estudo orientado ao ciclo de gestão do conhecimento e incorporação à cultura organizacional – capturando, representando e disseminando o conhecimento, orientando a construção da cultura organizacional;
- Os fatores Críticos de Sucesso e;
- A Governança Abrangente que envolve a GRC - Governança, Risco e Compliance.

Todo este arcabouço teórico foi apropriado e traduzido em termos práticos através de dois checklists que serão chamados de módulos compondo o Framework de Diagnóstico.

Um primeiro (módulo I) se presta a estabelecer os objetivos/focos almejados pela Instituição de Ensino superior registrando a percepção da comunidade sobre este caminho percorrido. Um segundo checklist (modulo II) estabelece um grau de evolução (em quatro níveis) indicando através da existência efetiva de ações e estruturas existentes desconsiderando apenas as percepções, desejos e intenções.

Proposto o Framework, foram submetidos a critérios de verificação por experts e efetuados os ajustes sugeridos. Para viabilizar sua execução foram transformados em aplicativos baseados na web, que coletam os dados, aplicam critérios de MCDA e Pareto (80/20). Através de prova de conceito, estes resultados foram ajustados e

aperfeiçoados de forma visual, revelando o diagnóstico daquilo que se pretende e de onde se encontra a IES.
O resultado das validações dos experts, foi o aperfeiçoamento do Framework de Diagnóstico de Internacionalização para a Educação Superior (HEID: Higher Education Internationalization Diagnostic).
Para facilitar sua aplicação e avaliação, tal framework foi implementado em forma de recursos de programação na web. O Módulo I, registra e seleciona os focos de atuação da IES tendo sido desenvolvido em linguagem moderna (com Django). O Módulo II, através de uma Planilha Google registra o trajeto percorrido pela Instituição durante os vários períodos de avaliação. Ambos apresentam recursos visuais para identificação de focos, prioridades e estágios.

Considerações finais

A análise teórica produziu a base para a elaboração dos aspectos práticos que devem ser considerados a todo instante quanto se trata de internacionalização de instituições de ensino superior.
Diversos conceitos teóricos foram apropriados no framework, incorporando teorias, modelos e outros frameworks, consolidados em um diagnóstico de Internacionalização. A despeito de verificação e validação apresentarem conceitos distingo (um interno e outro externo) ambos foram aplicados ao instrumento de diagnóstico proposto através de experts e prova de conceito e software que implementou estre framework em forma de software baseado na Web. Em todas as abordagens o objetivo geral está sempre permeado pela gestão do conhecimento na busca de explicitar as dimensões, os indicadores, disseminá-lo e fazer uso de modo que passem a fazer parte da cultura da organização.
Duas abordagens norteiam todo o processo. A primeira se refere ao processo de internacionalização onde o Modelo da Internacionalização Abrangente, com uma proposta de seis focos de atuação envolve um menu completo de atuação conforme os objetivos estabelecidos pela Instituição de Ensino Superior. A rigor este modelo abrange todos os aspectos teóricos e práticos envolvidos, mas carece de uma visão que busque em todos os níveis o que a Internacionalização Responsável utiliza como BASIC.
Ao aplicar-se provas de conceito, e mesmo nos experts, observou-se uma preocupação geral com “qual o tipo de internacionalização de buscamos em nossa Instituição?”. Esta pergunta ratifica o conceito de que a Internacionalização deixa de ser prescritiva (receita de bolo que todos devem seguir) e passa a ser uma escolha da Instituição. Uma segunda consequência é que esta pergunta faz emergir a Internacionalização Responsável com fator transversal a ser observado em todos os focos da Internacionalização Abrangente. Assim o BASIC, aborda:

(i) O equilíbrio (balance) de oportunidades, e a introdução de programas devem ser capazes de contemplar não apenas o intercâmbio norte-sul como os regionais (exemplo da América Latina).
(ii) A prestação de contas (accountability), que representa não apenas a retribuição dos investimentos da Sociedade ao processo, como sua apropriação em termos de conhecimento.
(iii) A sustentabilidade (sustainability) do programa de internacionalização bem como do ecossistema que lhe dá suporte e inclui também a explicitação do conhecimento obtido pelos participantes do programa.
(iv) A inclusão (inclusion) de indivíduos e instituições sem a segregação de pontos como sexo, país, continente, entre outros. Novamente o intercâmbio

norte-sul ou países desenvolvidos e em desenvolvimento se sobrepões aos regionais.

(v) O compliance que associado à governança proporciona a segurança à instituição em conformidade com toda a regulamentação e aparato legal. As organizações privadas, apresentam maior agilidade e confiança, uma vez que podem fazer tudo o que a Lei não proíbe diferente da área pública que é regida pela liberdade negativa (onde se pode fazer o que a lei explicita).

Uma vez apresentado o tema que se refere à internacionalização, a segunda abordagem é a razão de existir do trabalho – é a possibilidade de explicitar os conhecimentos envolvidos em um diagnóstico. Assim o aspecto de Gestão do conhecimento traduz a busca incessante do conhecimento teórico e transformando-o em aspectos práticos.

O conhecimento não é o benefício de uma ciência única. Qualquer ramo da Ciência possui seu próprio conhecimento valioso e o campo de estudo é considerado, afinal, um "ramo do conhecimento". Durante a vivência no EGC / UFSC foi explorado um amplo leque de ferramentas, procedimentos e rotinas de gestão, da liderança às ontologias, do empreendedorismo aos algoritmos. Essa foi uma gama muito grande de novos conceitos, e qualquer pessoa aberta a novas ideias sempre aproveitará isso.

A partir dessa visão, na execução do diagnóstico foi evidenciada a dimensão da Governança, Risco e Compliance (GRC) com vistas a estruturar-se para verificar e reportar à alta administração se o que foi proposto em termos de Internacionalização está sendo executado. Apurou-se que ética, transparência e os aspectos de comunicação, apontados como pontos fundamentais do processo foram incorporados a esta dimensão do framework. Naturalmente leis, regulamentos e demais normativas, como os relatórios que fazem parte de qualquer GRC são também destacados no framework.

Na abordagem inicial, se pretendia o papel do auditor, para verificar não apenas que estava sendo feito como deveria, mas do modo correto. Adiante ao aprofundar os estudos e apresentar os aspectos práticos em forma de checklist, concluiu-se que a Auditoria que pode fazer uso de aspectos de governança não seria uma dimensão abordada, pois a estruturação, comunicação e relatórios de auditoria, tanto interna como externa estão plenamente regulamentados tanto nas organizações públicas como privadas e com controles externos.

Os questionários e entrevistas com experts estavam ligados ao objetivo de verificação do Framework, expresso através de um checklist. No entanto foram abertas oportunidades de comentários e sugestões e que comentassem a experiência de internacionalização em suas Instituições. Ressalvamos que todos os participantes são de universidades públicas e dos questionários e entrevistas podemos destacar:

- Não houve qualquer menção a um sistema de recompensas no processo de internacionalização;
- Na internacionalização o protagonismo explicitado é de professores e alunos não existindo menção ao envolvimento do pessoal administrativo;
- Há várias exigências nos editais para mobilidade, no entanto não há um roteiro de capacitação aos envolvidos;
- O esforço maior fica a cargo do escritório de internacionalização não existindo um engajamento de toda a comunidade acadêmica;

- A colaboração e grupos de pesquisa internacionais deixam de ser prioritárias em função da falta de alocação de recursos. Burocracia e escassez de bolsas de pesquisa são fatores mencionados;
- Em geral, não há prioridades estabelecidas ou países e regiões alvo definidas para a mobilidade. À medida que convênios são firmados há uma busca em criar e atende demanda;
- Co-curriculum e dupla titulação não foram abordados como postos de destaque ou benefícios. O ponto central é a mobilidade e a dificuldade com idiomas é ponto comum, evidenciando preferências aos países lusófonos;

Depois de os especialistas revisarem as questões, um software foi projetado e construído. Qualquer projeto de software deve definir Requisitos (o que deve ser feito) conforme citado por O'Brien e Marakas (2011) e Laudon e Laudon (2018). Para tanto, foram especificados requisitos e utilizando interface web e modernas tecnologias de engenharia de software o sistema foi construído utilizando a linguagem Python e a interface do framework Django. Muitos aprimoramentos tecnológicos devem ser implementados, principalmente no que se refere à Interface Homem-Computador (HCI), mas nesta versão acadêmica, todos os artefatos estão totalmente funcionais. Embora testes profundos e extensos tenham sido feitos usando novas versões, a versão atual 0,6-1 é satisfatória. Os comentários principais são mais intuitivos e fáceis de usar. Foram feitas adaptações, mas podemos lembrar que este sistema deve ser utilizado por consultores que realizem atividades de internacionalização do Conhecimento, Governança, Ensino Superior.

Uma segunda lista de verificação foi implementada em planilha do Google e informa o estágio de implantação da IES (escala de quatro níveis). A estrutura, composta por 66 perguntas, permite um diagnóstico para saber o foco desejado da IES e o status de implementação do processo de internacionalização. As perguntas devem ser avaliadas e cada resposta será convertida em um ponto de pontuação. Após todas as respostas, a quantidade total de pontos é calculada. O total de pontos é convertido em uma escala de resultados: iniciantes, estão no caminho certo, bom trabalho, sucesso. Mesmo sendo testada, não é uma solução obrigatória, é apenas uma proposta. O uso intensivo e frequente desta lista de verificação permitirá melhorias e correções no futuro.

Com tal arcabouço teórico e conhecimentos agregados e organizados tem-se o framework para o diagnóstico da Internacionalização de Instituições de Ensino Superior.

Palavras-chave:
Quadro de diagnóstico de internacionalização do ensino superior; Foco na Internacionalização; Nível de Internacionalização do Ensino Superior; Ciclo de Gestão do Conhecimento para a Internacionalização do Ensino Superior.

ABSTRACT

Due to **Globalization** and the need for **Innovation,** the Internationalization of organizations becomes one of the main factors in the **Knowledge society**. In **Educational Institutions,** the Internationalization process is a **requirement** in all processes, and even **Accreditation** is involved. Immersing in an internationalization process, means to stablish motivations and start – this way, monitoring and diagnosis become vital to success. The **Question**: Under the prism of knowledge, which theories, models and processes can guide the diagnosis of Internationalization of Higher Education Institutions? From the **Knowledge cycle approach** (capture and extraction; dissemination and sharing; use and optimization) which theories, models, and frameworks can contribute directly to this kind of **Diagnosis**? A scoping review outlined the areas of (a) **Compliance** and **Governance** which establish the internal regulations and the support structure; (b) the **Audit** which verifies that "what has been written" is being carried out appropriately and in compliance with the relevant regulations and (c) the participation of **Leadership** and High Management in **Changes** which must be incorporated into the **Organizational Culture.** All these are grouped into a performance of **Consulting** by experts focused on the **Diagnosis of Internationalization process in higher education institutions.** A literature **Review identified** the gap that involves this type of diagnosis, consolidating the proposal of this thesis. As a result, framework dimensions were analyzed, adjusted and enhanced with six expert's validations and verifications (survey and interview). Due straight normative and external control, the Audit dimension was refused. All other dimensions were commented, and several issues included as a checklist. The enhanced framework by experts was translated into a new diagnostics framework, **functional web program** for Higher Educations Internationalization Diagnostic (**HEID**) and a concept-proof was carried out on it. A second checklist was implemented in a **Google spreadsheet** and states the implementation stage of HEI (four levels scale). The new framework enables a diagnostic result to know the HEI's desired focus and internationalization process implementation status. Concerning Higher Education Internationalization, this feature simplifies the important challenge of reaching out the **Organizational Knowledge** and incorporating it to the organizational culture - ***Knowledge is the reason for this study***.

Keywords:
Higher Education Internationalization Diagnostic Framework; Focus in Internationalization; Level of Higher Education Internationalization; Knowledge Management Cycle for Higher Education Internationalization.

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LIST OF ABBREVIATIONS AND ACRONYMS

AI Artificial Intelligence
AIF Author Impact Factor
Altmetrics Alternative metrics
A&HCI Arts & Humanities Citation Index
CAPES Coordination for the Improvement of Higher Education Personnel
CBR Case-based reasoning
CFS Correlation Based Feature Selection algorithm
CI Comprehensive Internationalization
CNPq National Council for Scientific and Technological Development
CPqAM Aggeu Magalhães Research Center
CV Curriculum Vitae
CVs Curricula Vitae / Curriculums Vitae
DBSCAN Density-based Spatial Clustering of Application with Noise
DC Degree of Collaboration
DGP Directory of Research Groups
DORA San Francisco Declaration on Research Assessment
EASST European Association for the Study of Science and Technology
EGC Graduate Program in Engineering and Knowledge Management
EM Expectation Maximization Algorithm
FSS Fractional Scientific Strength
FP Fractional Productivity
GS Google Scholar
HEIHigher Education Internationalization
Higher Education Institution
HEIPHigher Education Internationalization Process
HGP The Human Genome Project
IBL Instance-Based Learning algorithms
ICCBR2016 The Twenty-Forth International Conference on Case Based Reasoning
ID3 Iterative Dichotomiser Algorithm
IF Impact Factor
IG Information Gain Algorithm
JIF Journal Impact Factor

KBS Knowledge-based System
KE Knowledge Engineering
KM Knowledge Management
LIBER Association of European Research Libraries
LOOCV Leave-One-Out Cross-Validation
MERG Microcephaly Epidemic Research Group
ML Machine Learning
MCTI Ministry of Science, Technology and Innovation
MCTIC Brazilian Minister of Science, Technology, Innovation and Communication
MTD Most Typical Deviation
MTV Most Typical Value
NB Naïve Bayes
NN Nearest Neighbor
OECD Organisation for Economic Co-operation and Development
PhD Doctor of Philosophy Degree
REF UK Research Excellence Framework
R&D Research and Development
SCI Science Citation Index
SCOPUSElsevier's Scopus-abstract and citation database of peer-reviewed literature
SNA Social network analysis
SSCI Social Sciences Citation Index
S&T Science and Technology
ST&I Science, Technology and Innovation
STI Science, Technology and Innovation
STI2014 2014 International Conference on Science and Technology Indicators
STI2016 2016 International Conference on Science and Technology Indicators
UFSC Santa Catarina Federal University
UK United Kingdom
USA United States of America
WW II Second War
WWW World Wide Web
SCI Science Citation Index
WoS Web of Science

SUMMARY

1 INTRODUCTION

1.1 HIGHER EDUCATION INTERNATIONALIZATION PROCESS (HEIP)

Nowadays internationalization is one of the most relevant subjects in Higher Education discussions. Lebeau (2018, p.77) describes its impacts in learning and teaching, in Research groups and all services in a Higher Education Institution (HEI):

> As the word “internationalization” is becoming more prevalent in higher education institutions, stakeholders may want to know the actual impact of internationalization on higher education institutions and how internationalization has made a difference in teaching, learning, service, and research.

One of the most visible and disputed aspects refers to academic **mobility**, that is the displacement and absorption, during a certain period, of students, teachers and technicians among institutions. For Stallivieri (2017) the academic mobility is one of the strengths of internationalization and its preparation is fundamental:

> The Brazilian or even foreign educational institutions increasingly perceive that if there is not a correct investment and an adequate preparation of the groups of exchange students, the activities proposed in each of the programs are totally or partially unsuccessful. (STALLIVIERI, 2017, p.19)

This way, when talking about the internationalization of higher education an immediate connection with how mobility is made. “Although student mobility has been the most visible face of higher education internationalization, much wider attention is now being given to the dimension of internationalization {…]” (HUDZIK, 2015, p.18), there is an important question: Why internationalization?

A large set of rationales helps to explain and understand the reasons for adopting an internationalization process. To achieve higher international academic standards, earning money, getting along to new trends, techniques and tools for teaching and research, or even government development politics searching for a new country position in the global revolution. All the way, motivation and rationales are not the central point of this document, as each HEI can develop or adopt its own reason and will have the opportunities and challenges of their choice. So, considering and respecting any University choice, this work fulfills a lack in the decision process which is: - how to diagnose the higher education internationalization process adopted.

Another important view refers to the concepts: globalization, internationalization, knowledge and innovation. Although these terms are imbricated,

and moving the minds of all managers, they must be studied attentively. These terms will be explored later but first it is necessary to differentiate globalization from internationalization and then Gacel-Avila can support with:

> The concept of internationalisation differs dialectically from that of globalisation because it refers to the relationship between nation-states, which promotes recognition of and respect for their own differences and traditions. By contrast, the phenomenon of globalisation does not tend to respect differences and borders, thus undermining the bases of the very same nation-states, and leading to homogenisation. In this sense, internationalisation can be understood as complementary or compensatory to globalizing tendencies, given that it allows for a resistance to the latter's denationalising and homogenising effects (GACEL-ÁVILA, 2005, p.124).

An important distinction must be done: Globalism and Globalization (the implicit meaning in Internationalization of Higher Education). Globalization implies the material aspect of trade, capital, and the flow of people. The cognitive aspect is also affected by the perception that the "global" also affects the "local" – "think global, act local". DERANI (2004) highlights the concepts already adopted by several authors with a clear distinction between Globalism (idea of a global market with economic prevalence), and Globalization (where isolation is fiction and there are multidimensional aspects involving culture, ecology and also economy). In a paradigmatic way Ramos (1981) focuses on the same theme emerging a new meaning to the Wealth of Nations with substantive rationality in complementation to economic rationality.

Considering the HEIP it is necessary to notice the multidimensional aspect of it. All the way, resources are not unlimited (economic issue), mainly in Educational areas, and results must be predicted and measured. Accordingly, the aspects of planning and monitoring are mandatory nowadays.

Selecting, evaluating, and aggregating useful models in Higher Education Internationalization (HEI) is a challenge. Thus, identifying common points, and diverse concepts is a great issue when constructing an institution's knowledge, transforming knowledge, from tacit to explicit.

There are some well-known Global Universities rankings and all of them consider several important parameters to compare each one. When adopting the Internationalization process, a Higher Education Institution may find useful models and, in spite of thousands of institutions, each one has a different process. For instance, the focus of University A can be more distinct considering University B.

Ranks are specially important, external comparing each IHE, however the diagnosis and evaluation of their own goals and outcomes in the Internationalization process require looking for results in a specific focus. These specific assessments considering a personal diagnosis require several approaches. The organization's culture, organization’s knowledge and expert’s orientation may be a fast track for the IHE success, considering that all over the world, thousands of universities have adopted models, frameworks, checklists to gather a notorious level of internationalization.

A framework for internationalization, from the point of view of knowledge, seems to be a very useful companion, as well as a diagnostic considering its own purposes is fundamental to know its evolution. That is what this thesis is about.

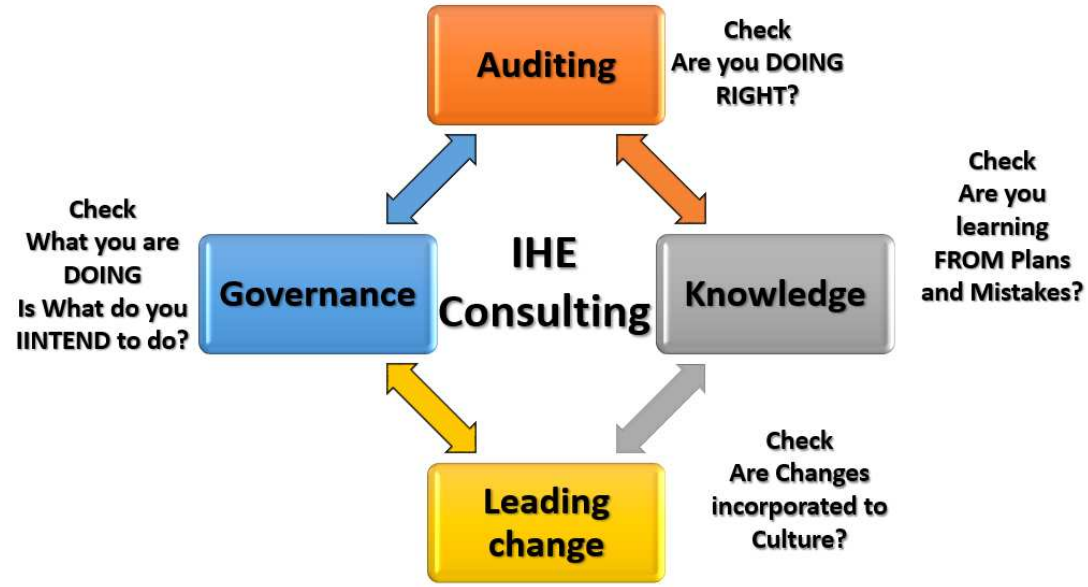
1.2 THE CONTEXT

Considering an environment of limited resources, the challenge is to estimate the cost-benefit with the purpose of obtaining better results. When starting the internationalization process, academic and administrative managers are not used to dealing properly with it. There are a few opportunities in which the HEI can rely on internal experts in this field of knowledge.

One of the recommended alternatives is the **expert consulting services** in this area since experts can be of help explaining motivations, resources, and critical factors. The help from experts can reduce costs and time, and also better results can be reached in a shorter time. Training is another clear advantage to gather information to the institutional knowledge about Internationalization. Observing the main actors in the Higher Education Internationalization Process (HEIP), some roles can be performed by the consultant and are represented in Figure 1 – Roles in the IHE Consulting.

- Governance;
- Auditing;
- Leading Changes & implementation;
- Knowledge & Organizational Culture;
- Expert consulting (which is a mixed action involving the other roles).

Figure 1 – Roles in the IHE Consulting



Source: Author's Creation (2019)

1.2.1 Role1 – The consultant as a governance/compliance

This role requires, besides this field of literature and practical experience, to promote adequate organizational structure to the purpose and plans. Verifying if rules and norms are structured and accountable is deeply needed in this role; conformity in fulfilling the defined requirements is also required.

The consultant acting as a member of governance and checking compliance, should examine the guidelines and plans to observe:

i. Are guidelines, plans and actions coherent and adherent to the mission, vision, and values of the HEI?
ii. Is the organizational structure suitable for purposes, objectives, and goals?
iii. What is "written" is being followed?
iv. Are the acts suitable for accountability?

1.2.2 Role 2 – The consultant and the auditing processes

Once the proposed activities are defined and are carried out, the new Consultant's role is to observe if the actions are being performed properly. Verifying what is effective, efficient, the good practices of the area and if they are according to the normative and legal aspects is a fundamental task.

Based on plans and actions, the Consultants must develop a methodical examination and a review of accounts. They also must check security, verify and keep track of the financial, organizational, operational, and strategic goals.

At this moment the consultant acts as an **auditor**; in this case, identifying existing and potential weaknesses is the challenge.

1.2.3 Role 3 – The consultant and the leadership of the changes.

Innovation is the central theme for organizations. So, driving people to the right solutions and incorporating the changes into the organizational culture is one of the important goals to innovation.

The literature on "changes" and changing management has shown a lot of efforts during the last two decades. An example of this are the publications of Professor John Kotter, from Harvard University; Nowadays he has expanded the scope of the 8-Step Process from its original version in Leading Change (2014).

Changes should be planned. In addition, resistance to change must be avoided and the leader's actions are decisive in it.

Figure 2 – 8-Step Process in Leading Change

Source: John Kotter (2018)

Engaging people to understand and act with well-understood practices and dealing with needs, expectations, and compensation is one of the main tasks of the leader (NORTHOUSE, 2016; MICIĆ, 2015; ERICKSON, 2010).

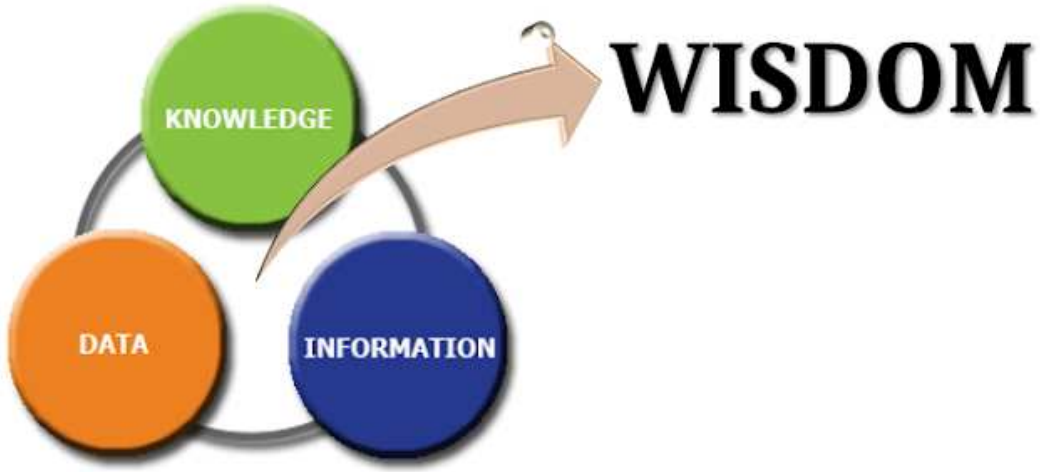
The consultant should notice that the conditions of change have been properly generated. That means a lot of effort in the management of participation, the involvement of all staff, and monitoring of results, as well. Despite high technology, all that matters must be done by people. Consider checking if this stage was properly implemented by the leaders (including the board and senior managers).

1.2.4 Role 4 – Knowledge Management & Organizational Culture

By recognizing our "knowledge society" intrinsically knowledge is admitted as the propellant spring of organizations in relation to competitiveness. Knowledge is also a fundamental part of the innovation processes.

In this role, the objective of the expert consultant is to validate the knowledge cycle allowing knowledge to be captured, registered, and disseminated, being incorporated into the culture of the Organization (Figure 3 - Virtuous cycle of knowledge).

Figure 3 – Virtuous cycle of knowledge



Source: Created by the Author (2019)

Checking data conditions, transformations of the information and knowledge usability is common sense, but it is a very challenging discipline. Data must be

captured and understood. Information must be a relevant and updated set of data and *Knowledge* means cognition and fully acquaintance and it could be tacit and explicit (BRACKETT, 2014).

The requirements of KM have an ISO[1] regulation; on the other hand, Organization Culture requires changes. John Kotter[2] has a consistent contribution in this area. At this time, the consultant must check the process of Internationalization and verify the KMC that corresponds to the IES stage of Knowledge process and leading changes.

1.2.5 Role 5 – Expert consultant

One of the important issues in the internationalization of higher education refers to developing a good plan. Goals and objectives are defined and steps are predictable. As we will see later, The Higher Education Internationalization Process - HEIP has several concepts and steps according to each author.

After starting or in the middle of HEIP, one difficulty is determining the position of the institution in the process. Knowing its actual position is a main requisite for planning the next goals. When an expert studies it and a diagnosis is provided, the results are better.

An Expert's consultancy is a usual service, mainly regarding quality assurance, accreditation, etc. In the internationalization process it is a brand-new service, mainly for the expert's skills required. These skills are related to a strong experience and knowledge of the HEIP and also must transit in other areas like auditing, compliance, leadership, and knowledge cycle.

The fifth expert's role is a mix of the other roles (leading changes, knowledge cycle, governance, risk and compliance, and auditing) and that means a consultant's role.

The main results in this area are the organizational culture amendments, and then new structure, leadership, motivation, and new (and high) standards must be developed. As one can see, this is a continuous effort and an external expert's consultancy service is recommended.

[1] ISO 30401-2019 Knowledge management systems - requirements

[2] Since 1989 Dr Kotter (Harvard) has published studies about strategies to change the organizations.

1.3 THE PROBLEM

As seen in the previous context that summarizes the problem of this work, then emerged a question which defines the issue to be solved:

Problem: ***Which theories, models and processes can drive the diagnose in the Internationalization of Higher Education Institutions?***

To solve this problem, it will require a multidisciplinary task involving several areas of science and interdisciplinarity, as well.

In the Post-graduation program of Knowledge Engineering and Management– PPEGC, interdisciplinarity is a crossing concept in the research areas and classes. Each subject of the program considers not only its truths but also the truths existing outside their context (PACHECO, TOSTA, SÁ FREIRE, 2010; PACHECO, 2013). The objective of the interdisciplinarity in the PPEGC is the reconstruction of the whole, as its meaning in the complexity of the tissue was exemplified by Morin (2006). In other words: “It is the reconstruction of a complex and comprehensive approach in all matters that matters'' (Author, 2019).

Integrating all these points involves a different methodological process in each knowledge area. Not only complexity in thinking, but the difficulty to integrate methods could be a challenge for a researcher. There is not a bulletproof interdisciplinarity methodology, and probably it will not consider its own definition.

1.4 GOALS

1.4.1 General goal

From the perspective of Knowledge, to propose a conceptual framework to the Internationalization of Higher Education Institutions Diagnostic (HEID), considering its own focus, and concerning advisory roles.

1.4.2 Specific goals

- To identify the models and frameworks related to the Internationalization of Higher Education - IHE.
- To identify frameworks, routines, processes, and procedures related to good practices of auditing, governance, change management and knowledge management.
- To construct and suggest a conceptual framework involving the 5 roles of the diagnosis' consultancy.

1.5 JUSTIFICATION: RELEVANCE, ORIGINALITY, AND CONTRIBUTIONS

1.5.1 Solution

There is no diagnostic tool which considers a particular preference of a Universtiy. The private ones, despite all regulations, can define specific goals and outcomes with a large level of independence and sometimes maximizing profits. So a Board of Directors ou even the owner itself, can define the main focus of IHE as Mobility or Research and consider other focuses as secondary. Even public institutions may consider Publications and International Research much more important and reliable according to their budget. The Higher Education Institution problem at this point,is to consider its own reasoning and values and not a fully internationalization process.

A solution to the problem involves a framework construction. Like any framework, it will be developed with the study of theories, models, and other frameworks. As it will be seen, to carry out a diagnostic view of the process, a very useful help will be provided by experts who must know a lot about HEIP and also must follow rules of auditing, leadership state, compliance and governance – which implies **acting as an expert consultant**.

An assessment framework can be an interesting solution, mainly considering all these dimensions, and also the main focuses of the Higher Education Institution. To support this task some roles will be considered, and the consultancy service is an advantage, mainly when starting the Internationalization Process.

These skills and actions support the reputation of the University, the knowledge issues, and publications involving these topics. The Internationalization of Higher

Education and Knowledge are frequent and growing subjects in scientific publications all over the world. The HEIP is nowadays aimed by every Higher Education Institution due to requirements of globalization, innovation, marketing, and sustainability.

1.5.1.1 Using models and Frameworks for analytical study

To justify the elaboration of a framework as a solution for the proposed problem, a brief view of models and Frameworks will be described.

For people involved with Knowledge Engineering, Information Technology, and Computing, the term "framework" has a **practical** meaning, involving models, tools, processes, and relations. Frameworks are widely applied in Software Engineering especially in design and implementation with object orientation systems.

From a practical Information Technology (IT) point of view, the framework is represented by a **skeleton** of applications, providing the coding **portability** for the basic **functions** of a program and allowing **adjustments** and adaptations. The domain of the problem to be solved will be intrinsically linked to a model or meta-model defining a structure and operations with data.

Even so, models of Higher Education Internationalization are required. As the knowledge approach is central, Knowledge Life Cycle is required too. It is also necessary to conduct a diagnostic evaluation to determine stages of the Internationalization Process. As it is unusual for the internal people it is necessary to consult an expert.

This kind of consultancy is not an easy role – one must have profound knowledge in the internationalization process and also transit for auditing, compliance, leadership and changes. Due to globalization, innovation and, of course, internationalization, Higher education Institutions need to promote the organization's changes and that means organizational culture. One of the most important challenges is knowledge – a basis for our society. This is what this thesis presents: a knowledge based approach for an internationalization process of higher education, driven by a framework.

1.5.1.2 Mandatory: higher education expertise and other disciplines transit

The expert's consultancy in the academic area requires a lot more from the consultant because it constitutes a knowledge center, and theoretical references must be deeply considered. This kind of arrangement requires an extensive background in practical acts and its connection with theory. Analyzing models and verifying the adherence of the HEIP stage to theory, is a desired result.

In this solution of problems all elements of internalization should be analyzed and must be adequate. The relevant processes must be listed and the construction of a framework emerges as an exhaustive and dominant task. Lessons learned, the best practices are some of the knowledge artifacts that must be carried out.

It is worth noticing that it is not only the guidelines, models and processes of the internationalization of the HEI, but the construction of a framework with processes, models, and tools. This involves the five roles as in Figure 1 – Roles in the IHE Consulting: auditing, governance, knowledge management, changing leadership and the role of the consultant which involves all of them.

1.5.1.3 Defining relations: Models & Frameworks

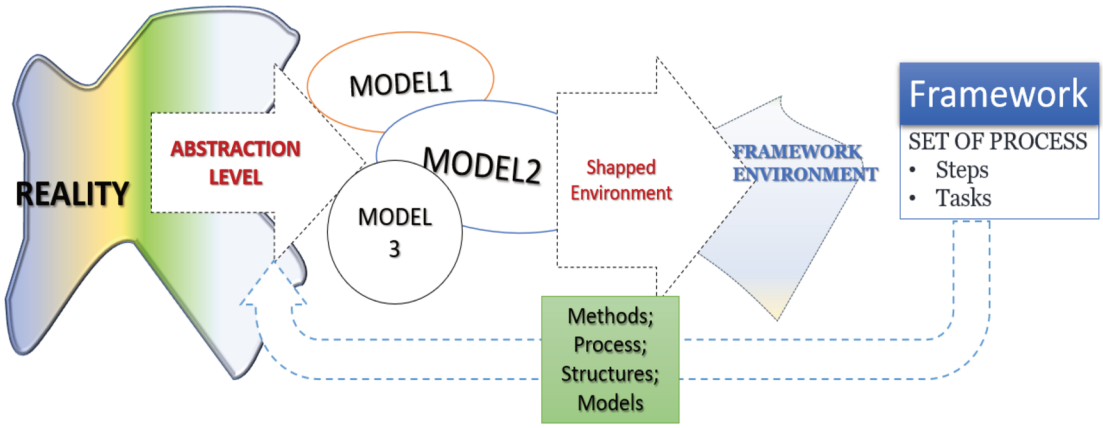
There are several concepts and definitions and they are found in theoretical reference, however misunderstandings are common when one refers to Models, Frameworks and sometimes Methodology. So, after a lot of authors' concepts, the adopted concept included in this document is represented in Figure 4– Models & Frameworks relations and means:

- Models usually define the environment.
- Environment means specific actions, procedures, and tasks,
- All these can be included in a framework,
- A framework itself can generate a new model

Models and Frameworks are recursive concepts.

Referring to frameworks, one will need broader contexts that establish their relationships at a higher conceptual level. Figure 4 is a good representation of these concepts.

Figure 4 – Models & Frameworks relations – single view



Source: The author's creation (2018)

The models represent an abstraction of reality. In a large sense, models usually express a system or methodologies or even a taxonomy. The model should extract practical aspects and relations from reality and deliver "value".

In order to generate value, a Model has as fundamental requirements the theoretical consistency, predictive power and, of course, must be adherent and coherent with reality. All these must be settled according to its approach, purpose and its level of abstraction.

1.5.1.4 Models in the Knowledge Management Cycle (KMC)

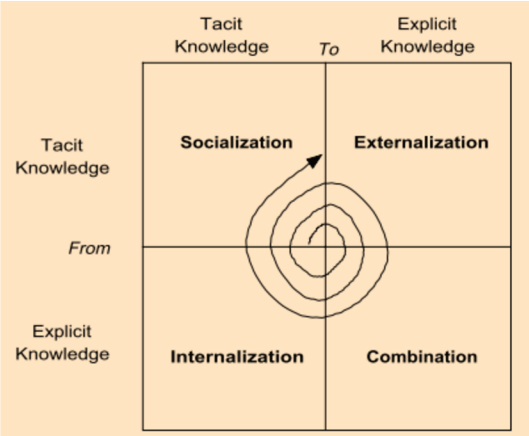
> Innovation, it is easier to explain than to achieve knowledge, but all boards of all companies agree that "Today, knowledge is a key enterprise resource" (SCHREIBER, 2000, p.2). During 2002, Julian Birkinshaw and Tony Sheehan in a MIT article stated:Most executives today recognize that their organizations must be able to manage knowledge effectively — it's a strategic imperative. Just how they should go about developing that ability is the challenge. (BIRKINSHAW; SHEEHAN, 2002, p.1)

The theory of organizational processes differs from Explicit to Tacit Knowledge. Nonaka and Takeuchi (1995) represent an extensive study of organizational knowledge creation. Since then, a lot of scientific works emphasize the value orientation that knowledge management should have in business or the business-value chain (PORTER,1985).

Nonaka and Takeuchi (1995) (Figure 5) and Schreiber (2000) (Figure 6) clarify the importance of organizational knowledge as a key resource for organizations. The

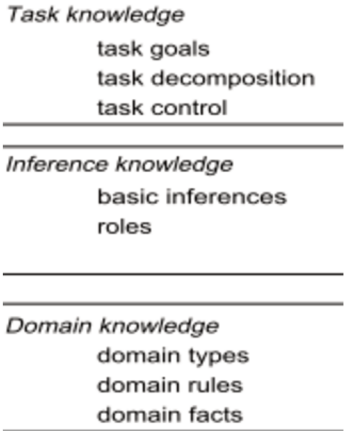
theory of knowledge construction processes and the distinction between tacit and explicit knowledge are detailed by Nonaka and Takeuchi (1995), while Schreiber (2000) introduces the CommonKads, and establishes a model with three categories related to the structures of knowledge:

Figure 5 – Dynamic model of Knowledge creation



Source: Adapted from Nonaka and Takeuchi (1995)

Figure 6 – General categories of the Knowledge model



Source: Adapted from SCHREIBER (2000, p.90)

Concerning Figure 5 and Figure 6, based on Nonaka and Takeuchi (1995) and Schreiber (2000), it is necessary to describe the knowledge creation spiral:

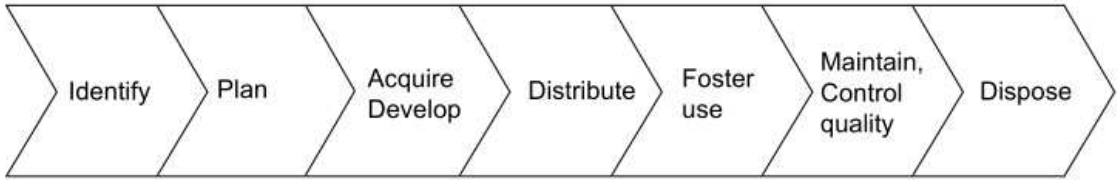
a) **Socialization** - from tacit to tacit knowledge.
   Teaching is better than speaking.
b) **Externalization**: from tacit to explicit knowledge.
   Describing the rules of Knowledge-intensive practices is needed.
c) **Combination**: from explicit to explicit knowledge.
   The integration of explicit knowledge can generate new ones.
d) **Internalization**: from explicit to tacit knowledge.
   Doing this step, one can carry out a task successfully without “thinking a lot” about it.

When talking about concepts and representations of concepts, there is another important concept in Knowledge, which refers to the term “ontology”. In the field of Knowledge Engineering, concept of ontology emerges and it will be presented in its comprehensive and popular definition: “An ontology is an explicit specification of a conceptualization” (GRUBER, 1993, p.3).

There are some visual representations, notations, and rules. When presenting a Framework proposal, it is common to use a Cognitive Map (CMAP) also called a Mind Map to represent the relations and concepts of HEI.

From the models (Fig 5 and Fig 6) of Nonaka and Takeuchi for knowledge and knowledge model, Schreiber establishes a first framework that characterizes knowledge management and it is described in detail in his book (CommonKads). The purpose of this framework is to cover the complete life cycle of knowledge in an organization, serializing tasks (Figure 7).

Figure 7 – Activities in knowledge management



Source: Activities in knowledge management and the associated knowledge-value chain (SCHREIBER, 2000, p.72).

Thus, in CommonKads emerges “a simple, but very **practical definition of knowledge management**, it is ‘*a framework and tool set for improving the organization's knowledge infrastructure, aimed at getting the right knowledge to the right people in the right form at the right time’* ” (SCHREIBER, 2000, p. 72; emphasize by us)

Schreiber (2000) grouped the common activities listed by authors at that time and Figure 7 exemplifies them:

- Identify internally and externally existing knowledge;
- Plan what knowledge will be needed in the future;
- Acquire and/or develop the needed knowledge;
- Distribute the knowledge to where it is needed;
- Foster the application of knowledge in the business processes of the organization;
- Control the quality of knowledge and maintain it;
- Dispose of knowledge when it is no longer needed. (SCHREIBER, 2000, pp. 70-72)

A literature review (using bibliometric data) is a good way to justify a research subject. In the beginning, this review was conducted using four Science databases (Web of Science - WoS, SCOPUS, EBSCO, and IEEE) and we have designed four stages, too.

1.5.2 An integrative Literature Review

During the first stage, several searches were conducted to find the Higher Education Internationalization publications. Using this data, one can observe the growing importance of the subject during decades, mainly after 1990. The “HIGHER EDUCATION INTERNATIONALIZATION” or “INTERNATIONALIZATION OF HIGHER EDUCATION”. Also, complementary and related subjects were included like “GLOBAL UNIVERSITY” or “WORLD-CLASS UNIVERSITY”.

In all queries some connectors were applied like AND, OR, NOT, etc. and Wildcards (*$?)[3] when supported. Looking for “UNIVERSITY” or “UNIVERSITIES” can be done using “UNIVERSIT*” a match word with wildcards. After several queries using native engines of each base and composed string, the “query string” was chosen. The full query string is more useful and can be carried out in several scientific databases.

After these initial queries (a scope review), the SCOPUS and WoS were the most significant database for this subject research. Using WoS, results are more significant and recovered documents were more adequate and all significant results were included. After several searches defining a scope and using more specific strings with non-obvious selections and several connectors, the use WoS was a better way to get effective results in this focus. Education science (linked to Higher Education) is much more significant in WoS when compared to SCOPUS (Social Sciences dominance).

Once the main subject was exposed, it is important to try finding the terms CONSULTING, AUDITING, LEADERSHIP, KNOWLEDGE, GOVERNANCE & COMPLIANCE linked to Higher Education Internationalization – HEI. Rare publications are found in some areas (like consulting). Some results are excluded because the subjects referred only to “ranking”, or “finance auditing” or even “religion”. All abstracts were considered and almost all articles were read (except the excluded ones).

Some seminal articles and books indicated by experts were included and also the main references of the author’s publications are considered, as well. This way the queries resulting documents were considered as well as a lot of authors and scientific literature were valuable for this research.

[3] The asterisk (*) represents any group of characters, including no character. The question mark (?) represents any single character. The dollar sign ($) represents zero or one character.

The relevance and originality were supported by literature review and they are demonstrated in quantitative and graphic results. Frame 1 contains the database search strings.

Frame 1 – Higher Education Internationalization query in Science databases

QUERY STRING OF INTERNATIONALIZATION OF HIGHER EDUCATION	Database	
General Topic: Higher Education Internationalization		
("global university*" OR "world%class university*" OR "higher education internationalization" OR "internationalization of higher education") After analyzing recovered documents (considering this thesis focus) we've found better quality results using WoS and SCOPUS databases.	**WoS** 1043	**SCOPUS** 1332
	EBSCO 1690	**IEEE** 209
	WoS 1032	**SCOPUS 1332**

Source: Created by the Author (2019) considering the English, Spanish; Portuguese and French languages

Now mixing terms and delimiting to WoS and SCOPUS Elsevier research data base. A bibliometric data was built with the retrieved information.

Frame 2 – Union queries of CONSULTING, AUDIT, LEADERSHIP AND GOVERNANCE

Refers to search for both terms		
SPECIFIC QUERIES	**WoS**	**Scopus**
("global universit*" OR "worldclass universit*" OR "higher education internationalization" OR "internationalization of higher education") AND "CONSULTING" ➔ "consultation" (medical) & "counseling" were found and not used	0	0
("global universit*" OR "world%class universit*" OR "higher education internationalization" OR "internationalization of higher education") AND "AUDIT"	7	7
("global universit*" OR "world%class universit*" OR "higher education internationalization" OR "internationalization of higher education") AND "LEADERSHIP"	29	45
("global universit*" OR "world%class universit*" OR "higher education internationalization" OR "internationalization of	40	67

higher education") AND ("GOVERNANCE" OR "COMPLIANCE")		

Source: Author creation

The next step refers to including or rejecting articles. After reading the abstract (mainly for exclusion) or the text of each article of the "specific queries", the selected documents are listed in Frame 3.

Frame 3 – Selected articles of specific queries

Internal ref.	AUDIT	
N/A	Monitoring System through Improved Governance and Audit: The Case of Malaysian Public Universities By: Kasim, Nawal; Shamsuddin, Jamali; Kamaluddin, Amrizah; et al. Conference: 27th International Business Information Management Association Conference Location: Milan, ITALY Date: MAY 04-05, 2016 INNOVATION MANAGEMENT AND EDUCATION EXCELLENCE VISION 2020: FROM REGIONAL DEVELOPMENT SUSTAINABILITY TO GLOBAL ECONOMIC GROWTH, VOLS I - VI Pages: 1315-1325 Published: 2016	The paper highlights and serves as a wake-up call for practitioners in auditing of public universities to work towards a paradigm shift from the current auditing practice to more effective practice. (R11)
R05	Transnational education as an internationalisation strategy: meeting the institutional management challenges By: Stafford, Sally; Taylor, John JOURNAL OF HIGHER EDUCATION POLICY AND MANAGEMENT Volume: 38 Issue: 6 Pages: 625-636 Published: 2016	SEE NEXT LINE (REDUNDANT)
LEADERSHIP		
R05	Transnational education as an internationalisation strategy: meeting the institutional management challenges By: Stafford, Sally; Taylor, John JOURNAL OF HIGHER EDUCATION POLICY AND MANAGEMENT Volume: 38 Issue: 6 Pages: 625-636 Published: 2016	The paper aims to offer a theoretical insight into governance and leadership of transnational programs and thereby provide practical guidance for strategy formation.

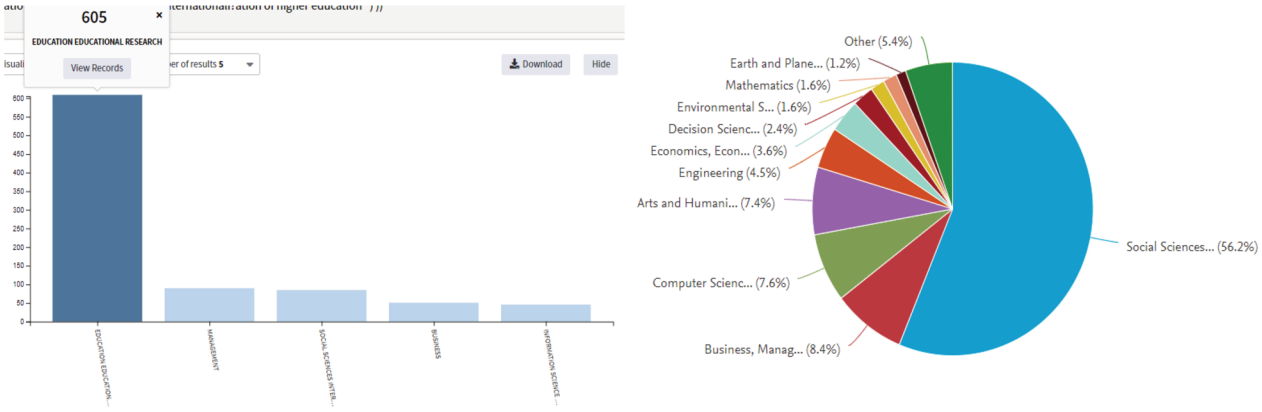
R06	ACADEMIC FREEDOM, SHARED GOVERNANCE AND LEADERSHIP IN EXCELLENT ACADEMIC INSTITUTIONS By: Miller, Richard Conference: Annual International Conference of the Eurasian-Higher-Education-Leaders-Forum Location: Astana, KAZAKHSTAN Date: JUN 12-13, 2013 Sponsor(s): Eurasian Higher Educ Leaders Forum EURASIAN HIGHER EDUCATION LEADERS FORUM: GLOBAL TRENDS IN HIGHER EDUCATION AND THEIR IMPACT IN THE REGION Pages: 13-19 Published: 2013	This paper presents some practical lessons in leadership and governance learned during the establishment of Olin College of Engineering in Massachusetts.
R02	Prestige auditing and the market for academic esteem: a framework and an appeal	The paper closes with an appeal to soft-variable evaluations in higher education contexts
GOVERNANCE, RISK & COMPLIANCE		
R11 A	Malaysian Public Universities Governance System: A Compromise between Collegiality, Autonomy and Corporate Management Approaches	The trends and issues on institutional governance, management, and administration

Source: Author creation (2019)

1.5.3 Visual representation OF SCIENCE WEB and SCOPUS data

The main area of HEI is the “EDUCATION EDUCATIONAL RESEARCH” but “MANAGEMENT” and “SOCIAL SCIENCES INTERDISCIPLINARY” where relevant (Figure 8).

Figure 8 – Number of publications by Knowledge



Source: Web of Science (2019) and SCOUPS (2019)

The dominance area corresponds to Social Science, Education, and Management. Education areas are dominant in WoS and it is directly linked to the thesis' theme. Detailed information about Science Areas is listed in Table 1, as well as the number of publications and corresponding proportions are presented, however only areas which presented percentages superior to 3% are listed.

Table 1 – Number of publications by Knowledge Area

Field: Web of Science Category	**Recs**	**% of** 1,032
EDUCATION EDUCATIONAL RESEARCH	605	58.624%
MANAGEMENT	86	8.333 %
SOCIAL SCIENCES INTERDISCIPLINARY	81	7.849 %
BUSINESS	47	4.554 %
INFORMATION SCIENCE LIBRARY SCIENCE	42	4.070 %
COMPUTER SCIENCE INTERDISCIPLINARY APPLICATIONS	41	3.973 %
EDUCATION SCIENTIFIC DISCIPLINES	36	3.488 %

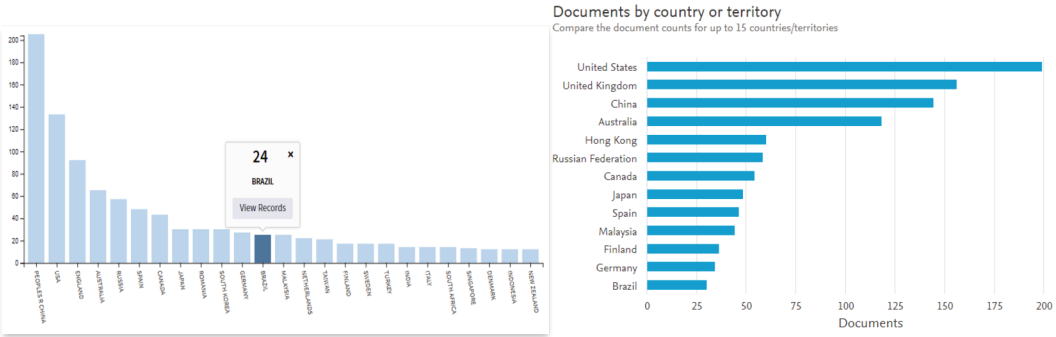
Source: Web of Science (2019)

When talking about countries (Figure 9), there is a significant number of publications from Republic of China , followed by USA and England (

Table 2 - Number of publications by Country-region). The two main economic nations are the first ones, and this is not by a single chance – that means efforts for it. In a

recent publication about China's Innovation and Tech Parks (published CiKi[4] 2018 proceedings) one can observe the growing investments in Knowledge.

Figure 9 – Number of publications by Country-region



Source: Web of Science (2019) and SCOPUS (2019). Note: 24 countries in Web of Science (2019) and 15 countries in SCOPUS (2019) – related do December-31 of 2018.

Table 2 - Number of publications by Country-region. For example, Brazil is placed in the 12th position, with an amount of 24 publications.

Table 2 – Number of publications by Country-region

Select	Field: Country/Region	Record Count	% of 1,032
1.	PEOPLES R CHINA	204	19.767 %
2.	USA	132	12.791 %
3.	ENGLAND	91	8.818 %
4.	AUSTRALIA	64	6.202 %
5.	RUSSIA	56	5.426 %
6.	SPAIN	47	4.554 %
7.	CANADA	42	4.070 %
8.	JAPAN	29	2.810 %
9.	ROMANIA	29	2.810 %
10.	SOUTH KOREA	29	2.810 %
11.	GERMANY	26	2.519 %
12.	**BRAZIL**	**24**	**2.326 %**

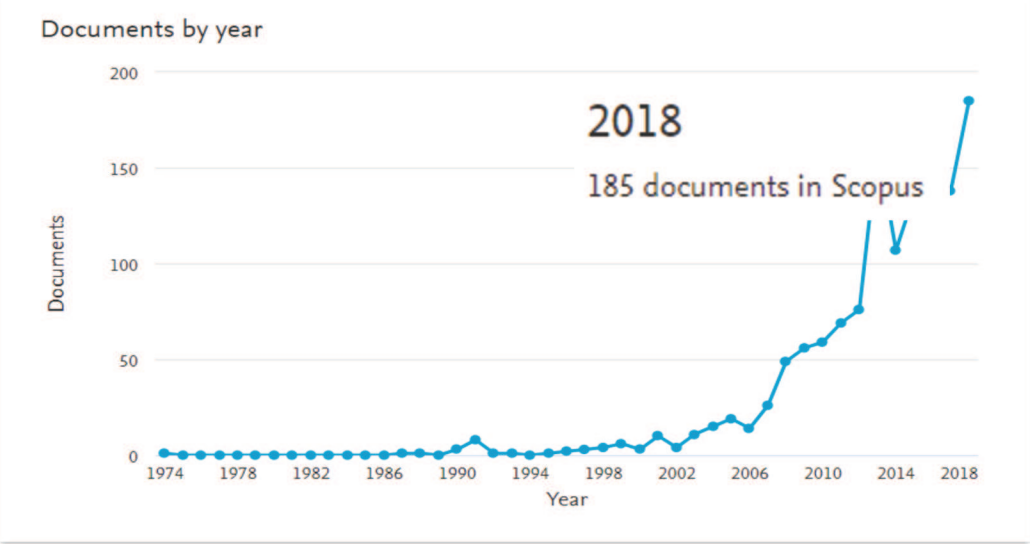
[4] The International Conference on Knowledge and Innovation (Congreso Internacional de Conocimiento e Innovación (ciKi) is a continental event that aims to promote conceptual, methodological, and practical development in Knowledge Management, Intellectual Capital, and Innovation Management.

13.	MALAYSIA	24	2.326 %
14.	NETHERLANDS	21	2.035 %
15.	TAIWAN	20	1.938 %
16.	FINLAND	16	1.550 %
17.	SWEDEN	16	1.550 %
18.	TURKEY	16	1.550 %
19.	INDIA	13	1.260 %
20.	ITALY	13	1.260 %
21.	SOUTH AFRICA	13	1.260 %
22.	SINGAPORE	12	1.163 %
23.	DENMARK	11	1.066 %
24.	INDONESIA	11	1.066 %

Source: Web of Science (2019)

Finally, the exponential growth of publications, mainly after 2002, indicates the relevance of the subject (Frame 4). The rate of specific publications considering the "5 roles" of this thesis and the complete absence of the main subject is significant evidence of its originality.

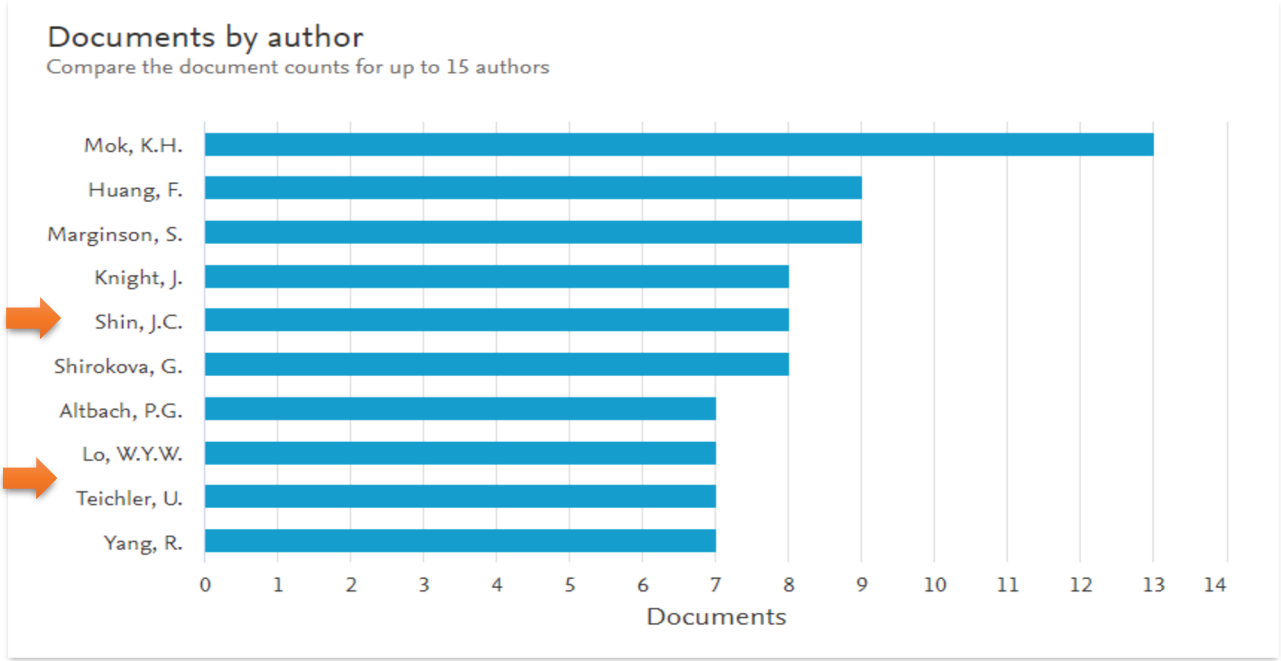
Frame 4 – Number of publications by year



Source: SCOPUS (2019). Note: WoS is very similar with an asymptotic curve

As it can be observed, the success of the Chinese development addressed to the Society of Knowledge increased a lot the publications of HEI. Some HEIP well-known researchers, Jane Knight and Altbach are the seminal authoring publications (Figure 10 - Number of publications by author) and appear in the first 10 authors; The Chinese origin of surnames are predominant among currently authors.

Figure 10 – Number of publications by author



Source: SCOPUS (2019)

Results in searching bring up articles about evaluation of Higher School Institutions, with models and frameworks (as related during the Literature Review). Concerning Internationalization, it was possible to find out that: the models and definition vary, mainly after 1990 – emerging new internationalization concepts. In literature, there is no diagnosis of the internationalization process considering the choices and purpose of the institution.

Considering older Internationalization prescriptive statements, which define each thing to be done and the several focus to be explored, new concepts will treat each Institution as unique, with particular interests, outcomes, values and goals. The assessment of internationalizations should consider the defined focus as a mainstream and the others as complementary. This kind of view differs from evaluating all focuses in the same way and with the same scale. For the sake of a qualified and enhanced

result, diagnosis should consider HE preferences and that probably means a qualitative approach.

1.6 ADHERENCE TO GPKEM / PPEGC

The Graduate Program in Knowledge Engineering Management – GPKEM or PROGRAMA DE PÓS-GRADUAÇÃO EM ENGENHARIA E GESTÃO DO CONHECIMENTO – PPEGC (Portuguese original), was the first Graduate Program in Knowledge Engineering Management created in Brazil (2004) [...]. GPKEM has won prizes and established national and international partnerships in the last quadrennial's evaluations carried out by CAPES[5] (level 6 in a maximum of 7). (PPEGC/UFSC, 2018).

The Program has addressed its topics of interest to the contemporary global agenda, such as cognition, applied intelligence, corporate education, production systems, total quality, environmental management, sustainability, entrepreneurship, innovation, among others (PPEGC/UFSC, 2018).

Concerning the PPEGC adherence, it is important to make evidence that this thesis could not be successfully carried out in a singular disciplinary area. The approach is turned to knowledge and the basis will be addressed in this subsection concerning three topics, as recommended by Pacheco, Selig, and Kern (2016).

I. **Identity**: How does the object of my thesis relate to the object of training and research of the EGC[6]?

II. **The structural context** in the EGC: How does my thesis contextualize in the areas of concentration and in the lines of research of the EGC?

III. **Factual reference**: What previous studies were carried out in the EGC that contextualize the same factors of identification of my work (e.g. thematic, methodological approach, application domain)?

(PACHECO; SELIG; KERN, 2016, no page)

The starting point was to identify previous studies related to this research subject. This way, studying and analyzing dissertations and theses from PPEGC, has built a factual report based on these documents.

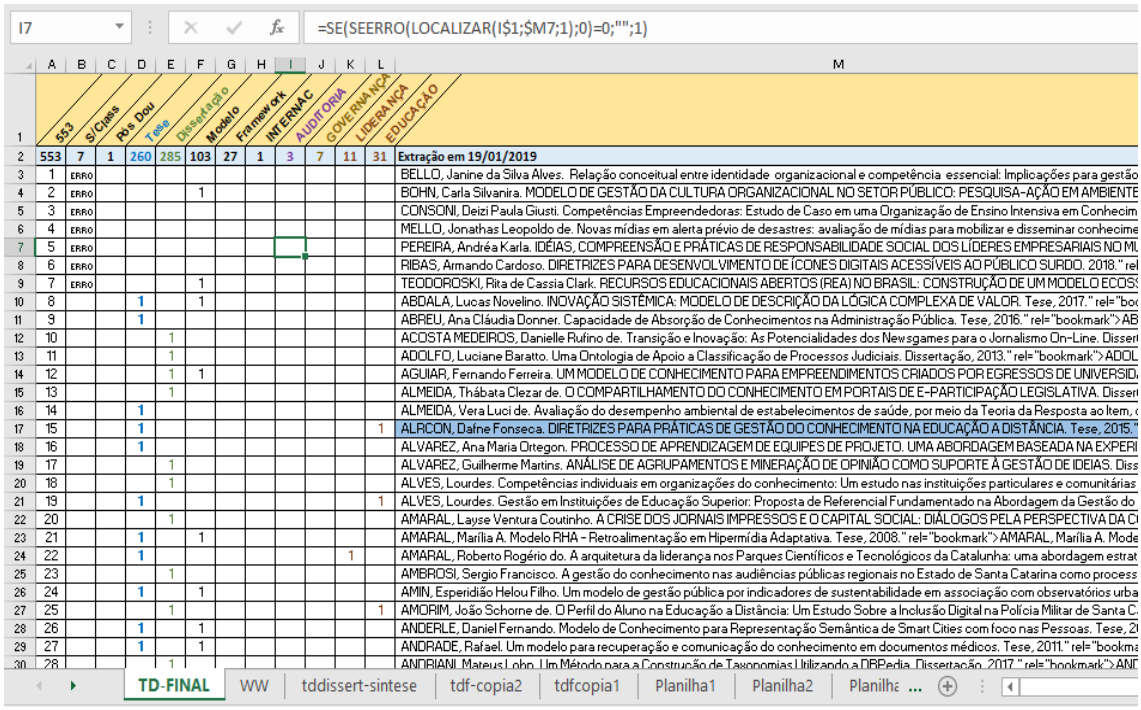
[5] CAPES: Coordenação de Aperfeiçoamento de Pessoal de Nivel Superior is a government agency linked to the Brazilian Ministry of Education in charge of promoting high standards for post-graduate courses in Brazil.

[6] EGC – Engenharia e Gestão do Conhecimento, is an Academic Department of Universidade Federal de Santa Catarina (UFSC) and refers to Higher Education, Graduate Progam and Posdoctoral area in Knowledge Engineering, Knowledge Management and Media.

The first point was to access the website btd.egc.ufsc.br, which is a base of dissertations and thesis of the Graduate Program in Engineering and Knowledge Management at the Universidade Federal de Santa Catarina (PPEGC/UFSC). Once the website was accessed, all documents were extracted and using a free software, all authoring data and abstracts were built in an Excel table. These data are demonstrated in Figure 11 which is a sample of the document.

After extracting more than 550 scientific publications from PPEGC (Graduate Program in Knowledge Engineering and Management) some interesting analyses were developed.

Figure 11 – Sample of data extracted and summary of looked up queries.



Source: Author creation from primary data grabbed from http://BTD.EGC.UFSC.BR.

First, strong preference for models and frameworks was detected in the PPEGC studies. This is a natural predisposition in the area, mainly considering that a model is a representation of some Knowledge from some reality. Frameworks and models are useful in any of the three interdisciplinarity concentration areas of PPEGC/UFSC (Table 3 – Analysis summary of EGC's dissertations and thesis).

Table 3 – Analysis summary of EGC's dissertations and thesis

	Search string	553	ADJUST
GRADUATED LEVEL	S/Classifficação inicial	7	0
	Pós Doc	1	1
	Tese	260	263
	Dissertação	285	289
KNOWLEDGE REPRESENTATION	Modelo	109	103
	Framework	31	27
SPECIFIC LINKED SUBJECTS	INTERNAC	1	
	AUDITORIA	3	
	GOVERNANÇA	7	
	LIDERANÇA	11	
	EDUCAÇAÇÃO	31	
	Jan/19th/2019 extraction data		

Source: Author creation from primary data of BTD/EGC extracted in Jan/19th/2019

This Table 9 is a summary of an extraction analysis using abstracts and full text. The analysis begins with an automatic search at the keywords (Portuguese) in a table containing 553 extracted data. These documents refer to the final document required for the Master, Doctor or Post-Doctoral degree in a graduate program of EGC.

All these documents are in a base of dissertations and thesis called "Base de Teses e Dissertações – BTD", and it can be searched on the website: http://btd.egc.ufsc.br/, which is the EGC repository for thesis (master's degree) or dissertations (doctoral and postdoctoral degree)[7].

Initially, 1 Postdoctoral document, 260 documents for Doctorate and 285 for master's degree; 7 mistakes were found and adjusted. Using another search there were 103 models and 27 frameworks found after a final checking. An amount of 31 documents were also linked to EDUCATION (EDUCAÇÃO), 11 related to LEADER ("líder"), 7 related to GOVERNANCE (governança), 4 related to AUDITING ("auditoria")

[7] We adopted a United States convention. In Brazil it is the opposite: dissertation is for Master's and thesis is for Doctor's.

and 1 related to INTERNATIONAL (“internacional”) themes like organizations internationalization or international bases.

Thus, we have a factual reference identifying previous studies involving education, governance, models, and frameworks (among others) related to this research in terms of thematic, methodological approach and knowledge domain.

Regarding the context of this research in the areas of PPEGC (Frame 5), one can situate this in the main area of Knowledge Engineering (KE) when it seeks to extract and represent knowledge through models and frameworks. Additionally, it involves the Knowledge Management (KM), when establishing “processes or products efficiently made resulting from relationships among people and non-human agents, aiming at value generation (PPEGC; 2018)”. Observing Knowledge Media (KMed) concepts referring to “knowledge sharing and dissemination” and intending “to think, communicate, disseminate, preserve, apprehend and create – knowledge itself”; in such manner, it is possible to consider this research, soft linked to the Media concentration area, too.

Frame 5 – Three interdisciplinarity concentration areas of PPEGC/UFSC

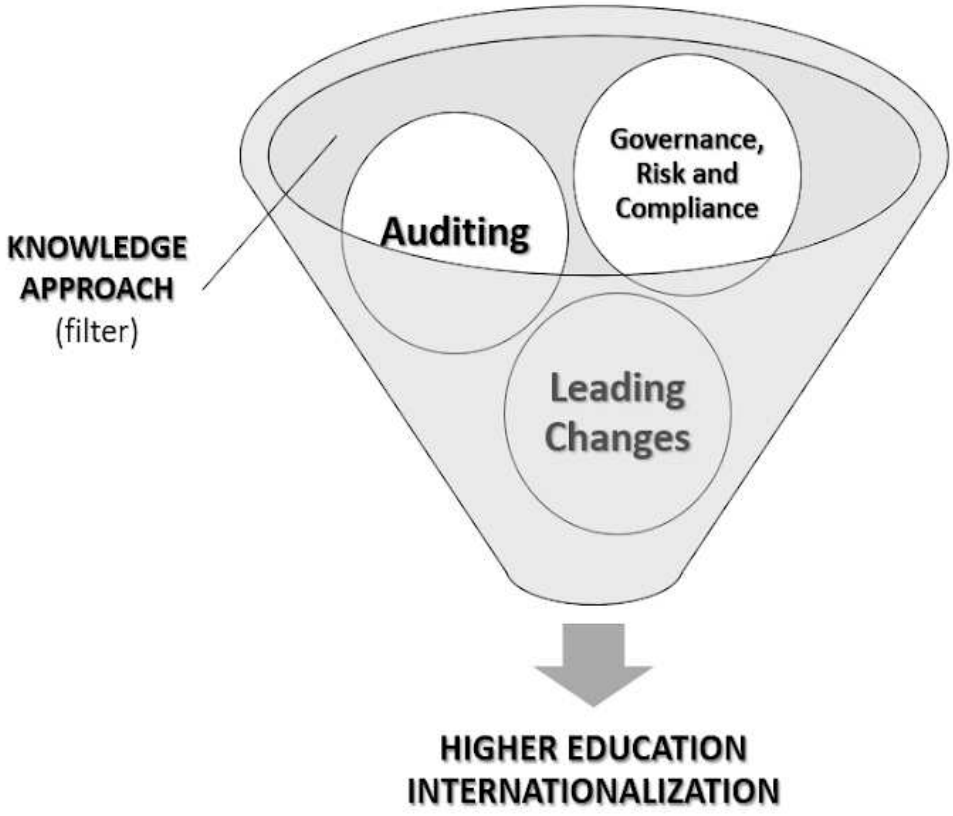
Areas	**Description**
Knowledge Engineering (KE)	The Knowledge Engineering pathway defines knowledge as “processes or products efficiently made resulting from relationships among people and non-human agents, aiming at value generation.” Based on the cognitive approach, the objectives of the Knowledge Engineering Concentration Path include researching and developing methods, techniques, and tools for building models and knowledge systems, within intensive knowledge activities.

Knowledge Management (KM)	The Knowledge Management pathway defines Knowledge as “processes or products efficiently made resulting from relationships among people and non-human agents, aiming at value generation.” Having the introduction of conceptual and methodological bases for the implementation of knowledge-based organizational management. Therefore, it aims to transform individual knowledge into collective and corporate knowledge. Based on the autopoietic approach, contents and research carried out focus on corporate knowledge, on the economy, on the organization, and on the knowledge worker. It allows the understanding and emphasizes the importance of determinant factors of transformations that are taking place in the current society and that are leading humanity from the industrial age into the knowledge age. This area studies conceptual and methodological bases for the implementation of knowledge-based organizational management. Therefore, it aims at transforming individual knowledge into collective and organizational knowledge, contents taught, and research carried out by this area focus on organizational knowledge, economy and the knowledge worker. In this sense, the Knowledge Management Concentration Pathway stimulates the understanding of key factors for the transformations which are taking place in contemporary society, for instance, the transition from the industrial era to the knowledge era.
Knowledge Media	The Knowledge Media pathway considers "knowledge as the result of the meeting of human or nonhuman actants in the generation of value”. This concept guides the area to work on knowledge sharing and dissemination, development, and evaluation of media which are aimed at catalyzing the ability of groups to - think, communicate, disseminate, preserve, apprehend and create – knowledge itself. It studies issues related to the philosophy of science, epistemology; sociology of communication; inclusion and innovation processes; cognition theories; techniques and production equipment of this kind of messages and the theories which study them.

Source: From EGC/UFSC (2019) extract from http://www.egc.ufsc.br/en/pos-graduacao/program

All the thesis is turned to Higher Education Internationalization considering the expert’s service from the knowledge point of view, as Figure 12 demonstrates.

Figure 12 – Integrate vision using knowledge view



Source: Author's creation.

1.7 METHODOLOGICAL APPROACH

This section defines the formal classification of this Scientific Research and the path to collect data, analyze them and the conclusions. First of all the steps are described (Figure 13); next a conceptual representation (Figure 14) of what was done and finally methodology is categorized with a classification.

This research was developed according to the following steps and it is represented in (Figure 13):

i. After an extensive search in science databases and literature some gaps were found, and research context and problem were selected. The mainstream are HEI and Knowledge.

- ❶ Context Challenges: Higher Education Internationalization (HEI) outcomes, Globalization pressure, Knowledge effects, Innovation, and changes.
- ❷ Where we are and where we intend to be? (There was no answer for HEI)
- Question: How to get a diagnosis, considering HEI issues?

A study of diagnostic requisites was done – metric, consistency, and factors.

ii. Integrative and narrative review was done searching for the answer. A mixture of competencies (roles) were found and detailed in order to get responses.

- ❸ Literature: Theories, Models and Frameworks. Best Practices and Lessons Learned. Organizational Knowledge and Culture. Framework and Diagnostic Issues
- ❹ Consulting roles or competencies were useful to a HEI diagnosis?
- Consulting must be updated to: Knowledge + Culture + Leadership & Changes + Governance + Auditing. The ideal feature to blend all these factors is a framework (so framework was studied too).

iii. To this achievement objectives were formulated, and the main result should be:

- ❺ Goal: From the perspective of Knowledge, proposing a conceptual framework to the Internationalization of Higher Education (IHE) diagnosis, considering its own focus, and concerning advisory roles.

  The main goal was divided into specific goals. Each specific goal intends to get partial responses.

  - Identifying the models and frameworks related to the Internationalization of Higher Education - IHE.

- Identifying frameworks, routines, processes, and procedures related to good practices of auditing, governance, change management and knowledge management.
- Constructing and suggesting a conceptual framework involving the capabilities/roles of the diagnosis' consultancy.

iv. Efforts were made to discuss, harmonize, mix and even abandon features and tools. After a deep research, theories were discussed, missed, harmonized, and abandoned. A HEI structure for universities was involved as well, with the need of a Governance contribution to propose a Framework.

- ❻ Blending Theories, Frameworks, Methods and Structure to **Proposing a DIAGNOSTIC Framework**

v. After proposing a solution Framework, it must be verified according to theories and models. First of all, colleagues, professors, and teachers were engaged, and the first feedback was received. Again, a pilot was constructed and criticized.

- ❼ VALIDATION AND VERIFICATION:
- Survey and Interview with experts and managers.

vi. All comments and evaluations were compiled and analyzed. Influence factors and suggestions to improve were incorporated. Items were modified and even abandoned.

vii. Additionally, two software instruments were designed, developed and tested. A web-based (qualitative) and a single sheet (quantitative) to diagnose..

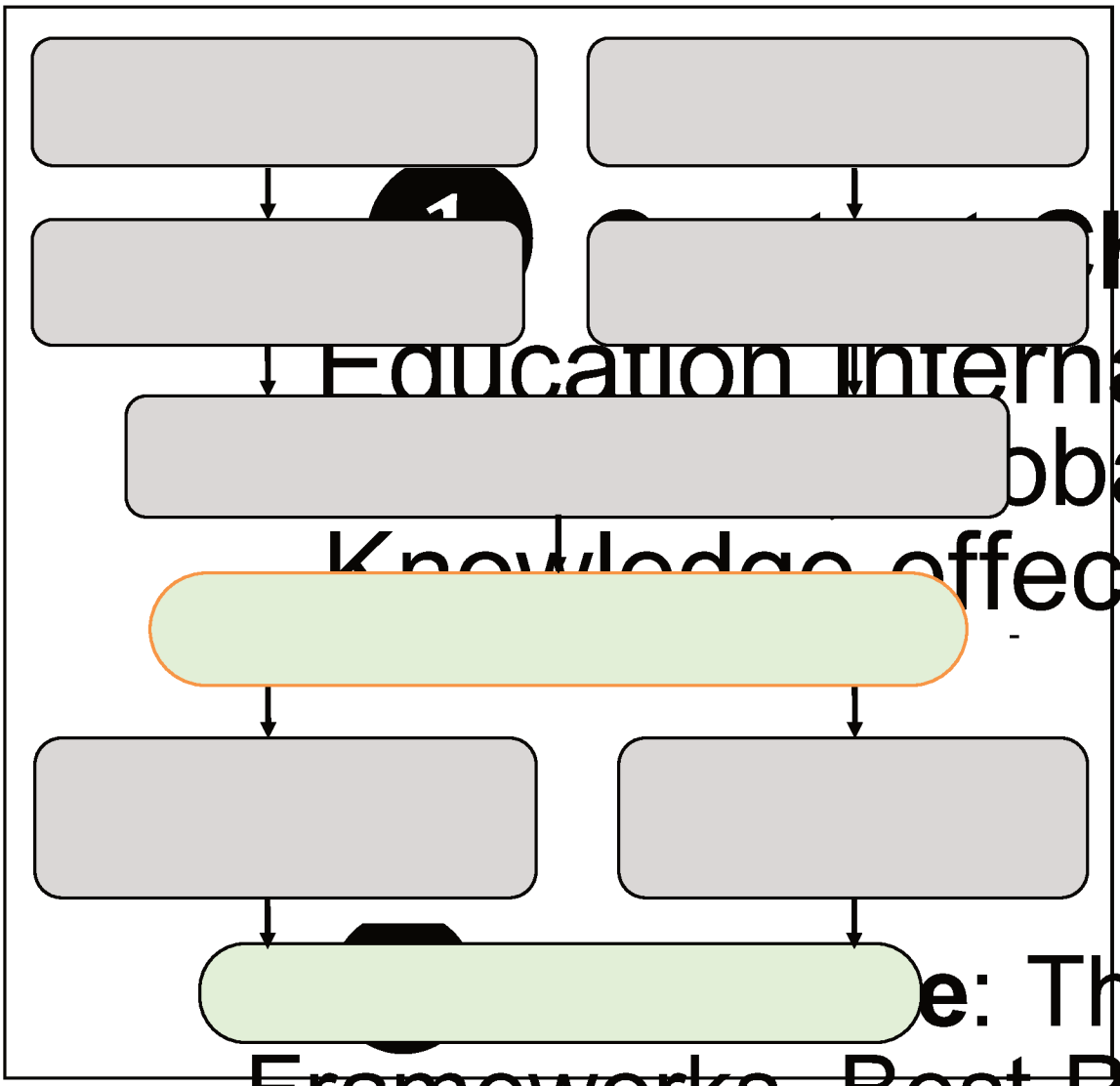
- ❽ Compiling and analyzing influence factors and suggestions to improve
- Software development (additional)

viii. Framework and Software were enhanced after incorporating changes and new testing was done.

- ❾ Adequacy and enhancements of Framework. ❶
- Extra software verification with concept proof.

A literature review on challenges, competences and to get a selection focused on the diagnosis of Higher Education Internationalization.

Figure 13 – Research approach phases



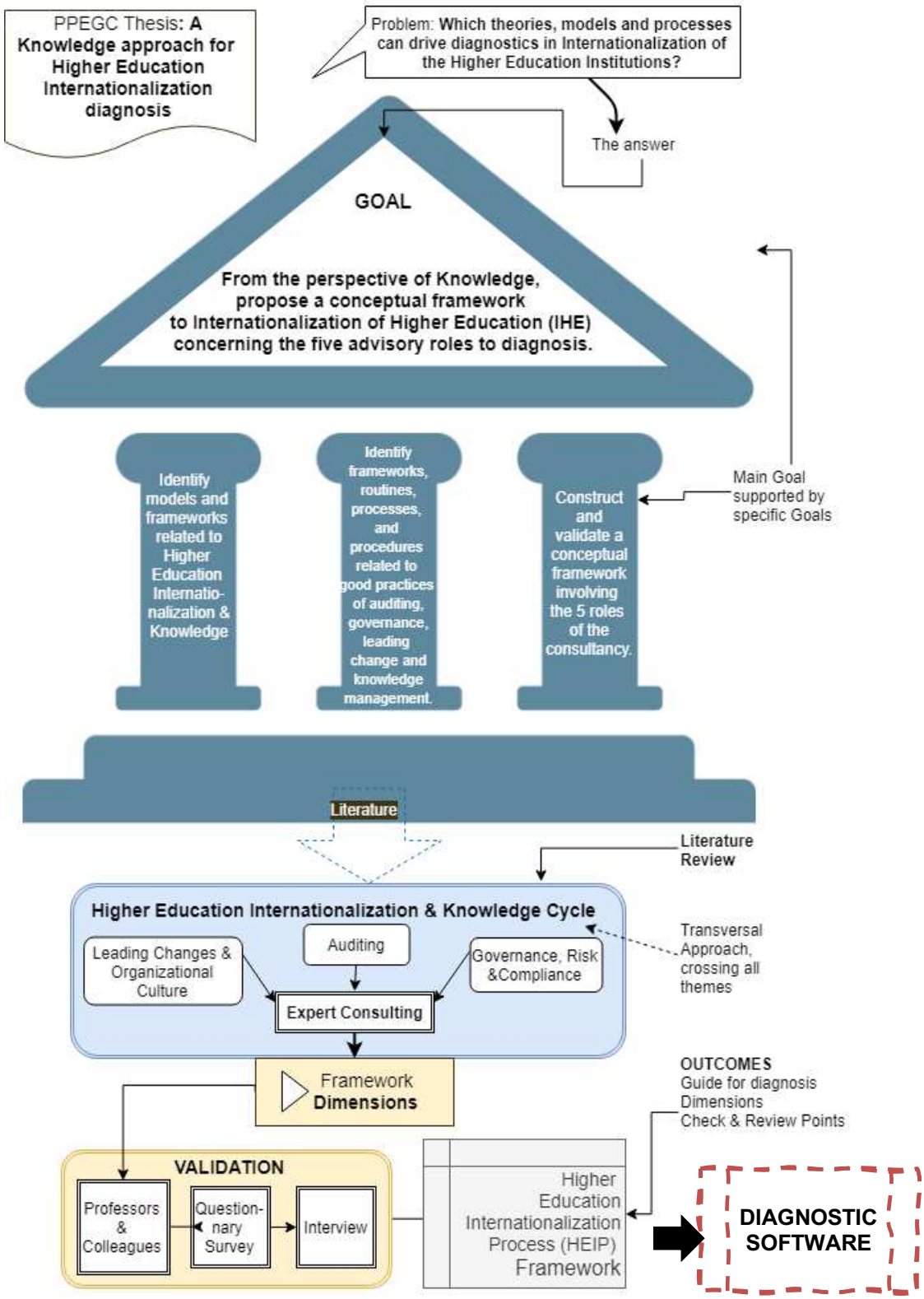
Source: Created by the Author (2020)

The following sequence is applied to develop the research; these steps include the diagnostic software, called later as HEID and a Google sheet. Conceptually after identifying a literature gap problem, it was defined and goals are described - Figure 14. It is represented in a visual form. After research and selection diagnostic issues were established and a framework was proposed based on models, theories and frameworks.

The framework proposed has two modules and four dimensions. The first one registering the Higher Education Perceptions and identifying strong and weak points. Another objective registers effective actions to advance in the Internationalization process.

A pilot was constructed and tested. After expert validation and adjustments an extra step was done with a software design and implementations.

Figure 14 – Visual representation of methodological steps



Source: Created by the Author (2019)

1.7.1 Methodological Classification

According to the study of several authors, research could be described as a systematic collection of data, interpretation, and evaluation, in an organized attempt to find answers to worthwhile questions, using predefined and documented methods and procedures.

Another thing is that a methodology is required for any science and even within a single area of science some subjects such as Political Science, Anthropology, Economics, History there are some distinct research methods. “[…] research methods that involve the forms of data collection, analysis, and interpretation that researchers propose for their studies" (CRESWEL, 2017, p.45)

Then, when talking about formal research methods’ classifications it is necessary to consider each section of a dissertation or thesis, taking into consideration that some parts are based on bibliography or documents research or even on experimental events; other sections could have observation or surveys as their main methods. A diagnostic evaluation, considering University outcomes and purposes is needed and can be found in Framework Module I proposition.

When observing the everyday researcher life, we found Global University ranking, but no one considered the main objectives defined by the Institution itself. So Nobel prizes are considered in spite of the fact that there’s no interest/or conditions to reach any. For instance, an international research group is a priority to a specific university, while another HEI considers mobility the main objective.

All these will be considered, and it was built in some steps, represented in chapters of this work. Since the method can be applied on each step of the Research they are represented by chapters in this paper (Frame 6).

Frame 6 – Thesis structure and methodological classification

Chapter	**Subject**	**Formal methodological classification**
General	Preliminary considerations	Descriptive
1st chapter	Introduction	Descriptive and Explicative
2nd chapter	Literature Review	Descriptive and Explicative

3rd chapter	Incorporated Models and Resulting Framework	Descriptive and Explicative
4th chapter	Framework Consistency	Descriptive and Explicative
5th chapter	Final Considerations	Descriptive and Explicative

Source: Author (2019)

By using a formal methodological classification of this scientific research, one can state the classification as Frame 7.

Frame 7 – General methodological classification

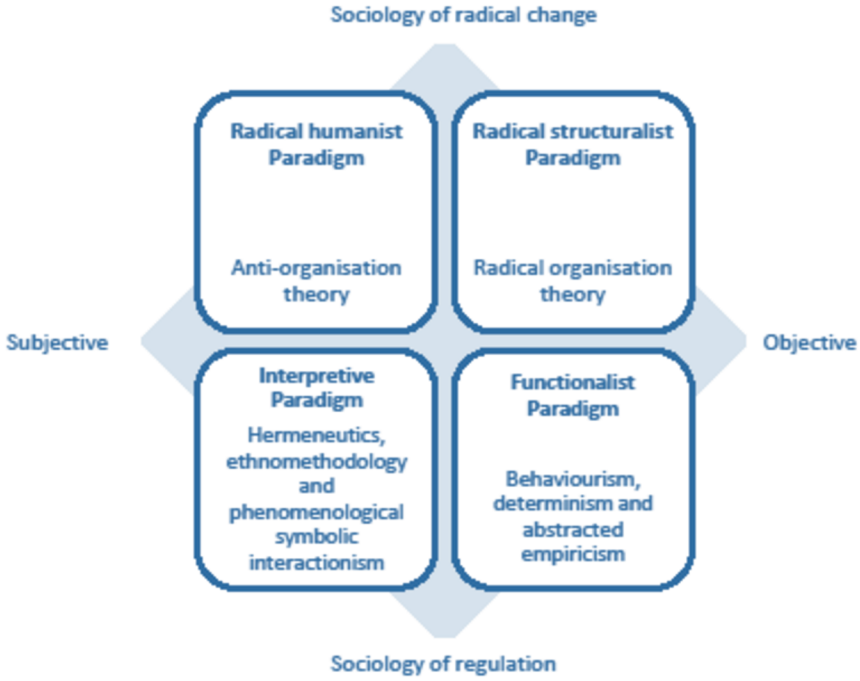
Nature of Investigation: **Applied**	Applied research is designed to solve practical problems and acquire knowledge about the real world.	CRESWELL el al. (2007) KOTHARI (2004) GIL (2010)
Objectives of Investigation: **Descriptive**	Descriptive research is conducted to describe the characteristics of a population or phenomenon. It illustrates relevant topics, and it is required to evaluate cause and effect.	LAMBERT & LAMBERT (2012); GIL (2008) MONSEN, VAN HORN (2007)
Approach of investigation: **Qualitative**	Qualitative research uses several inquiry strategies. It means observing, collecting and interpreting data. It refers to the subjective meanings, definitions, symbols, and metaphors.	CRESWELL; CRESWELL (2017) LEWIS, Sarah (2015) DENZIN (2008) CRESWELL et al. (2007) DENZIN; LINCOLN (1994)
Sources, **Procedures** & Strategy of Investigation: **Documents Bibliography Survey**	Bibliographic: It enables the researcher to be in touch with the existing publications Documentary: It is based on materials that have not yet received an analytical treatment. Survey: It involves direct interrogation (through a questionnaire)	CRESWELL; CRESWELL (2017) KOTHARI (2004) LAKATOS& MARCONI (2003)

Source: Created by the Author (2019)

1.7.2 Morgan & Burrell ‘s World View

By using Morgan & Burrell sociological theories (Figure 15) which are based on four major paradigms, this thesis relies on a qualitative view with a “sociology of regulation”, so with a “Functionalist Paradigm” and an “Interpretative Paradigm” as well. That means there are rational human actions and beliefs, but the researcher tries to observe "on-going processes" to better understand individual behavior (as a consultant).

Figure 15 – Four paradigms in the organizational theory of Burrel & Morgan



Source: Adapted from Burrell and Morgan (1999, p.22) and Morgan (1980, p,14).

This document relies on a **qualitative** method (CRESWELL, 2009) and has a **functionalist and interpretive view of the world** (BURRELL; MORGAN, 1979; MORGAN, 1980). It is divided into 5 sections and the results have practical applications, thus generating **applied research** (a framework).

1.7.3 Methodological path

The specific research of this document will have as outcome a framework structured in five general steps, as described in Frame 8.

Frame 8 – The methodological path and outcomes: framework design

Steps	Goals
I. Context & Problem	Definition of problem Research question Goals Justification Range & boundaries of research
II. Literature Review: Models, frameworks and procedures	Higher Education Internationalization Knowledge Cycle Auditing Governance & Compliance Knowledge Management & Organization Culture Leading Changes and Leadership **Consulting**
III. Framework Construction	Defining: Environment Procedures Methods Processes
IV. Framework Validation / Verification	Verifying internal consistency Validation of external consistency Analysis and adjustments
V. Software design and implementation	To make evaluation user-friendly and fast. This step was not prior defined.
VI. Findings & Final considerations	Findings and contributions to Science and Practice.

Source: Author creation

A special design for this thesis involves the Framework criteria assessment. During this step, initially, we will use our professors, advisors, and colleagues' suggestions. Next, a general assessment will be conducted applying a questionnaire and a survey will be submitted to people linked to the HEIP theme.

The proposal is to evaluate the framework's activities performance, functionality, applicability, reuse, reactions, barriers and satisfaction. To analyze these topics, it will be essential to have in mind the first part of the questionnaire which includes the profile of the respondents and the HEI characteristics (experience related to the area, public/private, etc.). A Likert scale and open-end questions will be used.

The information obtained will identify the weaknesses and strengths of the framework. The first part of the questionnaire (skills and profile) will show the value of

each answer. After this analysis, an especial round will be carried out with experts, using a questionnaire and interview whose purpose is to harmonize, enhance and adapt the framework regarding the survey responses and the experts' advice.

1.8 THIS DOCUMENT STRUCTURES

Below is shown a brief view of this document's structure (Frame 9 – Structure of this document) which is detailed as follows.

Chapter 1 is the introduction, where the research problem to be solved is stated. This chapter includes the research questions, goals, justification, scope and limitations, adherence to PPGEGC/UFSC, and the layout, which outlines the structure of this document.

In **Chapter 2** the Higher Education Internationalization relevant subject is presented. In addition, a Comprehensive Internationalization model and a cycle of HEI are detailed, as well as some aspects of Governance and Compliance. Besides, Auditing activities and Leadership are presented and the full role of the consultant in HEI is developed.

Chapter 3 is a specific discussion about diagnostic issues and tools to be used. At the beginning some concepts are listed, models and frameworks are exposed. Design, implementation, and a validation guide are considered.

This way, environment boundaries are designed by the studied models and state process, methods and practices involving the 5 roles. That means the framework design.

After framework definitions, it is necessary to check externally the reality's representation in the framework. Internally to the framework, the coherence of its processes, methods, and practices with the models that compose it will be verified.

This validation and verification will be accomplished observing the adherence and homogeneity of the established procedures: (a) using previously developed consulting reports; (b) a consultancy service will be developed applying to another higher education institution interested in internationalization processes. Final considerations will be sent to experts for opinions and comments.

Frame 9 – Structure of this document

Chapter	Subject	Description
General	Preliminary considerations	General considerations about the focus
1st chapter	Introduction	Higher Education Internationalization The context, the Problem, and Objectives Needed skills and competences of the HEI consultant Methodological Approach Justification Adherence to the PPEGC
2nd chapter	Literature Review with models, framework and process focus. Investigate the domain Knowledge in these areas.	Literature Review Higher Education Internationalization – HEI & models Knowledge Engineering and Management & KMC models Organization Culture & Organization Knowledge Governance & Compliance Auditing methods and process Leading Changes Experts in a Consulting practice
3rd chapter	Diagnostic Issues and Tools Build an organized set of data and metadata. Incorporated models and resulting in a conceptual framework or meta-framework.	A theoretical approach to frameworks ● A Framework and models' construction review ● A Validation and verification of a framework A representation of models and environment boundaries The incorporated process, methods, and models Descriptions, details, and approach ranges Framework Design, implementation - Checklist design and implementation Validation Guide
4th chapter	Framework reliability and final proposing	Definitions and Concepts Indicators Design of: - Two Modules Framework - HEID – Higher Education Internationalization Software
5th chapter	Verification & Validation using previous guide	Validating the externals Verifying the internals Experimental validation and Concept Proof
6th chapter	Final Considerations	Outcomes and usefulness of the framework Practical and theoretical contributions What is next?

Source: Author (2019)

1.9 DELIMITATIONS

This research is supported by a literature review of documents and bibliography and experts-oriented publications. The main objects are models and frameworks that can be linked to the consulting empiric reality theme.

Themes such as GRC, Auditing and Leadership are listed, only in the aspects concerning the focus. As for groups formation (the way they are born, the way they raise and die) it is an important question of leadership but reporting about these studies will take another thesis – Northouse (2018), Yukl (2013), Yukl and Fleet (1992) and Goleman, Boyatzis and McKee (2008) are an excellent beginning.

The specific theme of Internationalization of Higher Education concerns the process of internalization itself. There is no evaluation about reasoning for any University to adopt; there is no evaluation about government and public policies either. Once it is decided on the IHE pathway, this is a study to suggest a diagnosis using the university priority and motivation as a cornerstone.

The academic structure innovations in the teaching and learning processes were not considered. The Innovation aspects such as e-learning, blended-learning, ubiquitous-learning, MOOCs are only mentioned but not exploited.

This is a worldwide framework and restrictions (regulation, accreditation, profits, market) may apply to specific countries and institutions.

2 LITERATURE REVIEW

Purpose and goals: **This 1ST section intend to explicit relevant theories, in order to define dimensions to be analyzed when building a higher education Internationalization diagnostic. A diagnostic is a first step when improving a new organization culture process. This way, all concepts are carried out as roles to be played when a Higher Education Internationalization consulting service is taken.**

Along with this section, cornerstone aspects of theory and models involving the HEIP diagnosis will be reported.

A first aspect refers to the Internationalization of Higher Education caused by evolution, globalization, innovations and sustainability requirements. Nowadays, this is

the first theme of good universities looking for excellence, although universities were always international – knowledge does not respect frontiers, only investments.

After the Knowledge Society, the next subject is the use of models, frameworks and Knowledge Base Systems constructions. Some of these Knowledge Cycle models will be part of the intended framework.

Other aspects involving the role of the expert's consulting service are listed, too. Governance, Risk and Compliance (GRC) involves the definitions of rules, regulations and a Structure to support the HEIP.

After having all regulations defined, it is necessary to check if they have been done. Verifying if all things to be done have actually been done is the role of Auditing. Paying attention to the way things are done, their risks and objectives is the role of internal or external auditors. Deviations must be reported to the top administration.

The last detailed role refers to Leading Changes and The Organization's Culture. The main objective is to certify that all processes of internationalization will be incorporated by the organization – being part of its Organizational Culture. Observing top management involvement, departments and courses in a proactive way are concerning subjects for an expert's consultant.

Finally, the consulting role. It means all previous roles are understood and requires some particular skills like a T-shaped professional.

2.1 HIGHER EDUCATION INTERNATIONALIZATION CORNERSTONES AND APPROACHES

2.1.1 Higher Education Internationalization

"University of Bologna (1088) that established what we call University nowadays" (Bologna University History)

Purpose and goals

The purpose of this subsection it to present a context of University Internationalization, origins, implications and what is actually, happening. To bring the context, the environment, the history, models, and implementations it starts with up-to-date concepts and gradually presents the origins and history.

A fleeting history of Universities internationalization is described and Triple Helix and models of internationalization are listed. We will detach the Responsible Internationalization (with BASIC) as a transversal aspect of all models. A special mention refers to Comprehensive Internationalization (CI), a modern and comprehensive process with six main aspects. This CI, based on a model of Rudzki, (1995) has a large domain and was adopted by thousands of HEIs. Other precursors models like Neave, Davie, Dijk & Meljer are specific views and their dimensions limit the HEIS' performance.

The Countries' economic development has expanded due to globalization and innovation. The importance of knowledge is clear evidence in a **Knowledge Society**. In the same way, the internationalization of higher education generates new and enhanced educational skills. The internationalization of Higher Education (IHE) is a process and suffers a lot of changes in concepts and constructions and, different cultural contexts are involved.

The international aspect has always permeated the world of knowledge inside universities. In the Western world it was the University of Bologna (1088) that established what is called "University" nowadays. It began[8] in Bologna in the late 11th century, when the Masters of Grammar, Rhetoric, and Logic began to devote themselves to law (from Bologna official site, 2018).

When it concerns the Globalization factors, there are several publications covering the importance of knowledge for companies. Besides, considering small companies (the biggest European workforce[9]), a recent study related to internationalization lists the importance of knowledge in all factors. Trindade et al. (2018) state five factors:

(i)international knowledge (means knowledge, of course);
(ii)international networks involving innovation co-production. (Knowledge is the main resource for innovation);
(iii)tangible and intangible resources. (Intangible means intellectual capital and, of course, knowledge)
(iv)innovation (where knowledge is a central component), and
(v)public policies where Tech and Science Parks (are directly connected to knowledge).

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[8] 1088: The Bologna "Studium" was founded by students and for students. Bologna is the oldest university in the Western world (from Bologna official site: https://www.unibo.it/en/university/who-we-are/our-history/the-numbers-of-history

[9] SMEs (small and medium-sized enterprises) account for 60 to 70 per cent of jobs in most OECD - SME Annual report 2017-2018.

> We live in the knowledge economy – the knowledge society. As one can observe, the world of organizations has emerged and Universities are still the main source of formal scientific knowledge.

Today in the knowledge society era, technological advances, mobility, innovation become an important motivation and a critical success factor for the universities of the 21st Century (Stallivieri, 2017; De Wit, 2010). Thus theories, models, and frameworks propose different approaches to this intense demand.

The Knowledge Society, Information and Communications Technologies (ICT), Market Economy, International Trade agreements, Governance, and Compliance are the strongest influences in higher education internationalization programs. “It is impossible to look at the concept of internationalization without considering the realities of the environment in which higher education is operating […] There are a number of factors closely related to this flow and which are seen as integral elements of globalization” (KNIGHT, 2007, pp.208-209). The Frame 10 covers the Implications of Globalization for Internationalization as conceived by Knight:

Frame 10 – Implications of Globalization for Internationalization

Element of Globalization	**Impact on Higher Education**	**Implications for the International dimension of Higher Education**
Knowledge Society Increasing importance attached to the production and use of knowledge as a wealth creator for nations.	The growing emphasis on continuing education, lifelong learning and continual professional development creating a greater unmet demand for postsecondary education.	New types of private and public providers delivering education and training programs across borders. For example, private media companies, networks of public/private institutions, corporate universities, multinational companies.
	Need to develop new skills and knowledge resulting in new types of programs and qualifications.	Programs more responsive to market demand. Specialized training programs being developed for a niche market and for professional development purposes and distributed on a worldwide basis.
	Role of universities in research and knowledge production is changing and becoming more commercialized.	Increased international mobility of students, academics, education and training programs, research, providers and projects. Mobility is physical and virtual.

ICTS New developments in information and communication technologies and systems.	New delivery methods applied for domestic and cross-border education, especially online and satellite-based.	Innovative international delivery methods such as e-learning, franchises, satellite campuses require more attention given to accreditation of programs/providers and recognition of qualifications.
Market Economy Growth in number and influence of market-based economies around the world.	Greater commercialization and commodification of higher education and training at domestic and international levels.	New concerns about the appropriateness of curriculum and teaching materials in different cultures and countries and the potential for homogenization as well as new opportunities for hybridization.
Trade Liberalization New international and regional trade agreements developed to decrease barriers to trade.	Import and export of educational services and products increased as barriers were removed.	Increasing emphasis on commercially oriented export and import of education programs and diminished importance to international development projects.
Governance Creation of new international and regional governance structures and systems.	The role of national-level education actors both government and non-government is changing. New regulatory and policy frameworks being considered at all levels.	New international/regional frameworks under consideration to complement national and regional policies and practices especially in the areas of quality assurance, accreditation, credit transfer, recognition of qualifications, and the mobility of students.

Source: (KNIGHT, 2007, p.210)

Higher Education services are looking for alternative sources of income. They face new providers with technological advances and low cost. There is a high impact and strong efforts must be done to be more competitive or to survive. “The way Higher Education responds to globalization; however, determines whether it will continue to play a consequential role in the evolution of human civilization” (DEARDORFF; CHARLES, 2018, p.16).

All over the world, academic mobility is the primary evidence of the internationalization of higher education and there is, certainly, a large amount of money involved in it. “Erasmus is the EU's program to support education, training, youth and sport in Europe whose budget of €14.7 billion will provide opportunities for over 4

million Europeans to study, train, and gain experience abroad" (ERASMUS, 2019). Numbers and value of ERASMUS are significant.

Figure 16 – Erasmus in numbers

Source: ERASMUS Statistic (2019)

The University role is knowledge-centered and it suffers the impacts of globalization. "Over the past few years, the growing impact of globalization has taken greater relevance as an offshoot of internationalization: the latter plays a key role, as well as being the main vehicle through which academic institutions can come to grips with the impact of globalization" (GUADILLA, 2006, p.194)

Concerning strategic issues, Neaves (2006) brings together the three spheres for the Knowledge Society: Knowledge, Governance, and Access. The transitions of Higher Education to this new society depends on these three spheres in a cross-national, multi-level and multi-disciplinary basis.

> Knowledge, Governance and Access have been constant preoccupations to the world of government, to the three Estates of higher education – the Academic, Administrative and Student Estates – and to society these past three decades. They figure amongst the pressing concerns of society, and thus amongst the abiding preoccupations of those who must recognize and meet society's expectations of its universities (NEAVE, 2006, p.18)

2.1.1.1 From triple Helix to Responsible Internationalization

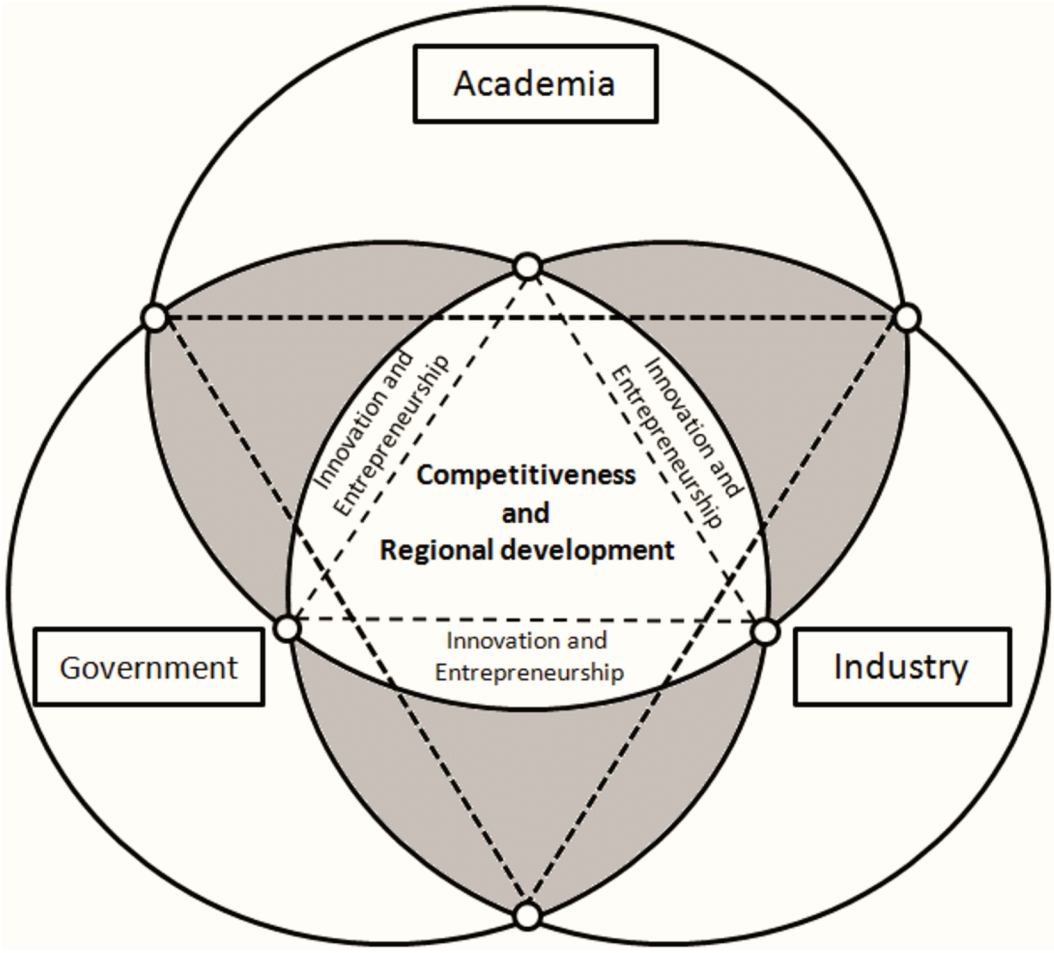
Some authors are emphatic in determining internationalization as an aspect of the survival of higher education institutions. Facing the accelerated process of globalization, perceived mainly in the last decades, the universities have had to seek for a new space, with higher levels of internationalization. Internationalization is a matter of survival and institutions need to be prepared to discuss and offer solutions to new challenges (STALLIVIERI, 2014).

For the seminal researcher Jane Knight (2004) there is an emphasis on intercultural aspects, the global dimension and the mission and vision of each institution. All these characterize HEI as a "process" and therefore they will have adjustments over time: 'The process of integrating an international, intercultural or Global dimension into the purpose, functions or delivery of post-secondary education ' (KNIGHT, 2004, p. 11).

Referring to two elements of the triple helix (ETZKOWITZ & LEYDESDORFF; 1995; 1996, 1998; LEYDESDORFF & ETZKOWITZ, 1998; ETZKOWITZ, 2003), Altbach and Knight (2007) are explicit when considering policies and programs involving government and academy. As government and academia seek to observe the market needs, that means there is a Triple Helix in action (governments, industry and academia) as seen in Figure 17.

Some criticism was found on Etzkowitz theories and even four, five and six were already described by authors. Etzkowitz studies about university-industry were developed with MIT, Stanford, Cambridge and other top universities. These universities represent the highest level of standards. Of course, most universities in the world are not included in that high-level of excellence. Anyway, it is always recommended to study the best ones with the purpose of observing their steps to success (best practices), as well as studying failures is necessary to avoid future problems (lessons learned).

Figure 17 – Proposed new conceptual model: Triple Helix Triangulation



Source: Farinha and Ferreira (2013, p.18)

Hudzik (2011; 2015) goes beyond the Triple Helix adding the mission, learning, structure and services to give rise to the Comprehensive Internationalization (CI) concepts. Rumbley (2013, 2014) highlights that internationalization comprises both the individual level of institutions and their national extension.

The concept of Internationalization has changed during the last years. From a single view of mobility, curriculum or cultural interchanges, the new concept involves a complete process and Jane Knight has an integrated definition: *"**Internationalization at the national sector and institutional levels is defined as the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of postsecondary education**"* (KNIGHT, 2003; 2004; 2015; emphasized by us).

Although the term "process" transmits the traditional sense of a system (INPUT-PROCESS-OUTPUT), it's important to observe that outputs or outcomes were put aside in this definition. It's not the outcomes (like mobility or benefits) that really matters

for a nation's development; the main meaning of the process**,** in this case, is the continuous evolutionary efforts applied to internationalization and to the quality of education enhancement.

The effective triad, as stated by Knight (2004) is the "International, intercultural, and global" dimensions, lightening the idea of the relationship between nations, cultures, relationships, or even countries, communities and institutions. The international dimension must remain central and sustainable.

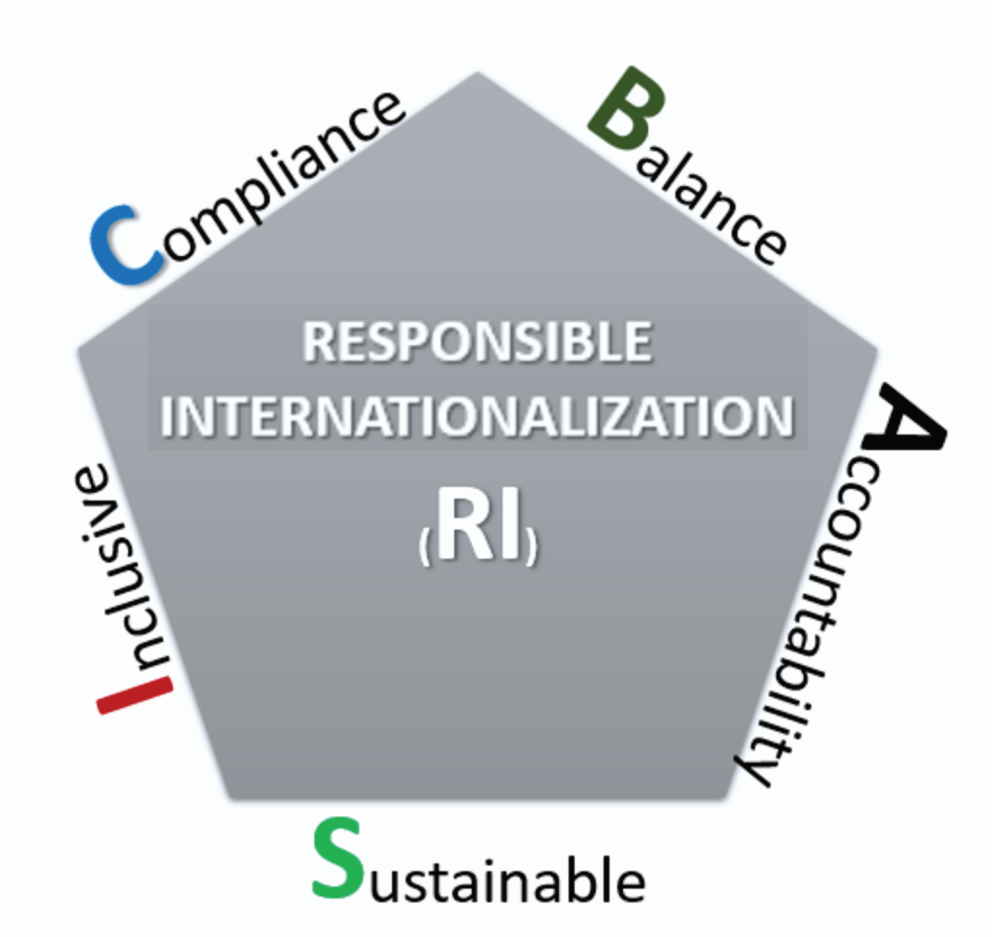
The other three terms "purpose, function, and delivery" must be considered at the same time: (a) the purpose refers to missions and objectives of higher education; (b) function meant primary elements or tasks (teaching, research, social services) of a national postsecondary system or an institution with traditional or global interest; (c) delivery of their programs. Therefore, integrating an international or intercultural dimension into the teaching, research, and service functions of the institution are also found in earlier definitions.

Stallivieri[10] (2018) by observing the global context of internationalization, establishes the concept of "Responsible Internationalization" based in five (BASIC) dimensions: **B**alance, **A**ccountability; **S**ustainable; **I**nclusive and **C**ompliance (Figure 18).

The terminology suggested by Stallivieri (2018) reflects a modern concept explaining the requisites to reach internationalization in a responsible way. The **Inclusive** term means that all students are welcome and are supported to Learn in appropriate classes and could participate in school life. **Sustainable** refers to a comprehensive approach to the University's development. Teaching, learning and Community engagement are required. The **Balance** means no deficit in budget, facilities, staff and knowledge transfer. **Compliance** means that regulations, policies, and guidelines are followed in the educational institutions and **Accountability** is the process of evaluating performance based on the full publication of measures and management of acts. Stallivieri BASIC (2018) is an up-to-date concept involving social innovation subjects and not only the top-down hierarchy but social management.

[10] Presentation information from University Management and Leadership Institute (IGLU/UFSC) to Latin America University Managers and Principals.

Figure 18 – Responsible Internationalization – The BASIC pentagram



Source: Stallivieri (2018)

"Model" is a human creation to model reality. "A model is an invention, not a discovery" (MASSOUD ET AL. 1998, p. 277). In such a manner, any model will probably be obsolete in the future and another enhanced model will get its place. Comprehensive Internationalization (CI) is a model, too. Despite the CI model having a high level of abstraction (means large possibility of reuse) and also having a huge range concept domain, it is possible to enhance it by using another transversal dimension – Responsible Internationalization.

This extended dimension to the CI model will give another vision to each focus considering de B-A-S-I-C. So, during each focus examination of the CI model, it is important to study **B**alance, **A**ccountability, **S**ustainable, **I**nclusive requests and **C**ompliance (BASIC).

2.1.1.2 Models, not just one model

The model proposed by Hudzik (2011), means a wide range internationalization, or transversal but translated into other languages it does not find exact matches or meanings. A simple analogy could be made to these famous hotel structures of all-Inclusive Resorts. One can realize that the CI model is extensive and complete, integrated and superior.

This model is detailed in an ACE/NAFSA publication which can be downloaded directly from the NAFSA site. NAFSA is an Association of International Educators and a membership organization promoting international education and providing professional development opportunities to the field (http://www.nafsa.org).

As seen before the concept came to us, from the earlier twelfth century:

> Higher education internationalization is not a new concept. The movement of students, scholars, and ideas across national boundaries was a prominent feature of the twelfth and thirteenth century's Europe; communities of international scholars formed as a result at several prominent universities. Such mobility significantly ebbed after the fifteenth century (albeit with pockets of resurgence) until the latter half of the twentieth century (HUDZIK, 2011, p.18).

By accessing the American Council on Education – ACE[11] site, one can discover the CIGE Model for Comprehensive Internationalization, which is defined as:

> Comprehensive internationalization, as defined by CIGE, is a strategic, coordinated process that seeks to align and integrate policies, programs, and initiatives to position colleges and universities as more globally oriented and internationally connected institutions (ACE/CIGE, 2018).

ACE's Center for Internationalization and Global Engagement (CIGE) helps institutions to develop and sustain comprehensive, effective internationalization programs that increase global engagement for students, faculty and staff (ACE, 2019).

As cited in the ACE website, the CIGE Model (Figure 19 and Frame 11) for Comprehensive Internationalization is comprised of six interconnected target or focus areas for institutional initiatives, policies, and programs:

[11] The American Council on Education (ACE) is a nonprofit 501(c)(3) U.S. higher education association established in 1918. ACE's members are the leaders of approximately 1,700 accredited, degree-granting colleges and universities and higher education-related associations, organizations, and corporations.

Figure 19 – CIGE Model for Comprehensive Internationalization

Source: ACE site (2019)

Another useful and detailed definition of Comprehensive Internationalization is provided by the International Association of Universities[12] (2019):

> Comprehensive Internationalization is a commitment, confirmed through action, to infuse international and comparative perspectives throughout the teaching, research, and service missions of higher education. It shapes institutional ethos and values and touches the entire higher education enterprise. It is essential that it is embraced by institutional leadership, governance, faculty, students, and all academic service and support units. It is an institutional imperative, not just a desirable possibility. Comprehensive internationalization not only impacts all of campus life but the institution's external frames of reference, partnerships, and relations. The global reconfiguration of economies, systems of trade, research, and communication, and the impact of global forces on local life, dramatically expand the need for comprehensive internationalization and the motivations and purposes driving it.

The Comprehensive Internationalization - CI Model, is supported by the International Association of Universities (UNESCO House) and CIGE and it is accepted by thousands of Higher Education Institutions.

This model adopted by the CIGE is ratified by NAFSA, an International Association of Universities (UNESCO House), and today there are more than 2,000 universities all over the world that adopted it. This acceptance is instructively linked to the fact that it is not restricted to aspects of interchange of students and teachers, administrative structure, or only academic details. Instead, it is turned to specific points,

[12] The International Association of Universities, created under the auspices of UNESCO in 1950, is a membership-based organization serving the global higher education community through: expertise & trends analysis, publications & portals, advisory services, peer-to-peer learning, events, global advocacy.

it establishes 6 focuses that are considered simultaneously to form the term Comprehensive Internationalization (CI).

Frame 11 – Comprehensive Internationalization (CI) focus

Focus	Detailed information
I. Articulated Institutional Commitment	Strategic planning involving key stakeholders articulates an institution's commitment to internationalization and provides a roadmap for implementation. Formal assessment mechanisms reinforce this commitment by framing explicit goals and holding the institution accountable for accomplishing them.
Strategic planning. Internationalization is prioritized in mission statements and institution-wide strategic plans and through explicit internationalization plans. **Internationalization committee**. A steering committee composed of representatives from across the campus is designated to oversee the implementation of internationalization initiatives. **Campus stakeholders**. Focus groups, surveys and open discussions convey priorities, address concerns and gain buy-in by students, faculty, staff and other stakeholders. **Assessment**. Following from articulated goals, progress and outcomes of internationalization are formally measured and assessed	
II. Administrative Leadership, Structure, and Staffing	The involvement of top leaders and appropriate administrative and reporting structures form an essential framework for implementing internationalization.
Senior leadership. The president and CAO are committed to internationalization and are engaged in the process from the start. **International office**. An office or offices are designated to coordinate campus-wide internationalization activities. The faculty or staff member primarily responsible for internationalization reports to the CAO or president.	
III. Curriculum, Co-curriculum, and Learning Outcomes	As a core purpose of higher education, student learning is a critical element of internationalization. An internationalized curriculum and co-curriculum ensure that all students are exposed to international perspectives and build global competence. Globally focused student learning outcomes articulate specific knowledge and skills to be addressed in courses and programs
General education requirements. Courses that focus on foreign language, regional studies, and global issues are included in undergraduate general education requirements. **Internationalized courses in the disciplines.** Courses within each major incorporate an international perspective and highlight global issues in the field. **Co-curriculum.** Programs and activities address global issues, reinforce international elements of the curriculum, facilitate discussion and interaction among students of different backgrounds and support the integration and success of international students on campus.	

Student learning outcomes. Internationally-focused competencies are included in campus-wide student learning outcome goals and assessments. **Technology**. Technology is used in innovative ways to enhance global learning, e.g. through joint coursework and interactions with students and faculty abroad.	
IV. Faculty Policy and Practices	As the primary drivers of teaching and research, faculty plays a pivotal role in campus internationalization. Institutional policies and support mechanisms ensure that faculty have opportunities to develop international competence and are able to maximize the impact of these experiences on student learning.
Tenure and promotion policies. Tenure codes state explicitly that international work and experience should be considered in tenure and promotion decisions. **Hiring guidelines**. International background, experience and interests are among the criteria upon which faculty candidates are evaluated. **Faculty mobility**. The faculty has opportunities to teach, conduct research and attend conferences abroad. Administrative and funding mechanisms support faculty participation in outside programs (e.g. Fulbright). **On-campus professional development**. Workshops, seminars, and other programs help faculty build international competence and incorporate international perspectives into their teaching.	
V. Student Mobility	Student mobility, which refers both to the outward flow of domestic students to other countries to engage in an education abroad experience and the inward flow of international students to study at U.S. campuses, is often a focus of internationalization efforts. Orientations, re-entry programs and other support structures and activities help facilitate student adjustment and maximize learning.
Credit transfer policies. Students can easily earn credit for study abroad through approved programs. **Financial aid and funding**. Student financial aid is applied to approved study abroad programs, and resources are available to help students locate additional funding. Scholarships and other funding are available for international students. **Orientation and re-entry programs**. Orientation and re-entry programs help students maximize learning during study abroad, and integrate knowledge gained into their overall program of study. Academic and cultural orientation sessions are provided to all incoming international students. **Ongoing support and programs for international students**. Academic and social support structures and programs facilitate international students' full integration into campus life.	
VI. Collaboration and Partnerships	Establishing and managing successful collaborations and partnerships abroad is a key aspect of internationalization for many institutions. Such relationships can provide international experiences for students and faculty, enhance the curriculum, generate revenue, and raise the visibility of institutions at home and around the world. ACE recommends a 4-step approach for creating and managing international partnerships

Step 1: Strategic planning. Partnerships and collaborations should be based on a careful planning process that clarifies international goals and objectives, particularly with respect to student learning outcomes. International collaborations should align with overall institutional mission and priorities and should take into account availability of financial and personnel resources.
Step 2: Review possible structures. International collaboration can take many forms, and institutions should become familiar with a variety of options before talking to potential partners. Some modes of engagement will likely emerge as a better institutional fit than others; some may be rejected outright, and others may only be appropriate for partners that meet certain criteria.
Step 3: Identify potential partners. It is important to analyze the higher education context in target countries, including policies, priorities, structure, and operations. A careful analysis can eliminate certain types of institutions as potential partners and make others a higher priority. Peer institutions in the U.S. can provide useful information on potential partners abroad, and conferences often include opportunities for direct networking with institutional representatives from other countries.
Step 4: On-going management. As partnerships proliferate, institutions may find themselves with too many MOUs – often of varying scope and effectiveness. Another common situation is for partnerships based on a personal connection to dissipate once that connection is no longer active. Centralized coordination, engaging a broader base of faculty support, and designating certain relationships as "strategic" can help mitigate these issues.

Source: ACE (2019)

"If you can't measure it, you can't improve it."
Peter Drucker

Sometimes the powerful influence of one or two academic departments turns education management into a Feudal system. "In general, top-down command and control models do not fit well with Higher Education Institutions" (HUDZIK, 2011, p.22). Academic departments' decisions, governance, and administrative leadership are important factors in HEI, and performance must be measured in all levels.

This model also suggests monitoring and measuring data or performance indicators concerning the 6 focus areas. Some goals may be single ones as a building capacity: Number of programs offered, students, and so on. Other goals may be reflected in participation levels; other goals measure the valued end products or outcomes. A relation constructed with these evaluations is a plus. They are related as exposed in Frame 12.

Frame 12 - Measure samples of input, output and outcomes

Input Measures	Output Measures	Outcome Measures
Number and diversity of studying abroad options, locations, subject matter, and support.	Number and diversity of students studying abroad; length of study; curricular integration; safety; cost control; etc.	Impacts on knowledge, attitudes, beliefs, life skills, careers, etc.
Institutional research expenditures per faculty members. Or, external research dollars, etc.	Publications; patents; incidence of citation; grants and contracts from external sources.	Enhanced reputation/ awards; commercial applications income; economic development of locations/ regions; community problem solving, etc.
Dollars, people, and other resources applied to the problem- solving engagement.	Numbers of projects/ locations, numbers of people involved.	Impact on people's well-being and condition: economic, health, income, nutrition, safety/security, access, etc.

Source: Hudzik (2011, p.25)

Of course, there are distinct realities in each country. The sample in Frame 12 applies mainly to private institutions in the USA. The Comprehensive Internationalization process includes several steps. These steps will depend on how advanced each HEI is in the internationalization process.

The adoption of strategies and their conversion into action plans is a meticulous process that begins with the evaluation of the HEI strategy and the definition of its mission, vision, and values. There is no bulletproof model!

"A journey of a thousand miles begins with a single step" (Lao Tzu Quotes)

Sometimes plans are not established with the prescience of the initial phase of "world-class university thought contagion"(VIANNA; STALLIVIERI; GAUTHIER, 2018). Discussing benefits, goals, problems and understanding the steps to the internationalization process are hard leadership's tasks. Thus, the Board and Senior manager considering them as urgent (as cited by John Kotter, 2018) is needed. Motivation is an important factor to gather all staff collaboration and create a "sense".

Knowing where you are and where you need to go are important issues. In many cases this kind of self-assessment is flawed in the institution of higher education, that assumes to be in unreached stages of evolution.. Even so, efforts at each step forward are not enough; also plans are not consolidated and execution is usually unsuccessful. The final effect is that goals are not achieved, and expectations are frustrated.

Despite all these challenges, experts in this area claim that “getting started” is always important – “a long journey begins with the first step”. Even with errors during progress, that will be achieved, concepts will be clearer, and the upcoming plans will be improved. That implies developing a culture of continuous improvement in universities and due to this, a minimum planning is required.

During this phase, training strategies and plans are important, and the adoption of expert advice becomes a resulting acceleration factor and cost reducer (VIANNA; STALLIVIERI; GAUTHIER, 2018).

This consultant of IHE for internationalization should be adopted for the academic life or day-to-day of the university. This implies not only the knowledge of structures, territory, power and hierarchy disputing, but also knowing a lot of the process of internationalization in its theoretical and practical aspects. Thus, this consultancy works in the area of IHE and cannot be non-committed counseling and without involvement in the day-to-day, as may occur in some affairs. The consultant must be integrated into the process but with no hierarchical position.

In this case, the consultancy work involves the theoretical and practical framework, but especially the possibility and elaboration of critical thinking in relation to the plan and actions. This can be done based on Robert Ennis (1962) and can be established as:

(i) Capturing the transmitted meaning and the real strategic propositions;
(ii) Clarifying ambiguities and contradictions (if existing);
(iii) Checking the specificity of the problems and feasibility of deliverables or proposed actions to solve them;
(iv) Verifying that the proposed monitoring is reliable;
(v) Checking the suitability of definitions and concepts;
(vi) Checking the scope and authority of the item.

All of this, according to Reynolds (2011) must (i) be registered with evidence and undeniable facts; (ii) must be based on relevant and clear criteria; (iii) use reliable methods and techniques in the elaboration of judgments. This is related to the act of framing itself and it will be discussed later in Models & Frameworks.

Each action must be in accordance with the previously defined goals in a plan. In addition, to verify the adherence of the action plan to the strategic planning, it is necessary to verify if the organizational structure is adherent and coherent to the purposes. It must confront what is "written" with the objectives and structure of the sector (which involves aspects of governance and compliance) and verify that the actions are being developed in the best way possible, addressing efficiency and effectiveness (auditing).

Another important issue for successful IHE consulting is the involvement of the consultant in constant observation and guidance on the aspects of the changes that will occur. Incorporating the changes in the organizational culture and consolidating the knowledge of the institution are indispensable requirements.

Models, not just one model.

Despite the CIGE model, the Comprehensive Internationalization (CI) it is important to identify other life cycle models of internationalization. The model adopted depends on the institutional context, like missions, traditions and preferences. In the same way models will affect the administrative organization and support.

Another aspect refers to leadership, management and coordination, and this subject will be discussed in the upcoming section.

There are some theoretical approaches to internationalization and the models proposed (Frame 13). Each one has advantages, opportunities, and limitations. There are so few powerful models like CI and actually, this is a new research area, funding and academic efforts are growing fast, mainly in developed nations.

Frame 13 – Summary of Models of Internationalization

A. Neave's model	Identified two paradigms in internationalization models: (a) leadership driven and (b) base unit driven. Also "managerial rational" versus "academic consensual" models were identified. Build a matrix matching "leadership" and "base unit" with "definitional" and "elaborative" scopes of strategy. His model also has a "dimension of change" and a distinction between "centralized" and "decentralized	● Descriptive ● Analyze and identify the approach of models ● Academic and administrative issues. ● Centralized and distributive
B. Davie's model	**STRATEGIES AND STRUCTURE TO DECISION PROCESS**	● 2 axis model ● Prescriptive

	1. *Ad hoc*-**central** strategy activities should have unclear and explicit concepts. 2. **Central**-systematic strategy: internationalization mission is explicit through specific policies and procedures. 3. Ad hoc-**marginal** strategy where minor or lower-level decisions are not based on clear decisions. 4. A systematic-**marginal** strategy is limited, organized and based on clear decisions.	● Based on 4 strategies ● Refers to a structure for the decision process
C. Dijk & Meijer Model	Based on Davies model, Dijik & Meije introduce the concept of interactive or unilateral support in internationalization activities. It can be represented in three dimensions or a cube. That means eight combinations or routes.	● 3 axis model ● No normative
D. Rudzki's Model	Rudzki (1995; 1998) model identified the activity levels of internationalization in Higher Education Institutions bringing us four dimensions. Also identified contrasting action modes as "reactive" and "pro-active".	● Reactive x pro-active actions model, with 5 steps each.

Source: Created by the Author (2019) according to the literature search

a) Neave's Model

Neave, using studies published by UNESCO, identified two paradigms in internationalization models: (a) leadership driven and (b) base unit driven. The first one refers to a leadership directly linked to the main administration; it reflects the personal area's pursuit for its leader's view. The other refers to clearly oriented activities available by central administrative units to support the vision.

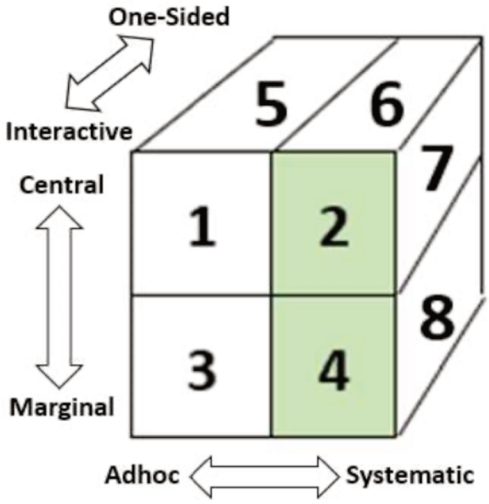
Neave found in those early years (1992) a fact that remains until today: "managerial rational" versus "academic consensual" models. He designed a matrix matching "leadership" and "base unit" with "definitional" and "elaborative" scopes of strategy. His model also has a "dimension of change" and a distinction between "centralized" and "decentralized" models. This Neave's approach was taken as a basis for new conceptions in internationalization models.

b) Davie's model

The model of Davie suggests that the internationalization process usually starts with a marginal policy and ad-hoc regulations. The next step will be structuralizing combined with the expansion of the internationalization activities.

These actions will provide a "broadly developed and well-founded internationalization policy" (Dijk; Meijer, 1998, p.47)

Figure 20 – Models of Internationalization



Source: Created by the Author (2019) from literature analysis

c) Hans Van Dijk and Kee Meijer Model

It is possible to distinguish processes of internationalization implementation. They pointed routes (Frame 14) 1-2-6-8, 1-5-68 and 1-5-7-8 as a real internationalization priority process in the institution.

Frame 14 – Dijk & Meijer and Davie's internationalization model

Combinations	Dimensions			Route 1	Route 2	Route 3
	Policy	**Implementation**	**Support**	**Low-starters**	**Organized leaders**	**Entrepreneurial institutions**
1	Marginal	Ad hoc	One-sided	**1**	**1**	**1**
2	Marginal	Systematic	One-sided	**2**		
3	Marginal	Ad hoc	interactive			
4	Marginal	Systematic	Interactive			
5	Priority	Ad hoc	One-sided		**5**	**5**
6	Priority	Systematic	One-sided	**6**	**6**	

7	Priority	Ad hoc	Interactive			**7**
8	Priority	Systematic	Interactive	**8**	**8**	**8**

Source: Classifications and routes improved by Author from of Dijk & Meijer and Davie's model

We can observe the importance of high priority in the institution to the internationalization policy and all levels of administrative support.

d) Rudzki's Model

Rudzki (1995; 1998) model identified the activity levels of internationalization in Higher Education Institutions carrying four dimensions. This model also identified two contrasted action modes as "reactive" and "proactive". The proposed model has five steps each, as shown in Frame 15. Rudzki (1995) considers the term 'university' as any institution of higher education and defines:

> Such a combination of internationalization as a phenomenon with a conceptual model with which to analyse the process, is further enhanced by the identification of activities in each of the **four dimensions of the process, namely organizational change, curriculum innovation, staff development and student mobility**. (**This ordering is deliberate** in that it addresses the elements in terms of their permanence, starting with the organization which outlives those who work within it, and ending with those transient beings known as the students.) (RUDZKI, 1995, pp.421-422; emphasis added).

Frame 15 – The five steps of Reactive and Proactive models of Rudzki

Reactive action mode	Pro-active action mode
1 Contact	1 Analysis
● Academic staff engage international contacts ● Curriculum ● Mobility limited ● No clear plans	● Strategic analysis of objectives and rationales ● Staff training ● Consultation and auditing SWOT and cost analysis
2 Formalization	2 Choice
● Institutional agreements ● The uncertainty of resources' availability	● Plans and policy on consultation and network ● A defined measure of performance ● Formal allocation of resources
3 Central control	3 Implementation
● Management control increase	
4 Conflict	4 Review

● The lower level of staff's goodwill due to conflicts with management ● The decline of activity and frustration of expectative	● Performance evaluation of policy and plans
5 Maturity or decline	5 Redefinition
● Change to a new approach (e.g.: pro-active)	● Continuous improvement (and back to 1 Analysis)

Source: Rudzki (1995; 1998)

A SWOT analysis is a great starting point for planning. Concerning the strategic analysis, Rudzki (1998) also suggests a PEST analysis (Political, Economic, Social and Technological). The purpose of PEST is to identify the external trends (environment) in a more detailed way. An example of this PEST analysis is Frame 16.

Frame 16 – Sample of PEST analysis suggested by Rudzki

Political	**Economic**
UK Government policy on HE	Need to recruit 'full-fee' students
Possible introduction of fees	Low inflation
Decreasing the value of student grants	Financial constraints on capital expenditure of Universities
EC policy on human capital	National s billion budget deficit
Social	**Technological**
High unemployment level	Increasing the level of skills required
Excess of demand over supply for University places	The increasing availability of Information Technology
English as the common international language - 'lingua franca'	Ease of travel and communications

Source: Rudzki (1995, p.4)

In early studies (RUDZKI, 1993 apud RUDZKI, 1995, p.437) has identified the critical success factors of internationalization and fine priority:

1. Favorable staff attitudes;
2. Having the active support of senior management;
3. Having staff with a specific international brief;
4. Having staff who are fluent in foreign languages;
5. Availability of additional funds internally;
6. Having good partner institutions;
7. Having staff development focused on internationalization;
8. Access to information in good practice;
9. Having staff experienced in teaching overseas;
10. Remission from teaching.

Later in 1998, Rudzki presented a thesis building a full model of internationalization using grounded theory.

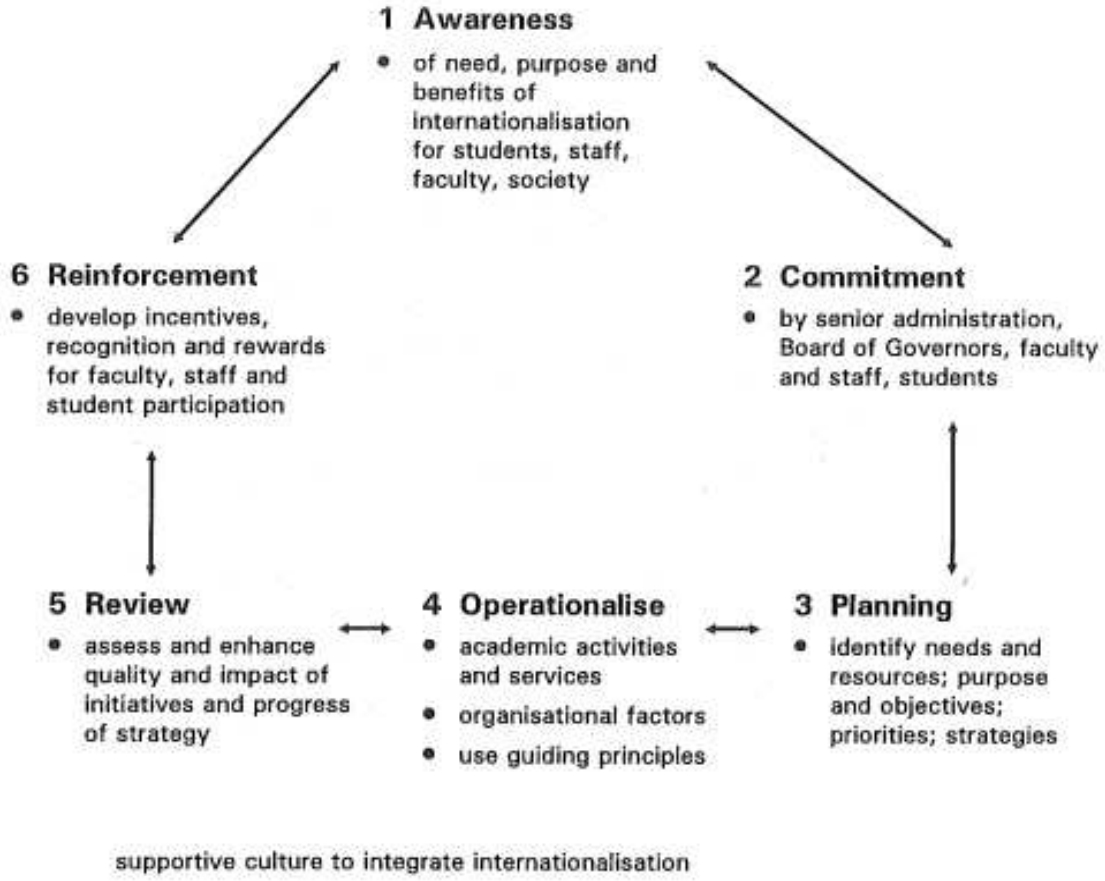
"A goal without a plan is just a wish" (Antoine de Saint-Exupéry)

HOW TO DO THIS? The Internationalization implementation cycle is the answer.

All authors consider the implementation of this process as a singular one. There are no two equal implantations, but the authors also agree about an HEI Cycle containing Commitment, Planning, Execution and Monitoring. Commitment and engagement are gathering with motivation to participate in the decision process. The others seem familiar to PDCA, a Plan-Do-Check-Action from Edwards Deming (Japan in 1950, related to Total Quality Management - TQM and Quality Circle (QC) activities).

Talking about implementations, there is one of the main concepts of the Internationalization process, conceived by Jane Knight (2007). It has six steps as shown in Figure 21 – Knight & De Wit Internationalization Cycle:

Figure 21 – Knight & De Wit Internationalization Cycle



Source: Knight and De Wit (1995; p.26)

Jane Knight and De Wit detail every step, and their main concepts are in Frame 17.

Frame 17– The Knight and De Wit internationalization Cycle

STEP	Detail
1. Awareness	Means to put in mind the benefits, and the importance of the process to stakeholders. All people on campus must be included, and the requisites, strategies, resources and challenges must be discussed. It is not only the "small group" participation but all people – this will be later called "internationalization-at-home".
2. Commitment	The build commitment on the process turned to teaching and learning, researchers and all academic and administrative services. Senior administrators should drive this commitment to a strategic plan proposal involving the whole university.
3. Planning	A comprehensive plan must be developed. Defining goals and proposals is a critical requirement. The reasons, outcomes, features, and resources must be organized.

	Plans must happen on several different levels. “The scope of Internationalization is enormous and often it is optimism, not realism that prevails” (KNIGHT; DE WITT; 1995, p.27)
4. Operationalize	“Defining priority and clearing the academic and administrative actions and activities is the central point. The operational plan must be customized for the purpose, needs and resources of the university” (KNIGHT; DE WIT, 1995, p.28)
5. Review	That means monitoring the success of individual activities and a periodic review of plans and general university budget. Adjustments must be done.
6. Reinforcement	As the process is cyclical all steps must be repeated. Continuous support and monitoring will give support to improve quality. Benefits, incentives, recognition, and rewards should be deeply considered and build new opportunities for continuous innovation.

Source: Knight and De Wit (1995; pp.25-28)

“Internationalization is a continuous and ongoing process because it grows out of a cycle of recurring events. It is comprehensive because it involves all university sectors and levels of the educational process” (GACEL-AVILA, 2005, p.124).

A process of internationalization should be continuously improved. Certainly, the decision process is one of the most important aspects to be considered in a cycle of implementation. Gacel-Avila (2012, p. 3) highlights the decision makers and senior staff:

> Internationalization should be considered as a key strategy with the potential to help the region overcome backlogs and shortcomings at a faster pace. Actions should be taken to train decision makers and senior staff, both at the institutional and regional levels, in the field of comprehensive internationalization strategies (GACEL-AVILA, 2012, p. 3)

Referring to Latin America internationalization Gacel-Avila states that they are still “focused on traditional activities of student and faculty mobility, without taking into account the broader concept of comprehensive internationalization” (GACEL-AVILA, 2012, p. 2).

Stallivieri (2018) states a serial 10-step list in purpose to the internationalization of higher education. As can be observed, there are similarities with the Knight proposition and with Kotter’s leading changes. Stalliviere goes beyond giving a practical path including monitoring and declares “at home internationalization” in an Integrate and transversal international dimension into academic and administrative units. Later in this thesis, there is a detached point where Stallivieri suggests the “Responsible Internationalization”, which is a crossing view over HEIP.

Frame 18 – Ten steps to internationalization

TEN STEPS TO INTERNATIONALIZATION OF HIGHER EDUCATION

Identify the importance and the need of internationalization.
Build goals and plans to carry out the internationalization process.
Turn plans into formal and official documents supported by institutional compliance.
Adopt an adequate administrative and academic structure.
Establish a closer relationship and the adherence between goals, plans and the mission, vision and values of the institution.
Integrate the transversal international dimension into projects of administrative units and academics departments.
Integrate strategies including teaching/learning and research issues.
Consider: academic and administrative mobility, curriculum innovation and research groups.
A systematic and periodical evaluation of internationalization quality and achievements.
Define international relations groups and committees in purpose to implement the changes needed.
Construct a plan of publicity, visibility and rewards to successful activities.

Source: Stallivieri (2018, p.19)

2.1.2 Knowledge & Knowledge Management Cycle (KMC)

"The only thing that is constant is change" (Heraclitus)

Purpose and goals

The knowledge cycle and models are presented here. CommonKads and the pathway to Knowledge-Based Systems (KBS) have some aspects registered.

The organization's Knowledge and a timeline of Knowledge Cycles also provide the importance of a new focus in Organizational Knowledge as proposed by Nonaka and Takeuchi (tacit to explicit).

As one can see in our "Knowledge Society", knowledge is clearly the mainstream to innovation. Models, cycles and benefits of the adoption of a knowledge cycle are also listed.

2.1.2.1 The Knowledge and Knowledge Society

In the early 1970 Alvin Toffler's book named "Future Shock" showed the speed of change in science and technology. Today, all over the world, the acceleration of changes has been considered as true. Nowadays every single manager of a very small organization is worried about "changes" that dramatically occur due to globalization and innovations.

A new tech device development or software can modify (and eliminate) a big market share: Mobile Phones, Airbnb, Netflix, Uber are the most known examples. There are others not so familiar to most people, like Cirque du Soleil - it is a revolutionary conception in the Circus Industry. Several theories and methods like "Blue Ocean Strategy ", "Design Thinking" and others demonstrate a new view and approach of problems and solutions (VIANNA, GAUTHIER, 2018).

In these previous approaches remains innovation as a result and "knowledge" as a cause. The most important resource in the organizations' strategic actions is knowledge (GRANT, 1996; FAGERBERG, 2004; AGARWAL; AUDRETSCH; SARKAR, 2010) and the central point of this capacity is not only the individual tacit knowledge but the organization's (explicit) knowledge capability to be directed (mainly) as a predictive power (NONAKA; TAKEUCHI, 1995. GRANT, 1996; SEIFOLLAHI, RAHIMI, 2018). The 21st century is an information (and knowledge) explosion promoted by technology (LIU, CHEN, 2018) and organizational IT capability has significant impact in organizational performance and sustainable competitive advantage (AKRAM et al., 2018).

Despite all these, still remains a question: if knowledge is a need, what is knowledge after all? Surely there is not a pacific and common definition or concept. "It is argued that knowledge is an ambiguous, unspecific and dynamic phenomenon, intrinsically related to meaning, understanding and process, and therefore difficult to manage" (ALVESSON; KARREMAN, 2001, p.995).

Just for a brief concept of Knowledge, one surely can state that knowledge is a subjective concept: "Knowledge is a subset of information; it is subjective; it is linked to meaningful behavior; and it has tacit elements born of experience. (LEONARD; SENSIPER, 1998, p. 3). Despite this, there is a common point about "tacit" and "explicit" categories, and the transitions from one to another as Nonaka and Takeuchi

(1995) exposed later. “Knowledge is a concept – like gravity. You cannot see it, but can only observe its effects” (HUNT, 2003, p.100).

In all organizations, knowledge should be a strong basis and mainly in educational institutions, where knowledge is the main product. Concerning education, knowledge production is represented by scientific publications; that means “researchers” are involved: professors and graduate students (mainly). “The students go through the necessary steps of scientific knowledge production and publication, exercising crucial aspects of the scientific activity” (KERN; SARAIVA; PACHECO, 2003).

Referring to scientific knowledge, a comprehensive definition of Knowledge is a hard (or maybe an impossible) task. Several authors and different concepts can realize that the traditional views (of scientific knowledge) require conceptual amendment (STEFANOV, 2016). Anyway, there are some guidelines to investigate explicit knowledge and the metalanguage that has been conducted (ELLIS, 2004) and it is adequate to consider explicit knowledge as a construction.

Is knowledge a justified true belief? Is knowledge also a manifestation of intellectual powers, which supplements the traditional components of justification, truth and belief? (TURRI, 2012). Other authors demonstrate that factual and subjective knowledge are two distinct dimensions of knowledge (HO, 2019).

Considering Plato’s initial definition of knowledge (reasoning process without sensorial interference) and even the recent ones, there is a big question – how to get there or how can companies get there? Regarding this, one can state that a knowledge cycle study is needed and, of course, a Knowledge Management Cycle (KMC) must be considered. The center point is an integration of the individuals' specialized knowledge.

If the strategically most important resource of the firm is *knowledge (GRANT, 1996;* HANSEN, NOHRIA, HERNEY, 1999; *ZACK, 1999, 2002)* the ability to acquire, the organizational behavior and knowledge management are the big challenges (NONAKA, TAKEUCHI, 1995; NONAKA, 2008; *ZACK, 1999, 2002*).The way knowledge processes are carried out, remains an important and up-to-date discussion.

2.1.2.2 ISO 30401 Knowledge management systems — Requirements

All aspects of ISO are involved at this work (leadership, commitment, policy, planning, roles etc.). Of course, creating a Knowledge management culture is the central goal.

Acquiring new knowledge means to provide the organization with knowledge that was previously unknown or unavailable within the organization.

ISO 30240 (item 4.4.2 page 4) refers to a knowledge management system covering the following activities:

- **Applying** current knowledge means to make knowledge effective, integrating the current relevant knowledge of the organization in order to enable improved actions and decision making.
- **Retaining** current knowledge means to safeguard the organization from the risks of knowledge loss.
- **Handling outdated** or invalid knowledge means to protect the organization from making mistakes or working inefficiently, as a result of use of knowledge inappropriate within the current organizational context.

Although ISO involves high level activities definitions, there are other models that can establish more detailed steps; some of them are presented next.

2.1.2.3 A Knowledge Model and a Knowledge Model Cycle

During the next pages it is intended to present Knowledge, Knowledge Cycle and Model. This is the model that will be considered the main approach when developing the Consulting Framework. Context is an important matter and useful in the internationalization process, so organizational knowledge is also described.

2.1.2.3.1 General Knowledge Cycle

A Model should represent a reality (or a part of it), a cognitive representation of it and also its deviations (FORNARA et al., 2008; SMITH, 2004; VLADIMIROVNA, 2018). When building a model, the goal (and challenge) is to list the representative rules and “not all” the rules in a large flat knowledge base. To reach structured knowledge is the path. A synthesis model is required and it must represent the structure to communicate important information.

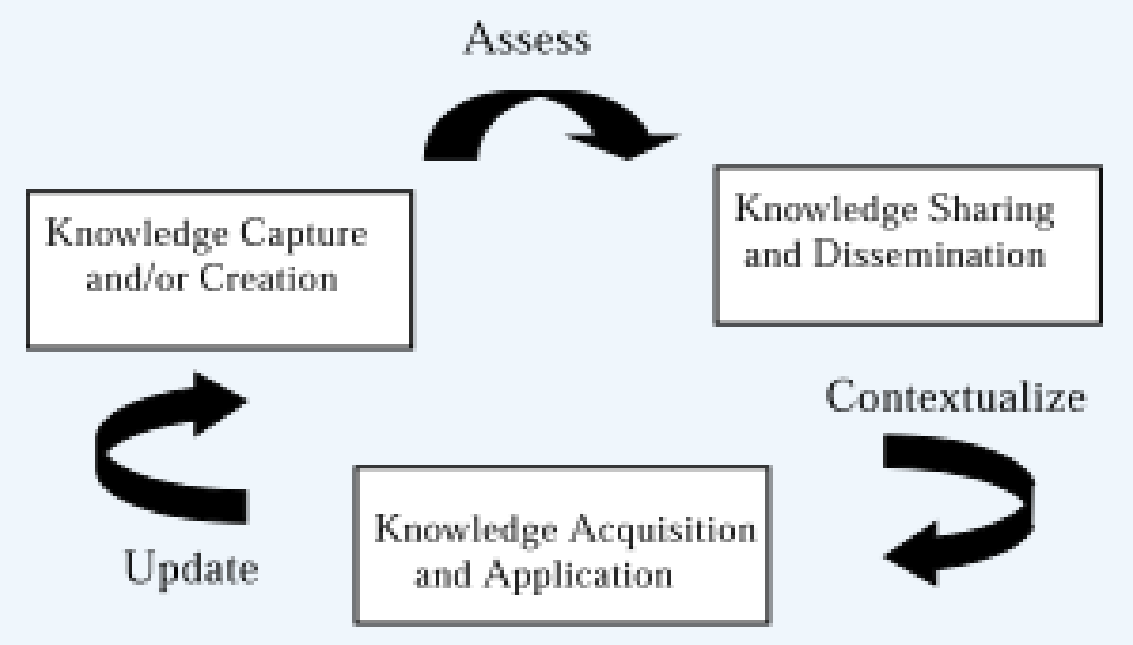
On the basis of studies concerning KM Cycles, there are three main approaches:

- Knowledge capture and/or creation;
- Knowledge sharing and dissemination;
- Knowledge acquisition and application.

That means (Figure 22 – Dalkir integrate model of KMC) that several operational activities are developed in each stage and between them such as:

- knowledge content is assessed
- knowledge is contextualized
- knowledge is understood (“acquisition”)
- knowledge is used/applied (“application”).
- knowledge content is updated
- knowledge is identified
- knowledge is codified and available
- Incorporated into internal knowledge and know-how
- New knowledge and know-how (“creation”)
- Knowledge is inventoried
- Assessment of selection criteria
- Evaluating if knowledge has enough value to the organization
- Value added to intellectual capital

Figure 22 – Dalkir integrate model of KMC



Source: Dalkir (2005, p.43)

2.1.2.3.2 Wiig's model

Karl Wiig's model presented in 1993 is one of the oldest references found in formal literature. It has four phases: Build, hold, pool and apply. It is a simple concept but it is worth doing until today and represents the main tasks of knowledge workers.

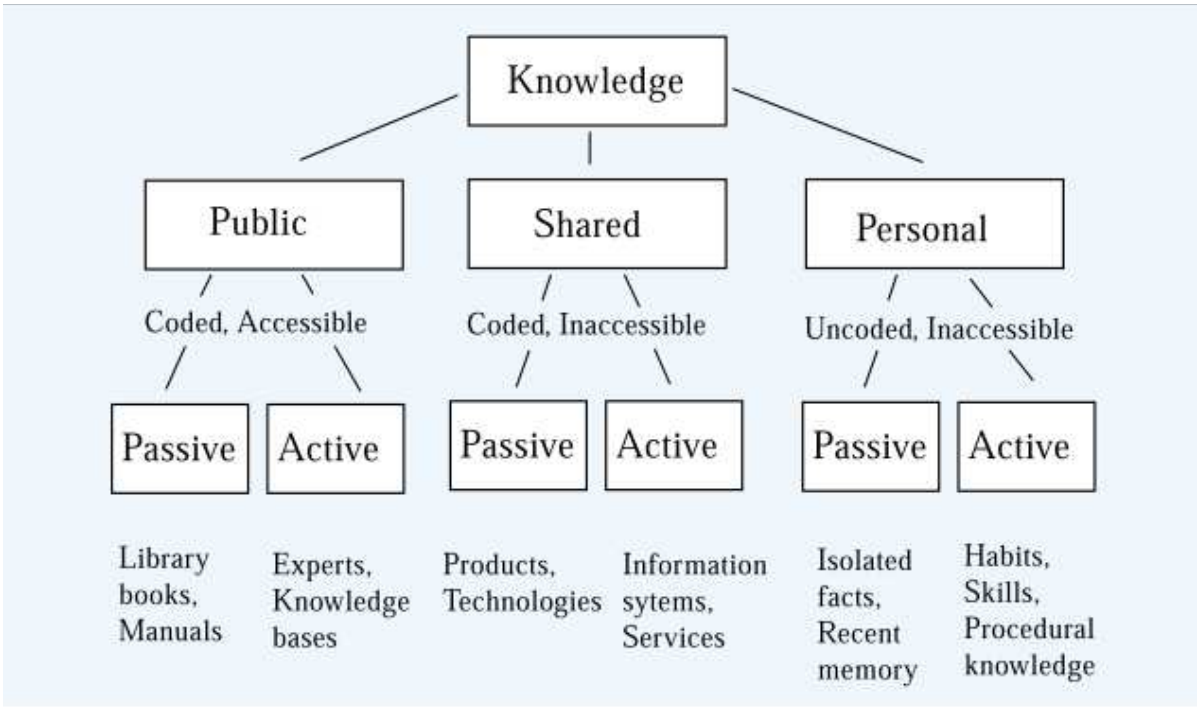
"To summarize, Wiig (1993) proposes a hierarchy of knowledge that consists of **public, shared, and personal knowledge** forms. (DALKIR, 2005, pp.64, emphasized by us). These three forms vary from the most to the least accessible one. In addition, four types of knowledge are considered: factual, conceptual, expectational, and methodological. Wiig also defines a hierarchy of Knowledge forms (Figure 23 and Figure 22).

> **Factual knowledge** deals with data and causal chains, measurements, and readings—typically, directly observable and verifiable content. **Conceptual knowledge** involves systems, concepts, and perspectives (e.g., the concept of a track record, a bullish market). **Expectational knowledge** concerns judgments, hypotheses, and expectations held by knowers. Examples are

"Knowledge rests not upon truth alone, but upon error also." Carl Gustav Jung

intuition, hunches, preferences, and heuristics that we make use of in our decision making. Finally, **methodological knowledge** deals with reasoning, strategies, decision-making methods, and other techniques. Examples would be learning from past mistakes or forecasting based on analyses of trends. (DALKIR, 2005, p.64)

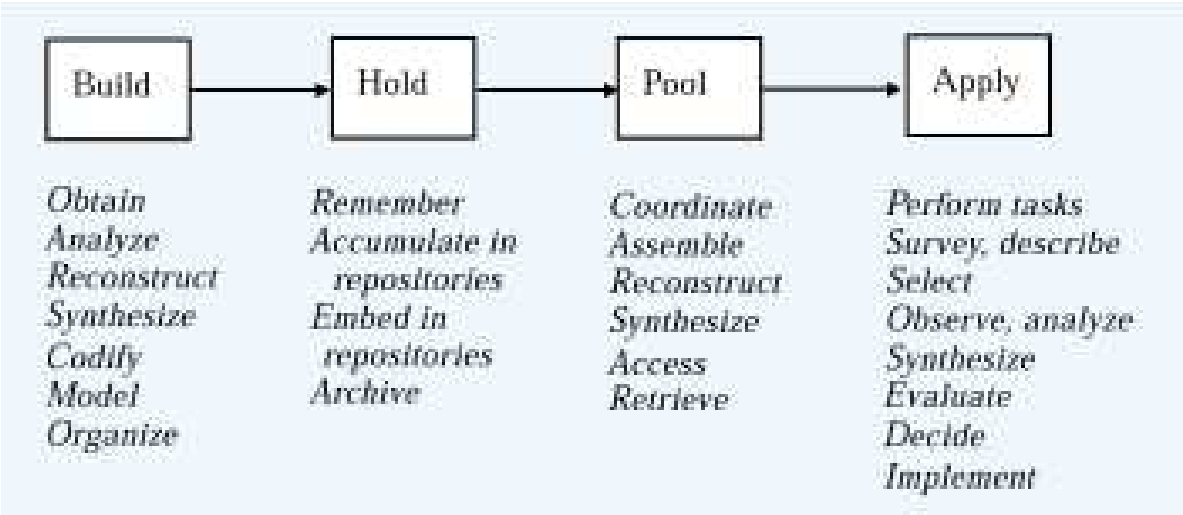
Figure 23 – Wiig's hierarchy of Knowledge forms



Source: Dalkir (2005, p.85)

Karl Wiig proposed his KM model in 1993 with the claim that knowledge will be useful and valuable only if it is organized and synchronized. According to Wiig, the ultimate purpose of KM is “to make the organization intelligent-acting by facilitating the creation, accumulation, deployment, and use of quality knowledge.” Through his KM cycle, WIIG attempts to show how knowledge is built and used by individuals and organizations.

Figure 24 – Summary of Wiig KM and Key activities



Source: Wiigs (1993 apud Dalkir (2005, p.42)

As one can observe, this cycle is close to IQBAL(2017) - Figure 28, Evans, Dalkir and Bidian (2014) - Figure 27 and others KMC as shown in Figure 21.

Wiig (1995) defines the four main steps and includes activities (Frame 19) in each phase.

Frame 19 – The Wiigs model of Knowledge Cycle – Activities detailed.

Phase	Description
i. Build ↓	Management: Refers to management activities for knowledge workers such as acquiring, partition, codification, etc. Acquiring: Purchasing, learning from experience, formal and informal, individuals and collective sources (repositories, organization memory) External and internal sources and tacit and explicit knowledge. Key activities: ● Obtain ● Analyze ● Reconstruct ● Synthesize ● Codify ● Model ● Organize
ii. Hold ↓	Knowledge accumulation in various knowledge-based databases and repositories. Retrievable Information storage and in people training. The use of knowledge tools is required to make all these available to employees. Key activities: ● Remember

	● Accumulate in ● repositories ● Embed in ● Archive ● repositories
iii. Pool ↓	Are collective actions to access accumulated knowledge (Networks, IT-based technologies, social interactions, etc.). Crosstalk between pools and experts counseling. Coordinating, assembling, accessing and retrieving knowledge. Key activities: ● Coordinate ● Assemble ● Reconstruct ● Synthesize ● Access ● Retrieve
v. Apply	That is capitalizing knowledge. Knowledge used for improving work processes. New knowledge generation. Reach out profit and benefit due knowledge company achievements. Key activities: ● Perform tasks ● Survey, describe ● Select ● Observe, analyze ● Synthesize ● Evaluate ● Decide ● Implement

Source: Wiigs (1993) apud Dalkir (2005, pp.39-43)

Notice that Intellectual assets and capital are the main sources for competitive quality on knowledge-based intellectual-capital.

2.1.2.3.3 CommonKads

One of the most famous models and complete models described is the CommonKads by Schreiber (2000). This model suffers criticism when applied in real context – there are a lot of details that should be considered - and enhancements have been suggested by other authors. Anyway, it is the most comprehensive model for Knowledge and is used in the design and project of Knowledge-based Systems (KBC) and that is why it is presented now.

"Framework, model and methodology" are frequently used when referring to CommonKads. The author (SCHREIBER, 2000) refers to the model on page 90 of the book. "A knowledge model has three parts, each capturing a related group of knowledge structures. We call each part a knowledge category" (SCHREIBER, 2000, p.90). As can be perceived, CommonKads comes with a structured methodology for KBS Projects; there is a set of models turned to the organizations and applications.

There are several analytical tasks involving a knowledge system. They are focused on determining the boundaries of a Knowledge model and a detailed analysis of the tasks must be conducted to understand the reality or the system.

- **Analysis** of System Model and a description.
- **Classifications** and **Associations** generating a set of classes.
- **Diagnosis** and Model of system environment and behavior
- **Assessments** of criteria and rules
- **Monitoring** system behavior.
- **Prediction** of output in the future.

The COMMONKADS methodology consists of three main components: **First**, it proposes a modeling framework to represent and analyze tasks. **Second**, it brings up a set of task templates to identify the potentially reusable task. **Third**, the models are validated through simulation or prototyping.

More and more organizations recognize that there is value in the knowledge implicitly embedded in their current business processes. Explaining this knowledge is the goal. The terms intellectual capital and knowledge assets are commonplace today and they are deeply related.

2.1.2.4 A Knowledge Model overview for KBS

As referred by SCHREIBER (2000) a Knowledge model can be divided into categories (Frame 20), and each one is related to a group of knowledge capturing,

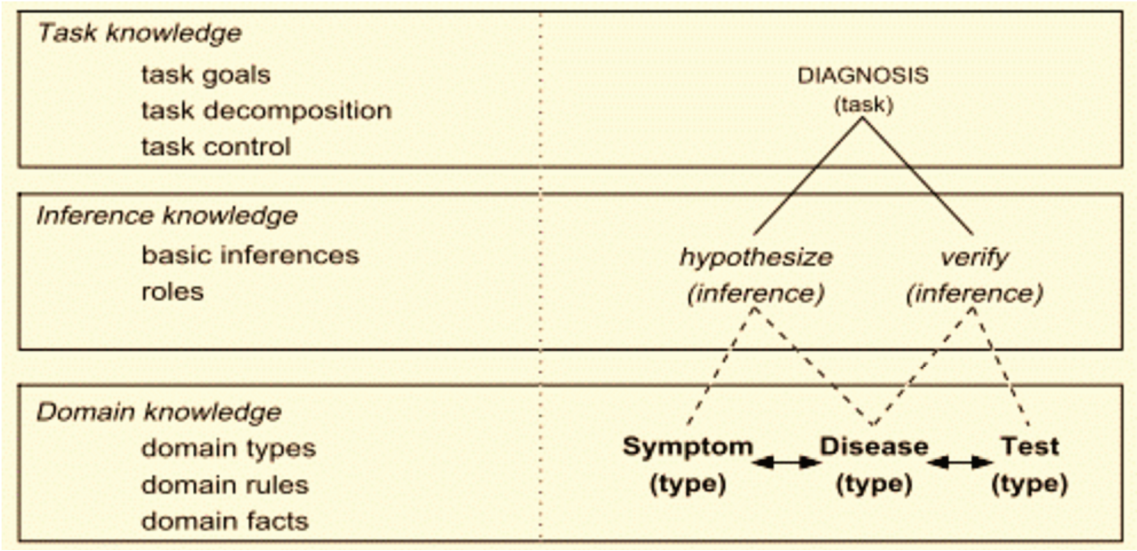
i. Domain knowledge
ii. Inference knowledge
iii. Task knowledge

The **first** category is "**domain knowledge", which** is related to domain-specific knowledge and information types. So, when having a medical diagnosis application, it should contain diseases, symptoms, etc., including relations between them (Fig 21). It sounds like an "object model" in software engineering.

The **second** category, the "**inference knowledge**" describes the basic desired inference steps. Inferences represent built blocks of the reasoning machine. In a medical application for example: "diagnostic hypothesis" and "verifying" with clinical examination and laboratory results; this is the cause-searching category.

The **third** category of knowledge is "**task knowledge**" – this is "how". Task knowledge describes what goal(s) an application pursues, and how these goals can be reached through a decomposition into subtasks and (ultimately) inferences. So, it describes a sequence of the "hypothesize" and "verify".

Frame 20 – Overview of knowledge categories in the Schreiber Knowledge Model



Source: Scriber (2000, p.90)

When building a Knowledge model, there is a list or a checklist of documents. This is the expected documentation of the model (SCHREIBER, 2000, pp.184-186):

- KNOWLEDGE MODEL: Full knowledge-model specification in text plus selected figures.
- INFORMATION SOURCES USED: List of all the information sources about the application domain
- GLOSSARY: List of application-domain terms with their definition
- COMPONENTS CONSIDERED: List of potentially reusable components
- SCENARIOS: A list of the scenarios for solving application problems
- VALIDATION RESULTS: Description of the result of validation studies
- ELICITATION MATERIAL: Includes the material gathered during elicitation activities (e.g., interview, etc.)

Additional information is also important:

- A list of all information sources used;
- A list of domain terms with explanations (= glossary);

- A list of model components that were considered for reuse plus the corresponding;
- Decisions and rationale;
- A set of scenarios to solve the application problem;
- Results of the simulations undertaken during validation.

The Schreiber theoretical model is important for its completeness, although its practical application can sometimes be exhaustive and it demands a lot of time and effort – this is due to the requirements it establishes.

2.1.2.5 Organizational knowledge & KM FRAMEWORKS TIMELINE

Organizational knowledge means the ability of a company to generate completely new knowledge, distribute it and incorporate it into products, services and systems (NONAKA; TAKEUCHI, 1995). Conversion of tacit knowledge into explicit knowledge is one of the problems of knowledge management. The Knowledge management Cycle has several frameworks from Huber (1991, p.1) ("knowledge acquisition, information distribution, information interpretation, and organizational memory") to Evans, Dalkir, Bidian (2015) (Identify/create, store, share, use, learn, improve).

Frame 21 – KM timeline (models and frameworks)

Authors	Main Concept of KMC
Huber (1991)	Acquisition, distribution, interpretation, organizational memory
Wiig (1993)	Creation, sourcing, compilation, transformation, dissemination, application, value realization
Meyer and Zack (1996)	Acquisition, refinement, store/retrieve, storage/retrieval distribution, presentation
Nickols (1996)	Acquisition, organization, specialization, store storage/access, retrieve distribution, conservation, disposal
Skyrme (1998)	Identify, create, collect/codify, knowledge database, diffuse/use
Bukowitz and Williams (1999)	Get, use, learn, contribute, assess, build/sustain, divest
Alavi and Leidner (2001)	Creation, storage/retrieval, transfer, application
Holsapple and Joshi (2002)	Acquiring, selecting, internalizing, using
Birkinshaw and Sheehan (2002)	Creation, mobilization, diffusion, and commoditization
Lee and Hong (2002)	Capture, development, sharing, utilization

McElroy (2003)	Individual and group learning, knowledge claim validation, information acquisition,
O'Dell, Grayson and Essaides (2003)	Organizing, sharing, adapting, using, creating, defining, collecting
Rollet (2003)	Planning, creating, integrating, organizing, transferring, maintaining, assessing
Awad and Ghaziri (2004)	Capturing, organizing, refining, transferring
Becerra-Fernandez, Gonzalez and Sabherwal (2004)	Discovery, capture, sharing, application
Heisig (2009)	Sharing, creating, using, storing, identifying
Dalkir (2005, 2011)	Knowledge capture and/or creation, knowledge acquisition and application, knowledge sharing and dissemination
Sağsan (2006, 2009)	Knowledge creation, knowledge sharing, knowledge structuring, knowledge using, knowledge auditing
Evans and Ali (2013)	Identify, organize and store, share, apply, evaluate and learn, create
Evans, Dalkir, Bidian (2015)	Identify/create, store, share, use, learn, improve

Source: Shongwe (2016)

Shongwe (2016) revealed (Frame 21) that, in spite of the common terminology, they differ in the number of processes and "some frameworks of the processes follow a certain sequence (Evans, et al., 2015) and in others they do not follow any sequence (MEYER & ZACK, 1996)" (SHONGWE, 2016, p.146).

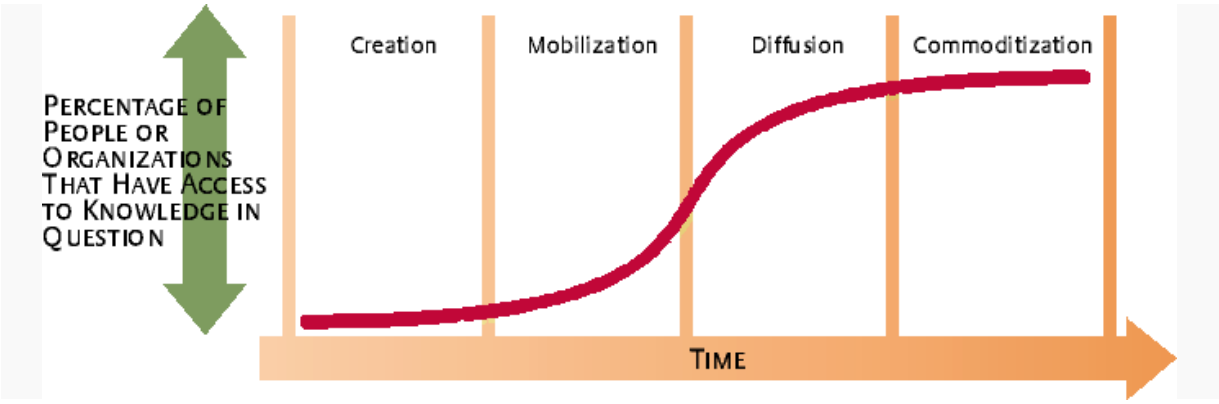
All of that implies a Knowledge Management (KM) that consists of systematic processes. It involves acquiring, organizing, sustaining, applying, sharing, renewing, etc. the organizational knowledge. That means to create value due to the enhanced performance of the organization (DAVENPORT AND PRUSAK, 1998) and acting to build knowledge after an understanding of how it is created, acquired, processed, distributed, used, harnessed, controlled, etc. (EVANS, DALKIR; BIDIAN, 2014).

One of the challenges for a company that intends to get around the knowledge era (organizational knowledge), is (a) to know about the necessary steps and (b) identify the current step the organization is in. Consequently, considering a lifecycle is closely possible to identify steps:

> The lifecycle metaphor allows us to make sense of both the stages of knowledge development as well as the processes of evolution and exploitation, as it moves from one stage to the next. It also offers a way of making sense of the conditions under which different knowledge management strategies are appropriate. (BIRKINSHAW; SHEEHAN, 2002, p.4)

Some of the authors were deeply interested in identifying the progress of companies during KMC processes. To Birkinshaw and Sheehan (2002, p.77) “Knowledge progresses through four stages as it develops over time. As it becomes accessible to more and more people — first in one organization, then in many, and finally to the general public — companies must use different strategies to realize its maximum value”.

Figure 25 – Identifying stage percent in companies



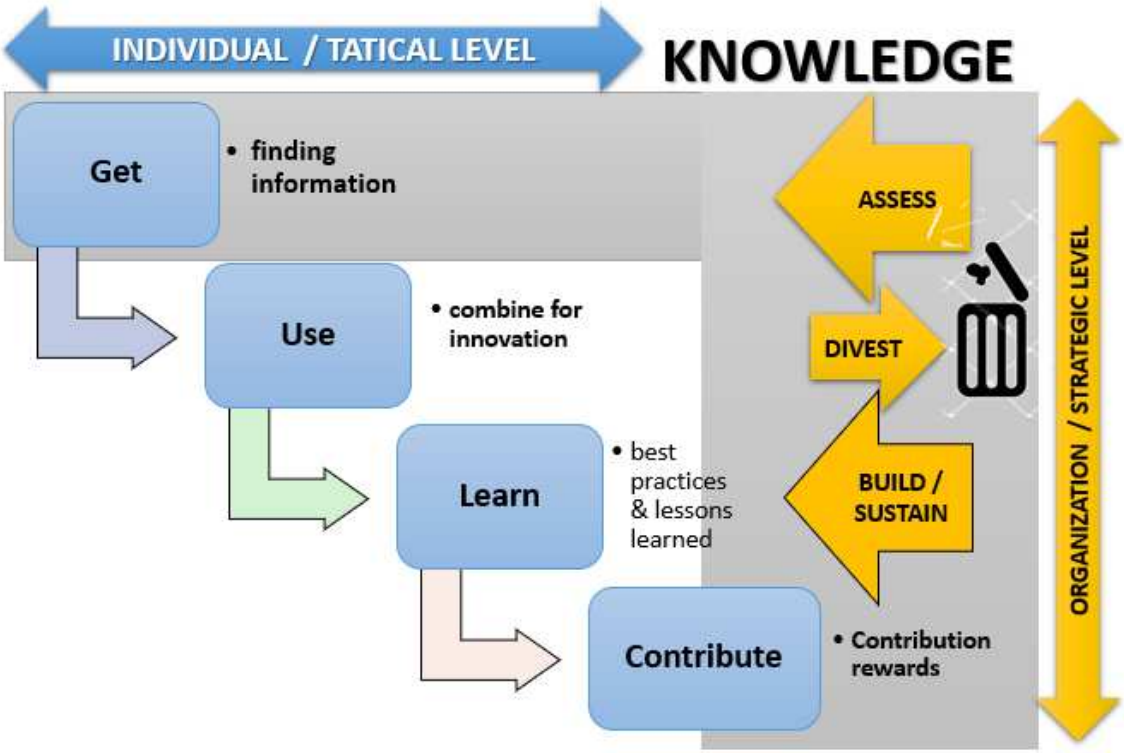
Source: Birkinshaw and Sheehan (2002, p.77)

One interesting and useful KMC framework is suggested by Bukowitz & Williams (1999). This framework involves tactic and strategic processes and defines a diagnosis framework (including recommendations) for each stage detected in the knowledge lifecycle (Figure *26*):

> The model proposed by Bukowitz and William (B & W) defines strategies for the management and improvement of knowledge assets. The model addresses the tactical and strategic aspects, defining an extensive diagnosis questionnaire of the current situation and allow to define corrective actions (VIANNA et al., 2017, p.4) (free translation)

The Bukowitz and Williams model (Figure *26*) considers repositories, relationships, technologies, communication infrastructure, functional skill sets, process know-how, environmental response, organizational intelligence, and external sources. Using this, the model describes how to generate, maintain and deploy the Knowledge.

Figure 26 – Bukowitz and Williams Knowledge Management Cycle



Source: Bukowitz and Williams (1999)

Bukowitz and Williams (1999) describe a knowledge management framework useful to determine the steps in the creation of the knowledge process in the organization. These processes are detailed as:

a) **Get stage:** It consists in finding the required information to solve problems, innovate and reach competitive advantage.
b) **Use stage**: Using and combining information (in individuals or groups) in order to advance organizational innovation.
c) **Learn stage**: It is the learning process for creating competitive advantage. Organizational memory is useful concerning registering of success (best practices) and failure (lessons learned).
d) **Contribute stage:** Effective post of knowledge in the repository (implicit to explicit). Stimulating the process and contributions rewards are recommended.
e) **Assess stage:** Means the continuous evaluation of the intellectual capital in terms of usability, adequation, immediate and potential use.
f) **Build/sustain step:** The purpose is to sustain the process of intellectual capital absorption and get a better competitive organization. It is the growth and maintenance of knowledge.
g) **Divest step**: It is the final step of Bukowitz and Williams KMC. The cost or benefit of holding and divesting the information must consider where the central point is creating value.

In 2009, after studying and analyzing the term “knowledge” in 160 worldwide frameworks Heisig published a detailed article in the Journal of Knowledge

management. Despite a wide range of terms, some are detected to knowledge activities and the critical success factors of KM. The six most frequent entries, according to the new ranking would be as follows (term and frequency) and four factors for success are shown in Table 4 – Frequent knowledge activities and Factors of Success.

Table 4 – Frequent knowledge activities and Factors of Success

Order	Six most frequent entries	Count	Critical Factors	Count	Frameworks
1	Use	41	Human-oriented factors: Culture – People – Leadership	149	100
2	Identify	37	Organization: processes and structures	99	83
3	Create	36	Technology: infrastructure and applications	96	94
4	Acquire	33	Management-process: strategy, goals, and measurement	80	61
5	Share	31			
6	Store	24			

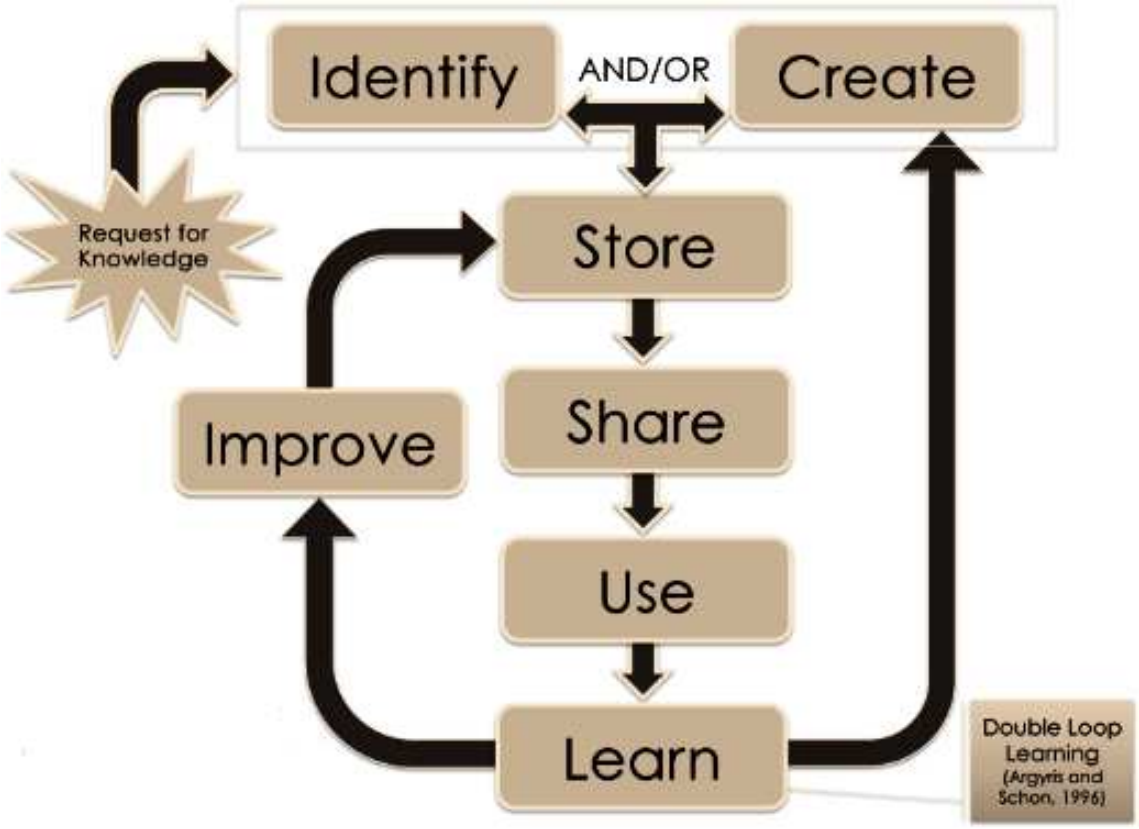
Source: Heisig (2009, pp.10-14)

This is a very summarized table of Heisig (2009) data, and the article is full of details and statistics, like (Average, Median, Standard deviation, Minimum-Maximum Range) and a partial score of each word and synonymous. By observing this Table 4 – Frequent knowledge activities and Factors of Success, it is possible to identify the main values to be considered concerning Knowledge Models and Frameworks. Of course, the core meaning of the term “knowledge” is frequently enhanced and improved and by consequence the Knowledge Lifecycle.

EVANS, DALKIR and BIDIAN (2014), suggest a holistic view of the knowledge life cycle. It further extends previous life cycles models and Heisig’s (2009) analysis of KM frameworks. It is called a “holistic view of the knowledge life cycle”, built on previous life cycles models and Heisig’s (2009) analysis of KM frameworks. It further extends previous models by including different knowledge forms.

The contribution of this KMC model (Figure 27) is “the notion of second order or double loop learning and associating some facilitating initiatives and technologies for each of its phases” EVANS, DALKIR; BIDIAN, 2014, p.1).

Figure 27 – Evans, Dalkir and Bidian - double KMC



Source: Evans, Dalkir and Bidian (2014, pp.155-157)

This model extends previous models by including different knowledge forms. Also, it integrates the notion of second-order or double loop learning. It facilitates initiatives and technologies for each phase. Evans, Dalkir and Bidian (2014, pp.92-94) define:

Identify:

The identity stage involves eliciting codified and encapsulated knowledge assets (e.g., documents in electronic and print format stored in a knowledge repository and/or live demonstrations and observations of artifacts).

Create

A knowledge request may trigger the need for new knowledge assets to be created if none are found through searching during the identified stage.

Store

Once the knowledge has been deemed valuable to the organization, based on the analysis and assessment in the identify and create phases, it is stored as an active component of the organizational memory.

Share

Knowledge assets are retrieved from the organizational memory, to be shared (disseminated/communicated) both internally and externally. Once shared, knowledge assets can be activated (put to use) – their value can be extracted and applied throughout the organization, to solve problems, make decisions, improve efficiency, or promote innovative thinking. Knowledge assets can be used in encapsulated form (Wiig, 1993), but there will always be some degree of tacit knowledge that is applied.

Learn

The knowledge assets that have been shared and used in previous phases can also be used as the foundation for creating new and refining existing knowledge assets. The use of knowledge, particularly in situations where experts provide contextual understanding, leads to employees gaining experience, as they interpret the impact of knowledge on their work environment

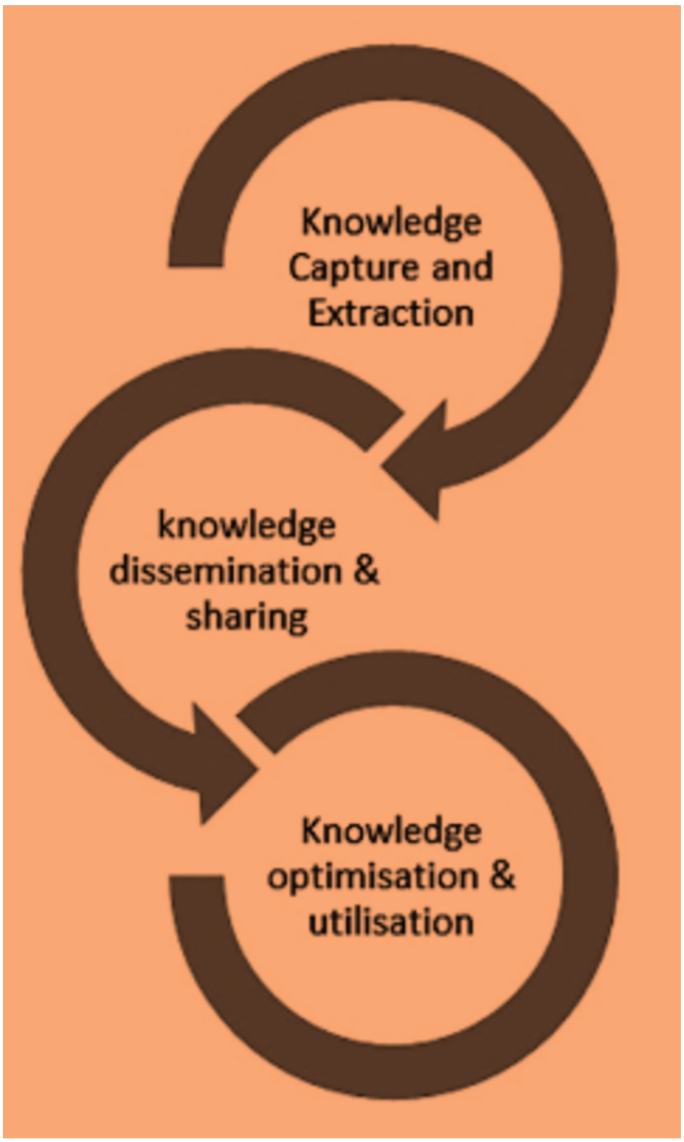
Improve

The learning that takes place in the previous phase leads to further refinement of the knowledge assets. The new value is either identified or created from them and additions or updates are made to keep them current in the organizational memory and applicable to the organizational context.

Iqbal (2017) using another grouping approach, designs an intuitive approach as shown in

Figure 28. It is a simplified view and useful for a general classification of steps. As the meaning of each step is like Evans, Dalkir and Bidian (2014) they are not repeated here.

Figure 28 – Knowledge Management Cycle – KMC



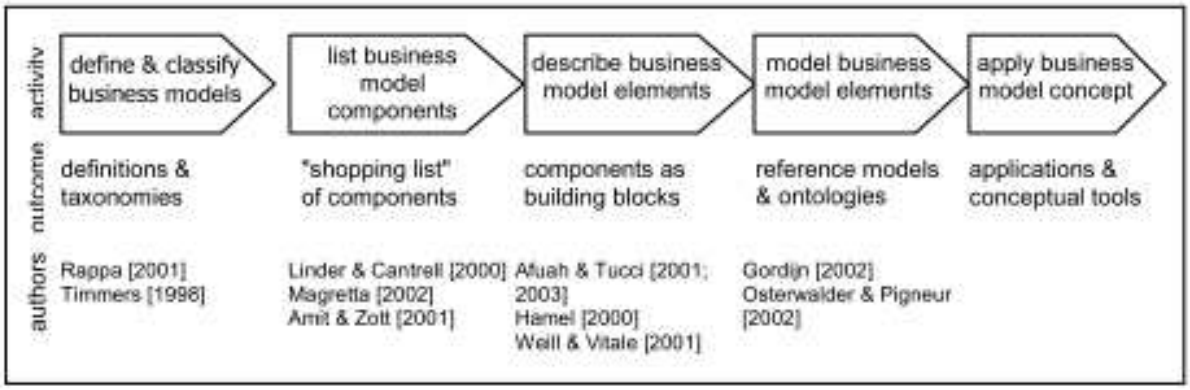
Fonte: Iqbal (2017, p.70)

Models cannot be static and must change continuously. When talking about Business models this is a truth: “A competitive business model that makes sense in today’s environment might be outdated or even obsolete tomorrow” (OSTERWALDER; PIGNEUR; TUCCI, 2006, p. 210).

Figure 29 indicates a business model including some tasks / steps. *Mutatis mutandis,* these same phases occur in systems, ontologies, etc. Notice that (i) definitions and taxonomies are in an early stage, then (ii) there are components, then

(iii) components begin to constitute interrelated sets, later (iv) they become reference models and ontologies and finally the model generates applications and tools, such as frameworks.

Figure 29 – The evolution of business concept model



Fonte: Adaptado de OSTERWALDER, PIGNEUR, TUCCI (2006, p.11)

As one can see, even in a business model, there are some basic tasks: list model components, describe components, make references and apply concepts and models. The same model is recommended using similar steps to get a union of models and construct a framework for HEI consulting. It will be a cycle of knowledge.

Benefits from adopting a Knowledge Cycle in organizations can be observed. Several authors have stated the potential of KMC adoption in organizations. Apurva Anand et al. (2011, p. 936) after extensive research have built a list of them, as seen in Frame 22.

Frame 22 – Summary of KM Benefits

No.	KM Benefits	Reference
1	Best decision making	Singh et.al. (2006), Dalkir (2005), Chase (1997)
2	Smoother collaboration	Singh et.al. (2006), Dalkir (2005),
3	Enhanced learning	Dalkir (2005)
4	Improved communication	Chase (1997)
5	Improved employee skill	Dalkir (2005), Chase (1997)
6	Increased employee satisfaction	Dalkir (2005)
7	New or better way of working	Chase (1997)
8	Sharing best practices	Davenport (1998), Singh et.al. (2006), Dalkir (2005), Chase (1997)
9	Enhanced the continuity of the organization	Beijerse (1999)

10	Improved employee loyalty and retention	Anantatmula & and Kanungo (2006), Beijerse (1999)
11	Improved productivity/efficiency	Singh et al. (2006), Anantatmula & and Kanungo (2006), Chase (1997)
12	Increased empowerment of employees	Anantatmula & and Kanungo (2006)
13	Increased sales/profits	Singh et.al. (2006), Anantatmula & and Kanungo (2006), Chase (1997)
14	Cycle time reduction	Singh et.al. (2006), Chase (1997)
15	Develop new business opportunities	Anantatmula & and Kanungo (2006), KPMG (2000),184
16	Developing core competencies	Beijerse (1999)
17	Enhanced flexibility	Singh et.al. (2006), Chase (1997)
18	Improved business processes	Anantatmula & and Kanungo (2006)
19	Faster new product development	Beijerse (1999)
20	Improved responsiveness	Singh et.al. (2006), Dalkir (2005), Chase (1997)
21	Reduced risk	Beijerse (1999)
22	Enhanced customer relation	Dalkir (2005),
23	Enhanced products or services quality	Chase (1997), Dalkir (2005),
24	Enhanced customer satisfaction	Dalkir (2005),
25	Better management of intellectual capital	Demarest (1997)
26	Increased speed of innovation	Davenport (1998), Singh et.al. (2006), Dalkir (2005), Chase (1997)
27	Improved revenues through licensing of patents	Singh et.al. (2006), Anantatmula & and Kanungo (2006)
28	Reuse of information and Knowledge	Singh et.al. (2006)

Source: Anand et al. (2011, p.936)

2.1.2.6 Knowledge reviewed during this subsection (postface)

Our present era is turned to globalization, innovation, knowledge creation and management. How to gather this challenge is a key question that has attracted researchers all over the world, and of course, KM does not belong to one area and interdisciplinarity as adopted in PPGEG is the mainstream.

As one can realize, even in qualitative or quantitative investigations, there is not a final shape. Thousands of formal literacy resources like periodicals and books bring several consistent theoretical levels.

During this section, there is a review of the literature on Knowledge Management (KM) and Knowledge Management Cycle (KMC). It was intended to provide a high-level view of several key terms, concepts, and theory.

Another goal is to bring up various terminologies and a brief exploration of the current status of KMC. With this analysis of the main contributions and agreements of researchers and practitioners, it is intended to position the Knowledge approach to the theme of consulting in the Internationalization of Higher Education.

Considering the importance of Knowledge in our society, there are a large number of different approaches to the KM process such as Schreiber, Nonaka e Takeusi, Iqbal, Dalkir, Wiig, Bukowitz and Williams and others.

Some features were highlighted to use during a framework construction. Processes were considered and their tasks, steps, connections, relations, and differences were presented, and the major stages were identified as Knowledge capture and creation, organization and retention, dissemination and use/reuse. Finally, a summary of KM benefits is reported.

This section is just the beginning for any reader interested in Knowledge research. Every day new approaches to the KM process are emerging and IT has a main role in this evolution. The main goal is an improved knowledge basis for discussions and research.

2.1.3 Governance, Risk Management & Compliance (GRC)

"GRC is not only about business, it's fully about ethics and reputation." (Vianna)

Purpose and goals

Governance is considered an important structure to preserve the health of the organizations, rules and regulations. The purpose is to make evidence about the needs of an adequate structure to preserve the main rules and goals of the HEI. This involves a formal description (and dissemination) of the internal rules, compliance to regulations and considering the risk of deviation like frauds, agency conflicts. Later all these points can be auditing.

The agency conflict and Nippon-German or Anglo-Saxon origins are mentioned as origins. Thus, Governance, Risk and Compliance (GRC) are stated as a strategic view of the organization.

Governance in Educational Institutions is a particular kind that is referred, too.

2.1.3.1 Brief in Governance origins and evolution

Nowadays Governance is a healthy organization's requisite. One can realize a group of relations among all levels of management and how the whole company operates – the management and control are approaches and the main focus should be performance.

Dey (2008) investigates the association between corporate governance and agency conflicts in the firm. He found that "firms with greater agency conflicts[13] have better governance mechanisms, particularly those related to the board, audit committee and auditor" (p.1143). After all, Dey conceives that the existence and role of governance are linked to the level agency conflicts.

In advanced economies there are two models: the shareholder model and stakeholder model. The first has its focus on maximizing shareholder value; the second, the stakeholder model, considers protecting the interests of all parties involved (shareholders, managers, employees, trading partners) (MAASSEN, 1999; DORE, 2005; DRAGUSIN, 2012, 2014).

Governance models are associated with the model of capitalism in origin. That means the Anglo-Saxon model (based on external control mechanisms) has a focus on shareholders' defense of interest, while Nippon German (based on internal control mechanisms) is turned to all organizations' stakeholders. For example, preservation of employees (co-manager with employees' representative) is common in Japan and not relevant in the U.S. In a deep observation, it is possible to consider the German model located between the Anglo-Saxon and the Japanese model: an intermediate governance model.

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[13] It's a conflict emerged when "the agents" entrusted to look after the interests of "the principals", use the power for their own benefits.

The German model is a non-liberal, coordinated and socially oriented model of capitalism. […] German firms differ by a high level of cooperation. The characteristic feature is the regulation of labor relations by the developed institutes, trade unions, and social norms. Corporate governance in the Anglo-Saxon model is conducted in the interests of shareholders. It aims at maximizing the profits of the company (STREECK, YAMAMURA, 2001; Essays, UK, 2018).

Models are enhanced every day. Most of the reforms in Japan and Germany governance models, "over the past decade have purported to be about making top managers more honest and efficient" (DORE, 2005, p.437).

The dominant model (Anglo-Saxon model) "is based on a well-developed regulatory framework which states rights and responsibilities, and relationships between the key players that make up the triangle of corporate governance, namely: managers, directors and shareholders" (DRAGUSIN, 2014, p.166).

In Anglo-Saxon countries (such as the USA, UK, Australia, Canada, etc.) executive directors and non-executive ones operate together and often make use of board committees like audit, remuneration and nomination committees. This intends to preserve the shareholders' interest and profits.

Modern governance has a deep influence on Western models. Considering the emergent Asia economy, another potential model has been developed in these countries. There are very few studies about it, but Wang and Liu (2018) propose a preliminary analysis for an emerging Asian model of governance by incorporating two interlinked phenomena: shared cultural, historical norms and trajectories, and intraregional transnational knowledge transference. They present the first analysis of South Korea, Singapore, Taiwan, Vietnam, the People's Republic of China, Malaysia, and the Philippines involving industrial and consulting policies. There are some conclusions like:

> […] demonstrated that the state and state-led capitalism remain a key force shaping economic development strategies and public governance" […] they point to an important trend in the evolution of Asian governance from being a pure recipient of governance knowledge from the West to a proactive innovator of local knowledge (WANG, LIU, 2018, pp.132-133).

2.1.3.2 GRC – Governance, Risk Management & Compliance

Governance has been linked to Risk Management and Compliance (GRC) as exposed next in this section. Anyway, Governance combines an accurately controlled structure of information and results over the entire organization. Risk management is also a goal, so provides control mechanisms to ensure strategies, decisions, and actions needed.

It is a comprehensive knowledge concerning best practices and lessons learned. This knowledge is carried out by using governance experts in monitoring and analyzing the issues, looking for benefits for the stakeholders.

A comprehensive governance framework will address mainly:

- the company's performance and The Board of Directors' strategic goals, objectives and performance evaluation.
- the relationship of the top management with all leaders, ethical conduct and transparency.
- risk management, corporate compliance and responsibility boundaries
- reliability of reporting (internal/external).

In all literature, it is highly recommended that compliance and governance coexist at the same time.

Compliance describes the ability to act according to a set of rules (internal and external). Thus, compliance refers to externally imposed rules and internal control systems to manage risks.

A compliance officer must look for adequate internal controls to measure and manage risks according to all regulatory laws and organizational rules.

Therefore, governance and compliance activities are turned to reach all staff in an adequate and accurate decision-making process. Risks must be periodic and systematically evaluated and reported. Two fundamental factors are directly involved: leadership and knowledge management processes which will be studied later. Compliance means conforming with the stated requirements and governance means the structure to support it.

Risk management is the way to identify, analyze and respond to risks that might affect the organization and depends on the perceived gravity. There are several risks like technological risks, information security risks, commercial risks, financial risks, etc.

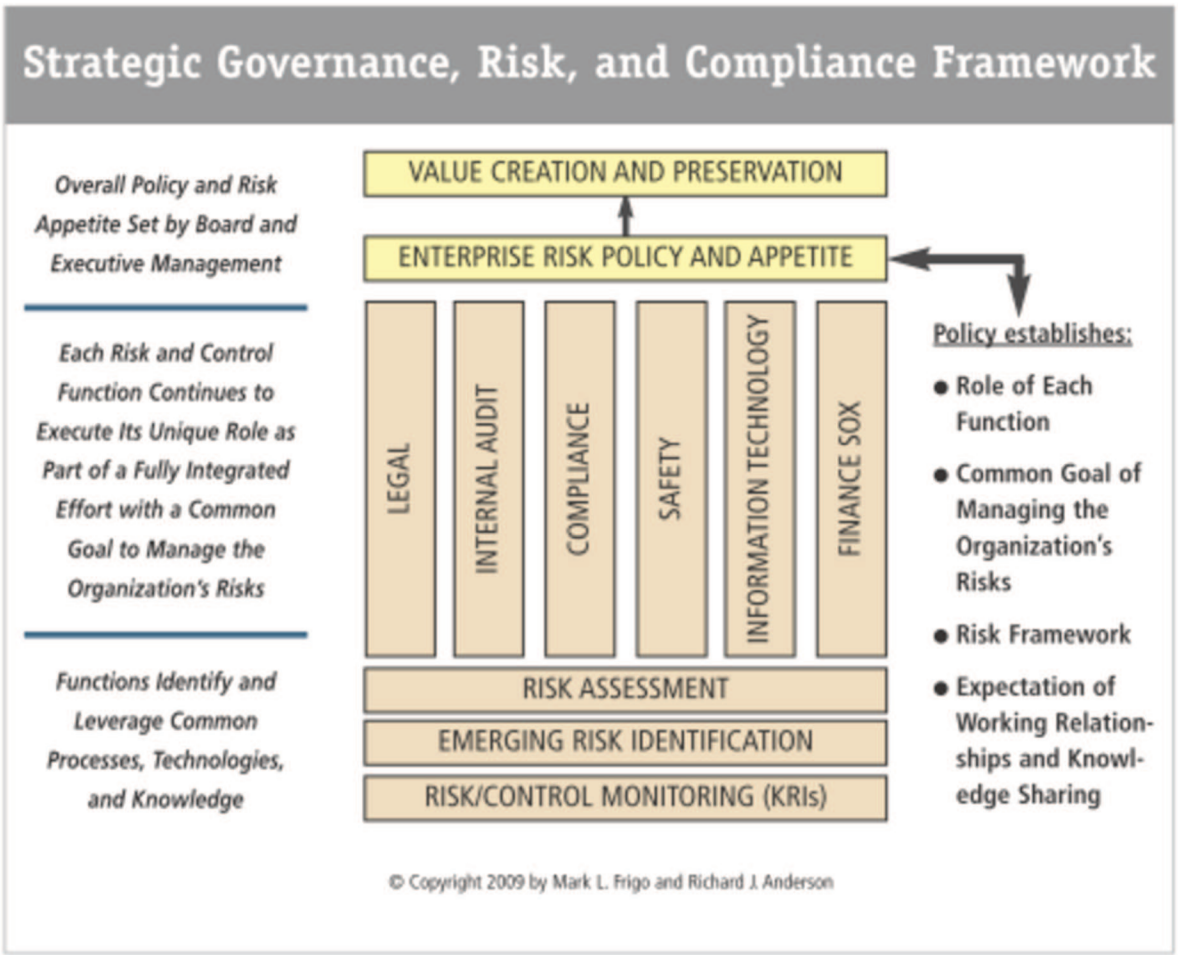
Governance, Risk, and Compliance or "GRC" reflects a new way for integrated actions inside companies. Usually, a regulatory internal framework is adopted.

> Governance, Risk and Compliance (GRC) is an emerging topic in the business and information technology world. However, to this day the concept behind the acronym has neither been adequately researched, nor is there a common understanding among professionals (RACZ; WEIPPL; SEUFERT, 2010, p.106).

2.1.3.3 GRC as a strategic view

When studying GRC, the term is mainly used when Information Technology and Financial issues are involved. Governance, regulatory compliance and risk management are all related in these publications. Enterprise Resource Management (ERM) is also cited in GRC publications. Nine publications were found with frameworks and two of them are listed. The first one refers to a strategic view of GRC (Figure 30).

Figure 30 – Strategic Governance, Risk and Compliance (GRC) Framework.



Source: Frigo and Anderson (2009, p.22)

Although Frigo and Anderson (2009) refer to the financial aspects, they present control functions holistically and seek to enhance the company's efficiency and effectiveness. One can also notice the knowledge sharing importance referred right on the bottom of Figure 30 – Strategic Governance, Risk and Compliance (GRC) Framework.

They started with a board-level policy that established the strategic risk policies and related the risk appetite of the organization. "The policy sets the common overall goals of value creation and protection as well as the expectations for the working relationships among the GRC functions" (FRIGO; ANDERSON, 2009, pp. 22-23). The policy clarifies several roles like:

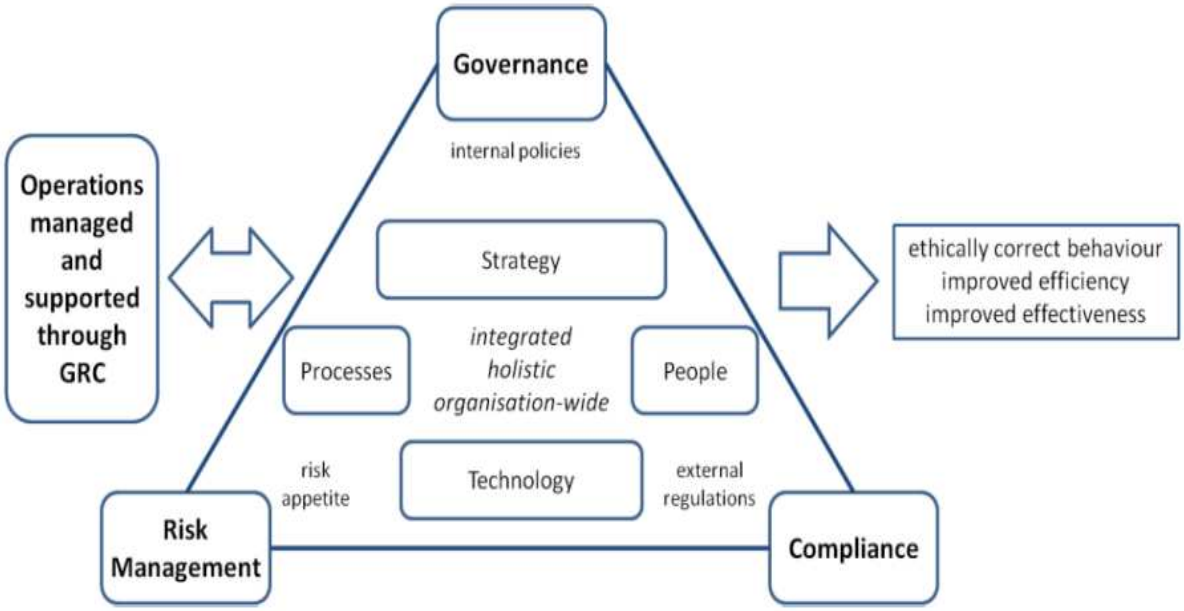
- An overall focus on strategic risks to shareholder value;
- Maintaining an enterprise-wide perspective;
- The sharing of information and knowledge;
- Common development and investment in technology and tools;
- An enterprise-wide risk framework and language.

The relationship across the organization units will be cleared after considering the primary roles and activities of each function. Objectives and initiatives must be clarified too, so one can define the risk and controls for each function. Thus, GRC can build organizational restructuring and mitigate internal conflicts.

Not all organizations have experienced the GRC. "Some are just now thinking about implementing activities such as a risk management function. The Strategic GRC Framework can be a useful tool in this situation" (FRIGOM ANDERSON, 2009, p. 23).

Another study defines key elements that should be examined when researching the integrated GRC concept. Although with a focus on IT, it can be used to build a high-level frame of reference highlighting the elements like Figure 31. Figure 31 - Frame of reference for integrated GRC.

Figure 31 – Frame of reference for integrated GRC



Source: Racz, Weippl and Seufert (2010, pp.113-114)

Governance, Risk Management and Compliance are the core subjects of GRC. Each subject(Governance, Risk Management and Compliance), has four basic components of GRC: strategy, processes, technology and people.

The rules are defined based on internal policies and external regulations. All components and rules must be integrated considering the organization-wide. They must be aligned with the organization's operations. By applying this approach organizations can achieve the objectives of GRC as stated by Racz, Weippl and Seufert (2010, pp.113): "ethically correct behavior, and improved efficiency and effectiveness of any of the elements involved".

GRC must support the management and the execution of the organization's operations depending on the company's processes (from Educational, IT companies, to supply chain) including segregation of duties.

GRC is a continuous process. It must be embedded in the culture of an organization. It also supports the way management identifies and protects against relevant risks. GRC is a basis for monitoring and evaluating the effectiveness of internal controls. The framework presented in this section can be adapted for each organization and focus; it responds and improves operations based on knowledge.

2.1.3.4 University-Academic Governance

Universities become the central point on how countries plan their future. HEIs are one of the main centers of knowledge creation in a knowledge society. It represents social mobility, they provide a nation skilled workforce, and also provide continuous upgrade of qualifications and all these affect the countries' economy. By accessing the governance of universities these various stakeholders may influence Universities' decision-making.

All changes, globalization, and the "age of knowledge" are obviously connected to the "*root*" of knowledge, and a new structure is demanded:

> The Age of Knowledge emphasizes that the ongoing transformations of knowledge, both within universities and for society more generally, must be understood as a reflection of the larger changes [...] (DZISAH; ETZKOWITZ, 2011, p.)

Governance should be the system of decision-making within and for the university. The Australian National Audit Office defines corporate governance as the "processes by which organisations are directed, controlled and held to account. It encompasses authority, accountability, stewardship, leadership, direction and control exercised in the organisation" (MOSES, 2006, p.2). The next section of this thesis will be devoted to the HEI audit challenge.

Governance in this broad definition is dispersed. MOSES (2006) has distinguished mechanisms, including:

(1) state regulation, governments' prescriptions, and rules;
(2) guidance by external stakeholders (government, representatives of industry and commerce on university boards);

(3) academic self-governance. The traditional collegial decision-making within universities, peer review of academic communities of funding agencies, groups research regulations;

(4) managerial self-governance. It refers to formal organizational hierarchies and their roles.

Also based in De Boer, Enders and Schcimak's root (2007), Findikli (2017) has added a 5th mechanism:

(5) Competition for material and symbolic resources—personnel, prestige, and funds—between and within universities is the final dimension of HE governance

(FINDIKLI,2017, p.396). That means “competition for scarce resources” (De Boers, Enders and Schcimak, 2008, p.38).

De Boer, Enders and Schcimak (2007;2008) also observed the raising of peer-review in university management activities:

> The individual academic’s influence and power to defend his own status and autonomy has been weakened, as has the formal collective power of academics in intra-university collegial bodies. (BOER; ENDERS; SCHIMAK, 2007, p.15)

Concerning International trends in HEIs actions and governance, there is an important question to be addressed: changing of beliefs, ideals, and values. As globalization is the main trend, HEIs are constantly looking for new processes for innovation and the transformation of traditional universities management. New mechanisms, evaluation and accreditation issues, laws and regulations, funding agencies, affect the HEIs governance. Processes are in a redesigned activity (KOGAN et al. 2006) (OLSEN, 2007).

As public governance, government governance and knowledge governance the creation of University or Academic Governance comes from Corporate Governance. This is due to the University modern organizational structure as told by Blake and Kogan (2007):

> The creation of powerful managerial infra-structures that now parallel and to some extent replace the academic structures of deans, heads of departments and professors. In the latter case, the implication is that government by professionals or academics that used to be based on collegial decision-making bodies have become integrated into the administrative line of the organization and thus become part of top-down decision-making structures. (BLAKE; KOGAN, 2007, p.478)

Due to these new organizations, the traditional decision-making process involving collegiate is changing, mainly in private HEI. New structures are supported by the creation of directories. All these infrastructures are growing in qualitative and quantitative terms. Marketing, quality assurance and international connections of the university are carried out by professionals:

> This reverses the basis of legitimacy and the movement of decision-making premises. Whereas decision making used to be based on collegiate bodies that at each level of the organization were composed of representatives from the organizational level below, decisions are now often trusted with leaders who are appointed by and are supposed to implement the policies of leaders on the organizational level above their own so that department chairs are appointed by deans and deans by rectors. (BLAKE; KOGAN, 2007, p.478)

To Kohler and Huber (2006) it is possible to get different means in Higher Education Governance. Basically, it depends on the level of analysis (for example, national, local, institutional, or subunit).

> Three primary authority levels must be attended: the understructure (i.e. basic academic or disciplinary units), the middle or enterprise structure (i.e. individual organisations in their entirety), and the superstructure (i.e. government and other regulatory mechanisms that relate organisations to one another). All three levels must be considered when trying to understand what is happening within particular higher education institutions (KOHLER; HUBER, 2006, p.135)

Institutional Governance in universities has multiple aspects. Over time, the concepts of governance in higher education and its performance have helped to explain the areas of strategic action, the involved, the main actors, etc. The main characterizations are shown in Frame 23.

Frame 23 – Governance in higher education – main aspects

Main aspects of governance in higher education institutions			
Performance levels and actions	**The strategic vision of the actors**	**Involved Actors**	**Strategic level – Evaluation and self-assessment**
Zgaga (2006, p. 39)	Boer, Enders & Schimak (2007, 2008)	Enders (2004)	Palmiero (2006)
Internal or institutional: governance HE. **External or systemic**: Governance focused on the educational system. **International or Global:** Governance focused on educational aspects from a global perspective.	**Academic oligarchy:** Rectors, members of higher university councils, members of Educational councils, directors of university agencies and other structures directly affecting education. **Actors in intermediate organizational structures**: CEOs, Presidents, trustees, advice supervision and monitoring (greatest influence from the years 1980) **Government actors:** Government administrators of the educational area, supervision, with influence on the educational aspects in regional and local governments and agencies. High government levels, national Congress (generators of laws) and regulatory agencies.	● Students ● Central Administration ● Direction and advice ● Stakeholders ● Agencies ● Governments	Strategic planning. Meet their strategic goals and objectives and remain faithful to their declared mission. Monitor the effectiveness of various programs. Provide fiscal oversight and ensure fiscal integrity. Recruit and guide new trustees and develop existing administrators. Prepare for succession in the leadership of the Council. Evaluating the President. Ensure academic integrity and student learning; And Improve the image and public position of the university. The experience tells us that rarely the councils engage in a complete self-assessment.

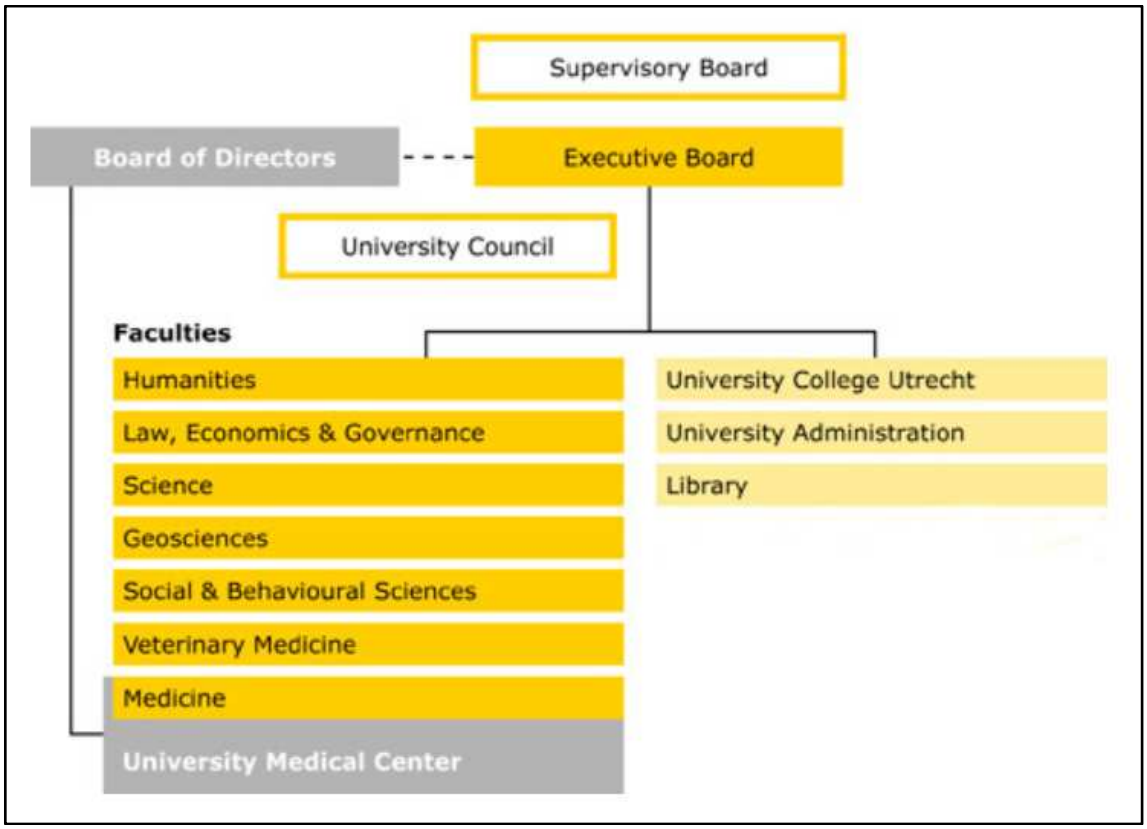
Source: Henard and Mitterle (2010) and cited in top columns.

Government policies and initiatives should be always connected to governance structure. In Brazil such initiatives like the program *Ciência Sem Fronteiras* (CSF) (Science Without Borders) which has opened the world of scientific research to Brazil, and at same time showed up the difficulties of communicating in a foreign language. Another difficulty is to collect evidence of experiences in mobility (STALLIVIERI, 2015; 2016; 2017).

A further and recent initiative is the Institutional program of internationalization, *Programa Institucional de Internacionalização – CAPES – 'PrInt'*, promoted by CAPES (CAPES, 2019). Such a program promotes the construction, implementation and consolidation of strategic plans for the internationalization of Brazilian institutions. Despite the official accountability, a governance action could be useful.

When looking for governance structures, there are several samples, like the governance structure illustration from the Netherlands' Utrecht University - UU, which can be found on the UU website – See it below.

Figure 32 – University governance example



Source: Ultrech University site – Netherlands (2018)

The governance structure of the Utrecht University (Frame 24) is laid down in a series of specific regulations, including the governance and management regulations and the structure is defined as:

Frame 24 – Utrecht University s management structure

Layers of governance	**Actors**
● central level of the university level ● level of the service departments and faculties	● The Executive Board ● Supervisory Board ● Faculties ● Employee and student representation ● Confidential Advisor ● Professors ● The University Service Departments

Source: Ultrech University site – Netherlands (2018)

Ultrech considers the involvement of its employees and students to be of major importance. The Ultrecht University has seven faculties that provide education and conduct research in the fields of humanities, social sciences, law, economics, governance and organization, geosciences, natural sciences, veterinary medicine and medicine. (Utrecht University, 2018)

The Board can have its performance evaluated externally or can make a self-assessment on how they meet their responsibilities. The assessment would include how well they:

- engage in strategic planning;
- meet their strategic goals and objectives and remain true to their stated mission;
- monitor the effectiveness of various programs;
- provide fiscal oversight and ensure fiscal integrity;
- recruit and orient new trustees and develop existing trustees;
- prepare for succession in board leadership;
- assess the president;
- ensure academic integrity and student learning; and
- enhance the university's public image and standing.

(PALMIERO, 2007, p.2)

Frame 25 – Selected Performance Indicators for institutional level

Students Social composition
- Number of applications for each place
- Overall percentage of international students
- Percentage of students retained after one year
- Percentage of entrants who graduate
- Percentage of graduates in employment or further study six months after graduation

Research
- Scores on a national peer review system
- Rise in income from non-government sources
- Average publications record (or citations) per staff member
- Number of commercial spin outs / royalty income
- Overall percentage of postgraduates

Staff
- Staff turnover
- Percentage on fixed term contracts
- Percentage from other nationalities
- Proportion of female staff

Finance/Efficiency
- Percentage of income from non-government sources
- Percentage of total expenditure on salaries
- Financial health/efficiency ratios (reserves/solvency etc)
- Percentage expenditure on building maintenance.

Source: Fielden (2008)

There are several studies about performance indicators related to HEI. Fielden (2008) provided a condensed list (Frame 25) in an overview approach: Frame 25 - Selected Performance Indicators for institutional level - overview

Source: FIELDEN (2008, p.57)

Assessments can reinvigorate boards and all administrative structures, avoiding stagnation and accepting the “status quo”. In addition, perspectives of operational change and changes in board structure, board policies and procedures are important issues during an evaluating process.

Efficiency, responsibility, faster response to problems, transparency and accountability are important issues in HEI governance systems. The outcomes are very interesting and there is a transformation of course – new and professional structures, integration of triple-helix (ETZKOWITZ, 1996) is rising, and countries are in a fast social and economic pursuit. Goal-orientation, Internationalization, and competition are stronger every day.

> As a result of the development of higher education system governance and promoted by the idea that more autonomous institutions with certain internal

> structures can increase their performance, efficiency, and responsiveness to external demands, a transformation of internal governance structures occurred in many institutions that can be described as a shift from academic self-governance and the responsibility of collegial bodies to more managerial self-governance and individual responsibility (VOSSENSTEYN, 2016, p.51).

To Enders (2004) governance is a good way to know more about internationalization of HE: […] “the development of governance theory was made to look for the strengths and weaknesses of this approach for higher education studies in an internationalizing environment” (ENDERS, 2004, p.379)

2.1.4 Auditing

Auditor: The person in any business enterprise most likely to know what is actually going on, and least likely to be able to do anything about it.
(unknown)

Purpose and goals

Another subject refers to Auditing. Monitoring and clearly communicating facts are a common task nowadays in all organizations.

Internal or outsourced auditors are permanently monitoring tasks, checking practices and reporting risks. To check if all things are being done or if they are in an appropriate way, is a real challenge. Auditing can be a "peace of mind" for top management; however, the cost-benefit must be considered.

Recommended by experts and professional organizations, auditors work on frauds and financial issues to bring quality and accreditation[14].

Introduction

People are constantly checking up on each other, constantly monitoring the ongoing stream of communicative exchanges and accounts that make up daily life. As company management gradually became aware of its responsibility for preventing fraud and error, the primacy of fraud detection emerged as a focus for external audit (POWER, 1997).

In our knowledge society, auditing is a very common task in business environments, but when did audit tasks start?

> The advance of audit culture and calculative styles of reasoning have many possible genealogies, most of which can be traced to the eighteenth and nineteenth centuries (or earlier) and the rise of science, Enlightenment rationalism, and the new world order created by mercantile and industrial capitalism (SHORE et al., 1997, p.441)

[14] Accreditation is a certification of competency and credibility of an Organization. In some countries Educational Accreditation is a government attribution in others, comes from of an independent organization.

Of course, “numbers and facts”, one of the results of auditing, has a large effect on governance. It is important to consider how these data are produced, the measurement proceedings and patterns, what to measure and how to deal with missing data.

In the twenty-first century it is quite common in large enterprises to find teams of internal auditors, compliance officers, quality inspectors, fraud investigators, risk management specialists, and others in order to manage the risk.
Auditing has internal and/or external roles.

2.1.4.1 Auditing and THE auditor roles

An organization has different objectives and strategies, and, of course, different risks. Organizations have functions and sectors devoted to these specific areas and these people review and evaluate procedures and facilities in order to clear up risks. Internal auditors will be in charge of some of these functions and subjects.

Internal audit (IA) is distinct from external audit but complementary. They may work together and need to be coordinated to get the best cost-effective results. Both are considered essential for effective governance, compliance and risk management. The acts of an auditor are, according to the international standards and outcomes, reported to the board or auditing committees separately.

Overtime experts will provide guides on all these areas, keeping them updated as events and circumstances change. Internal and external auditors have a key role in the corporate governance structure to assure the effective management of risk.

What is the general difference between internal and external auditors? Frame 26 illustrates the main aspects of skills and activities and Frame 27 the distinct roles.

Frame 26 – Difference between Internal and External Auditors

Concerning to	**Internal**	**External**
Who	Usually, employee but can be outsourced too. Accounting and specific backgrounds are required.	Are outside 'Registered Auditors' from accountancy firms.
Purpose	Check organizational practices to meet strategies and mitigate risks.	Verify annual account according to legal requirements and give a true view of organization reality.

Setting up the agenda	The internal audit agenda is set internally in the light of the business's risks and objectives.	The external audit firm will set its own program of work based on its assessment of the risks of the accounts being materially misstated (distortion).
Kind of Reports	Internal auditors provide a tailored report about how the risks and objectives (of the business area being audited) are being managed. There is a focus on helping the business move forward - so expect there to be recommendations for improvement.	External auditors' main report is in a format required by Auditing Standards and focuses on whether the accounts give a true and fair view and comply with legal requirements. If other things come to light which the auditors think should be brought to the client's attention they will be reported separately to the directors in a 'management letter'.
Reports to	Internal auditors report internally. Relevant managers will usually receive copies of reports as there will be recommendations that would have been discussed that they will need to act on. Ultimately internal auditors report to the audit committee (if there is one) or the Board so there is high-level oversight.	External auditors report primarily to the shareholders or the trustees for an unincorporated charity (but also see 5 re management letters).
Actions after auditing	The internal audit follows up will be agreed on a case by case basis. It can include looking to see whether recommendations have been implemented and/or consultative help to guide the implementation of recommendations.	There is no external audit follow up, until the planning stage of the next year's audit; when past issues should be considered.
Publicity & Transparency	Usually, no. E.g. In the UK private or charity sectors, internal auditors' reports are not published publicly.	The main external auditors' report will be publicly available. 'Management letters' are not publicly available.
Required or not?	Internal audit is discretionary.	In the case of external audit legal requirements vary; although the trend has been towards more organizations being exempted from the audit. However, stakeholders such as the bank or

		investors may require you to have your accounts audited.

Source: LEWIS (205); SIMUNIC (1984)

Internal auditing represents a “peace-of-mind” for (top) managers but it is not required in all organizations. Some government laws and regulations, or market position may oblige the institution to do so (e.g. accreditation process in USA; in other countries like Brazil, this is a government responsibility). Internal employees usually do It, but outsourcing can be a cost-effective solution for small companies and faculties.

External auditing is a regulated activity and laws can determine other external control regulations too. Audit services and companies are regulated. Of course, the big organized and well-known companies are preferred after a cost-benefit analysis. This involves market share disputes and the reputation of HEIs. Here are the roles (Frame 27) of internal and external auditors.

Frame 27 – The distinct roles of internal and external audit

Item	External audit	Internal audit
Recipient of reports	Shareholders or Members	Board members and senior managers
Objective(s)	Add credibility and reliability to reports from the organization to its shareholders by giving an opinion on them	Provide the assurance that members of the board and senior management use to fulfill their duties
Coverage	Financial reports and related disclosures, financial reporting risks and their management	All categories of risks, their management including the flow of information around the company, and governance
Timing and frequency	Project(s) tied into the financial reporting cycle, focused on the objective of audit opinion	Ongoing and pervasive
Focus	Mainly historical	Ideally forward-looking
Responsibility for improvement	None – duty to report control weaknesses	Fundamental to the purpose of internal auditing
Status and authority	The statutory and regulatory framework	International professional standards and Code of Corporate Governance

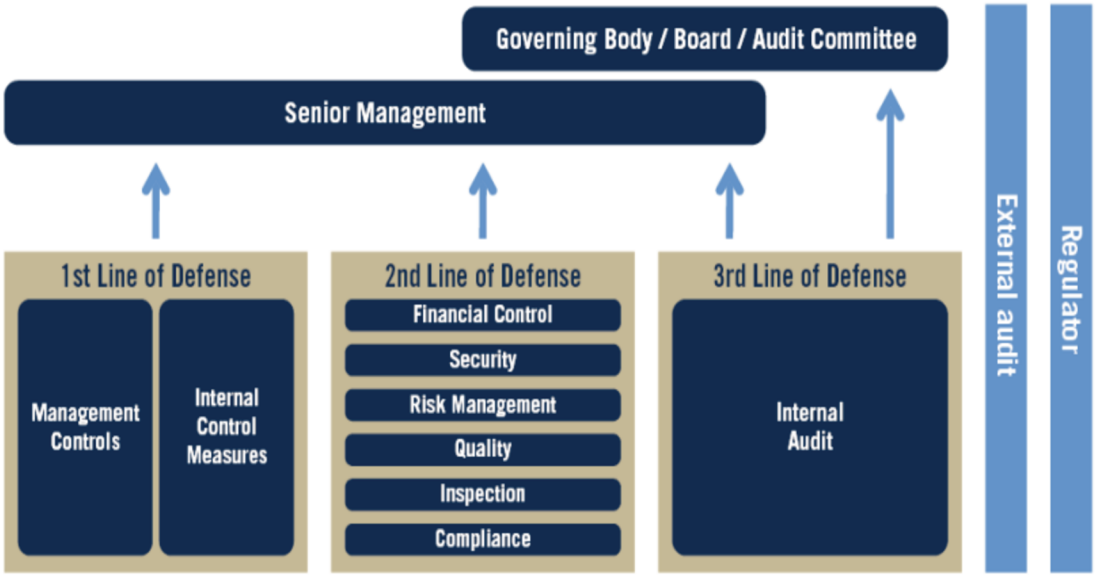
Independence	Professional ethical standards are overseen by the audit committee and regulatory framework	Professional ethical standards are overseen by the audit committee

Source: IAA Policy Paper (2019)

2.1.4.2 The three lines of defense model

The board provides direction to the senior management and delegates to the CEO the responsibility of operating the risk management and controlling it. There are some stages or levels when talking about defense (Frame 28 and Figure 33) and The European Confederations of Institute of Internal Auditing (ECIIA)[15] and The Federation of European Risk Management Associations (**FERMA**)[16] have directive laws about it.

Figure 33 – The three lines of Defense Model



Source: Adapted from ECIIA/FERMA guidance on 8th EU Company Law Directive

[15] The ECIIA represents the beacon of the Internal Audit profession in the wider geographic area of Europe and the Mediterranean: • 36 countries • 40.000 members

[16] FERMA exists to widen and raise the culture of Risk Management throughout Europe to its members and to the risk management and insurance community. It achieves its aims by promotion and raising awareness of risk management through the media, by information sharing, educational and research projects. Is the representative organization of the risk management profession in Europe and Risk Leadership in Europe.

The Institute of Internal Auditors - IIA[17] and the Institute of Directors Association (IOD)[18] all over the world (from the US, the UK to Thailand, etc.) endorse the "Three Lines of Defense" model (Figure 33). An explanation of the functions and responsibilities is offered:

(i) First line of defense – functions that own and manage risk;
(ii) Second line of defense – functions that oversee or specialize in risk management, compliance;
(iii) Third line of defense – functions that provide independent assurance, above all internal audit.

Certainly, the three lines of the defense model (Figure 33) are not "automatic" guarantees for success. All three lines collaborate with each other and with the audit committee. Boards need to pay attention to the conflicts and to the potential conflicts of interest; they need to ensure that the safeguard actions were correct.

Details of the three lines of defense are described next (Frame 28).

Frame 28 – Three lines of Defense description

Line of Defense	Description of line functions and characteristics
1st	operational management has ownership, responsibility, and accountability for directly assessing, controlling and mitigating risks. This is the front office - for example, in case of credit, those who make lending decisions should be responsible for lending prudently.
2nd	defense consists of activities covered by several components of internal governance (compliance, risk management, quality, IT and other control departments). This line of defense monitors and facilitates the implementation of effective risk management practices by operational management and assists the risk owners in reporting adequate risk-related information up and down the organization. Includes support functions, such as compliance, legal, human resources (HR), and especially the central risk management organization
3rd	Internal audit forms the organization's third line of defense. An independent internal audit function will, through a risk-based approach to its work, provide assurance to the organization's board of directors and senior management. This assurance will cover how

[17] IIA - Established in 1941, IS an international professional association with global headquarters in Lake Mary, Florida, USA. The IIA has more than 185,000 members. Generally, members work in internal auditing, risk management, governance, internal control, information technology audit, education, and security.

[18] The Institute of Directors (IoD) was founded in 1903 and intend to represent your point of view as a business leader both locally and nationally. Our objective is to ensure your views are considered when the government is reviewing policy, legislation or seeking the opinions of the wider business community. It has 30,000+ members and the business community.

	effectively the organization assesses and manages its risks and will include assurance on the effectiveness of the first and second lines of defense. It encompasses all elements of an institution's risk management framework (from risk identification, risk assessment, and response, to a communication of risk-related information) and all categories of organizational objectives: strategic, ethical, operational, reporting and compliance. Focus on the observation and evaluation of the effectiveness of risk management as well as other conduct within the business.

Source: TUSEK & HALAR (2013); LUBURIĆ (2017), FERMA, ECIIA Part I and Part II (2019)

Internal auditors could be a central point of an organization's corporate governance with effective ways to check and recommend processes improvements. Finnish Education Evaluation Centre Publications – FINEEC (2017) considers the quality of education a central question and a real challenge when building the internationalization of HEIs. Concerning this matter, please consider quality based on institutional approaches. In the same way as Knight (2004), FINEEC considers that the HEIs need, during an audit task: "[..] meet European quality requirements and is based on an institutional approach. The autonomy of HEIs to develop their quality systems according to their own needs and goals is a central premise for the audit model" (FINEEC, 2017, p.6).

The areas of evaluation are each assessed as one entity using the scale: excellent, good, insufficient. The level good is a minimum for each area and must be reached in order to pass the audit. To be "approved" an institution must be (at least) "good" in all areas.

2.1.4.3 Higher Education Auditing

When it comes to the internationalization of higher education, there are some closer services of consulting and auditing, suggested by the International Strategies Advisory Service of International Association of Universities – IAU. Association of College and University Auditors (ACUA) and FINEEC. Tax, values, expenses, frauds, and compliance must be checked from administrative support to academic issues. FINEEC states (Frame 29) the evaluation areas and topics and defines criteria for a minimum desired level:

Frame 29 – Evaluation criteria for the development level good

Concerning areas	Topics to be investigated	Area of evaluation
1. How HEIs create Competence	● The planning of education ● The implementation of education ● The enhancement of education ● Example(s) of successful development activities	**Evaluation area I** assesses the procedures which support student-centered, working-life oriented planning, implementation, and development of education, which is based on research or artistic activities. The HEI is able to present examples of effective development activities which are based on feedback and evaluation data.
2. How HEI promotes impact and renewal	● Managing societal interaction and impact ● Impactful research, development and innovation activities and artistic activities ● Promoting impact through the operational culture ● Example(s) of successful development activities	**Evaluation area II** assesses the procedures used to manage and improve societal interaction, strengthen the impact of the HEI's research, development, and innovation as well as artistic activities, and support an experimental operational culture.
3. How HEI enhances quality and well-being	● Using the quality system in strategic management ● Using the quality system in the development of staff competence ● Functionality and development of the quality system ● Example(s) of successful development activities	**Evaluation area III** assesses how the quality system is used in strategic management and the development of staff competence. The overall functioning of the quality system and the systematic nature of the development work are also assessed.
4. Learning HEI	An area of evaluation selected by the HEI	**Evaluation area IV** assesses an area selected by the HEI where it wishes to receive feedback for the development of its operations.

Source: FINEEC (2017, pp. 7-16)

FINEEC provides guidance and a checklist for auditors, with more than one hundred topics in the four concerning areas (Frame 30). FINEEC (2017, p.51) also has a specific team composition and selection criteria. It also provides training and establishes that the audit team and leaders must have experience in the following areas:

I. knowledge of quality systems;
II. good knowledge of the higher education system;
III. insight into the societal impact;
IV. experience in management, development of the core duties of HEIs, development of staff competence, and expertise in the field of teaching and learning;
V. previous evaluation of audit experience or experience in quality work;
VI. in addition, at least one team member must also possess expertise in the area of evaluation selected by the HEI;
VII. Chairs of the audit team must have previous experience in evaluating HEIs operations;
VIII. Vice-chair is selected by the audit team from among its members;
IX. All members have equal status as evaluators;
X. A member is disqualified from acting as an auditor if he/she is an interested or relation to the HEI.

I.

The best administrative practices indicate that interest parts, employees or ex-employees are disqualified[19], and cannot act as a member of the audit team. Ethical and operating principles are listed by FINEEC (2017, p. 21):

Frame 30 – Operating and ethical principles

Aspect	Description
Impartiality and objectivity	Auditors must take an impartial and objective approach towards the audited HEI, as well as recognize their position of power and the responsibility related to it.

[19] Disqualification is determined in compliance with the provisions of the Administrative Procedure Act (434/2003, Chapter 5, sections 27–29)

Transparent and evidence-based evaluation	The audit must be based on FINEEC's criteria as well as on material collected in connection with the audit.
Confidentiality	All the information acquired during the process, except for those published in the final report, are confidential.
Interaction	The audit is carried out through good cooperation and interaction with the HEI.

Source: FINEEC (2017, p. 21)

During the last years, significant transformations occurred in Higher Education Institutions. All of these aspects grow in quantity: the number of HEIs and accreditation; presence of female and mature students; the size of the student's population; new types of professional programs; collaborative provision in research and publications; credit accumulation and transference; government fund and regulations; interdisciplinary themes instead of traditional single-discipline boundaries, expansion of postgraduate students, range and nature of education courses, inclusion, quantity and the admission profile of students, new demands of education related to the competitiveness of industry and commerce, transparency, accountability, new centers of technology, habitats for innovation and entrepreneurship, science and technology parks, emerging tech startups, and information technology influence.

Technological and software solutions can reduce error, efforts in registering and controlling and also can provide a consistent audit trail. Publicity, transparency, accountability are important data characteristics, and the open-data technology and mainly linked-open-data could be more useful. Web semantic is also a good extracting data resource for humans and no-human agents. This is the future beginning in the university.

Universities are the main asset in transforming lives through teaching and driving social mobility. All these themes invoked (before) are deeply connected to Higher Education, and universities due to Internationalization are becoming complex structures. The global challenges define a new hierarchy, levels of management and academic structures are responsible for research and knowledge dissemination.

Auditing has a new frontline in the academic area and the audit culture, and its practices are valuable support. It is a symbolic regulation and represents the power control of GRC academics. The increased awareness of the importance of the auditing practice is related to the quality of the institution, mainly considering the internationalization process.

2.1.5 Leading Changes & Organizational Culture

The more complex society gets, the more sophisticated leadership must become. (FULLAN, 2001)

Purpose and goals

Engagement is an important issue and related to Changes and Leadership. Departments, Courses, Faculties, and the administrative staff must be all involved.

The top managers' support is mandatory during all HEIP.

Minimizing errors, reactions and gathering an urgency sense to changes is a master point. This subsection reports not only the steps for change but how to accelerate them.

The purpose is that after changing, it must be part of the organizational culture.

Introduction

In all actions inside University people and groups are the agents, then it is necessary to study these teams and the leader's actions. Internationalization, innovation, sustainability and leadership are areas of scientific research – there are few (5 found in Dec/2018) specific studies concerning the intersection of leadership and internationalization of higher education and even internationalization of firms.

The management of the internationalization process must be strategically planned and less "ad hoc" as it occurs nowadays. International affairs and day-to-day activities also require efficient administration; thus, the need for effective leadership is raising as well.

In Europe with The European Association for International Education (EAIE) and in Australia with The International Education Association of Australia (IEAA), the development of advanced leadership capabilities among up-and-coming international education professionals is an area of concern (MURRAY, 2014).

Kraus et al. (2018) studying about firms (not just HEIs) states that there are few studies, and suggests an investigation starting point as:

> [..] relationship between the staffs' international experience, maturity of Internationalization and the leadership style applied by the firm. Further, research on how Internationalization is embedded process-wise in the firm and the interaction of employees with regard of different leadership styles

> would help broaden scientific understanding on the Internationalization of a firm. (KRAUS ET AL., 2018, pp.569-570)

Across Canada, the Association of Universities and Colleges of Canada (AUCC) has carried out research with the four-fifths of all Higher Education Institutions identifying internationalization as a top strategic priority (AUCC, 2014) and some findings are:

> The most prominent finding of AUCC's 2014 survey is that Canadian universities are deeply committed to internationalization. Fully 95% identify it as part of their strategic planning and 82% view it as one of their top five priorities. This commitment is deeply embedded at senior administrative levels of most institutions and is being translated into action with increasing urgency: 89% of respondents say that the pace of internationalization on their campuses has accelerated (either greatly or somewhat) during the past three years. (AUCC, 2014, p.4)

In the private industry, mainly 4.0, disruption is a familiar word in several senses. When innovation, management, and knowledge is required, corporate boards usually seek for non-traditional leaders and often outside the company. Different skills, new and fresh approaches are required. In educational areas, there are new demands, new competitors, new markets with e-learning, ubiquitous learning, blended learning, MOOCs and so on. Traditional educational models are getting down and internationalization is highly requested. In developed countries this is for real:

> Colleges and universities are being squeezed by rising costs, buffeted by increasingly activist stakeholders, struggling to keep up with the effects of digitization on traditional educational models, and facing off against new competitors, such as MOOCs (massive open online courses). Competition for students is so fierce that many universities must rely heavily on student-aid "discounts" to keep dorms and classrooms filled. Demographic change, meantime, demands the continuous reassessment of student–customers and their needs. (BEARDSLEY, 2018, p.1)

A series of recent discussions by members of the Consortium for Advancing Adult Learning & Development (CAALD[20]), with focus in the rapid growth of the gig economy[21], the new challenges and opportunities for innovation efforts, have some interesting finds about Educational enterprises. They found the inertia is abandoned and several Educational Directors or Principals are coming from business companies:

> INERTIA IN HIGHER EDUCATION

[20] CALLD a group of learning authorities whose members include researchers, corporate and nonprofit leaders, and McKinsey experts.

[21] Gig economy: a labor market characterized by the prevalence of short-term contracts or freelance work as opposed to permanent jobs.

> Jason Palmer, general partner, New Markets Venture Partners: Our higher education system is 25 years behind the curve. There needs to be a new set of institutions and programs that are jointly owned and managed by corporations or industry.
>
> Betsy Ziegler, chief innovation officer, Kellogg School of Management: One of the flaws of the American higher education system is that once you cross the graduation stage, we largely sever the relationship with you—except for viewing you as a donor. Your connection and loyalty to the school haven't changed but the relationship with the institution has.
>
> Lynda Gratton, professor of management practice, London Business School: The universities will struggle to adapt to lifetime learning. At London Business School, we launched the master's in management as a one-year program for students at the beginning of their careers. We also have the Sloan program for mid-career people. (MACKINSEY, 2017, pp. 1-2)

Keep in mind that the previous examples refer to new demands like e-learning, MOOCs, etc. Lifelong learning is more complex for the University but could be a good solution for some individual faculties. From an institutional perspective, it is not obvious to find how this would fit with our current teaching practices. That means creating a new educational-business model around it.

Another study to understand how HEI leaders perceive the relationship between their international background, and their commitment to and vision of the internationalization at their institutions, "HEI leaders who value internationalization often draw on their own personal—and, at times, international—experiences, in order to demonstrate their investment in internationalization" (LARSEN; AL-HAQUE, 2016, p.421) .

The role of leaders is too broad and comprehensive in HEIs internationalization.

> To achieve the true goals of internationalization, the campus must try to promote and develop all types of internationalization efforts, encourage the development of collecting international expertise from different sources, developing links with international institutions and promoting experience sharing within the campus (SAID, 2015, p.82).

Complexities associated with understanding leadership in higher education internationalization were observed in a joint empirical research study conducted by the LH Martin Institute for Higher Education Leadership and Management, The University of Melbourne (Australian partner) and Tilburg University and the Netherlands (European partner). Here are some findings (MURRAY, 2014, pp.17-19)

I. Professionals and leaders in Internationalization in both Australia and Europe face contexts that are ever-changing, frequently turbulent in a public policy sense and increasingly business focused.

II. In both locations, the process of Internationalization is highly dependent on academic involvement.
III. Responsibilities for the Internationalization in Universities are increasingly broadening to involve a greater number and variety of institutional players (academic staff, teaching, research, and service)
IV. There was a co-dependency of professional administrative and academic staff becoming even more pronounced. Mechanisms to foster this development are increasingly imperative in Europe and in Australia.
V. Challenges
    a. the ability to be innovative, strategic and persuasive within the institutional context
    b. requirements of specific technical skills (strategic planning, change management, project management, intercultural communication, negotiation skills, and human resource management)
    c. resources, secure high-level support to successfully conduct the enterprise are needed for effective management
    d. leadership and management roles require specific roles identified for strengthening like “innovator”, “broker”, “monitor”, “coordinator” and “director”.
    e. expressed need for improved innovation and entrepreneurial/strategic skills to meet ever-changing external and internal challenges.
    f. professional development of different forms and levels is required to suit participants at three different levels (middle managers, executive directors, and senior executives/CEOs).
VI. There is a strong shared view that the co-dependency of administrative and academic roles must be addressed in professional development.
VII. Less formalized training at all levels is perceived as to be more relevant and clearly necessary.
VIII. Modest formal courses on Internationalization at graduate level, focused on leadership and management might be of value/interest to middle managers.
IX. Training involving peer learning, networking, mentoring or coaching and buddying are viewed as being particularly valuable to middle managers too.
X. Short courses/seminars to fine tune or enable acquisition of technical skills (e.g. change management, project management, teambuilding,

communication / cross-cultural negotiation and mediation skills, brokering skills, financial management and fundraising skills; business innovation skills) are viewed as important.

XI. Individualized expert meetings/seminars with top leaders in Internationalization on specific topics (e.g., good practice examples and theme-based case studies on key priority issues) and one-on-one peer learning with counterparts in institutions either within the same country or other countries are viewed as being of more value to directors/ associate deans and to senior institutional executives.

XII. Topic-specific one-off seminars and workshops are viewed as valuable for groups at all levels focused on Internationalization and global higher education.

XIII. Senior university executives moving into an Internationalization role, early role clarification and familiarization involving individualized, tailored executive leadership programs would be of value.

XIV. Participation in networks involving experience beyond the higher education sector and up-skilling of non-academic skills (e.g., business skills, cross-cultural negotiation skills) would also be beneficial.

Despite this investigation being carried out in Europe and Australia, it sounds relevant when considering the context of all responsible to support and develop international education professionals elsewhere. Training these skills are desired and effective.

Leadership training is expensive, but concerning the HEIs' internationalization benefits and globalization needs, there are some common points:

> Although frequent exchange of ideas, people and capital among countries through internationalization has brought many benefits to students, societies and countries, higher education leadership faces many challenges when it comes to preparing campuses to meet the increasing needs of globalization (SAID, 2015, p.82).

In recent publications, there are global trends concerning (a) increasingly professional management of higher education; (b) strategy and performance planning and monitoring; (c) leadership and accountability required. All these "changes" and changing the culture, structures and "*status quo*" are not an easy issue.

Leaders are needed for any process, mainly considering organizational changes and the culture of the organization. Talking about internationalization means talking about changes and, of course, the culture of the institution.

Senge (1996), Fullan (2007), Alvesson & Sveningsson (2015), Kotter (2012, 2018) have discussed many topics about leading changes in modern knowledge-oriented companies. Changes are peremptory and a culture of change means fast adaptations getting creative breakthroughs and avoiding messy environments and internal departments fights and misunderstandings.

Culture is constructed in groups through cumulative practices and learnings. For Chainn (1988, p.7) a concept of organizational culture is related to learning, groups, changes and can be thought of as:

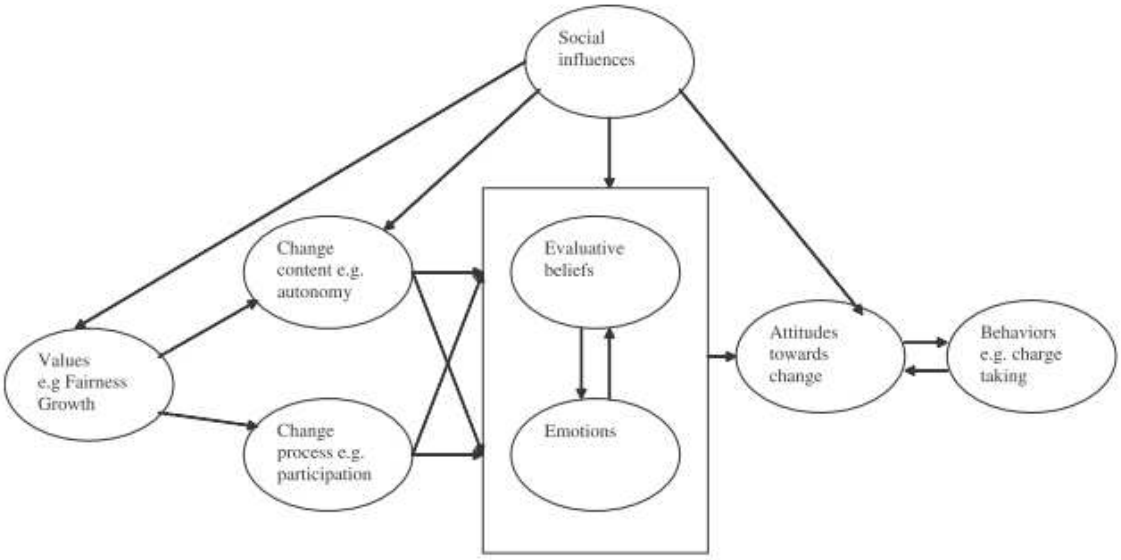
I. A pattern of basic assumptions,
II. invented, discovered, or developed by a given group,
III. as it learns to cope with its problems of external adaptation and internal integration,
IV. that has worked well enough to be considered valid and, therefore
V. it is to be taught to new members as
VI. the correct way to perceive, think and feel in relation to those problems.

Projects of change involve organizational culture in one sense or another. To some, culture is in the center of this matter: “Culture is often seen as either the key issue to be changed or something that is crucial to be taken seriously in order to make change possible” (ALVESSON; SVENINGSSON, 2016, p.3).

Another interesting dimension concerns the presumed ‘need’ for change, including espoused or ‘real’ motives for change (KOTTER, 2012; ALVESSON; SVENINGSSON, 2016, p.3). Authors suggest that change efforts usually fail to materialize as planned and there is recurrent negligence of aspects of the organizational culture.

Internationalization should be a planned process to make changes in the organizational culture so it involves people, systems, etc. and minimizing negative reactions is highly desired. Maximizing the talents and abilities of the organization staff is “a plus” and will support a successful organizational change.

Figure 34 – Causes and consequences of attitudes toward changes



Source: Lines (2005, p.12)

By perceiving consequences and investigating causes (Figure 34), the consultant must study the participation (pure or forced), autonomy (enlargement or cutting down), growth perspectives, excessive worried behavior, standard behaviors and common beliefs in the University. Some members can react to change by exhibiting anger, anxiety, enthusiasm, emotions and even joy; probably this could be remarked but not reported; it is outside the focus of a consultant in internationalization – this could be addressed to other professionals.

Organizational change can be defined as “a deliberately planned change in an organization’s formal structure, systems, processes, or product-market domain intended to improve the attainment of one or more organizational objectives” (Lines, 2005, pp. 9-10). There are bottom-up and top-down changes, but all levels of hierarchy and leadership must be involved.

Intentionally, or even unconsciously, people bring up to their day-to-day life several defense mechanisms when they are faced with changes. “Individuals go through a reaction process when they are personally confronted with major organizational change” (BOVEY; HEDE, 2001, p.435). Resistance is a common challenge when a change process is going on.

2.1.5.1 The 8-step change model: John Kotter

In 1995 John Kotter published an article in the Harvard Business Review (HBR). The next year the book was printed – Leading Change. The article was "Leading Change: Why Transformation Efforts Fail" in which Kotter discusses eight mistakes organizations make that result in unsuccessful change (lessons learned). All these mistakes are linked to the 8 steps (Frame 31). Briefly, the mistakes or errors, Kotter (1995) identified are:

- **Error** 1: Not Establishing a Great Enough Sense of Urgency;
- **Error** 2: Not Creating a Powerful Enough Guiding Coalition;
- **Error** 3: Lacking of a Vision;
- **Error** 4: Under-communicating the Vision by a Factor of Ten;
- **Error** 5: Not Removing Obstacles to the New Vision;
- **Error** 6: Not Systematically Planning for, and Creating, Short-Term Wins;
- **Error** 7: Declaring Victory Too Soon; and
- **Error** 8: Not Anchoring Changes in the Corporation's Culture.

Kotter (1995, 1996, 1997, 2007, 2012), Kotter and Borner (1998) and Hammel (2001) have given several meanings to the subjects of leading changes, efforts and fails. When talking about fails, Kotter (2007) states:

> The most general lesson to be learned from the more successful cases is that the change process goes through a series of phases that, in total, usually require a considerable length of time. Skipping steps creates only the illusion of speed and never produces a satisfying result. A second very general lesson is that critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains. Perhaps because we have relatively little experience in renewing organizations, even very capable people often make at least one big error.

Kotter describes the eight steps (Frame 31) people follow to produce new ways of operating (Leading Change Book, 2012) and dig in every step describing how to successfully deal with that problem (Heart of Change book, 2012).

Kotter (2012, p. 61) tells us: "Although gathering and analyzing information is usually seen as the best way to make a business decision, in fact, people change only when you touch their emotions. Thus, changemakers must appeal not to the logical brain but to the eyes and *heart*".

Frame 31– The 8 steps change process of Kotter

Step	Key		Subject
1.	Sense of Urgency	“Increase Urgency”	Demonstrate (do not just explain) that change is "urgent."
2.	Coalition	“Build the Guiding Team”	Assemble a "guiding team" including but not limited to top managers. Ideas will come from all levels of the company.
3.	Vision	“Get the Vision Right”	Once you have urgency and a team, develop a motivating "vision."
4.	Communicate	“Communicat e for Buy-In”	Communicate the vision and urgency with honesty, clarity, and passion.
5.	Empower	Remove Barriers to “Empower Action”	Confront barriers, such as cynical attitudes, old procedures or lack of resources.
6.	Short-term wins	“Create Short-Term Wins”	Attempt changes that can be done in the short run to build hope and energy. However, do not let short-term wins lead to complacency.
7.	Consolidate	“Don’t Let Up”	Maintain focus on your ultimate goals.
8.	Institutionaliz e	“Make Change Stick”	Institutionalize the company's new behaviors, attitudes, and processes.

Source: Adapted from Kotter (2006, 2011, 2012)

Each idea or step must be executed – “practice is the way” (Frame 32). To give your transformation effort the best chance of succeeding, take the right actions at each stage—and avoid common pitfalls.

Frame 32 – The idea in practice – practicing the leading of changes

Stage	Actions Needed	Pitfalls
Establish a sense of urgency	• Examine market and competitive realities for potential crises and untapped opportunities. • Convince at least 75% of your managers that the status quo is more dangerous than the unknown.	• Underestimating the difficulty of driving people from their comfort zones • Becoming paralyzed by risks
Form a powerful guiding coalition	• Assemble a group with shared commitment and enough power to lead the change effort. • Encourage them to work as a team outside the normal hierarchy.	• No prior experience in teamwork at the top • Relegating team leadership to an HR, quality, or strategic-planning executive rather than a senior line manager
Create a vision	• Create a vision to direct the change effort. • Develop strategies for realizing that vision.	• Presenting a vision that's too complicated or vague to be communicated in five minutes
Communicate the vision	• Use every vehicle possible to communicate the new vision and strategies for achieving it. • Teach new behaviors by the example of the guiding coalition.	• Undercommunicating the vision • Behaving in ways antithetical to the vision
Empower others to act on the vision	• Remove or alter systems or structures undermining the vision. • Encourage risk taking and nontraditional ideas, activities, and actions.	• Failing to remove powerful individuals who resist the change effort
Plan for and create short-term wins	• Define and engineer visible performance improvements. • Recognize and reward employees contributing to those improvements.	• Leaving short-term successes up to chance • Failing to score successes early enough (12-24 months into the change effort)
Consolidate improvements and produce more change	• Use increased credibility from early wins to change systems, structures, and policies undermining the vision. • Hire, promote, and develop employees who can implement the vision. • Reinvigorate the change process with new projects and change agents.	• Declaring victory too soon—with the first performance improvement • Allowing resistors to convince "troops" that the war has been won
Institutionalize new approaches	• Articulate connections between new behaviors and corporate success. • Create leadership development and succession plans consistent with the new approach.	• Not creating new social norms and shared values consistent with changes • Promoting people into leadership positions who don't personify the new approach

Source: Kotter (2006. p.3)

Kotter's 8-Step Model for effective change can be described as: In the **1st** step (sense of urgency) the competitive reality must be studied, identifying crisis and opportunities. The (**2nd**) refers to creating a coalition and that means a team with

expertise and empowerment. The next (**3rd**) refers to Vision as a path for change efforts and Strategy to get there. Communication of the vision (**4th**) is to use all media to engage employees guiding to a proactive behavior. The **5th** refers to first initial changes in structure and systems with the purpose of mitigating reactions and encouraging risk-taking of all people. Generating and celebrating short-term wins (**6t** step) is a good way to get self-confident allies and getting visibility. Increasing credibility and changing policies and structures for a successful transforming change is the step of Consolidation (**7th**). Finally, the **8th** is to anchor the new approaches in the organizational culture which means the organization's future and includes new leaders and managers in the process.

2.1.5.2 Leading and Accelerating

Kotter (2018) after several years of leading change publications and observing the dynamics of the business has dedicated several articles to accelerate (Frame 33) the evolution.

Frame 33 – The 8 steps of evolution and how to accelerate to lead changes

1996 – LEADING CHANGE	2014 - ACCELERATE
• Respond to or effect episodic change in finite and sequential ways. • Drive change with a small, powerful core group. • Function within a traditional hierarchy. • Focus on doing one thing very well in a linear fashion over time.	• Run the steps concurrently and continuously. • Form a large volunteer army from up, down, and across the organization to be the change engine. • Function in a network flexibly and nimbly outside of, but in conjunction with, a traditional hierarchy. • Constantly seek opportunities, identify initiatives to capitalize on them, and complete them quickly.

Source: Author adaptation from Kotter (2018)

Kotter has recently introduced the enhanced 8 Steps (now known as the 8 Accelerators) and the 4 Change Principles to set organizations up for success as shown in Figure 35.

Figure 35 – The 8 accelerators and 4 change principles

Source: Kotter (2014, 2019)

These 8 steps are not detailed here, but Kotter describes each one. When constructing the framework for this thesis result, the ones closer to the IHE theme will be described. Kotter (2018) also enumerates the principle of change applied to the process (Frame 34). All these principles must be considered the whole time during the process of leading change.

Frame 34 – The 4 Change Principles

1st - Leadership & Management
• In order to capitalize on windows of opportunity, leadership must be paramount – and not from one executive. • It is about vision, action, innovation, and celebrations, as well as essential managerial processes.

2nd - Head & Heart
• Most people are not inspired by logic alone, but rather by fundamental desire to contribute to a larger case. • If you can give greater meaning and purpose to your effort, extraordinary results are possible.
3rd - Select Few & Diverse Many
• More people need to be able to make change happen – not just carry out someone else's directives. • Done right, this uncovers leaders at all levels of an organization; ones you never knew you had.
4th - Have to & Want to
• Those who feel included in a meaningful opportunity will help create change in addition to their normal responsibilities. • Existing team members can provide the energy… If you invite them.

Source: Kotter (2019, p.9)

2.1.5.3 Strategic changes

When observing the daily requirements of globalization, one can perceive the increased speed of changes, the complexity of innovation markets which implies that the strategy of changing the organization must be rethought.

A strategy is not static – it is always dynamic and you need to find out the processes, the initiatives, the tasks, and the opportunities to get cheaper and more effective pathways. New structures and an organizational culture are emerging in response to the new requirements. Changes are needed and resistance to change is a not winning strategy in this faster-moving world.

Kotter proposed not only the process but a second system that is devoted to the design and implementation of the strategy. In recent years Kotter uses an agile network as structure, and a different set of processes, and guiding a coalition.

> In such a system the hierarchy can hand off the pursuit of big strategic initiatives to the strategy network, freeing itself to focus on Incremental changes to improve efficiency. The network is populated by employees from all levels of the organization, giving it organizational knowledge, relationships, credibility, and influence. It can liberate information from repositories with ease. It has a dynamic structure free of bureaucratic layers, permitting a level of individualism, creativity, and innovation beyond the reach of any hierarchy (ZOU; LEE, 2013, p.3)

Leaders and group actions must be observed. Leadership is required for the process of internationalization and top management involvement is also required. Thus, when developing consulting tasks, one must observe (and report) leaders, top management, groups and their influence in all changes.

In many respects, this could be due to the importance given to the process of monitoring change activities and being able to declare it a success.

2.1.6 Consulting

"The world of business is changing rapidly, and this is driving organisations to turn to the consulting industry for help"
(CONSULTANCY.ORG, 2019).

Purpose and goals

Expert consulting requires first of all HEIP and Knowledge Cycle references. It also requires from the consultant the ability to transit in different subjects such as Auditing, Governance & Compliance, Leadership and Changes.

All these skills require a T-Shaped professional as explained next. An expert consultant is a mix of all roles presented.

Introduction

As an auditor, a consultant can be internal or external. In several dictionaries you can find entries like that: A consultant (from Latin: consultare "to deliberate") is a professional who provides expert advice [1] in a particular subject or area.

A consultant is an expert or/and an experienced professional in a specific field with a wide knowledge of the subject matter. They act as individuals or as a member of specialized firms. (a) Internal consultant: operates within an organization and is available to be consulted on areas of their specialization by other departments or even individuals (customers, suppliers). (b) External consultant: someone independent or employed externally to the client (consulting firm or agency); it is usually a temporary action and there is a fee (e.g. McKinsey & Company currently boasts over 100 offices in over 60 countries, while, Bain & Company has 50 offices in 32 countries).

2.1.6.1 Internal and external consultants

For an easy understanding of the differences, it is useful to consider the advantages and disadvantages of both internal and external consulting as shown in

Frame 35. Top organizations create internal consulting groups in order to foster innovation; smaller firms use external consulting teams simply due to perceived budget constraints.

Frame 35 – Internal x External Consultants – Advantages & Disadvantages

Internal	External
ADVANTAGES	
Advantage #1: Integrated Understanding The main advantage most industry leaders cite when advocating for an internal consultant is that the internal consultant has an integrated understanding of the company, its policies, politics, and culture. On the other side, external consultants come in with limited insight into the corporate culture, an internal consultant can navigate swiftly across an organization. In other words, internal advice comes from a background of seeing problems occur within the company on a regular basis.	**Advantage #1: Established Reputation** For decades, large consulting firms such as McKinsey, Bain, and Boston Consulting Group have maintained their reputation for having the best strategy consulting practices. However, along with the expertise comes a hefty price tag that many client companies are not so willing to cough up. Yet their reputation precedes them for good reason, after working with multiple large, influential corporations. Despite the cost, external consultants have advantages which internal consultants can't necessarily replicate due to their long-term reputation for good work and for hiring the best MBA graduates from the best schools.
Advantage #2: Follow-Through / Implementation Internal consultants also can work from recommendation through the implementation of their projects. External consultants usually stay on a project until they present their conclusions. However, internal consultants can observe and support the implementation of their suggestions, help navigate the change, and make tweaks along the way. This allows for more possibilities of long-term success within the organization.	**Advantage #2: External Objectivity** Coming from an outside perspective allows consultants to have a more objective, bird's eye view of the company and the industry. Instead of becoming too engrossed within a specific company, external consultants should be on top of the industry as a whole. Not only do they have a broad perspective, but an experienced consultant will have had multiple experiences working with other companies in the same industry and that faced similar challenges. Therefore, they can apply experience from the past into their current projects and engagements.
Advantage #3: Proactive Planning A great testimony to a well-run internal consulting team occurred when Delta and Northwest Airlines merged in 2008. Two years before the merger, Rabkin and the internal consulting team had simply constructed a blueprint if Delta merged with another airline. In other words, a successful internal consulting team was able to proactively create a plan before the problem occurred, instead of scrambling after the problem happened.	**Advantage #3: Expert Status** Another advantage of not being as integrated into the work project environment is the ability to be regarded as an expert and not a peer. Due to the lack of concrete understanding of the role, internal consultants can be viewed as just another pair of hands to make changes within the organization. Instead, external consultants are hired for the sole purpose of their expertise and ability to create change for a specific business problem. This brings more clarity and focus to the role and helps concentrate efforts on the project at hand.
DISADVANTAGES	

Disadvantage #1: Ambiguity Most internal consultants find one of their biggest dilemmas in the lack of a defined role. Whether due to lack of specification in the contract or in the job description, a nebulous understanding of the role can cause a lot of frustration for any internal consultant. Hand in hand with this dilemma is an unclear perspective of the "client." In other words, many internal clients don't know to whom to report their findings and to make their suggestions. Some simply just cite "the organization" as their client, instead of naming any individual or company segment.	**Disadvantage #1: Missing the Point** While internal consultants battle company politics from inside the company, employees often regard external consultants with suspicion. This reputation, unfortunately, is often deserved. Many consultants come into an organization without an understanding of the company or a willingness to hear opinions. Instead, they often try to implement one-size-fits-all strategies either taught to them by their consulting firms or from past consulting experiences. While knowledge from other consultants can often be helpful, it does not necessarily apply in all similar situations.
Disadvantage #2: Rocking the Boat Lastly, the double-edged sword of understanding company culture comes into play. While internal consultants boast the ability to navigate the waters of company politics, they are more likely than external consultants to be caught in the middle a storm. Consultants whether internal or external have to be sure they are making their decisions as objectively as possible. However, objectivity can come at the cost of political strife within the workplace, which internal consultants have to handle.	**Disadvantage #2: Passing the Buck / Implementation Risk** External consultants also face the bad fame of coming in presenting solutions and leaving. This conduct leaves many firms without a solid game plan and fails in the implementation process. External consultants do not tend to stay aboard after proposing their various strategies, and most clients do not want to pay them afterward either. Unfortunately, this leaves clients spending far too much money for too little change.

Source: Cerisano (2015) from 9Lenses[22]

The purpose of a consulting firm is to provide access to specific specialists/consultants and subject matter expertise. Consulting firms range in size from a single consultant to multinational corporations with dozens of employees in several areas like education, management, accountancy, law, human resources, marketing, public relations, security, education, finance, engineering, IT specialists, data science and many other specialized fields.

Indeed, internal consultants are helpful, and costs are embedded, although consulting is actually used when a company needs an outside, expert opinion regarding any type of decision. Higher education leaders are also facing tough strategic decisions about the institutions' future, and internationalization is one of them. Several administrators agree that their campuses lack the data and insights to support

[22] 9Lenses is a cloud assessment platform that enables companies to thrive in a data-driven market.

decision-making in an increasingly complex and competitive environment. Regulators should improve the quality of services. A bad regulation can encourage a compliance culture, stifling innovation, increasing workload and inadequate quality service at all. (CONSULTANCY.ORG[23], 2019; OFSTED[24], 2017; 2019)

2.1.6.2 Strategic planning and best practices from a team of experts

Science and IT — data, research, results — proposed teaching and learning to be re-invented in some ways. Higher Education Institutions are worried about improving the return on technology investments, teaching and research, getting better student's outcomes and increasing student's retention. The internationalization process is a pathway to all these aims. Developing a collection of best practices, frameworks, models, and strategic partnerships are required.

For a consulting service, there are the main challenges in Higher Education:

- Developing and implementing a strategic plan;
- Managing and implementing institutional changes;
- Launching and enhancing academic programs for internationalization;
- Designing strategic and innovation initiatives in IHE;
- Improving internationals' student learning outcomes (and retention);
- Exploring, developing, and launching new learning models and technologies;
- Growing international students' enrollment;
- Finding a new market share and a better revenue.

Teaching and learning are in a revolution. The teaching process is challenged to decide which tools to use and when to meet its learners. Deciding about tools and students' needs also requires training and supporting (mainly considering IT learning tools). It is necessary to take along a New Learning Culture, with a holistic look at the current teaching practices and culture.

Due to globalization, classrooms are being transformed, the new learning process is shaped (instead of "one size fits all"), decisions are data-based, coaching, collaborative learning and teaching are emerging fast.

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[23] Consultancy.org is an online platform for the global advisory and consulting industry.

[24] OFSTED is the Office for Standards in Education, Children's Services and Skills – UK.

Jane Knight (2014) in a presentation in The International Research Roundtable – in Australia[25], states that the first step HEI needs to know is about rationales for Internationalization. That means to be explicit (in a known and official document) about the reasons, goals and expectations of internationalization. This is the pathway to develop policies, structure and all activities involving internationalization. All these must be evaluated and monitored, Therefore, expected outcomes and impacts must be predicted. Globalization, accountability, organizational culture and innovation are matched together.

[25] The International Research Roundtable (Melbourne, Australia) was organised by IEAA and the International Education Research Network (IERN). It has been held annually since 2009 in conjunction with the Australian International Education Conference (AIEC).

Figure 36 – Globalization and Internationalization

Source: Author creation.

She refers to several obligations HEIs must attend with an adequate structure, academic and administrative support to fit the purpose of internationalization. To validate clear purpose and action it is necessary to do it – Knight (2014, p.4) use the phrase "Fitness OF purpose *versus* fitness FOR purpose"[26].

Internationalization is a positive reaction to globalization and involves "at home" (local) and "cross-border" approaches. Local is concerned with domestic students, curriculum, teaching and learning, curricular and extracurricular activities, research and innovation. Regarding the Internationalization process, leaders must take care of people, programs, providers, projects and policies. So, students, professors, researchers, MOOCs, virtual campus, cooperation, credits, and quality are common tasks considering cross board actions.

Because of the diversity of higher education institutions and their organizational cultures, the adopted model must be wide, long-range conceived, and not freeze the organization's internationalization. Each HEI will have its own set of reasons

[26] "Fitness of purpose" evaluates whether the quality-related intentions of an organization are adequate. "Fitness for purpose" is to ensure that, whatever is being designed, built or supplied fits in the intended purpose.

depending on their mission and values - “one size does not fit all”. That’s why frequent evaluation is needed: Benchmarking, improving plans, enhancing internationalization’s contribution to teaching/learning, research and innovation, and service to society.

Knight (2014) lists three important steps in a consulting service of HEIP. Comparing with audit and consulting one can find these steps and controls:

Frame 36 – Knight and the 3 Steps of Consulting and suggest auditing tasks

STEP	Consulting needs from HEIP	Auditing controls
1. Mapping	● description of what is happening at your institution in terms of internationalization (useful for both assessment and planning)	● Verify or suggest creation of an area responsible for collecting, grouping and categorizing this action. ● Must be up-to-date information. ● Processes must be clearly defined and published (public).
2. Evaluating	● assessment of the process (policies, programs, practices, outcomes) of internationalization ● assessment of results, outcomes, impact and contributions of internationalization	● Verify the existence and check policies, etc., according to mission, vision, and values of HEI. ● Check evaluation with plans and goals.
3. Improving	enhancement of internationalization process and contributions	1. Carry-out all these above and “work on this”

Source: Knight (2014) and the Author

Working on this (rightmost lower item in Frame 36: “work on this”), means you (a) establish a workflow; (b) Find-out the fulfillment of requirements; (c) find controls of Capacity / Performance and study them; (d) check the usability of programs and outcomes; (e) study the management plan and practices; (f) carry out surveys and interviews for clearing themes; (g) study and compare processes and outcomes and (h) improve process. All these are also knowledge in the consulting process, which will be used and enhanced all the time.

Knight (2014) is explicit that Mapping, Evaluation, Audit, Assessment, Review, Indicators, Quality Assurance, Quality Improvement and Accreditation are in scope of consulting. And there are several tools like:

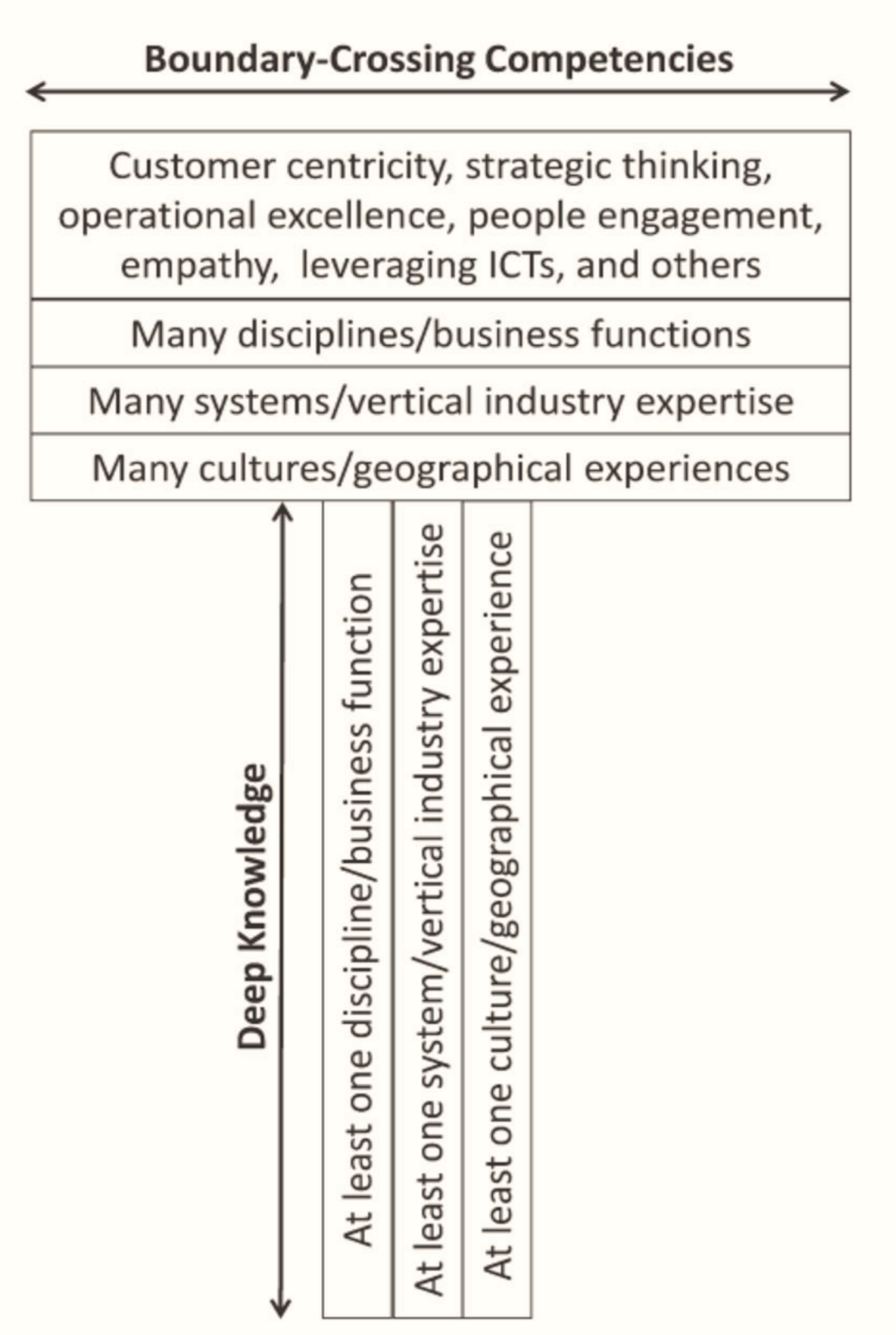
1. Checklist;

2. Questionnaires /surveys;
3. Audit/Review –Internal and External Evaluation;
4. Benchmarking;
5. Performance Indicators- outcomes based;
6. Accreditation/ certification.

The internationalization process consulting in Higher Education is not an easy task. Several skills are required compared to traditional consulting services (accounting; financial; industrial process). There is a new requirement for this kind of professional.

2.1.6.3 The T-shaped professionals

Figure 37 – The T-shaped professional



Source: DEMIRKAN & SPOHRER (2015, p.13).

Since last decade a new trend in human resources called “T-Shaped People” has emerged (Figure 37). There are E-shaped, Y-shaped, M-shaped, and others. The first one, the T-shaped, remains a strong business seek for employees. That means experience abroad (represented by the horizontal line in a “T”) and a deep expertise in a required subject (the “T’s” vertical bar) (HANSEN, 2001; BROWN, 2005; OSKAM, 2009; BROWN & WYATT, 2010; BERGER, 2010; DONOFRIO et al., 2010; DEMIRKAN & SPOHRER, 2015).

Companies do want to create a global-integrated innovation impact. But getting a new disruptive innovation in products or services is uncommon (or even rare):

> A key driver in the search for such high-impact innovations is the move to services. To be truly successful, such a move will require a new kind of talent—T-shaped people— supported by a new kind of organization. In other words, companies need to re-tune their talent engines to support a new generation of innovation (DEMIRKAN & SPOHRER, 2015, p.12).

We can find a large number of scientific articles in IT, marketing, medicine, engineering, management, where T-shaped professional skills are fully discussed. “T-Shaped managers not only act as experts advising the business (give) but they can also learn more about their products, services and markets from individuals in the business units (receive)” (CIP-AUSTRALIA, 2010, p.2).

As leaders, managers must be cultivated. Leadership practices and top managers suggest guidelines to create an environment in which T-shaped managers will flourish (HANSEN, 2001). Innovation and internationalization are a team result, a task-force plan and action, not a result of a solitary thinker. “The leadership of change, particularly large-scale changes, is beyond the capacity of any single individual to accomplish” (FORD & FORD, 2012, p.32). Teams, collaboration, and T-shaped people are needed in educational environments, as well.

Currently, when competition is higher and innovation is essential, companies are looking for a “generalist” to communicate with other colleagues and a “specialist” in faster economic changes. This is the way Higher Education Institutions need to be about consulting – a generalist transiting in auditing, compliance, leadership, knowledge management and a specialist in driving changes in Internationalization.

In HEIs, Governance, Risk and Compliance (GRC), studying and checking strategy, Process and People, providing an integrated Knowledge Management Cycle and Leadership for Changes to integrate the organizational culture are important topics. All these could result in a huge organization’s reputation – and must be oriented

in a wide range – all areas must be involved. Social changes, stakeholder's expectancy, internal and external community, society and government comprise a big influence. The HEI's values and its autonomy must be preserved; accordingly, participation and proactive attitudes are expected from all.

HEIs consulting services concerning accreditation, account reports and financial issues are stronger every day. Not only specific skills are needed, but also a holistic view on Education is deeply required. Due to Globalization and market pressures, all HEIs are in a hurry to reach out to a recognized structure in internationalization. For Consultants it is required a T-shaped view. It is also important having some understanding and practice on the process of internationalization. Several other pieces of knowledge are desirable and expected from a consultant like leadership of changes, auditing, compliance and mainly knowledge management which is necessary when it is intended to incorporate internationalization to the organizational culture.

2.1.6.4 Final practical information

Technology, Information Technology and Knowledge are deeply imbricated. Tools and techniques are responsible for registering data, saving a large amount of time, avoiding errors, and promoting better control.

Online translations tools as well as editing programs, provide good resources for teaching and learning. MOOCs, virtual *campus*, e-learning, blended learning and ubiquitous learning can be real – anyone can receive selected information anywhere. The dissemination of Information and knowledge can be accomplished in any environment. For example: although automated translations have grown in the 90's, the idea emerged in the early 1970; technology and faster computers have built a commercial and robust product with the "reuse" of stored units (FERNANDES; BARTHOLAMEI JUNIOR, 2009).

Communication is also a revolutionary area, not only for teaching and learning, but in cooperation and collaboration studies. Another good list of tech companions is applied in scientific publications, group research and administrative tasks. Search engines can be specific for science databases or retrieving the adequate information on time.

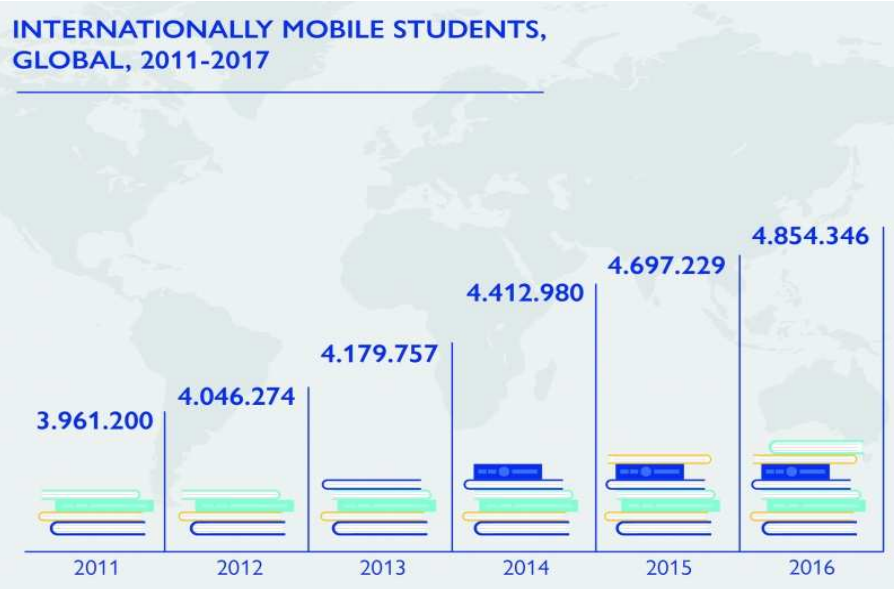
Alumni has been an effective resource to reach graduated students. The Harvard's Alumni Association (HAA), for instance, maintains and enhances a highly

engaged community of alumni and friends worldwide. The same way as Harvard, MIT's Alumni Association provides financial services, on-line journal access, discounts and memberships. Several Universities have developed this kind of association – Bauhaus, Berkeley, Bologna, Cambridge, Edinburgh, Imperial College, Oxford, Princeton, Stanford, Tokyo, Toronto, UCLA, USP, UNICAMP, UFSC[27] , Yale, and so on. One can easily find a list of the 50 most powerful Alumni networks in the USA or even all over the world.

Several tools are linked to HEIP. From general organizations in international mobility and co-operation or migration data portals to specific Universities, one can find data. UNESCO, OECD (in: Online Education Database), ERASMUS (https://ec.europa.eu/programmes/erasmus-plus/about/statistics_en) and others have significant data in Mobility (one can also find the 10 coolest visualizations of migrations' data). UNESCO estimated data (Figure 38 - Internationally Mobile Students) is obtained considering the international mobile student as:

> An internationally mobile student is an individual who has physically crossed an international border between two countries with the objective to participate in educational activities in a destination country, where the destination country is different from his or her country of origin. (UNESCO, 2015)

Figure 38 – Internationally Mobile Students



Source: IOM's GMDAC[28] based on UNESCO 2018.

[27] GENE was a first try to an Alumni Association of UFSC – Universidade Federal de Santa Catarina (2017).

[28] Established in Berlin in September 2015 at the invitation of the Government of Germany, the International Organization for Migration's Global Migration Data Analysis Centre (GMDAC) was set up to respond to calls for better international migration data and analysis

A local initiative, from UFSC (Figure 39 - SIGMA mobility registration system.), is the SIGMA system (<https://www.sigma.ufsc.br/>). SIGMA is a local website focused on the mobility of UFSC's Students, professors and staff. Like others, this web software is based on knowledge and register, it controls and provides strategic data for the international area.

Figure 39 – SIGMA mobility registration system

SOURCE: SIGMA / UFSC site at https://www.sigma.ufsc.br/

All these software provide not only a register and control but also a very consistent way to trace data as an audit trail.

When considering consulting or auditing, or even any investigation and research, the following questions must be answered:

A. Are the organization's approaches to governance, risk management and compliance integrated, holistic and organization-wide?
B. Were the four components of strategy, processes, people, and technology considered?
C. What does the procure-to-pay cycle look like across the four components?
D. Which rules affect the procure-to-pay cycle?
E. Which of these rules need to be considered in the research of consulting services?

F. Does the organization treat these rules in an integrated, holistic and organization-wide manner?
G. Do the GRC specific components interact with their “general” counterparts?
H. Does the GRC strategy influence the setting of targets for the order-to-cash cycle?
I. Are automated controls implemented in the order-to-cash application and linked to GRC systems?
J. Are the objectives of GRC achieved? Is the adherence to the rules in the order-to-cash cycle efficiently and effectively ensured?
K. Are there side effects such as improved efficiency and effectiveness of the procure-to-pay performance (e.g., lower cost, improved goods quality)?
L. Is unethical behavior prevented?

Nowadays in a turbulent world, organizational culture is often seen as central for sustained competitiveness and organizational change is a very broad area (ALVESSON; SVENINGSSON, 2016). Examining the internationalization progress in HEIs, business and academics consultants have highlighted the emphasis on technical elements. Considering the people's impact required and how management is conducted is mainstream. A consistent process of leading changes is required and must be observed.

After all these competencies, skills and roles, we must discuss representing knowledge and build a diagnostic instrument as a framework.

3 DIAGNOSTIC ISSUES & TOOLS

Purpose and goals: This 3rd section stablishes concept to support a Diagnostic Framework. First it discusses about models and theories and issues of framework's usability and design.
After this, discusses a path to verification/validation of frameworks.

Most of the time, diagnosis is related to identifying characteristics or symptoms of a particular disease. In a large sense, diagnostic can be considered as an instrument or technique used to identify a specific situation and performance.

Here diagnostic is represented, as explicit later, it will be represented by a framework, measures, and responses, with the purpose to define the internationalization process status. So, assessments, standards, scales, indicators, measurement, trends, theories, and practices are involved.

3.1 FRAMEWORKS & MODELS

This subsection starts with the concepts and definitions adopted. Later, in Appendix A, the reader will find the origins and a dozen of concepts studied.

After describing each consultant role, it is relevant to study Frameworks to define a building path to it: the use, types, and categories of frameworks and how they are built. The concepts of theory, models and frameworks are discussed. In our concept models, theories and frameworks are deeply linked and a result of a framework can be stated in terms of processes, activities, checklists, directives and even other models – it is a recursive artifact.

The proposed framework will have models (from HEIP, Management and all roles described). It also refers to other frameworks.

Design and implementations of frameworks and validations are considered. After this, a specific validation process to this thesis' framework is proposed which includes colleagues, professors and the advisor's suggestions, survey and interview with experts.

3.1.1 Concepts and guidance to this approach

> **"Existence is not an end in itself but merely the framework upon which all good, both real and imagined, may be built."** Simone Weil, Simon Weil: An Anthology

3.1.2 Backing to the concepts: Theory, Model and Framework

After studying relevant aspects of Knowledge Management, Internationalization of Higher Education and the other roles of Governance, Risk and Compliance (GRC), Auditing and Leading Changes it is important to review Theories, Models and Frameworks' concepts in order to conceive the desired dimensions scope.

One must know what a framework really is, the importance and the path to reach an adequate result. As a suggested solution to the question of this thesis, it points to a framework response, a bit more about "theory, models, metamodels, frameworks and metaframeworks" are presented during this section.

3.1.3 Models & Metamodels

When developing integration of concepts and theories in a new platform, a metamodel can be considered a useful approach. In such a manner, a metamodel can combine high-level concepts abstraction in a platform of integration and can be used as a template for another integration.

> A metamodel is a high-level abstraction of a model. A metamodel consists of a collection of concepts and rules which are necessary to build a model in a domain of interest. In a metamodel, the generic concepts are described (WEERNINK, 2015, p.2).

Metamodeling is useful to describe domain concepts to represent domain entities. A metamodel can be a taxonomy and there is a hierarchy concerning entities, models, and metamodels itself. Metamodels and frameworks have overlapping structures, this way is interesting to take a look at the metamodels construction.

Authors (SUGUMARAN, 2014; OTHMAN, BEYDOUN AND SUGUMARAN (2014); WEERNINK, 2015) indicate steps (Frame 37) to develop an adequate metamodel or a model for a specific domain integration, thus, frameworks containing models should be:

Frame 37 – Design and implementation of models, metamodels, and frameworks

Steps		Description
I.	**Model collection**	2. preliminary domain study 3. knowledge sources 4. literature review in the domain
II.	**Sets of Models**	5. Identifying sets from relevant contributions 6. Elect a list of candidates definitions.
III.	**Main concepts**	7. Extraction of main concepts 8. Clearing concepts 9. representation of abstract concepts
IV.	**Harmonize**	10. the consistency or inconsistency must be considered 11. Reconciliation and harmonize definitions 12. aggregation of concepts 13. link elements and eliminate inconsistencies 14. Identification of relationships
V.	**Construct**	15. use the synthesizing of the common concepts 16. infer new concepts 17. define new concepts and/or complementary concepts 18. clearly, represent concepts
VI.	**Validating**	19. Experts and Proof of Concept[29]

Source: Elaboration of Author based in ATZENI & TORLONE (1993); WEERNINK (2015);

Another contribution to a metamodel, model meta framework or framework construction is to avoid errors. Despite the publication being turned to IT programming there are several worst practices that can be avoided. Kelly and Pohjonen (2009), has identified several worst practices and refined categories, by analyzing 76 cases and more than 300 modelers. These “errors" are “**lessons learned**” (Frame 38) and could be very useful, mainly when designing the validating process:

[29] A Proof of Concept (or POC) project is a common approach used by companies to assess the viability of a software product for solving a need.

Frame 38 – Worst Practices for Domain-Specific Modeling

Category and percent[30]	Detailed information
Only Gurus allowed (12 percent)	Believing that only gurus can build trustful concepts (4 percent) or the opposite: "I'm smart and don't need help". The additional extreme to avoid is trying to do everything yourself, ignoring people's expertise.
Lack of Domain Understanding (22 percent)	Insufficiently understanding the problem domain (17 percent) or the solution domain (5 percent).
analysis Paralysis (8 percent)	Wanting the concept to be theoretically complete and assured. it's rational to be cautious when entering unfamiliar territory. It isn't useful unless you can use it for everything
tool: If You Have a Hammer … (14 percent)	Letting the tool's technical limitations dictate the development (14 percent) Ensuring good tool support for a language is an important aspect of its development,
too Generic/too Specific (37 percent)	Creating with a few generic concepts (21 percent) or too many specific concepts (8 percent), or using only a few models (7 percent)
Misplaced Emphasis (12 percent)	Too strongly emphasizing a particular domain feature (12 percent)
Predetermined Paradigm (7 percent)	Choosing the wrong representational paradigm on the basis of a blinkered view
Others	DO NOT APPLY FOR THIS THESIS PURPOSE

Source: Adaptation of Kelly and Pohjonen (2009, pp.23-27)

3.1.4 Studying Frameworks

There is no pacific definition at all; by observing the purpose, characteristics, structure, and search for definitions it is possible to reach a useful concept for this thesis. Before definitions, it is significant to observe some frameworks and their structures. First, it is important to consider a possible ISO definition.

[30] Because a single case might exhibit zero or many worst practices, percentages might not sum to 100 percent.

3.1.5 Where CAN one find Frameworks?

One can find the framework designation in all areas of science like The United Kingdom Research Excellence Framework (REF); The Australian Research Quality Framework (RQF); ISO 14040:2006 Environmental management e Life cycle assessment e Principles and framework; ISO 12913-1:2014 Acoustics -- Soundscape -- Part 1: Definition and conceptual framework; ISO/IEC 9594-8:2008 Information technology -- Open Systems Interconnection -- The Directory: Public-key and attribute certificate frameworks. Other common references to frameworks are:

- Porter's Five Forces framework;
- quality frameworks;
- corporate governance framework;
- governance frameworks;
- management frameworks;
- process frameworks;
- quality frameworks;
- regulation frameworks;
- management framework, etc.

As several authors state, Models, Checklists, Methods are used in a large and not adequate way; Even PRISMA[31] The statement is called the "PRISMA framework".

When describing the K-12 Science Education framework, the National Research Council from The National Academies of Sciences, states the main content of this framework:

> A framework for K-12 Science Education represents the first step in a process to create new standards in K-12 science education. […] identify and describe the major ideas for K-12 science education. The framework highlights the power of integrating understanding the ideas of science with engagement in the practices of science and is designed to build students' proficiency and appreciation for science over multiple years of school. […] creative models for organizing the core ideas. (NATIONAL RESEARCH COUNCIL et al, 2012, pp. ix to xi)

Standards, major ideas, integration, practices, building proficiency and models are part of the K-12 **framework**. By reading the book one can find the vision,

[31] Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement (published in 2009). It consists of a checklist and a flow diagram and is intended to be accompanied by the PRISMA Explanation and Elaboration document.

limitations, scope and approach, steps and structure. No explicit concept of the framework was found. Let's look for standards!

Foremost, accessing the International Organization for Standardization (ISO) glossary (https://www.iso.org/glossary.html) one cannot find a definition of "framework" nor for "model". In the last search (march/2019) in the website (https://www.iso.org/) and looking for framework the search engine resulted in:

All results

- Standards (866);
- Pages (20);
- News (401);
- Publications (2);
- Documents (2488).

By listing several ISO documents, it is possible to state that the International Organization for Standards (or "ISO") has developed and published a very large number of "ISO frameworks". In the description, it is usually possible to find specific terms as a "family of standards [that] will help organizations to manage […] security, financial information, intellectual property, employee's details and even third parties information". ISO documents are "living documents", they are continually updated to address new information or regulations needs. Then, with this information I hope the scope of frameworks is clear.

3.1.6 Frameworks are useful

This formal history is associated with Theories, Paradigms, Systems and Models, – which means one can consider a Science' path.

Thomas Kuhn (1962; 1970) in the book "The Structure of Scientific Revolutions", associates paradigms as patterns of scientific knowledge which evolve over time (Kuhn, 1962). A paradigm is a way of thinking in a context and according to "a basic set of beliefs". Guba's (1990) broad description is "a basic set of beliefs that guides action".

Burrel and Morgan (1979) and Morgan (1980) construct a simplified view in quadrants referring to paradigms and metaphors. Popper (1996) agrees about facilitating scientist communication with basic assumptions (i.e. paradigm), although

paradigms are not the real truth. All these terminologies converge to the concept of the framework that will be explicit later.

A recent basic search (march/2019) in WoS® scientific base has detected over 160,000 publications with the word “FRAMEWORK” (only) in the title. COMPUTER SCIENCE and INFORMATION SYSTEMS (Artificial Intelligence, Software engineering, etc.) and ELECTRICAL-ELECTRONIC ENGINEERING are predominant, comprising more than 51% of the searches. It was also possible to verify that The USA-28.305 %, PEOPLE’S R CHINA-15.714 %, ENGLAND-7.768%, GERMANY-5.847%, CANADA-4.881%, FRANCE-4.565%, and AUSTRALIA-4.296% are the most representative countries in this kind of publications.

3.1.7 Why ARE FRAMEWORKS massively used?

The real world or reality, is very large and, depending on the approach, must be divided into parts to be understood by the human mind. Taking as an example Anaxagoras and Empedocles’ discussion, a complete division of an element (e.g., the hair) into smaller and smaller pieces until it is understood but no longer as the original (hair example).

When dividing the whole into parts, a researcher can explain and discuss an approach using methods, dividing into systems, using models and detailing in frameworks. The predominance of frameworks in some Science areas is due to the strong connection of their dominium with Systems and Models. Another important argument is about Theories and Methods, all linked to the Frameworks’ concept.

When observing the “real world”, one can perceive several parts of it and connect these parts in a System with a tiny purpose. It could be more (or less) representative of reality depending on the abstraction level. So, decomposing the whole into parts is to analyze “the life” and represent it in a turned-key system. So, systems are valid or not, depending on their level of abstraction and purpose.

According to a Theory or Paradigm (involving context, beliefs, science community), the scientist/researcher can represent the real world in a Model. Models, Systems, and Theories are used to reduce reality in terms of smaller entities, which are, then, easier to explain. This way, a system (a piece of reality) can be also divided into parts (subsystems) and each one can be subdivided into another one, until science provides an explanation of the phenomena (VIANNA, 2016).

As we have seen in the previous text, Popper considers this reductionism useful for communication although it does not represent the “real world”. The same concept occurs with Morin (1992) to whom the complexity of thinking must be beyond the reductionist analysis.

> Although everything from molecules to stars, from cells to societies, is now regarded in terms of systems (in contrast with the previous century’s notions of “matter” and “vital substance”), this generality is not, by itself, sufficient to determine the epistemological significance of the notion of system in all its conceptual complexity (MORIN, 1992, p.371)

The reader may appreciate some core concepts involving Frameworks, Systems, Theories, and Methods, in appendix A, with a summary of several linked definitions.

When studying theory it is possible to find many of the words: explanation, structure, ideas, systematic, prediction, phenomena. According to some authors a theory is an expression of knowledge (Chinn and Kramer (1999), others like Welman, Kruger and Mitchell (2005) apud Fox and Bayat (2007, p.29) offer this definition: “theory is a set of interrelated propositions, concepts, and definitions that present a systematic point of view of specifying relationships between variables with a view to predicting and explaining phenomena”. As a result, thinking about theories is to answer with logical and scientific consistency the “why’s, “how’s, “when’s (and so) questions about phenomena.

3.1.8 Theoretical and Conceptual Frameworks

Theoretical and conceptual frameworks are used in an interchangeable way, even with the differences of concepts, methodology and the scope of their usability.

According to the paradigms and theories related, it is possible to develop a system or a model of phenomena. When using well-defined boundaries and delimitations of the theory it enables a deductive approach supported by a theoretical framework. Sometimes when grouping systems and theories it is necessary a large explanation of concepts and relations among elements – a conceptual framework. The inductive approach tends to lead to the development of a conceptual framework (or model), deductive approach to theoretical frameworks. There is a tiny difference that Imensa (2014) defines as:

> Accordingly, in inductive reasoning, the research framework (that is, conceptual framework) emerges as the researcher identifies and pieces together the relevant concepts from both theoretical perspectives and empirical findings on the topic with, so to speak, “an open mind”.
>
> […] As such, a conceptual framework is synthesized from a number of concepts, research findings and theoretical perspectives – some of which may be in opposition or competition with one another.
>
> […] Hence, in trying to distinguish between theoretical and conceptual frameworks one may say that, whereas research based on deductive reasoning makes use of a pre-existing theory, or theoretical framework, research-based of inductive reasoning tends to be ‘theory-building’. (IMENSA, 2014, pp.193-194)

As frameworks and metaframeworks contain models it is recommended to be aware that modeling may contain an adjusted language and semantics, terms, formulas, techniques, procedures, mechanisms, algorithms and so on (KARAGIANNIS and KÜHN; 2002). The framework goes beyond just defining steps applied to models in a context or environment.

3.1.9 Design and Implementation of Frameworks

As any other project, designing a model, a framework or metamodel and metaframework requires an organized set of steps. Looking for construction of models, metamodels and frameworks it is, then, possible to elaborate a lifecycle. “Frame 39 – Framework, model, metaframework and metamodel lifecycle” is based on a system’s design approach and several references coming from knowledge, software and management publications. Using the Unified Markup Language (UML[32]) it is also possible to build a diagram with a visual representation of the cases.

[32] The Unified Modeling Language (UML) is a general-purpose, developmental, modeling language. Mainly used in the software engineering it can provide a standard visualization of the design.

Frame 39 – Framework, model, metaframework and metamodel lifecycle

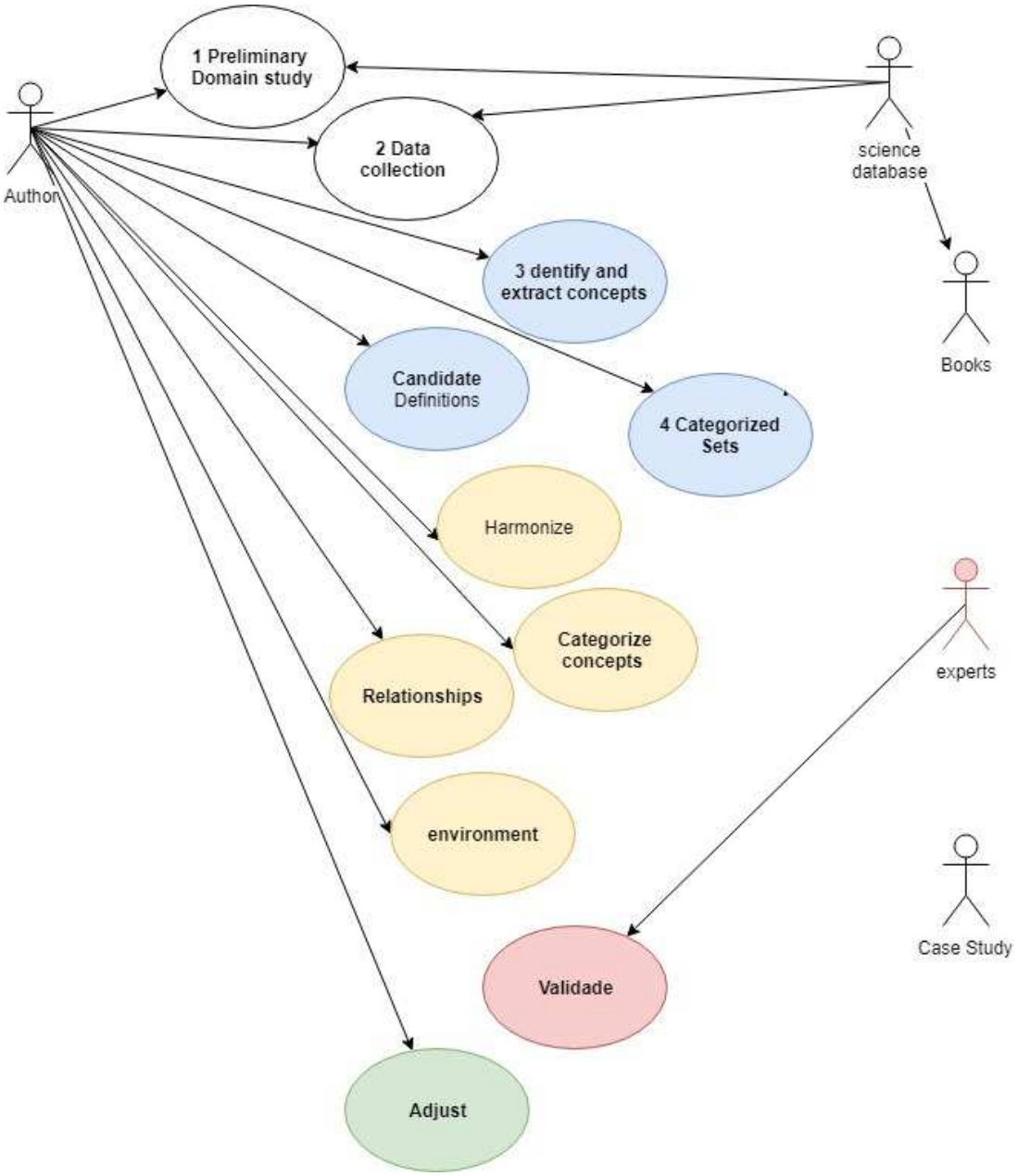
Nº	Title	Description	Details
1	**Data collection and preliminary domain study**	● prepare the knowledge source, namely, collecting relevant models, systems, theories and frameworks	● Science databases and expert recommendations ● Google Scholar
2	**Identifying and building sets**	● use the overall models to initiate ● ensured that all highly cited models are included	● group by approach or central subject
3	**Extraction of general concepts**	● concepts in selected models ● note type dependency	● Mapping a knowledge level description into an adequate representation ● Build a previous list of dimensions
4	**Short-listing of candidate definitions**	● detach commonly agreed meaning ● consider clearer definitions instead implicit ones	● Check common occurrence of any definition ● Eliminate, change, complete, modify, combine
5	**Harmonize definitions and terms**	● Check consistency with earlier choices ● in case of inconsistency choose the concept with more coherent usage	● Check the adherence to approaches ● Verify conflicting trends
6	**Categorize concepts**	● Designation of concepts according to the abstraction corresponding to the approach. ● List of dimensions/category	● Remains in the defined scope ● Register relevant Inclusion and exclusion
7	**Identify & Represent relationships**	● List relations within and across categories	● Uses diagrams, tables, maps to represent relationships interfacing the categories
8	**Define context and environment**	● Define pre- and post-requisites ● Define conditions or constraints ● specify the intended behavior ● Include best practices and lessons learned	● Explicit ranges and boundaries ● Explicit actors (triple helix) and audience ● Formalize requirements. ● Transform requirements into specifications, theoretically assumed
9	**Validate**	● Define a validation structure and tools ● Check elements' adherence to models & theories	● Experts judgment (quanti-quali) ● Case study

		● define assessment topics and determine the scale (e.g. Likert) ● pilot a questionnaire/survey & apply ● analyses or statistical measures ● point out acceptable outcomes	● empirical testing ● Use an adequate and well-known protocol ● Consider using grounded theory, focal groups ● Compare with other frameworks
10	**Adjust and enhance**	● Point out unsolved constraints ● Define new limits	● redefine environment and boundaries ● Define limitations and constraints

Source: Author compiled from OTHMAN, BEYDOUN, SUGUMARAN (2014); IMENDA (2014); BAYAT (2008); WICKRAMASINGHE (2006); WELMAN, KRUGER, MITCHELL (2005); FOX, HENDERSON-SELLERS (2002); KARAGIANNIS; KÜHN (2002); MESEGUER (1992).

Another interesting subject is a visual representation of a system or a model. There is a good standard called Unified Markup Langue (UML). Using UML, the representation of the "USE CASE diagram[33]" could be:

Figure 40 – Unified Modelling Language – Use case diagram



[33] UML Use Case Diagrams are behavior diagrams for actions (use cases). These cases can be performed in collaboration with another users or systems (actors).

3.1.10 Framework Validation Guide

After designing and implementation, the framework must be “verified” or “validated” (step 9 in Frame 39). Frameworks contain an integrated mix of interrelated theories and models. Theory and models’ validation are concerned with the theory and models themselves. Following, then, this way, a theory or model has its own validation. A framework does not need to validate the theory as it will be explained.

Considering that frameworks go beyond theories and models, including processes, relations and giving a practical view, it is necessary to verify the adherence of the framework’s elements to the practice. It is also needed, the internal coherence of the elements with theories and models. This is called internal elements validation or “verification”. As inflexible as possible, frameworks are “verified”, not “validated”.

Some authors consider validation encompassing both verification and evaluation: “We consider validation as a global term that embodies all other terms as specific aspects” (MESSEGUER, 1992, p.4). Other authors go even further determining differences: “Verification is about completely examining the system against its specifications. Validation is a concern with examining whether a particular design meets its intended purpose and performs as expected, or not” (YUSSIFF; AHMAD; MUSTAPHA, 2015, p.250).

Validation is an old topic in modeling. In the context of software engineering, an open definition expresses validation as the **determination of the correctness** of an application concerning the needs and requirements. It seems to be an “easy thing” if you have plenty of specification, thus, if you have goals you can also act in the same manner. Despite these tiny differences, **we will consider for the purpose of this thesis, validation (external) and verification (internal) to be equivalent**.

In experiments, metrics should be highly suitable, and, so, a variety of metrics could be used to assess the frameworks’ characteristics for **structural and functional approaches**. The full “**competence**” requirements are further subdivided into others like knowledge, **ability to use the knowledge to solve problems, efficiency, consistency, clearness, meaningless, no ambiguity, no redundancy, acceptability, correctness, adequacy, reliability**… in

Appendix C, you can find a dozen of variables. All these variables in metric results must be interpreted “in the context” (level of abstraction, remember).

Another way is testing a **case study** or multiple-case studies. By examining the environment and the framework behavior one can determine the **correctness, acceptance, robustness, meaning, performance, accuracy,** etc. Comparing standards or human performance or getting several judgments of adequacy is a good pathway.

As a framework or a model (or a system) has **several elements, each one can be validated** (if possible) and **relations** between parts can be checked too, by using very specific questions. intermediate or partial results produced can be evaluated, mainly if you have a previous definition of acceptable results. Sometimes it is possible to “tune” the experiment or calibrate the scale. A **pilot test** or pilot studies are almost mandatory for experiments, questionnaires, surveys, interviews and other interactive tools. Of course, a pilot is not a full study and it just prepares the main objective: “a pilot study is a small single-centered study” (THABANE, 2010, p.3).

A well-done pilot is a large part of exploratory research. “A well-conducted pilot study, giving a clear list of aims and objectives within a formal framework will encourage methodological rigor, ensure the work is scientifically valid and publishable […]” (LANCASTER; DODD; WILLIAMSON, 2004, p.307).

When capturing knowledge or getting evaluations, one can formulate open-ended or closed-ended questions. The last ones limit the answer to a set of alternatives and avoid large bias. Open-ended questions are richer in content but can be less objective or even miss the point. They require additional efforts for interpretation from respondents and researchers generating bias (REJA ET AL., 2003).

Experts validation and recommendations are always welcome, but a solitaire evaluation is dangerous - “always ask for a second opinion”. When confirmed, well… “it’s ok”. If it is not confirmed, please ask for another one, so you can mitigate the errors risk.

In models, systems or frameworks you will have representations, descriptions, explicative texts. They must be clearly defined, and the language must be correct (syntax and semantic), which means with no ambiguity. Representations of capabilities of the reality or representations of the problems

also must be considered. In the same way artifacts, objects, facts, problems, goals, rules, activities, actions, processes and others should be observed.

3.2 GLOBAL ASSESSMENT EFFORTS

Since the end of last century, assessment of internationalization was considered an interesting issue (STALLIVIERI, 2018, De WITT, 2015), “In the 1990s the focus was Assessing the Quality of Internationalization Strategies and Policies at the Institutional Level” (De WITT, 2015, p.14). The next paragraphs bring up several forms of internationalization evaluation, from associations, councils and ranking systems.

At the beginning of the century, Barrows (2000) states the difficult of a skill diagnostic in internationalization.

> Experience shows that academic (or business) establishments do not have the diagnostic skills and concepts of how these efforts work, what problems they have, how to assess failure or success, and h o w to develop a face-saving "exit strategy". Consequently, the sharing of knowledge is uneven, pragmatic, selective, reductionist, limited to narrow specializations, and involving only a very few scholars. (BARROWS, 2000, p.40)

One of the important organizations in the world is the British Council, which is the United Kingdom's international organization for cultural relations and educational opportunities. British Council (2016, p. 6) consider three dimensions:

i. **Openness**: government-level commitment to Internationalization; environment enabling international mobility of students, researchers, academic programs and university research.
ii. **Quality assurance and recognition**: a regulatory environment to facilitate the international mobility of students, education providers and academic programs.
iii. **Access and sustainability**: promoting student/academic mobility and international research collaboration; consideration of possible unintended consequences of Internationalization.

Other organizations provide world university rankings like Times Higher Education (THE), Quacquarelli Symonds (QS), U-Multirank and Academic Ranking of World Universities (ARWU), considering:

- Proportion of International students and staff

- Research Collaboration and Publications
- International reputation metric
- Inbound and outbound exchange students
- Opportunities of abroad study
- Diversity (range of countries)
- Degree programs
- Programs offered in a foreign language
-

In Brazil the significant rankings are *Ranking Universitário da Folha* (RUF) which is a private classification from a communication company (*Folha de São Paulo*[34]) and the other is built by the government. All the way, internationalization is a small part of both.

The International Association of Universities (IAU), created under the auspices of UNESCO in 1950, is a membership-based organization serving the global higher education. With more than 650 members from some 120 countries, since 2003, the IAU has conducted global surveys every four years and reports on institutional level policies and strategies on Internationalization with questions covering the following areas:

- Internationalization policy/strategy and infrastructural supports
- Importance of internationalization and expected benefits
- Internal and external drivers of internationalization
- Risks of internationalization to institutions and to society
- Internal and external obstacles
- Geographic priorities in internationalization
- Values and principles in internationalization policy
- Priority internationalization activities
- Funding of internationalization
- International student enrolment
- Outgoing student mobility
- Recruitment of international students
- Faculty members' international experience and mobility

[34] "A FOLHA" founded in 1921 is a Brazilian newspaper published in the city of São Paulo and the most widely circulated newspaper in Brazil.

- Internationalization at home
- Learning outcomes
- Joint and dual/double degree programs
- Language study

Another institutional-level survey is that of the European Association for International Education (EAIE). The EAIE runs a survey, the EAIE Barometer: Internationalization in Europe. Topics covered in the survey are as follows:

- Internationalization goals and priorities
    - Internationalization activities
- Strategic priority activities
    - Internationalizing according to the goals
    - Internal environment
    - Internationalizing strategy
- Management and organization
    - Training on Internationalization
    - Quality assurance
- Impact of the external environment
    - EU policies
    - National policies
- Challenges of Internationalization
    - Internal challenges
    - External challenges

Created with the purpose of developing a tool to measure Higher Education Internationalization, the Indicators for Mapping and Profiling Internationalization (IMPI) is a project coordinated by the Centre for Higher Education Development (CHE) in Germany. The Indicators for Mapping and Profiling Internationalization (IMPI) Project developed a toolbox of indicators and related objectives and activities for European higher education institutions which allow them to individually define a level of internationality, corresponding with their institutional goals. It provides options for comparison on the one hand but also offers opportunities for HEIs to choose their individual profile of Internationalization. The toolbox comprises a very large number of indicators; for

example, there are 32 indicators regarding studying abroad, and 39 indicators on funding and finance for Internationalization.

Another institutional level framework is the Certificate for Quality in Internationalization (CeQuint). The European Consortium for Accreditation (ECA) has developed a methodology to assess the quality of Internationalization at program and institutional level. “This Certificate confirms that a program or an institution has successfully incorporated an international and intercultural dimension into the purpose, function and delivery of its education” (ECA, 2020, np).

The framework for assessing the quality of internationalization at program level is shown below (Frame 40). It comprises five standards, defined by three criteria.

Frame 40 – CeQuInt, Certificate for Quality in Internationalization

	Standard	criteria
1.	Intended Internationalization	Supported goals, verifiable objectives, impact on education
2.	International & intercultural learning	Intended learning outcomes, student assessment, graduate achievement
3.	Teaching & learning	Curriculum, teaching methods, learning environment
4.	Staff	Composition, experience, services
5.	Students	Compositions, experience, services

Source: Adapted from ECA [35]

As it can be observed there are some good frameworks to evaluate the quality of higher education and quality of internationalization. All the way, there is no one tool to diagnose the process of internationalization for a specific HEI. Of course, assessment and diagnosis are a challenge because it depends on HEI internationalization's current focus.

[35] A detailed guide can be found at http://ecahe.eu/home/services/internationalisation/certificate-for-quality-in-internationalisation/

By using the presented tools, you can compare each. A HEI needs to enhance its quality of course and internationalization is a significant part of this – it means competition, and competitive advantage. Thus, building a framework turned to Internationalization is a huge issue. All of the previous approaches and demotions were considered and next, some key drivers will be explained, and they will drive internationalization efforts to new trends.

With a lot of different viewpoints and interpretations, measuring the internationalization stage is particularly challenging. As internationalization means different things to different people, and different governments, there are various researchers analyzing internationalization from different perspectives (De Wit, 2002, Knight, 2004).

3.2.1 Key drivers and trends

Today we observe a large-scale adoption of the Internationalization process in Higher Education. This unprecedented acceptance is being witnessed across a wide range of Universities, from a small faculty to large and famous universities in the public or private area.

It represents a large-scale opportunity for education services and global citizen skills. It means a certain disruption that enables innovation in Higher Education Institutions during several phases: adoptions, implantation, execution, evaluation and delivery.

Although extensive models of Internationalization have been adopted, there are core differentiators in purpose, goals and delivery. It has enhanced outreach in multiple sectors of universities, including staff, teaching, learning, collaboration, research, funding and so on.

Some trends are found during literature review:

- Global companies are looking for new business growth opportunities using modern Information technology solutions. This, of course, includes Higher Education Institutions.
- Software and Information technology are still truly “eating” the world as cited by Marc Andreessen in 2011. Startups are disrupting traditional businesses and trillions of dollars got reinvented industry and

transforming life using these newer technologies as New York Times headlines:

> **Google Reaches $1 Trillion in Value, Even as It Faces New Tests**
>
> The internet search giant became the fourth tech company — after Apple, Amazon and Microsoft — to reach the market milestone. (New York Times, 2020).

Amazon, Linkedin, AirB&B, Facebook, Telegram, Whatsapp are samples of this new tech-based industry.

IT is not only cost reduction or a better control, actually IT is the core of some companies. New approaches like ubiquitous learning, gamification, blended learning - all means IT and innovation driven. Data Science, Artificial Intelligence and Machine Learning are further inserted in a lot of business transactions.

As a new world of possibilities opens to Educational Institutions surely, consulting services should be “a plus”, but expert consulting requires, first of all, HEIP and Knowledge Cycle references. Universities are still the main starting point to research and knowledge as graduated students are introduced to science investigation.

In order to support the higher education internationalization process, the consultant needs the ability to transit in different subjects as Auditing, Governance & Compliance, Leadership, and Changes. All these talents require a T-Shaped professional as explained.

During this diagnostic study, there are some points to light up. Concerning Higher Education Internationalization some key drivers are linked to great power goals and are guiding trends.

- **Key Drivers**
  I. Internationalization is disruptive, not prescriptive. That means a new way of thinking faced with internationalization challenges.
  II. Defining its own focus in a range of activities is better than “one size fits all”. There is not a unique path or magic solution.
  III. Dominant HEI model means a Comprehensive Model and it is a mix of possibilities and opportunities.
  IV. Some aspects like inclusion, compliance, governance and sustainability must be explicit.

V. Even considering the process as a good one, there are some concernings like: technological structure, business interests, regulatory challenges.

VI. Investigating a set of technological, business, and regulatory challenges are mandatory.

VII. There are significant opportunities when adopting an appropriate Internationalization model. Although It can be a long way, it will define the future of a university and probably it's success or failure.

VIII. Almost all HEIs need internal and external support to implement the Internationalization process successfully. Adopting consulting services can determine shorter paths and earlier results; in this case there are some new Governance issues (as pointed in checklist later).

IX. Diagnostic and assessment are a cornerstone like planning and funds.

X. Leadership is very important. A Leader's involvement is vital. Cohesion and an accomplishment group is needed.

XI. Achieving Organizational Knowledge is mandatory. Best Practices and Lessons Learned must be shared. Knowledge must be used. The Knowledge Management Cycle must be intended and executed.

XII. Efforts must be used for attracting investments in infrastructure and innovation driven. This includes academic and administrative issues.

XIII. Internationalization Process:

a. must create opportunities for collaboration, research, publication, and consolidate relations with other universities.
b. Must help institutions on their core activities and a bright future.
c. Must respect Intellectual Properties (IP), standards, law and regulations.
d. Should create new boundaries and opportunities and even new markets.
e. Should increase efficiency for competitive advantage.

f. Must be according to vision, mission, scope, activities and the structure of the university.

XIV. Changing is the immutable rule.

Reflecting about all this, the guiding argument is collaboration. Internal and external interventions can be helpful and a solution. Collaboration is a secret: “Therein lies the secret of collaboration. The obstacle may exceed personal effort, but there must be a conviction that this obstacle will be eliminated with the collaboration of all” (PECOTCHE, 20011, p.84).

Internal collaboration is a task for leaders. Not so easy, it will require a lot of time to convince, training and probably awards, and almost everybody should be involved. External collaboration is a strategic decision, and it is characterized by consultants and that means thinking outside the box or creative thinking.

The role of consulting services

Auditors and consultants can be internal or external. In dictionaries you can find like that: A consultant (from Latin: consultare "to deliberate") is a professional who provides expert advice in a particular subject or area.

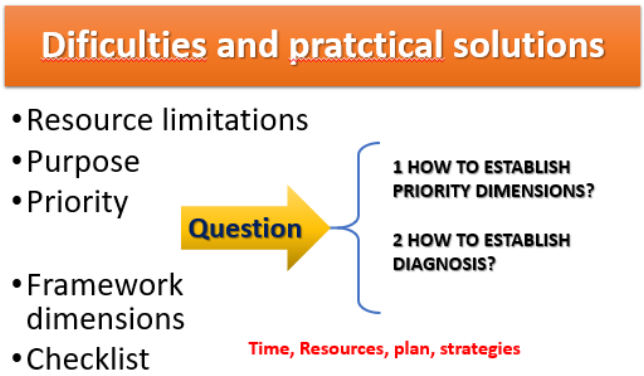
A consultant is an expert or/and an experienced professional in a specific field with a wide knowledge of the subject matter. They act as individuals or as a member of specialized firms. (a) Internal consultants: operates within an organization and is available to be consulted on the areas of their specialization by other departments or even individuals (customers, suppliers). (b) External consultants: someone independent or employed externally to the client (consulting firm or agency); usually it is a temporary action and there is a fee (e.g. McKinsey & Company currently boasts over 100 offices in over 60 countries, while, Bain & Company has 50 offices in 32 countries).

3.2.2 Diagnostic – patterns and scale

To have a diagnosis, there are some immediate questions to be answered. They are connected to the way metrics are built in order to evaluate a specific situation. Most of the time, a medical diagnostic is constructed by anamnesis and clinic exams; the same occurred during this framework development and a set of questions were settled and events were observed.

Dimensions or approaches were defined, and the range was established, in spite of the boundaries being arbitrarily defined, based on theories and practices. Initial questions are shown in Figure 41 – Difficulties and solutions.

Figure 41 – Difficulties and solutions



Source: Created by the Author (2019)

As internationalization focus is fully dependent on the Institution, a checklist will be dependent too. To evaluate priority there are several approaches like:

I. **GUT priority matrix** is an acronym that splits problems by:

- **Gravity**: analyze through problem extension and define immediate potential negative impacts.
- **Urgency**: define deadlines or the point without turning. Less time to solve means higher urgency.
- **Tendency**: doing nothing, problem will get worse or will it disappear along the time?

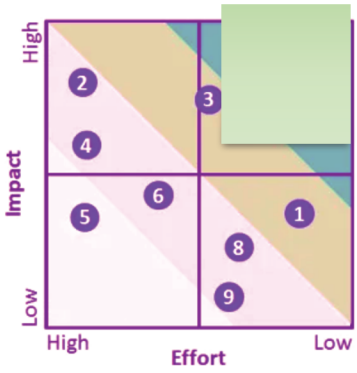
PROBLEM	G	U	T	G x U x T
11. Lorem ipsum dolor sit amet	1	3	4	12
12. Maecenas porttitor congue massa.	3	3	5	45

Using a Likert scale from 1 to 5 and multiplying each G x U x T will give total priority of item.

II. Impact–effort matrix is a faster, cost benefit analysis to solve a problem or a project (LEAN [36]and Kaizen features):

[36] Lean manufacturing is a methodology (1990 MIT) derivate from Toyota Production System and focuses on minimizing waste and simultaneously maximizing productivity. Lean manufacturing is based on a number of specific principles, such as Kaizen (continuous improvement).

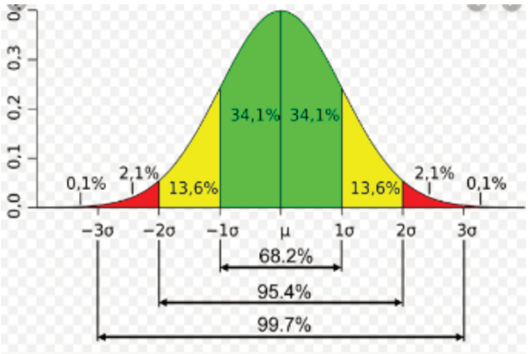
- First axis shows the effort (cost. Difficulty, time) to expense into a project
- The other axis shows the impact (value, benefit, advantages or profit) that will yield by project.



Regions with high impacts and low efforts are better than poor impacts and big efforts areas.

III. **Gaussian distribution** is also commonly called the "**normal distribution**" and it is often described as a "bell-shaped curve".

- Gaussian curve gives a 0.683 probability of being within one standard deviation (δ) of the mean and highly ones when another deviation is added to mean:

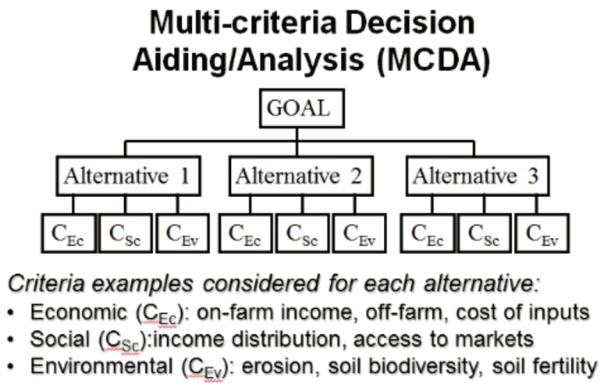


1 δ deviation = 68,2%
2 δ deviation = 95,4%
3 δ deviation = 99,7%

IV. **Kaplan & Norton's (1990) Balanced Scorecard (BSC) model** was developed to help firms measure business performance using both financial and non-financial data.

- Financial with focus in financial performance evaluating ROI for example.
- Customer with customer satisfaction with a service rating level.
- Internal process as a measure of business efficiency with unit cost or new products leading time.
- Organizational capacity turned do Knowledge and Innovations such as employee retention.

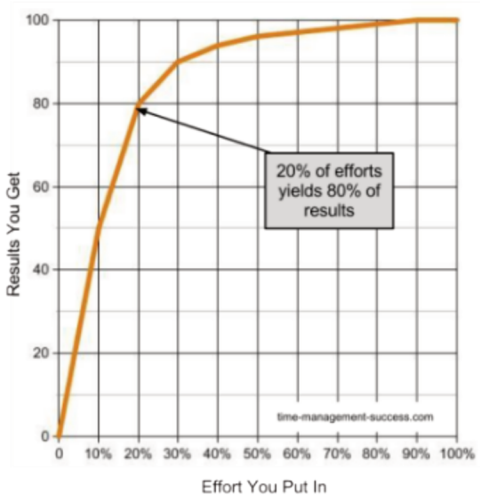
V. **A Multiple-Criteria Decision Analysis (MCDA)** is a decision-making analysis that evaluates considering multiple criteria as part of the decision-making process. This set of approaches has several methodologies. The most common elements are:



- the alternatives or options that will be evaluated (compared, ranked, sorted etc.).
- the criteria or attributes that will be used to weigh the alternatives.
- decision makers' preferences on each criterion (with weights or votes).
- resulting performance of each alternative on each evaluated criterion.

VI. **Pareto[37] Principle**, this rule suggests that 20 percent of causes generate 80 percent of effects or just 20 percent of your activities will account for 80 percent of your results.

- Vilfredo Pareto (1895) noticed that people in society are divided naturally into what he called the "vital few," (top 20% in terms of money and influence, and the "trivial many," or the bottom 80%).



- Later this relation was studied for researchers and confirmed in several situations

[37] "Pareto Principle." It was named after its founder, the Italian economist Vilfredo Pareto, back in 1895. He noticed that people in society seemed to divide naturally into what he called the "vital few," or the top 20 percent in terms of money and influence, and the "trivial many," or the bottom 80 percent.

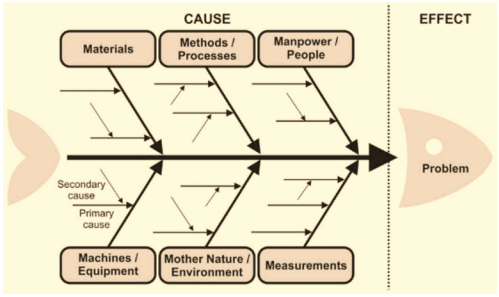
(20% of clients are 80% revenue, and so…) and named 20/80 proportion as Pareto rule.

- Pareto's 80/20 rule can be applied to virtually all situations. Used for prioritizing tasks, time, setting goals and productivity.

A detailed information is provided in the next section. The whole task of a better Higher Education Internationalization process needs actions. So, after priority definitions and diagnostic applied, ISHIKAWA diagrams (also known as fishbone or herringbone diagrams, cause-and-effect diagrams) can be applied to mitigate and solve weakness or problems pointed out by diagnostic. This kind of technique is not detailed during this thesis, but one can find a lot of literature and examples. Another good technique should be 5w2h, to plan actions and activities to be done after prioritizing. The process is a mnemonic for (why, what, when, who, how and how much). Experts and practice of this method reveal that defining "how" could be a better start, when analyzing 5w2h actions.

3.2.2.1 MCDA adopted criteria

Multicriteria Methodology for Decision Analysis – MCDA, allows incorporation of practical and theoretical dimensions of evaluation including objective and subjective factors. (ENSSLIN, MONTIBELER, NORONHA, 2001) & (ENSSLIN, 2002). One can define clusters and subclusters organized in a Decision tree.



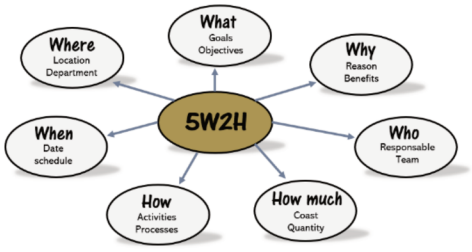
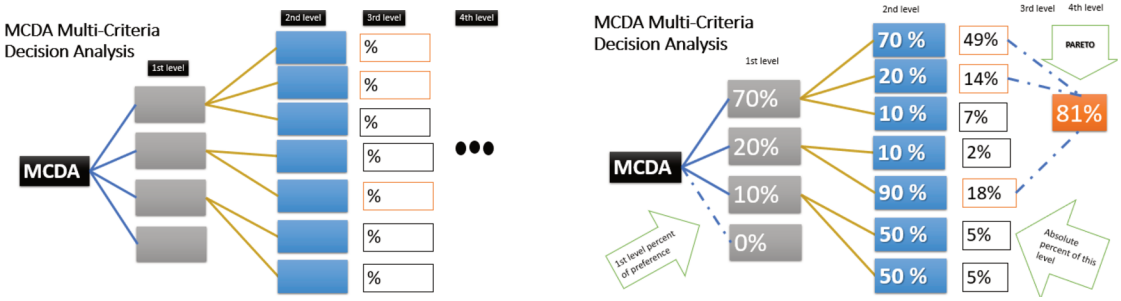


Figure 42 – Sample representation of MCDA criteria



Source: Created by the Author (2019)

Using MCDA, you will have a main category with a 1st level criterion. Each one receives a percentage and so on. Each level can be divided in sublevels, this way a second level is a percent of each 1st level. The same process on 3rd, 4th and so on (Figure 42 - Sample representation of MCDA criteria).

The last level (in this case 3rd level) is proportionally divided and ordered from higher to lower percent. Each one is added to the next until it reaches 80% or higher when summarizing. This represents 80% of the effects. This example was simplified to a better and easy understanding. At this point MCDA and Pareto were applied.

Applying the techniques to a questionnaire

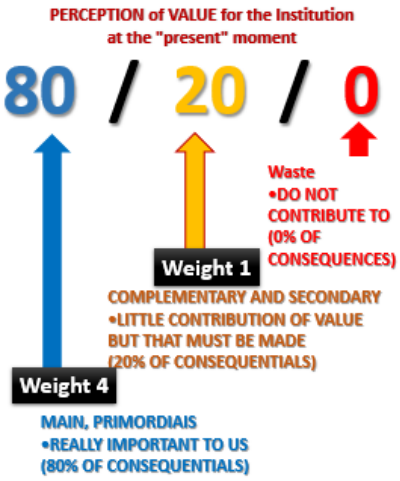
The use of Pareto, considering that 80 percent of the consequences come from 20 percent of the causes, emerges from the perception of important aspects compared to the unimportant ones. In a ratio of 80% to 20% we have a ratio of 4:1 i.e., out of every 5 elements 4 (consequential) are represented by 1 (cause). The remaining consequences (20%) come from all other causes (80%).

3.2.2.2 80/20 Pareto

As Pareto rule reveals, 20% of causes generate 80% of effects. The other 80% of causes generate effects of only 20% included in this total zero effects. So, the reason can be more explicit as 4:1:0 where (4) is a grade for causes that

are important (really matters), (1) is for complementary or secondary causes and (0) zero if the weight is not important at all (not needed).

A software program may be able to establish that a ratio of four to one, where the central and significant elements can weigh 4 the complementary weight 1 and the others being disposable. This will define which focus is priority according to Mission, Vision, Value and Outcomes of HEI.



4 PROPOSING A DIAGNOSTIC FRAMEWORK

Purpose and goals: **Based in literature theories, models and frameworks of section 3, this 4th section intends to propose a framework with two modules involving qualitative and quantitative questions to be evaluated as a checklist. It also designs and implements a software to receive checklist answers.**

4.1 PROPOSING A DIAGNOSTIC FRAMEWORK

This proposed and tested framework has two modules or parts. The first one relates to outcomes and objectives of Higher Education Institutions. This way, there is a large range of actions clustered. In a diagnostic, objectives and results will be evaluated according to these elected choices of the university – is a perception as Internationalization is not a prescriptive trial. The second module examines organization, structure, controls, and procedures and compounds a comparison revealing the Institution's stage in the Internationalization process.

As each elected focus of Internationalization is a choice dependent and objectives and results, a detailed construction will be fully described but it is important to know that for better and fast results; module one was implemented in a web-based software using 80/20 and MCDA techniques with questions answered using a Likert scale. The second module was constructed based in a

quarterly distribution in a modal arrangement of 66 questions with four levels of complexity.

During this chapter there is a description of the proposed framework turned to a Higher Education Internationalization. A first presentation of the result is presented in Frame 42 and Figure 45 with Dimensions of the framework. It contains the main configuration of the framework describing theories, models, and dimensions of the framework. The developed framework is called Higher Education Internationalization Diagnostic (HEID).

After initial simulations, testing, grouping and validations four dimensions are settled as:

1st dimension: **Higher Education Internationalization**

- Comprehensive Internationalization
- Responsible Internationalization
- Internationalization Cycle and Leading Changes

2nd dimension: **Knowledge Approach**

- Applied benefits
- Knowledge Cycle

3rd dimension: **University Governance Structure**

4TH dimension: **Critical Success Factors**

Aiming the Internationalization diagnosis (Figure 49 – Framework Module 2 – structure, controls and procedures evaluation). The **core dimension** is naturally the Higher Education Internationalization itself, so a Comprehensive Focus of Internationalization was selected. **Dimension one** represents the outcomes of higher education. This first dimension was completed with a transversal concept, involving Balance, Accountability, Sustainable, Inclusion and Compliance views proposed by Responsible Internationalization (Stallivieri, 2019).

Being a “process” Internationalization has several steps, which can be adjusted, verified, and, of course, declined. For a success on this matter, an implementation plan must be defined and executed. Dimension one, has included the Knowledge Cycle implementation defined by (Knight; De Wit, 1995) and considering this is a great change to be done, Kotter (2019) was incorporated with Leading Changes.

During this development, the contribution aimed was harmonized, checking the adherence of theories, consolidating models into a framework first dimension:

I. Comprehensive Internationalization,
II. Responsible Internationalization (transversal)
III. Internationalization Cycle and
IV. Leading changes.

Getting better and persistent should be an ideal solution to HEI, so with this in mind, emerges the second dimension.

Second dimension is the Knowledge approach. All this work has the purpose of explaining and getting a knowledge representation, with the goal of incorporating knowledge and changes to the Organization Knowledge and Organizational Culture. The second dimension is strongly connected with the first one, from leadership and implementation to purpose and deliveries of the Higher Education Institution.

In the New Society of Knowledge, knowledge is an extensive issue, so the Knowledge Management Cycle must be presented in the organization and each step is checked. KMC with Evans, Dalkir and Bidian (2014), Knowledge Cycle - Bukowitz and Williams (1999) involving Strategic Tactical process are included. All this was researched, linked and presented according to the Knowledge Cycle Modelling (SCHREIBER, 2000). All this represents the SECI of Creation knowledge spiral (NONAKA; TAKEUCHI, 1995).

Including all this must turn the eyes to peopleware again – there is a motivation for knowledge culture, are there reasonable benefits? So, benefits of knowledge must be applied directly to Internationalization and several authors have contributed to this matter. Thus, the study reveals some knowledge points can be considered as benefits. A list of immediate and potential benefits was listed, from risk, best practices, and collaboration.

This **second dimension** required deep studies and a process to blend properties of theories, frameworks and models and enhance each one with a Higher Education Internationalization objective.

Finally, **the third and fourth dimensions** have direct and practical purposes, they are pointed to **Critical Success Factors** and **University**

Governance Structure. The third dimension is governance structure: Governance itself is concerning legal status, guiding principles, risk and compliance and this is a very first obligation of the governance and audit people. The point to be observed here, is about the structure of governance and not the governance working role itself. The framework has the purpose of assuring that governance is worried about Internationalization and it is prepared to do this: top management issues, reporting issues are checked.

Auditing (internal or external) all over the world, has severe legal obligations and structures. Although this role is indispensable during a diagnostic of higher education internationalization, governance structure can be the main internal instrument to follow-up plans, complaints and evaluating risks. This way, the same structure of an Internationalization Comprehensive Governance can be applied to Auditing composition. Audit trail recommendations and guides can be found in the Institute of Internal Auditors, and External auditors can reach laws and regulations in several associations worldwide like the Association of Chartered Certified Accountants – ACCA.

The **last** dimension, number four, is also a practical issue and deeply connected to the governance purpose, so close that we can suggest creating a governance guide with success factors following-up. **Fourth dimension** is Critical Factors of Success to Internationalization Knowledge.

Beginning with the KM factor, collected from numerous frameworks and models by Heisig (1999), they are complemented and tailored to Internationalization and Knowledge transformed to the Internationalization process: Human-oriented factors; Organization and Technology factors and Management-process factors supporting internationalization were listed.

As can be seen next, each dimension adopted has been compiled in a large framework. Having in mind the purpose to get a fast and useful framework they were transformed into checklists.

The same way, the covid-19 pandemic materialized with danger and opportunity. During this period, Concept Proof Software was developed to get an easy and automated diagnostic. It was constructed from the checklists after the expert's validation of the framework. A deep testing was applied mainly to the core subject (internationalization), and the software is plenty reliable for testing.

Using web- based technologies is very useful to a diagnostic of all these frameworks.

> "The Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger; the other for opportunity. In a crisis, be aware of the danger--but recognize the opportunity."
> — John F. Kennedy

This web software was developed in Python (many thanks to *Nicolau da Silva* a master's degree student of Knowledge Engineering) and this application software is an explicit representation of all the knowledge collected into frameworks. The main goal is HEI, but all complimentary dimensions like knowledge and governance are developed and fully functional.

All dimensions were compiled in a large framework and transformed in two checklists, and details of construction and all processes are listed in this chapter. Motivations, rationales, and concepts are explained.

1.1. DEFINITIONS AND CONCEPTS ADOPTED

After studying, we aggregate and link several concepts (see Appendix A with a substantial quantity of annotated definitions), the core definitions adopted in this thesis are in Frame 41:

Frame 41 – Terms and adopted concepts

Terms	**Concepts**
Auditing	Conduct a planned, official and focused examination of an individual or organization.
Construct	A construct is an abstract concept that is deliberately created to characterize a collection of indicators represented by concrete forms of behavior.
Consulting	A professional or expert advice provided to a group or a person.
Compliance	Adherence or conformity in fulfilling official requirements, regulations and laws
Knowledge	Knowledge is an intellectual manifestation in a justified true belief.
Model	A model is an explicit definition of the dynamic interaction between the elements of a System.
Framework	A framework makes it available and comprehensible for a defined purpose: relations, definitions, and structure of a set of connected Models, Systems and even other Frameworks.

Governance	The whole process of governing (from decision-making, interaction, structure) of people involved in a central issue.
Higher Education Internationalization	Internationalization at the national, sector, and institutional levels is defined as the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of postsecondary education. Comprehensive internationalization is a commitment, confirmed through action, to infuse international and comparative perspectives throughout the teaching, research, and service missions of higher education. It shapes institutional ethos and values and touches the entire higher education enterprise. (It is essential that it be embraced by institutional leadership, governance, faculty, students, and all academic service and support units. It is an institutional imperative, not just a desirable possibility.
Map	A representation of static relations of elements in a system.
Process	A process is a dynamic approach describing activities in the purpose of achieving a goal, product or service by transforming inputs into outputs.
Procedure or Routine	A procedure is a serialized set of tasks, actions or steps in a process.
System	A system defines in a context and a paradigm, a set of interconnected elements and properties with a defined purpose.
Technique	A technique is a structured way for executing a part of a procedure or routine.
Theory	A knowledge expression of a complex phenomenon, interrelating concepts and definitions with systematic relation with variables.
Tool	A tool is an artifact for the practical application of a technique.
Validation or Verification	The act of verifying and evaluating any artifact or object regarding a specific objective

Source: Elaborated by the author considering several definitions and merging compatible terms. Higher education Internationalization concepts are extracted from Knight (2003; 2004; 2015), Hudzik (2011, p.6) and Hudzik & McCarthy (2012, p.6)

4.2 PROPOSED FRAMEWORK – STRUCTURE AND CONCEPTS

Measuring anything is deeply connected with the purpose of measurement, the instruments available and cost, of course. After measuring a diagnostic, it is possible, but it is particularly challenging when talking about internationalization. There are so many different perspectives and interpretations of the concept. Some of following (Knight, 2004) topics are meaningful:

- International activities, like student's mobility, international partnerships, projects, and research.
- Transnational education like delivery education in presential or distance mode. And the use of IT.
- Inclusion of intercultural dimension into the curriculum & learning process.

As an overview, a Cognitive Map (CMAP) was built. This map is represented by concepts, actions, and connections. At the top leftmost corner (orange color) is the main concept title to be decomposed (Higher Education Internationalization).

There are five yellow blocks representing the central aspects and some of them will be treated as framework dimensions.

Auditing is an important role when diagnosing and generally a consultant role (partial). All the way, the audit guide is user area dependent for external and internal auditors. Audit structure is clearly defined, and auditing checklist is constructed from users' issues. There is no need to define an auditing checklist of internationalization because it is selected from the users' issues checklist.

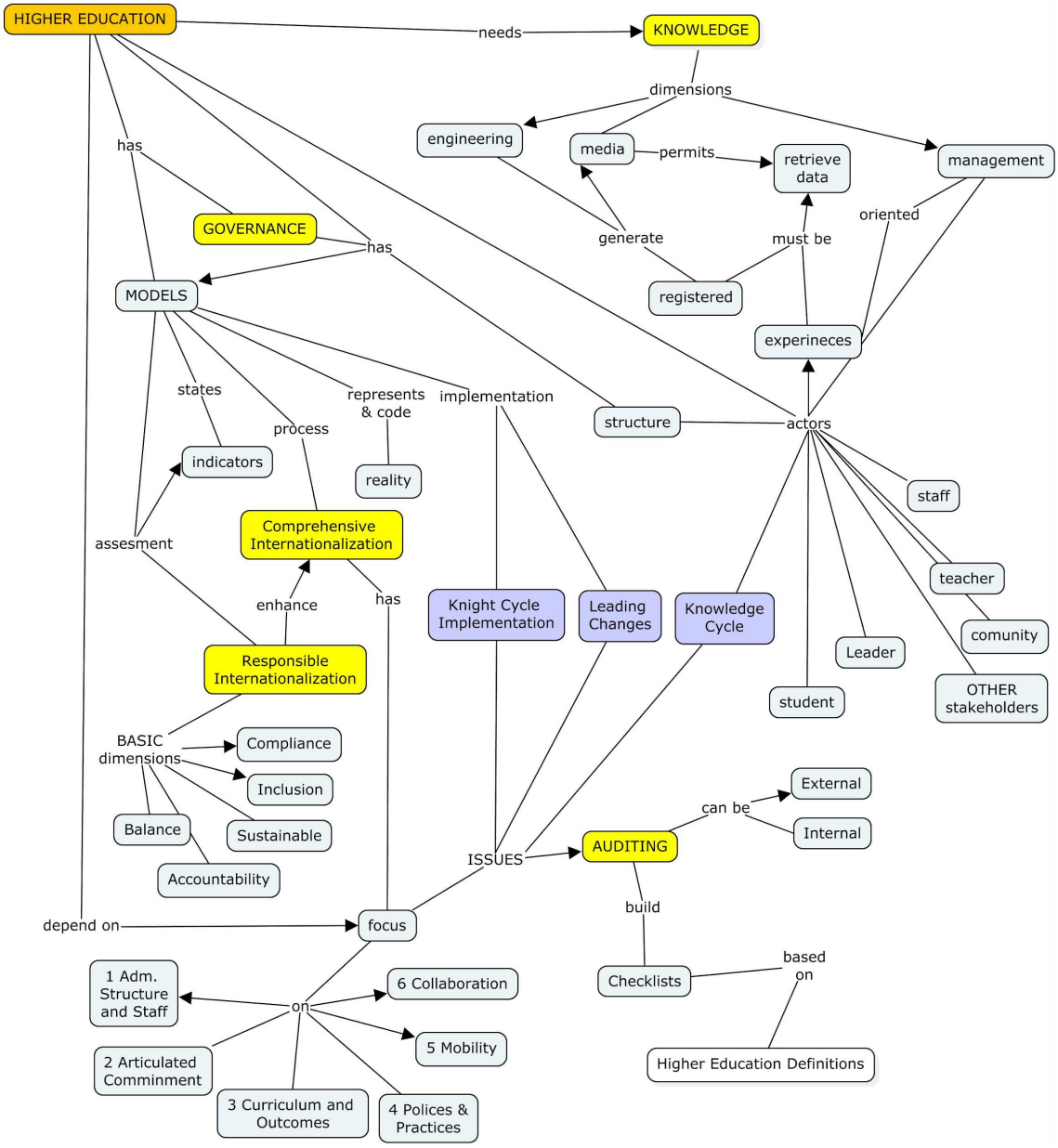
A Cognitive Map – CMAP (Figure 43 - Cognitive Map representing areas to be checked in Higher Education) illustrates that Governance (yellow block) has a dependent structure linked to the internationalization process. The same for auditing, checklist is built from the user's areas checklist. The nature of governance is an internal action, so verifying its own structure and communications is needed. The Framework adopted Governance as a Framework dimension for Internationalization diagnostic.

Comprehensive Internationalization and Responsible Internationalization are the core of the framework. This dimension observes focus, structure and has an extensive checklist for each focus. Internationalization dimension is supplied

also by three aspects (purple blocks): Implementation process; leading changes and knowledge cycle.

Organization Knowledge (another yellow block on the right top) is one of the main purposes of any HEI. Knowledge has a direct involvement in the success of the installation process and in the Organization Culture itself, transforming from tacit to explicit knowledge.

Figure 43 – Cognitive Map representing areas to be checked in Higher Education



Source: Author creation (2019).

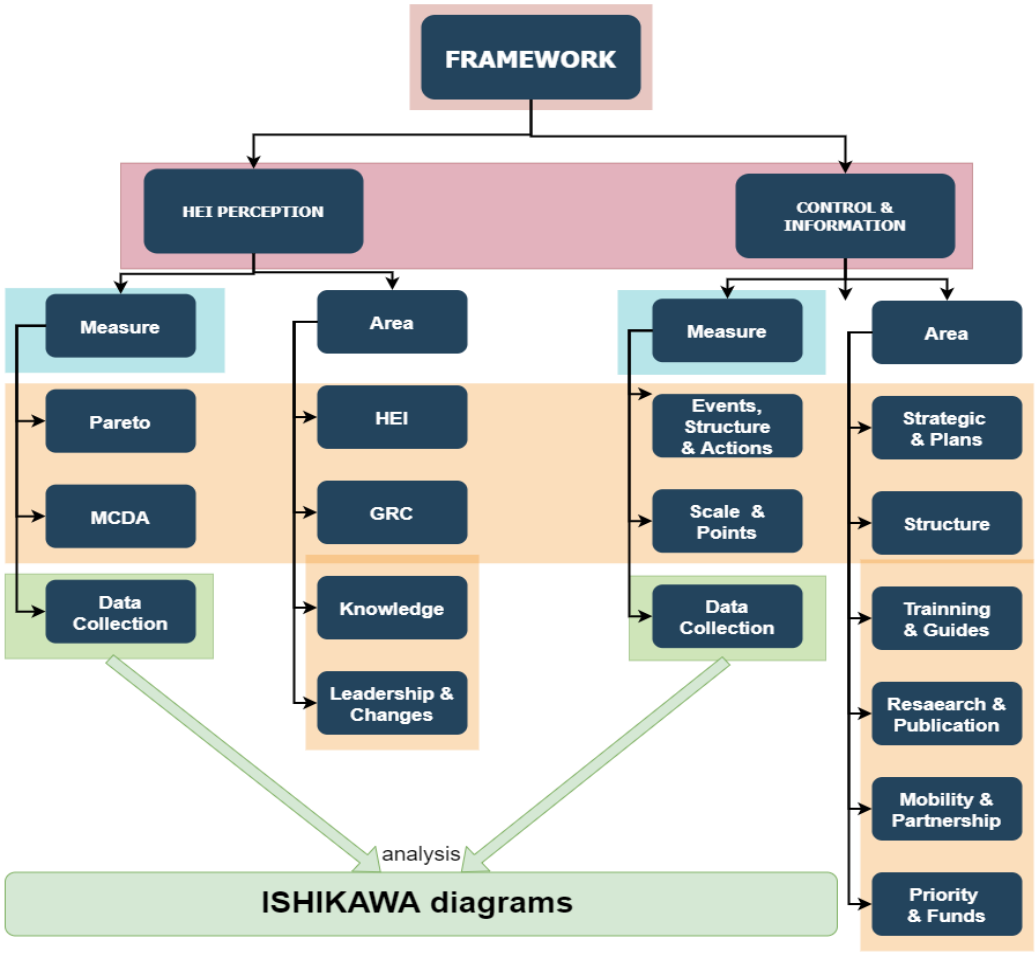
The diagnostic Framework of Internationalization is constructed with codification and abstraction in order to get a higher diffusion possibility. By keeping the number of categories needed down to a minimum and maximizing and giving a productive cognitive strategy. All these concepts are connected with “The Diffusion Curve in the I-Space” approach (BPISOT, CANALS; MACMILLAN, 2004, p.8-9).

The framework definitions begin with 7 dimensions: (i) Governance, Risk and Compliance; (ii) Auditing; (iii) Leading Changes; (iv) Internationalization implementation process; (v) Comprehensive Internationalization; (VI) Responsible Internationalization and (vii) Knowledge Management.

When converging the general framework into a diagnostic purpose framework, it was observed that some dimensions must be compacted or even suppressed (as auditing for example, as seen in CMAP (Figure 42- Cognitive Map representing areas to be checked in Higher Education). Other dimensions can be divided into subdimensions or focuses – e.g., Comprehensive Internationalization. That means a new level of abstraction.

Considering all these factors there are two approaches: The first one, a qualitative development method considering all actors’ perception; the second one, considers only defined data and structures. Thus, qualitative, and quantitative checklists were developed, as shown in Figure 44 - Vision of a fully consulting process using the HEID Framework.

Figure 44 – Vision of a fully consulting process using the HEID Framework



Source: Author creation (2019).

The first one has multiple checklists involving the internationalization aspects as shown in Frame 42 -– Dimensions of the framework. Each one must be verified in terms of purpose and goals of the Institution. For management staff it must define which are the main focus, which are the secondary or complementary and which has no importance. After this first stage of scope definition or focus definition, the second stage will be the evaluation itself when people involved will answer select focus questions. The third phase will be the scale measurement and grade.

The second checklist is turned to quantitative measures (indicators), registered information and effective comparisons. Initially it has more than 90 questions. After testing, it was reduced to 66 questions. A scale was suggested to each answer and a total is computed generating a grade comparison, including horizontal and vertical

Frame 42 – Dimensions of the framework

INTERNATIONALIZATION ASPECTS

1, A Comprehensive focus of Internationalization
- Articulated Institutional Commitment
- Administrative Leadership, Structure, and Staffing
- Curriculum, Co-curriculum, and Learning Outcomes
- Faculty Policy and Practices
- Student Mobility
- Collaboration and Partnerships

2, Responsible Internationalization Issues
- Balance
- Accountability
- Sustainability
- Inclusion
- Compliance

Internationalization Impacts

Implementation and leading changes

KNOWLEGE
- Requisites of Knowledge Modelling
- Knowledge Management
- Critical Factors of KM adopted for Higher Education
- Creation knowledge spiral
- Benefits of knowledge turned to Internationalization of Higher education.

GOVERNANCE
- Comprehensive Governance for Higher Education Internationalization

Source: Author creation (2019).

4.2.1 Framework and checklist construction

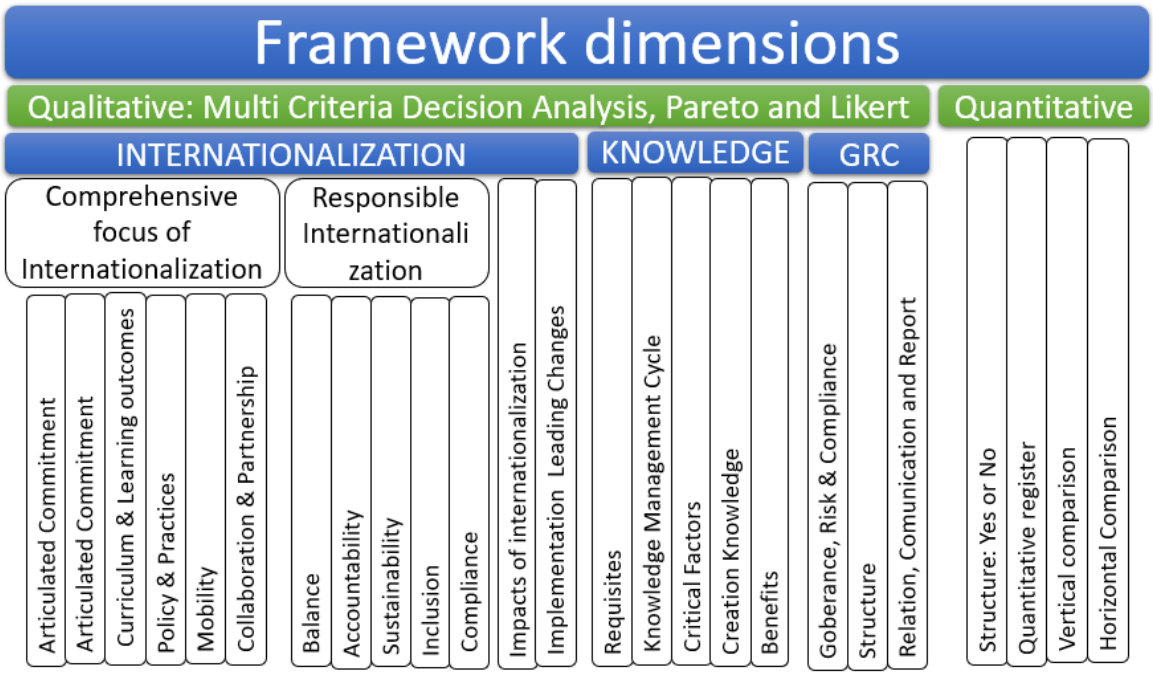
After dimensions were established and tested, several interactions were needed to reduce and enhance the list.

This kind of checklist is a large range of utilization. For example, Bukowtis & Williams (1999) use this kind of checklist / questionnaire to evaluate Knowledge Management stages. This kind of checklist uses the perceptions registering them, usually with a Likert Scale.

During survey studies, Likert[38] scale was a broadly used method for scaling responses. Commonly used in questions that ask people to indicate their level of agreement, from strongly agree to strongly disagree with five points scale. Likert-type scales are repeatedly used in education and research.

In this specific checklist there are some questions closely connected to Higher Education Outcomes, Goals and Mission. That means, each survey will be applied or not, depending on a specific purpose of the HEI. Each aspect is based on previous theories and models and fully defined later, including authoring citations (Frame 43). Next Figure 44, illustrates approach and derivate checklists connect to framework dimensions:

Figure 45 – Framework general view



Source: Author creation (2020).

When talking about Internationalization focus, this concept refers to the new concept of Internationalization. Not prescriptive, the Comprehensive Internationalization concept, brings up a menu and the HEI must select its own objectives, according to its own purposes and outcomes, mission, vision and values.

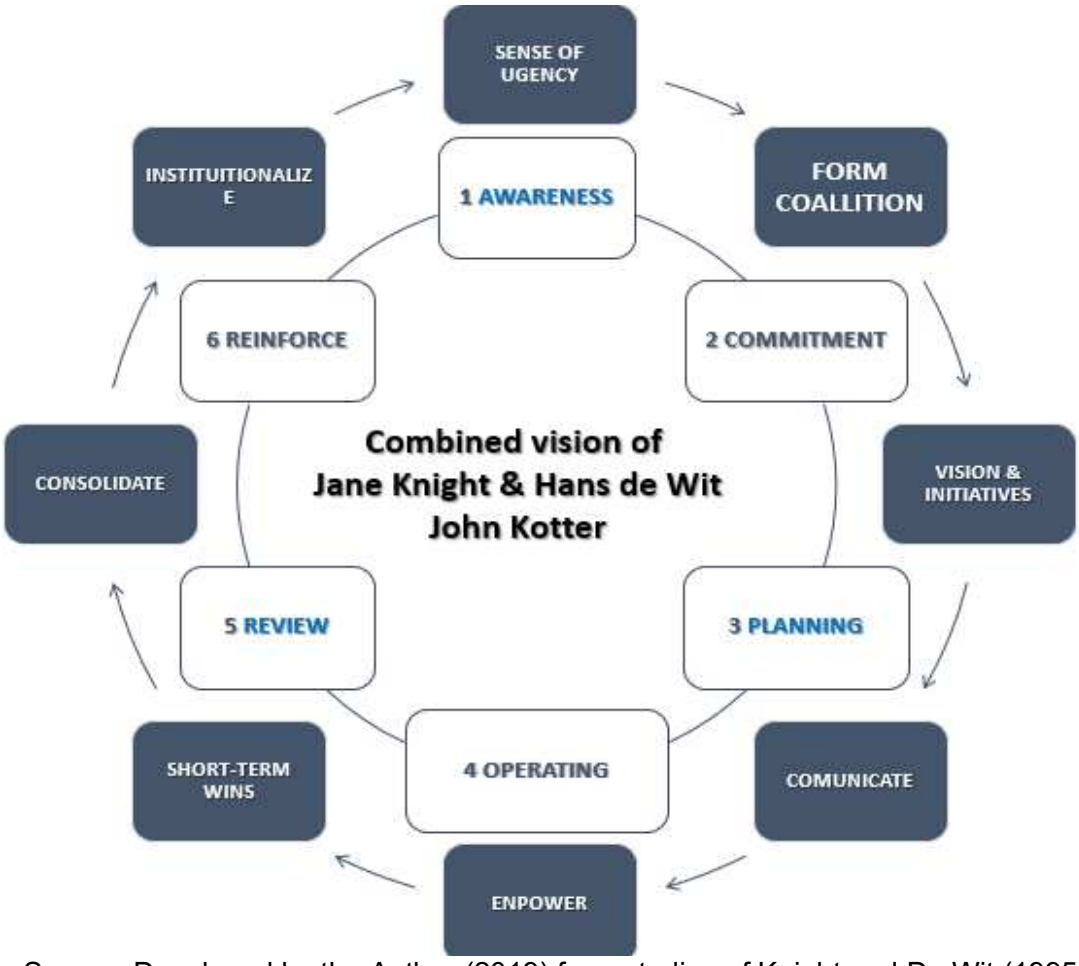
[38] Rensis Likert developed his scale (1932) to measure attitudes or opinions. Typical Likert scales have 5 or 7 points from agree to disagree with a proposed statement.

Other checklists are linked to the HEI structure: there is no reason to ask about Governance if a faculty does not have a governance structure; the same for Knowledge Management, and so on. Other checklists like Implementation or leading changes apply to every process of internationalization.

Adopting an Internationalization process is a great change, and it is useful to remind Kotter studies of Leading Changes, which are deeply linked to the Internationalization Cycle. The significance and results of this process depend on group actions and top management responsibility is fundamental. Dedication to Create, Empower, Monitoring and change Organizational Culture implies the importance of the process. Not only managers and leaders, but all academic communities need to be able to make change happen – this is a real empowerment. Better results are achieved when the meaning and purpose of efforts are clear.

Kotter's 8-Step Model for effective change and Knight and De Wit Internationalization Cycle can be found in Chapter 2 (Figure 20 and Figure 34) can be associated as shown in Figure 46.

Figure 46 – Knight and Kotter combined vision of Change



Source: Developed by the Author (2019) from studies of Knight and De Wit (1995; p.26) and Kotter (2006, 2011, 2012)

After consolidating these two visions they were stated in a unique Internationalization process view and a checklist was also included.

In this thesis, to establish a Higher Education Internationalization Diagnostic (HEID) system, a multi-dimensional framework has been constructed and then a checklist has been prepared. After testing and studies two criteria are selected: MCDA and Pareto rule and a LIKERT scale was constructed.

- **MCDA** - Multicriteria Decision Analysis: Complete and less complex process. It can consider objectives and subjective criteria.
- **PARETO** - Rule of 80/20 easy understanding and application. Where 80% of the effects come from 20% of the causes.

4.2.2 Module I (qualitative) – Goals and outcomes from university preference

Considering the need of selecting checklists to be applied, this kind of survey will need 3 stages: (i) choose the focus; (ii) answer questions and (iii) evaluate results. The whole checklist was implemented in software as a kind of proof. The criteria used and software requisites will be explained in the next section. At this time, the entire checklist is detailed in the frames (Frame 43).

Figure 47 – Visualizing the framework

Source: Author construction (2020)

These following frames were organized in four dimensions and parts (or sub dimensions) which are yellow colored (Figure 47). Items of each part are hierarchically numbered and green color marked. After that all sub items and atomic elements were listed.

Authors are cited on each item, or in titles and subtitles (dimensions or sub dimensions) when the whole group of concepts originated from the same authors.

Frame 43 – Framework details and citations

1ST dimension – Higher Education Internationalization This dimension is concerning Internationalization process and involves: Part 1 - Comprehensive Internationalization (ACE, 2019 & HUDZIK,2011) ans RI?? Part 2 - Implementation and leading changes: Knight and De Wit (1995; p.26) and Kotter (2006, 2011, 2012) **1 Focus of Internationalization – part 1** Strategic planning involving key stakeholders articulates an institution's commitment to internationalization and provides a roadmap for implementation. Formal assessment mechanisms reinforce this commitment by framing explicit goals and holding the institution accountable for accomplishing them.
1.1 Articulated Institutional Commitment
1.1.1 Strategic planning: Is Internationalization prioritized in mission (vision) statements?
Strategic planning: There are Strategic plans with explicit internationalization plans.

	Internationalization committee. There is a steering committee composed of representatives from across the campus that is designated to oversee implementation of internationalization initiatives.
	Campus stakeholders. There are focus groups, surveys and open discussions about internationalization?
	Campus stakeholders. There are discussions about priorities, address concerns and gain buy-in by students, faculty, staff and other stakeholders.
	Assessment. Following from articulated goals, progress and outcomes of internationalization are formally measured and assessed
1.2 **Administrative Leadership, Structure, and Staffing** Consider the involvement of top leaders and appropriate administrative and reporting structures form an essential framework for implementing internationalization.	
Senior leadership. Are senior leaders committed to internationalization?	
Senior leadership. Are leaders engaged in the process from the beginning?	
International office. Is there an office to coordinate campus-wide internationalization activities?	
International office. Are the faculty or staff members primarily responsible for internationalization linked to the president or a senior leader?	
1.3 Curriculum, Co-curriculum, and Learning Outcomes Consider the involvement of top leaders and appropriate administrative and reporting structures form an essential framework for implementing internationalization	
General education requirements. Are courses focused on foreign language, regional studies, and global issues required in undergraduate?	
Internationalized courses in the disciplines. There are courses which incorporate an international perspective and highlight global issues?	
Co-curriculum. There are programs and activities addressing global issues, reinforcing international elements of the curriculum?	
Programs and activities support the integration and success of international students on campus?	
Student learning outcomes. Internationally focused competencies are included in campus-wide student learning outcome goals and assessments.	
Technology. Technology is used in innovative ways to enhance global learning, e.g., through joint coursework and interactions with students and faculty abroad.	
1.4 Administrative Leadership, Structure, and Staffing Consider the involvement of top leaders and appropriate administrative and reporting structures form an essential framework for implementing internationalization.	
Tenure and promotion policies. Tenure (permanent position or stability) codes state explicitly that international work and experience should be considered?	
Hiring guidelines. International background, experience and interests are among the criteria upon which faculty candidates are evaluated.	
Faculty mobility. There are opportunities to teach, research and attend conferences abroad.	

Faculty mobility. Administrative and funding mechanisms support faculty participation in outside programs (e.g., Fulbright).
On-campus professional development. Workshops, seminars, and other programs help faculty build international competence
On-campus professional development: Are international perspectives incorporated into their teaching.
1.5 Student Mobility This item refers both to the outward flow of domestic students to engage in an education abroad experience and the inward flow of international students at U.S.A. campuses.
Credit transfer policies. There is credit for studying abroad when approved in an official program?
Financial aid and funding. There is financial aid when a student is approved in an official study abroad program.
Resources are available to help students locate additional funding.
Scholarships and other funding are available for international students.
Orientation and re-entry programs. Preparation!! There are programs to help students maximize learning during study abroad, and integrate knowledge gained into their overall program of study?
Academic and cultural orientation sessions are provided to all incoming international students.
Ongoing support and programs for international students. There are academic and social support structures and programs that facilitate international students' full integration into campus life.?
1.6 Collaboration and Partnerships A key aspect is establishing and managing collaborations and partnerships abroad. It can generate opportunities to expand global reach through collaboration and partnerships. Student and faculty exchanges, joint and dual degrees should be included.
Partnerships with institutions and organizations abroad. Connections take place at the faculty, unit, and/or institutional levels, and may originate "top down" or "bottom up." Appropriate procedures are in place to evaluate proposed partnerships and ensure legal compliance.?
Community collaborations. Organizations in the local community are tapped for cross-cultural expertise (e.g. among diaspora populations) and community members are invited to participate in internationalization activities on campus.
On-campus networks. The international office works collaboratively with an-array of administrative and academic units on campus to promote activities, support students and faculty, and communicate internationalization successes.
1ST dimension – Implementation - part 2 **2 Implementation and leading changes** All plans must be executed with the purpose to be incorporated in Organization Knowledge and Culture. This is the main path to changes. Knight and De Wit (1995) & Kotter (2019)
2.1 Awareness and Sense of Urgency
Benefits and importance of the process are listed and communicated?
All campus people are included.

A sense of urgency was established.
A guiding coalition was established.
A Vision is established, communicated and disseminated?
Obstacles of the new Vision are removed.
Sense of urgency and priority are defined and frequently increased?
Urgent changes are explained and demonstrated?
2.2 Commitment and Coalition
Teach and learn, researchers and administrative staff are committed to Higher Education Internationalization?
Senior management is driving commitment with a strategic plan?
A coalition guiding team is a builder.
There are people representing all significant areas of the University (not necessarily main managers).
Are you properly evaluating ideas from all levels?
An urgency sense and motivated Vision are constructed?
Whole university is involved.
2.3 Planning
A comprehensive plan is created.
Goals and critical proposals are defined?
Are reasons, outcomes, features, and resources organized?
Optimism and realism balanced in plans?
Vision and urgency and plans are clearly and exhaustively communicated
2.4 Operationalize
Priorities are defined.
Actions and activities cleared?
Operational plan defined?
Short-term wins are defined and reached?
Wins and realizations are celebrated and communicated?
Barriers must be confronted with old procedures and resources.
2.5 Review and Empower
Individual activities have periodic reviews and adjustments?
Plans and budget have periodic reviews and adjustments?
Lessons Learned are considered as a source of knowledge?
Are Leader attitudes evaluated?
2.6 Consolidate and Reinforce
Process cycles are monitored to improve quality.
Benefits, incentives, recognition, and rewards are considered and implemented?
New opportunities and innovations are stimulated?
Establish short-term wins to build hope and energy.
Organization Culture is encouraged by changes?
New processes and attitudes must be institutionalized.

2ND dimension: Knowledge Part 1- Knowledge benefits (several authors cited in each contribution) Part 2 - Knowledge Modelling and Knowledge Management Cycle - KMC
2ND dimension – Internationalization Knowledge benefits - part 1 **Benefits of knowledge applied to Internationalization of Higher Education.** When talking about Internationalization of Higher Education, there are some knowledge points considered as benefits. A list of immediate and potential benefits can be considered and evaluated.
Knowledge approach benefits applied to internationalization
Best decision making - Singh et.al. (2006), Dalkir (2005), Chase (1997)
Better management of intellectual capital - Demarest (1997)
Cycle time reduction - Singh et.al. (2006), Chase (1997)
Develop new opportunities - Anantatmula & Kanungo (2006), KPMG (2000)
Developing core competencies - Beijerse (1999)
Enhanced customer relation - Dalkir (2005),
Enhanced customer satisfaction - Dalkir (2005),
Enhanced flexibility - Singh et.al. (2006), Chase (1997)
Enhanced learning - Dalkir (2005)
Enhanced products or services (outcomes) quality - Chase (1997), Dalkir (2005),
Enhanced the continuity of the organization - Beijerse (1999)
Faster new product development - Beijerse (1999)
Improved processes - Anantatmula & and Kanungo (2006)
Improved communication - Chase (1997)
Improved employee loyalty and retention- Anantatmula & Kanungo (2006), Beijerse (1999)
Improved employee skill - Dalkir (2005), Chase (1997)
Improved productivity/efficiency - Singh et al. (2006), Anantatmula & Kanungo (2006), Chase (1997)
Improved responsiveness - Singh et.al. (2006), Dalkir (2005), Chase (1997)
Improved revenues through licensing of patents - Singh et.al. (2006), Anantatmula & Kanungo (2006)
Increased employee satisfaction - Dalkir (2005)
Increased empowerment of employees - Anantatmula & Kanungo (2006)
Increased sales/profits - Singh et.al. (2006), Anantatmula & Kanungo (2006), Chase (1997)
Increased speed of innovation - Davenport (1998), Singh et.al. (2006), Dalkir (2005), Chase (1997)
New or better way of working - Chase (1997)
Reduced risk - Beijerse (1999)
Reuse of information and Knowledge - Singh et.al. (2006)
Sharing best practices (and lessons learned) - Davenport (1998), Singh et.al. (2006), Dalkir (2005), Chase (1997)
Smoother collaboration - Singh et.al. (2006), Dalkir (2005)
2ND dimension – Knowledge Modelling and KMC - part 2 **Knowledge Modelling and Knowledge Management Cycle -** 2.1 Knowledge Modelling (SCHREIBER, 2000; NONAKA; TAKEUCHI, 1995).

2.2 Knowledge Management Cycle (KMC) - Bukowitz & Williams (1999) and Evans, Dalkir and Bidian (2014) and Iqbal (2017)
2.1 REQUISITES OF KNOWLEDGE MODELLING
2.1.1 Schreiber theoretical model applied to HEIP
There is a list of all information sources that can be used
A list of Internationalization domain terms with explanations (= glossary)
There is a list of components or structure of Internationalization justified by corresponding decisions and rationales
There is a plenty list of requirements for each components or structure
There is a set of scenarios for Internationalization (short, middle and long range / ideal and adverse)
There is a clear description of the expected and preferred results / outcomes
There are specified rules and procedures to deal of these challenges
There is a formal register of demands in HEIP
There is a clear description of the actual goals / results / outcomes and why they are imperative? (it can be by faculty, course or in general organization) kotter
There is a priority list?
Is priority list respected?
2.1.2 Tools, Methods and Techniques Dalkir (2005); Welman, Kruger and Mitchell (2005); Reynolds (2011); Chinn and Kramer (1999), Meyer and Zack (1996); Shongwe (2016); Evans, Dalkir and Bidian, (2014); Birkinshaw and Sheehan (2002).
There is a public list of HEIP applied tools and techniques (including desirable ones or a “list of wishes”)
There are Best Practices Repositories for registering successful practices
There are Lesson Learned Repositories for registering unsuccessful practices (to avoid)
Anyone can address issues related to Internationalization repositories
There is a feedback for each question
Documents, rules and statements also offer a way of making sense of the conditions under which different knowledge management strategies are appropriate.
2nd dimension – Knowledge management Cycle (KMC) - part 2 **2.2 Knowledge management Cycle (KMC) of Bukowitz and Williams (1999)** 2.2.1 Tactical 2.2.2 Strategic Bukowitz and Williams (1999) describe a knowledge management framework. It is useful to determine the steps in the creation of knowledge process in the organization. These processes can be applied to Internationalization and based on Evans, Dalkir and Bidian (2014) and Iqbal (2017).
2.2 Knowledge management Cycle (KMC) of Bukowitz and Williams (1999) Consider Bukowitz and Williams (1999) Knowledge management process framework applied to internationalization
2.2.1 Tactical process: refers to daily work knowledge

	The identify stage involves eliciting codified and encapsulated knowledge assets (e.g., documents in electronic and print format stored in a knowledge repository and/or live demonstrations and observations of artifacts).
	Get stage: There are efforts and results in finding required information to solve problems, innovate and reach competitive advantage in internationalization.
	Create Stage: A knowledge request may trigger the need for creating. Identify which are the core of information.
	Use stage: Individuals or groups, use and combine information in order to advance organizational innovation, solve problems and reach competitive advantages?
	Learn stage: There is a useful organizational memory of success (best practices) and failure (lessons learned).
	Contribute stage: Effective post of knowledge in the repository (implicit to explicit). Stimulating the process and contributions rewards are recommended.
2.2.2 Strategic process: refers to the goal alignment of Higher Education Internationalization with University future needs	
	Assess stage: There is continuous evaluation of the intellectual capital in terms of usability, adequation for Higher Education Internationalization (immediate and potential use)
	Build/sustain step: The purpose is to sustain the process of intellectual capital absorption and get a better competitive organization. There is a facilitative style of management to enable a knowledge ecosystem.
	Divest step: Refers to the cost / benefit of holding and divesting the information. Consider review the need of information (indicators, outcomes) and collecting data no more useful (middle and long range)

3rd dimension – Critical Success Factors (CSF) **3.1 Critical Factors of KM adopted for Higher Education Internationalization Process** **3.2 Higher Education Internationalization Process approach from KMC** HEISIG (1999) has collected KM frameworks worldwide from research and practice, to discover differences and to identify similarities within these KM frameworks. From these study Heisig extract critical success factors and they were directly connected to Internationalization Factors of Knowledge cycle are extracted from Nonaka and Takeuchi (1995) and Schreiber (2000)
3rd dimension – Critical Success Factors (CSF) - part 1: **3.1 Critical Factors of KM adopted for Higher Education Internationalization Process**
3.1.1 Human-oriented success factors to Higher Education Internationalization
Is the culture of internationalization stimulated? Such as: internationalization-oriented culture, internationalization sharing culture, culture and power, culture of learning, cultural and social factors
Are People stimulated? Such as: Human resources, employees' skills, employees' internationalization and experience, motivation and qualification, top management support.
Is the Leadership experience interchange stimulated? Such as: Leadership, knowledge leadership, leadership and support (18); top / senior management support
3.1.2 Organization factors of success
Are daily processes of internationalization defined? Such as: Common academic and administrative processes, organizational structures
Are daily support structures defined? Such as: organizational structures, organizational design, organizational infrastructure.
3.1.3 Technology factors for supporting actions of Internationalization
There is an adequate infrastructure of technology
There are useful and user-friendly applications
3.1.4 Management-process factors of Higher Education Internationalization.
There is an explicit internationalization strategy? Such as: strategic behavior; mission; long term vision; medium and short strategies; policy and planning
There is a specific way of measurement: measurement criteria, HEIP-performance measurement, performance indicators.
There are criteria for individuals, groups and organization?
3rd dimension – Critical Success Factors (CSF) - part 2: **3.2 Higher Education Internationalization Process approach from KMC**
3.2.1 Creation knowledge spiral (Nonaka and Takeuchi (1995)
There are efforts to Socialization of knowledge (from tacit to explicit knowledge=teaching)

	There are efforts to Externalization of knowledge (from tacit to explicit knowledge describing the rules)
	There are efforts to Combination of knowledge (generate new one knowledge)
	There are efforts to Internalization of knowledge (doing tasks in an easy and adequate way)
3.2.2 Knowledge Cycle - SCHREIBER, 2000, pp. 70-72	
	There is a designated group to Identify internally and externally existing HEIP knowledge.
	There is a plan to define what knowledge will be needed in the future. (why, what, where when/ frequency and who is responsible)
	There is a Plan to identify what knowledge will be needed in the future.
	There are adequate efforts to Acquire and/or develop the needed knowledge.
	There is a formal Distribution of knowledge to where it is needed.
	Foster the application of knowledge in the business processes of the organization.
	There is a Control the quality of knowledge and maintaining it.
	Dispose of knowledge when it is no longer needed.
4th dimension – Critical Success Factors **Comprehensive Governance Structure** A comprehensive governance framework according Frigo and Anderson (2009); Racz, Weippl and Seufert (2010); De Boer, Enders and Shcimak (2007), Findikli (2017); Moses (2006), will address:	
4 Comprehensive governance	
4.1 Comprehensive governance – Company and Board of Directors	
There is a comprehensive follow-up over the general company's performance?	
There is a follow-up over the Board of Directors strategic goals and objectives	
There is a comprehensive follow-up over the Board performance evaluation	
Enterprise-wide perspective is focused by the whole Board?	
There is an overall focus on strategic risks to shareholder/stakeholders' value	
Is there guidance by external stakeholders (government, representatives of industry and commerce on the University board)?	
4.2 Comprehensive governance - Relationship of the top management	
There is a clearly and effective relation and communication with all leaders	
Ethical conduct and transparency are clearly in the relations of the Top Management?	
There is a large sharing of information and knowledge	
There is a common development and investment in technology and tools?	
Comprehensive governance - Corporate GRC	
Is there effective corporate risk management?	
Compliance and responsibility boundaries as formally defined and published?	
4.3 Reporting trustworthiness	
There is a reliability of internal reporting of Risk	
There is a reliability of external reporting of Risk	
There is an enterprise-wide risk framework and language?	
4.4 Mechanisms	
State regulation, governments' prescriptions, and rules are followed?	

There is an academic self-governance. The traditional collegial decision-making within universities, peer review of academic communities of funding agencies, groups research regulations?
There is competition for material and symbolic resources—personnel, prestige, and funds—between and within universities?

Source: Author adaptation from literature.

4.2.3 Module II (quantitative) – Indicators Structure and Data Compilation

This is a checklist expressed through indicators, and it is not dependent on HEI purposes and goals. It clearly demonstrates what is the level of formal registering experiences – that means Knowledge, Organization Culture, Planning and execution competence. There are some initial concepts involved:

a) Indicators

Indicators can be expressed by using a number or in a proportion to a base defined number. Another answer can be: YES|NO. Using indicators one can define points to each answer and establish a grade to compare values from one to another year (or a lack of time).

b) Analysis

As used in finance analysis, most indicators suggested can have vertical and horizontal comparison. A vertical analysis looks at each line item as a percentage of a base within the current period: e.g.: quantity of foreign students by total number of students. Horizontal analysis looks changes over time, usually as percent from a period to another: e.g., percentage variation of foreign students from last to current year.

Abbreviations and symbols used in this frame:

- Absolute value (ABS): an absolute quantitative number (occurrences)

VII. % (Percent): a proportion to a base number resulting from:

  - VA: Vertical Analysis (percent relative to a base in the same period). E.g., quantity of foreign students versus total of students.
  - HA: Horizontal Analysis (percent relative to another indicator in another period). Students from current to previous year.

Symbols and Conventions

Responsible Internationalization Issues

- **B** Balance
- **A** Accountability
- **S** Sustainability
- **I** Inclusion
- **C** Compliance

A Comprehensive focus of Internationalization

1. Articulated Institutional Commitment
2. Administrative Leadership, Structure, and Staffing
3. Curriculum, Co-curriculum, and Learning Outcomes
4. Faculty Policy and Practices
5. Student Mobility
6. Collaboration and Partnerships

Frame 44 – List of Suggested indicators

SCALE – each item will be evaluated as: I. NOThere is No reliable values, no data recording. II. **YES,**The IES has numbers, but there is not systematic and formal control or statistics III. **QUANTITY**The IES has a control and registrations of the events **% COMPARISON** - IES can compare with older registered numbers IV. **Vertical** analysis- compare areas or departments or other base value V. **Horizontal** analysis – periods comparison. Can compare past to present and measure evolution (or not)	**Comprehensive Internationalization (CI)** Each item is classified according to CI Focus						**Responsible Internationalization** Each item is classified according to RI Focus				
Items to be checked at each period	❶	❷	❸	❹	❺	❻	B	A	S	I	C
1. Seminaries on internationalization have been executed during the period.				❹	❺				S	I	
2. Training on internationalization has been carried out during the period.		❷		❹	❺		B		S		C
3. Is internationalization in the Institution's Mission, Vision or Values?	❶								S		C
4. Funds designated and used in the internationalization program?					❺	❻	B		S		
5. Planned and executed internationalization events?				❹	❺				S		
6. The events contemplate the exchange of academic, professional, lifestyle and culture experiences.				❹	❺	❻	B		S	I	
7. Is participation in these events, is the registration of experiences part of the routine and requirements for participation in internationalization programs?				❹	❺	❻	B		S	I	
8. Have leaders or internationalization leaders been appointed in each area or department?	❶	❷				❻	B			I	
9. There are manuals, guides or folders that describe the main concepts of Internationalization and its strategic plans.	❶	❷				❻					C
10. Are there manuals, guides, and folders in other languages used to receive students of foreign origin?	❶	❷			❺	❻					C
11. Is there tutorials and videos in foreign languages, for the presentation of the routine of campus, academic processes and academic life?		❷			❺	❻				I	C
12. Are manuals, guides, and tutorials updated?		❷		❹							C

13. Is there an area, department or office responsible for internationalization?		2	3			6	B				C
14. Standards, rules, policies, and papers are documented and available for consultation.		2	3	4	5	6					C
15. Does the documentation make clear access to programs and funds, their requirements, benefits and obligations?		2			5				S		C
16. Is there an accessible institutional repository that records the experiences of student and teacher mobility?		2	3	4	5	6					C
17. Do repositories record best practices and lessons learned?	1	2	3	4	5	6			S		C
18. Students of the institution participate in the mobility program in foreign countries?					5	6			S		
19. Students from other countries have participated in the mobility program within the institution?					5	6			S	I	
20. Have the institution's professors participated in the mobility program in foreign countries?				4		6	B		S		
21. Teachers from other countries participated in the ISI mobility program.				4		6	B		S		
22. Technicians and administrators of the institution participated in the mobility program in foreign countries?		2		4		6	B		S	I	
23. Is there an institutional program for the reception of foreign students?					5	6				I	
24. There is a tutoring for students and foreign teachers				4	5	6				I	C
25. There is a formal program for the setting of foreign students and teachers.	1	2	3	4	5	6			S	I	
26. Are there foreign teachers invited to participate in campus activities? (events, teaching or research)				4		6				I	
27. Publications made with the participation of at least one researcher from another country?				4		6		A		I	
28. IES Research Groups that have a link but a researcher from another country.				4					S		
29. Foreign students received in exchange participate in research groups?				4	5				S	I	
30. Are there incentives for researching intercultural and international themes in the various modalities of academic works?				4	5		B		S	I	
31. Are there financial resources made available for research?				4					S	I	

32. Researchers at the institution participate in research groups from other countries?				❹		❻	B		S		
33. Do IES students participate in Research Groups in the countries of destination? During or even after visiting foreign countries.					❺	❻			S	I	
34. Publications in other languages.						❻		A	S		
35. Free training in other languages.		❷	❸	❹	❺					I	
36. Classes and curricular units in other languages.		❷	❸	❹	❺					I	
37. Equivalence with other credit universities in academic disciplines and activities.			❸				B		S		
38. Training for foreigners in native language.						❻				I	
39. Official program to encourage students and teachers to participate in international events.				❹	❺				S		
40. Official program for recognition of the best experiences of students and teachers in the international area.				❹	❺				S		
41. Are there awards and incentives as recognition in excellence performances in the international area?				❹				A	S		
42. Official program to stimulate students and teachers for the use and dissemination of techniques and tools auxiliary to the internationalization process.			❸	❹	❺	❻		A	S		C
43. Is there the formal recognition of meritorious external collaborators?				❹		❻			S		C
44. Is there the formal recognition of meritorious internal collaborators?		❷		❹					S		C
45. Is there adherence to government internationalization policies?	❶					❻					C
46. Is there the preparation and submission of projects to obtain funds for the internationalization program?	❶	❷	❸	❹	❺	❻			S		
47. Is there guidance for the preparation of proposals for funding agencies?	❶					❻			S		C
48. There are resources from promotional agencies designated and used exclusively in Internationalization.	❶					❻			S		C
49. Are there scholarships for foreign students?					❺	❻			S	I	

50. Is there an adequate offer of their own and/or affiliated accommodation for foreigners?					5	6			S	I	
51. Are there scholarships for IES students to other countries?					5	6			S	I	
52. Is there the planning and periodic review of goals and challenges for internationalization?	1							A			
53. Is there a periodic evaluation of the results?	1	2						A	S		
54. Are there objective and subjective factors/indicators established, as well as their periodicity of evaluation?	1	2						A			
55. Is there a self-assessment of students and teachers (received and sent)?	1			4	5				S	I	
56. Is there a balance of opportunities, funds and activities between the various areas of the university?	1					6		A			
57. Are there periodic reports of accountability in the international area that are accessible to the whole community?	1							A			
58. Do reports have easy visualization, use graphics and online web features?	1							A	S		
59. Are internationalization programs sustainable?	1	2				6			S		
60. Do internationalization programs seek equality of opportunities between people and environments, backgrounds and destinations?	1					6	B		S		
61. Is there a definition of priorities adherent to the public policies and mission, vision and values of the HEI?	1					6			S		C
62. Is there a clear and formal description of assignments, roles and responsibilities involving internationalization?		2									C
63. Is there adequate dissemination of internationalization priorities, goals and plans?	1	2				6	B	A			C
64. Is there a sustainability of processes, people, resources and expected return?	1	2		4		6			S		
65. Is there a periodic program for employees and attendants providing qualification in other languages of interest?		2				6			S	I	
66. Is there an experimental study aimed at establishing critical requirements and factors of success in international experiences?	1	2		4					S		

Source: Created by the Author (2019)

Frame 45 – List of suggested indicators

Item	Incluir colunas do qualitativo Measure	Comments
1. Seminaries on internationalization have been executed during the period.	YES | NO & Abs.; %	If yes, how many? Compared with other areas. Compare with earlier registered quantities.
2. Training on internationalization has been carried out during the period.	YES | NO & Abs.; %	
3. Is internationalization in the Institution's Mission, Vision or Values?	YES | NO	
4. Funds designated and used in the internationalization program?	YES | NO & Abs.; %	
5. Planned and executed internationalization events?	Abs.; %	
6. The events contemplate the exchange of academic, professional, lifestyle and culture experiences.	YES | In	
7. Is participation in these events, is the registration of experiences part of the routine and requirements for participation in internationalization programs?	YES | In	
8. Have leaders or internationalization leaders been appointed in each area or department?	YES | NO & Abs.; %	How many areas of total are represented?
9. There are manuals, guides or folders that describe the main concepts of Internationalization and its strategic plans.	YES | NO & Abs.; %	
10. Are there manuals, guides, and folders in other languages used to receive students of foreign origin?	YES | NO & Abs.; %	
11. Are there tutorials and videos in language strategies, for the presentation of the routine of campus, academic processes and academic life?	YES | In	
12. Are manuals, guides, and tutorials updated?	YES | In	

13. Is there an area, department or office responsible for internationalization?	YES | In	
14. Standards, rules, policies, and papers are documented and available for consultation.	YES | NO & Abs.; %	
15. Does the documentation make clear access to programs and funds, their requirements, benefits and obligations?	YES | In	
16. Is there an accessible institutional repository that records the experiences of student and teacher mobility?	YES | In	
17. Do repositories record best practices and lessons learned?	YES | NO & Abs.; %	
18. Students of the institution participate in the mobility program in foreign countries?	YES | NO & Abs.; %	
19. Students from other countries have participated in the mobility program within the institution?	YES | NO & Abs.; %	
20. Have the institution's professors participated in the mobility program in foreign countries?	YES | NO & Abs.; %	
21. Teachers from other countries participated in the ISI mobility program.	YES | NO & Abs.; %	
22. Technicians and administrators of the institution participated in the mobility program in foreign countries?	YES | NO & Abs.; %	
23. Is there an institutional program for the reception of foreign students?	YES | In	
24. There is a tutoring for students and foreign teachers		
25. There is a formal program for the setting of foreign students and teachers.	YES | In	
26. Are there foreign teachers invited to participate in campus activities? (events, teaching or research)	YES | NO & Abs.; %	
27. Publications made with the participation of at least one researcher from another country?	YES | NO & Abs.; %	
28. IES Research Groups that have a link but a researcher from another country.	YES | NO & Abs.; %	

29. Foreign students received in exchange participate in research groups?	YES | NO & Abs.; %	
30. Are there incentives for researching intercultural and international themes in the various modalities of academic works?	YES | In	
31. Are there financial resources made available for research?	YES | NO & Abs.; %	
32. Researchers at the institution participate in research groups from other countries?	YES | NO & Abs.; %	
33. Do IES students participate in Research Groups in the countries of destination? During or even after visiting foreign countries.	YES | NO & Abs.; %	
34. Publications in other languages.	YES | NO & Abs.; %	
35. Free training in other languages.	YES | NO & Abs.; %	
36. Classes and curricular units in other languages.	YES | NO & Abs.; %	
37. Equivalence with other credit universities in academic disciplines and activities.	YES | NO & Abs.; %	
38. Training for foreigners in native language.	YES | NO & Abs.; %	How many foreign participate every year?
39. Official program to encourage students and teachers to participate in international events.	YES | In	
40. Official program for recognition of the best experiences of students and teachers in the international area.	YES | In	
41. Are there awards and incentives as recognition in excellence performances in the international area?	YES | NO & Abs.; %	How many are laureated or deserving a special award recognition?
42. Official program to stimulate students and teachers for the use and dissemination of techniques and tools auxiliary to the internationalization process.	YES | In	
43. Is there the formal recognition of meritorious external collaborators?	YES | NO & Abs.; %	Donatives from people and enterprises. Authorities and political collaborators.

44. Is there the formal recognition of meritorious internal collaborators?	YES | NO & Abs.; %	Such as translators, reviewers, supervisors, instructors and so.
45. Is there adherence to government internationalization policies?	YES | In	
46. Is there the preparation and submission of projects to obtain funds for the internationalization program?	YES | NO & Abs.; %	
47. Is there guidance for the preparation of proposals for funding agencies?	YES | In	How many were oriented?
48. There are resources from promotional agencies designated and used exclusively in Internationalization.	YES | NO & Abs.; %	How much?
49. Are there scholarships for foreign students?	YES | NO & Abs.; %	
50. Is there an adequate offer of their own and/or affiliated accommodation so foreigners?	YES | NO & Abs.; %	How many offered and utilized?
51. Are there scholarships for IES students to other countries?	YES | NO & Abs.; %	How much for each country?
52. Is there the planning and periodic review of goals and challenges for internationalization?	YES | NO &Abs.	
53. Is there a periodic evaluation of the results?	YES | NO & Abs.	
54. Are there objective and subjective factors/indicators established, as well as their periodicity of evaluation?	YES | NO & Abs.	
55. Is there a self-assessment of students and teachers (received and sent)?	YES | NO & Abs.; %	
56. Is there a balance of opportunities, funds and activities between the various areas of the university?	YES | NO & Abs.; %	How much for each area?
57. Are there periodic reports of accountability in the international area that are accessible to the whole community?	YES | NO & Abs.; %	How many and period.
58. Do reports have easy visualization, use graphics and online web features?	YES | In	
59. Are internationalization programs sustainable?	YES | In	
60. Do internationalization programs seek equality of opportunities	YES | In	

between people and environments, backgrounds and destinations?		
61. Is there a definition of priorities adherent to the public policies and mission, vision and values of the HEI?	YES | In	
62. Is there a clear and formal description of assignments, roles and responsibilities involving internationalization?	YES | NO & Abs.; %	How many roles are described?
63. Is there adequate dissemination of internationalization priorities, goals and plans?	YES | In	
64. Is there a sustainability of processes, people, resources and expected return?	YES | In	
65. Is there a periodic program for employees and attendants providing qualification in other languages of interest?	YES | NO & Abs.; %	How many people are frequent?
66. Is there an experimental study aimed at establishing critical requirements and factors of success in international experiences?	YES | In	

Source: Created by the Author (2019)

All questions must be answered, and each answer will have a weight of value. Answers referring to “YES or NO, Absolute value or % of comparison”, demonstrate the level of capture, register and use of data/information – that means an evolutionary level. Considering all these points, a score scale is suggested to each kind of answer.

Suggested example of a grade to evaluate the Internationalization process based on indicators.

All these indicators can be used and the IES can state a value for each response. This way you can consider initial predictors (Frame 45) and score suggestion as shown in Frame 46;

Frame 46 – Suggest criteria for answer points

ANSWER	**Criteria**	**Score points**		**Example of grade level**	
NO	No value	0		**LIMITS OF POINTs**	**Level**
YES	The IES has, but has no formal control and statistics	1		From 1 to 82	Beginners
QUANTITY	The IES has a control and registrations of the events	2		From 83 to 165	In the right way
% COMPARISION Vertical analysis	IES has older numbers and can compare areas or departments or other base value	3		From 166 to 279	A good job
% COMPARISION Horizontal analysis	IES has older numbers and can compare from one to another period. Can compare past to present and measure evolution (or not)	5		More than 280	Nice results
				This interval was obtained generating random grades (0,1,2,3,5). Summarized and quartile distribution was calculated.	

Source: Author creation (2019).

1.2. GOING FURTHER TO A WEB-BASED COMPUTER PROGRAM

The analysis and validation of the framework was done. Chapter 5 (with findings) details the expert's considerations. The application of the framework itself suffers some proposed enhancements and the previously presented checklists (1 and 2) have incorporated all suggestions.

Thanks to several colleagues for testing and applying the checklists. Due to the existence of more than a few checklists and several questions, this phase was exhaustive. The main attention was to Internationalization, in spite of all checklists being checked twice for colleagues and some specialists.

Framework 1 is HEI objectives, outcomes and goals dependence. A web computer program was developed with a 3 stages approach: (1) to select and concentrate on focus; next (2) stage is evaluating topics and last (2) is the results stage.

Checklist 2, derived from Framework 2, and was built-in using a Google on-line spreadsheet. All items are objective, this way you have it or not and answers are summarized by the spreadsheet, and the result is calculated and informed.

All software was tested, and a concept proof was constructed.

4.3 DESIGNING A DIAGNOSTIC SOFTWARE – PRINCIPLES AND CONCEPTS TO A COMPREHENSIVE INTERNATIONALIZATION DIAGNOSTIC

Resources are limited and goals are linked to people, techniques, budget and policies. Priority can change over time, depending on leadership and policies. It is important to develop a Strategic plan, that means not just planning but implementing it to achieve goals.

During a plan execution there are several simple questions like: Are we closer to the main objectives? What are the impacts of new social, tech and political actions? Are changes being accepted? Are we prepared for new challenges? Who and what has been doing?

Winning a soccer match is a good thing, of course, and probably it is part of bigger objectives like being a championship leader. Being a leader depends

on a lot of things, like team health, money, motivation, training, partners, leadership, talent and so on. Some challenges are objective and others qualitative as talent, motivation etc.

Internationalization goals and plans must have data and information. But is information regarding internationalization activities available? Where can I find it? These are part of decisions and should be data supported.

> An institution needs to be able to collect and process relevant information and therefore a functional management information system is essential. These systems provide information needed to manage their internationalisation activities efficiently and effectively" (ECA, 2017, p.33).

4.4 CHECKLIST SOFTWARE CONCEPTS AND DEVELOPMENT

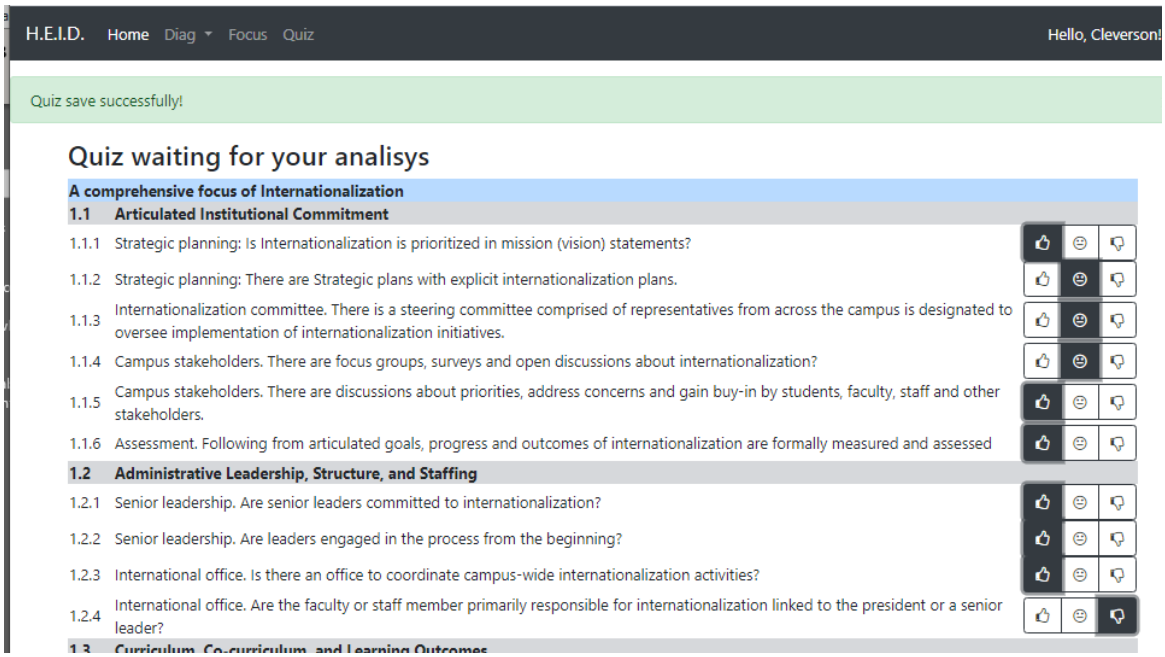
4.4.1 Design of Checklist – Module 1

User friendly systems are important and critical data must be stored and retrieved for decision makers. Responsiveness is also a desired attribute to an Information-driven management. Activities and data must be recorded in management information systems enabled to be consulted, reported and used. Having a way to register is a mature stage of Internationalization. Having relevant information is another, and capacity of retrieving desired information is another important issue. But the overall aspect is the way information is applied for better results (and decisions) and that means having DIAGNOSTIC & ACTION.

4.4.2 Scale for Module I

During focus selection of COMPREHENSIVE INTERNATIONALIZATION (CI) people (like Directors, Principals or each one chooses by the Board of Directors, Owner, etc.) will choose and evaluate the main focuses of the internationalization process, assigning 3 weights (4=Fundamental; 1=Complementary, 0-No interest at the moment). A questionnaire of a checklist should be presented to the chosen evaluator to determine focus priorities like Figure 48.

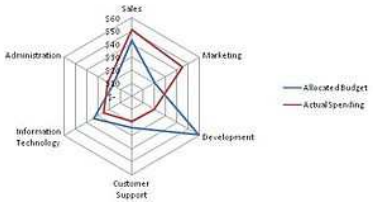
Figure 48 – A suggested implementation of focus weight consult



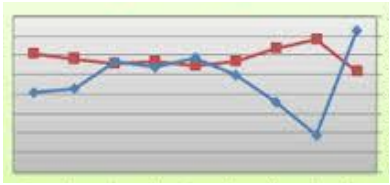
Source: From software implementation.

By using these weights, the questionnaire is customized containing only the selected questions that "should be evaluated". Again, Pareto's rule is applied in this focus choice phase.

A. Only these questions will be selected and contain a LIKERT scale of 1 through 5 for a complete evaluation of the same and other people. It is supposed that a new range of people will give the grade using 1-5 Likert.



B. After 1-5 grade choice of respondents, these results can be totalized and presented in several ways; a RADAR Graph is indicated for each item in a specific time. To follow up evolution during a period of time the LINE graph is a good visual resource.



As the Internationalization process is for all, involving the whole institution must be prioritized, and responses should be done with all stakeholders. As Internationalization is a process there is an additional checklist involving the implantation, installation and leadership.

There are also other processes in a specific way, and they depend on particular areas. These are specialized processes and should be evaluated by specialists in their respective areas and also the high management to which they are subordinated. So, specific questionnaires must be applied if they are acting in these areas. It means that if the IES has a governance, risk & compliance (GRC) and knowledge management (KM) area, they should answer precise questionnaires, together with the top management. They are:

- **GRC**: Top manager and specific area about GRC structure with internationalization focus.
- **KNOWLEDGE**: Top manager and specific area turned to internationalization focus.

Another theme is AUDITING, which can be internal or external. After studying and describing the audit structure and activities, it became obvious that the auditor's tasks are close to subjects they are auditing. External auditors are regulated outside, and internal auditors have a lot of rules and statements to follow.

Audit guides are built using the client areas checklist, and some aspects like control and responsibility are well known and do not need further explanations. Considering this, no audit checklist was constructed, linked to the Internationalization process as it is supported by the users-client checklist. Further information and guides can be found in the references cited in the literature review.

4.4.3 Design of Checklist – Module 2

Based on the same dimensions, checklist 2 is a simple questionnaire with 66 questions. It can be implemented in a spreadsheet program like Excel from Microsoft or Calc from Apache OpenOffice or LibreOffice or Google.

Questions must be evaluated, and each answer will be converted into a score point as shown in Frame 47. After all responses, the total amount of points is calculated. The total points can be found in a suggested result scale (Frame 48). Even being tested, it is not a mandatory solution, it is just a proposal. An intensive and frequent use of this checklist will allow enhancements and corrections in the future.

Frame 47 – A list of suggested indicators and score

Item	Measure and score points				
	0	1	2	3	5
	No	Yes			
… item description	No information	The IES bas, but has no formal control and statistics	The IES has a control and registrations of the events	IES has older numbers and can compare areas or departments or other base value	IES has older numbers and can compare from one to another period. Can compare past to present and measure evolution (or not)
1. Training on internationalization has been carried out during the period.	1				
2. Is internationalization in the Institution's Mission, Vision or Values?		1			
… SUMMARIZE	C1	C2	C3	C4	C5

Source: Created by the Author (2019).

4.4.3.1 Scale for Module II

At the end, a sum of C1 to C5 has to be done and a target is determined by a scale (suggested) as follows.

Frame 48 – Result Grade level

Suggested grade level scale	
TOP LIMITS OF TOTAL POINTS	**Designated Level**
From 1 to 82	Beginners. A challenge was started.
From 83 to 165	You are in the right way. Doing the right things
From 166 to 279	A good job. Right things in the right way.
More than 280	Nice results and Success.

Source: Created by the Author (2019).

This interval was obtained generating random grades (0,1,2,3,5) for each answer. After that it was distributed in a modal order and summarized. A quartile distribution was calculated, resulting in the boundaries of each range. The scale can be modified by adopting a linear scale variation considering minimum and maximum score.

Figure 49 – Framework Module2 – structure, controls and procedures evaluation

	Item description or statement	ERROR	No information, no control.	The IES bas, but bas no formal control and statistics	The IES has a fully control and registrations of the events	IES has older numbers and can compare areas or departments or other base value	IES has older numbers and can compare from one to another period.
1	Seminaries on internationalization have been executed during the period.	ok	☐	☐	☑	☐	☐
2	Training on internationalization have been carried out during the period.	ok	☑	☐	☐	☐	☐
3	Is internationalization in the Institution's Mission, Vision or Values?	ok	☑	☐	☐	☐	☐
4	Funds designated and used in the internationalization programme?	ok	☑	☐	☐	☐	☐
5	Planned and executed internationalization events?	ok	☑	☐	☐	☐	☐
6	The events contemplate the exchange of academic, professional, lifestyle and culture experiences.	ok	☑	☐	☐	☐	☐
7	Is participation in these events, is the registration of experiences part of the routine and requirements for participation in internationalization programs?	ok	☐	☑	☐	☐	☐
8	Have leaders or internationalization leaders been appointed in each area or department?	ok	☐	☑	☐	☐	☐
9	There are manuals, guides or folders that describe the main concepts of Internationalization and its strategic plans.	ok	☐	☑	☐	☐	☐
10	Are there manuals, guides, and folders in other languages used to receive students of foreign origin?	ok	☐	☐	☑	☐	☐
11	Is there tutorials and videos in languages strategies, for the presentation of the routine of campus, academic processes and academic life?	ok	☐	☐	☑	☐	☐
12	Are manuals, guides, and tutorials updated?	ok	☐	☐	☑	☐	☐
13	Is there an area, department or office responsible for internationalization?	ok	☐	☐	☑	☐	☐
14	Standards, rules, policies, and papers are documented and available for consultation.	ok	☐	☐	☑	☐	☐
15	Does the documentation make clear access to programs and funds, their requirements, benefits and obligations?	ok	☐	☐	☐	☑	☐
16	Is there an accessible institutional repository that records the experiences of student and	ok	☐	☐	☐	☑	☐

Source: Created by the Author (2019).

It is important that the adopted scale persists from one year to another, to compare results (better or worst). You cannot change scale or rules when carrying on a diagnostic.

4.4.4 Summary of adopted Likert scales

Both cases use a Likert scale of five points and Frame 49 is a summary of them.

Frame 49 – Summary of adopted scale in both checklists

Module 1		Module 2	
Criteria Description	**Score**	**Criteria Description**	**Score**
Most Important Primordial or main focus (80% of effects), and	0	No information	0
		The IES bas, but bas no formal control and statistics	1
Complementary Secondary or complementary focus (20%)	4	The IES has a control and registrations of the event	2
		IES has older numbers and can compare areas or departments or other base value	3
Not Important at all (zero effect)	1	IES has older numbers and can compare from one to another period. Can compare past to present and measure evolution (or not)	5
SCALE: Three level scale, using Pareto 80/20 and MCDA criteria **RESULT**: Radar Graphis		**SCALE**: Five points scale (Likert) and using Fibonacci to empathize best results **RESULT**: Five intervals (quartiles)	

Source: Created by the Author (2019).

4.5 HIGHER EDUCATION INTERNATIONALIZATION DIAGNOSTIC SOFTWARE

4.5.1 How it works

Software design has some specific issues addressing the Internationalization of Higher Education. This issue refers to selecting the focus of Comprehensive Internationalization which is determined by a group of stakeholders.

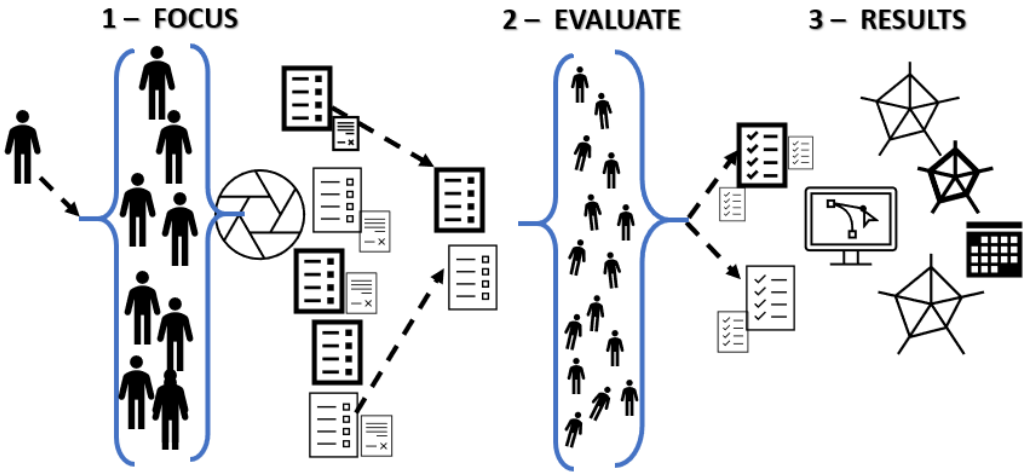
First of all, a Higher Education Institution must be registered, and a system administrator is linked to HEI. An Administrator can grant permissions to people to select focus questions and answer questionnaires. Usually top managers

(principals, directors, board of directors) are nominated to choose the focuses of Internationalization. This action has to be done including the stakeholders' data (e-mail, name, role etc.) and permissions to focus selecting, answering questions or both.

Once the HEI is inserted a Diagnostic process can be started. A Diagnostic has 3 system procedures: (i) define focus, (ii) answers and (iii) results. Now the qualitative questionnaire supported by a checklist framework dimension will be described. Another quantitative checklist will be discussed next – it will not be perception dependent.

The beginning of the process is defining Diagnostic's start and due date. After that, the focus selecting people must be defined and registered and notified of this stage due date – that means (i) define focus procedure.

Figure 50 – Software main functionalities designed



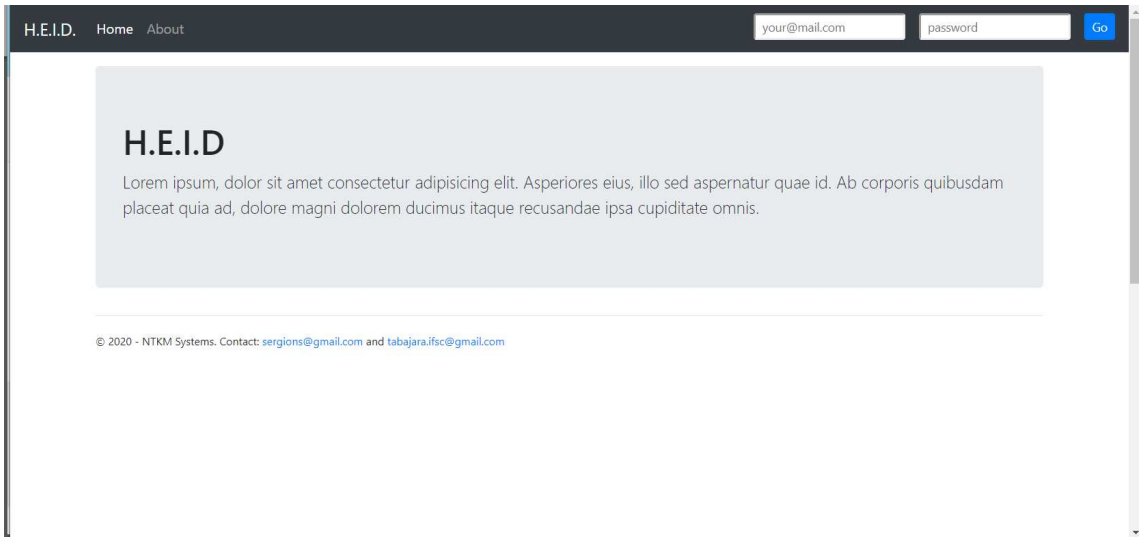
Source: Created by the Author

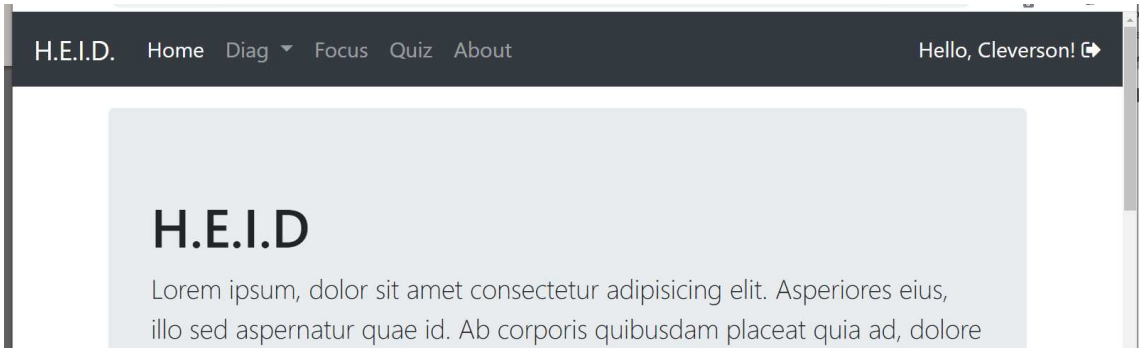
During **Focus definition**, a group of questions are presented to answerers and a focus is classified as primordial or main focus (80% of effects), secondary or complementary focus (20%) and not important (zero effect) or it is not a focus now (please remember that some today zero-effect focus can be an effective focus in the future).

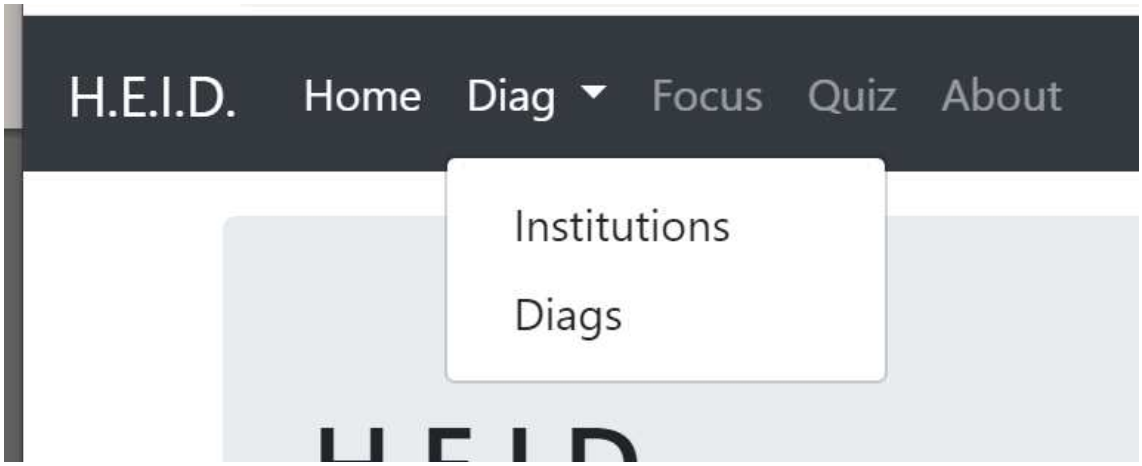
As diagnostics can be done from year to year, focus can change in each Diagnostic event. All scores are registered and computed defining the questions to be answered in the current diagnostic event.

During the 2nd procedure of a diagnostic, which is **answering questions**, a Likert scale from 1-5 will be applied. A new team or even the first team will evaluate statements and choose an answer. Of course, considering “at home” internationalization it is possible to suggest that all areas of the University be represented by answers. All universities must be involved, and proactive leadership will be “a plus” to be nominated to answer questionnaires.

IMPLEMENTATION



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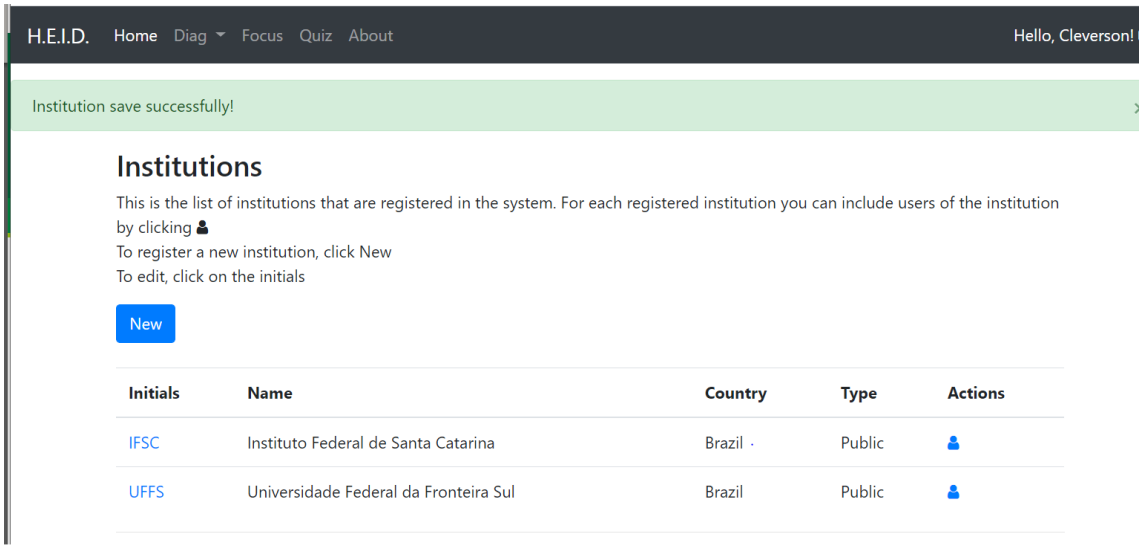
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About
Hello, Cleverson!
Institution save successfully!
Institutions
This is the list of institutions that are registered in the system. For each registered institution you can include users of the institution by clicking
To register a new institution, click New
To edit, click on the initials
New
Initials
Name
Country
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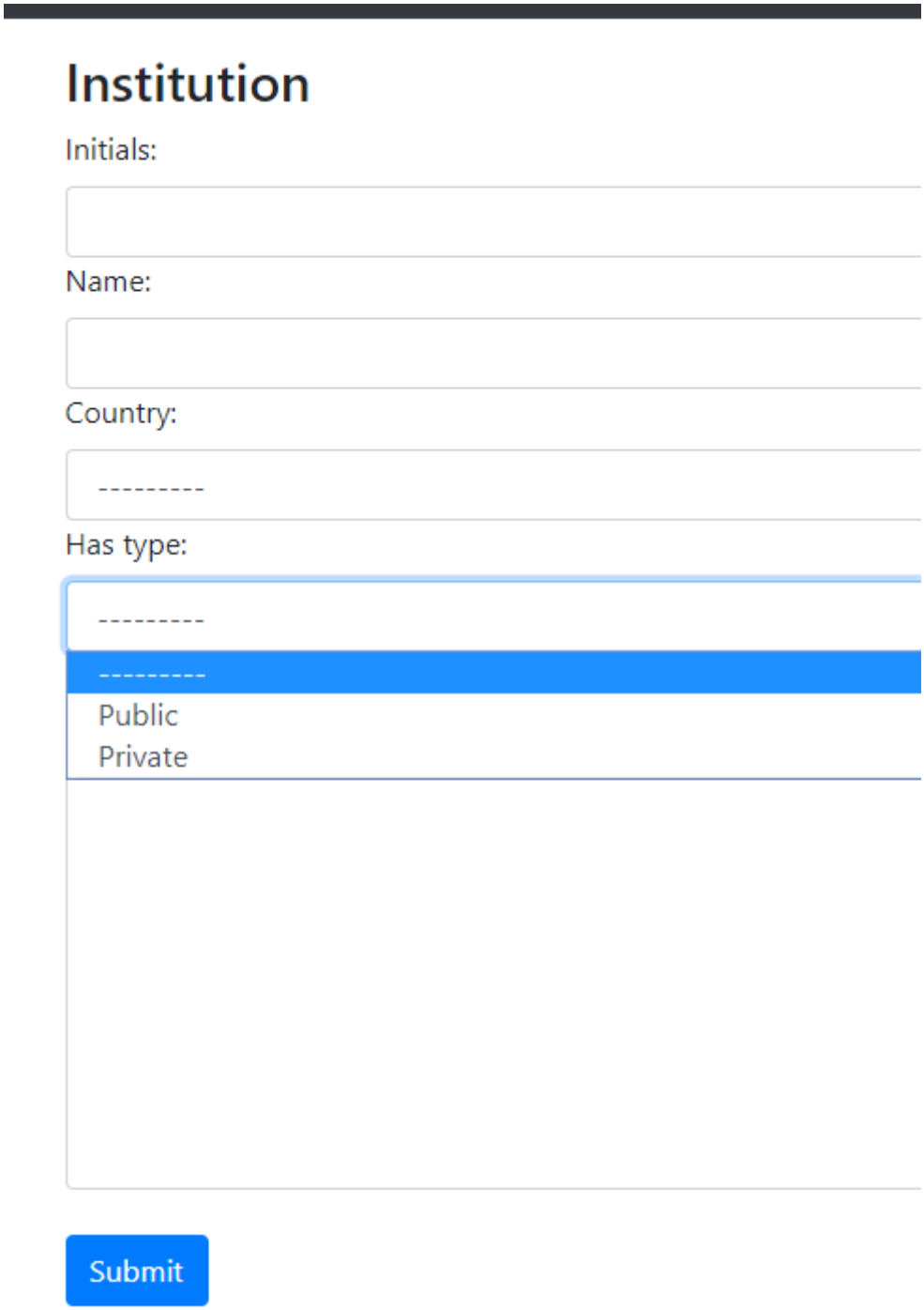
IFSC
Instituto Federal de Santa Catarina
Brazil
Public
UFFS
Universidade Federal da Fronteira Sul
Brazil
Public


Institution
Initials:
Name:
Country:

Has type:

Public
Private
Submit

Users of Universidade Federal da Fronteira Sul

Primeiro nome:

CLEVERSON

Último nome:

TABAJARA

Usuário:

tabajara

Senha:

Endereço de email:

ifsc.tabajara@gmail.com

Role:

Professor

Enable:

Add

Name	E-mail	Actions
CLEVERSON TABAJARA	ifsc.tabajara@gmail.com	

ag Focus Quiz About

Diagnostics

Diagnostics registered for a given institution, and there may be more than one for the same institution.
After registration, define the users who will define the focus and those who will answer the questionnaire whose focus has been set by clicking in ◉.
When users complete the survey that defines the focus, click ★ to analyze and consolidate the focus for the survey.

New

Institution		Type	Current step	Start	End	Actions
IFSC	Instituto Federal de Santa Catarina	A comprehensive focus of Internationalization	In quiz process	02/02/2020	08/02/2020	
IFSC	Instituto Federal de Santa Catarina	Impactos da Internacionalização (KNIGHT, 2007, p.210)	Defining Focus	02/02/2020	08/02/2020	

Diagnostic

Institution:

UFFS - Universidade Federal da Fronteira Sul

Quiz type:

4 - KNOWLEDGE MANAGEMENT

Start:

02/02/2020

End:

15/02/2020

Start focus:

03/02/2020

End focus:

03/02/2020

Start quiz:

04/02/2020

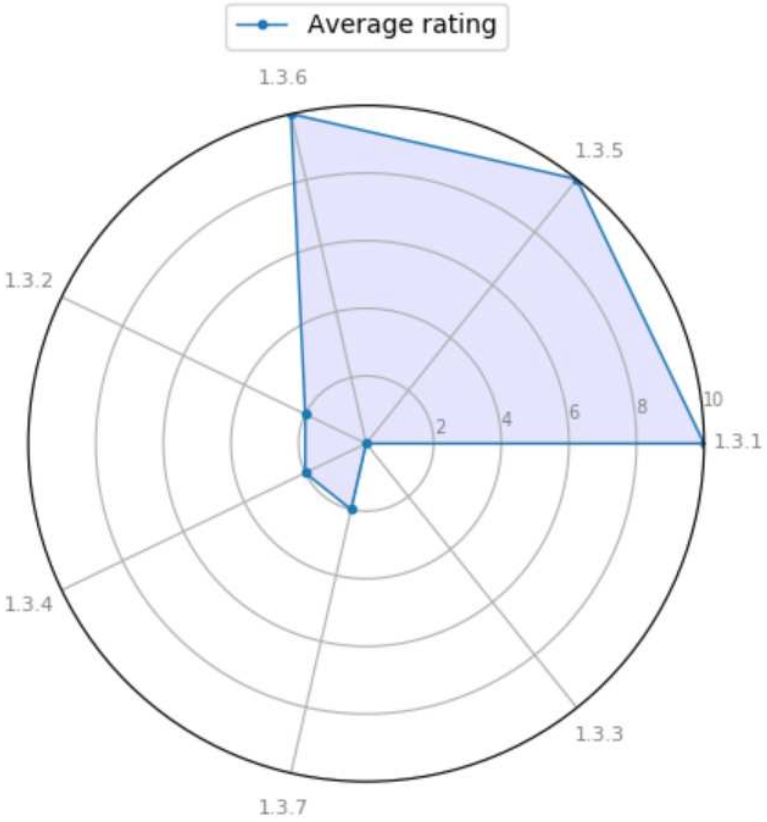
End quiz:

15/02/2020

Submit

1.2.4 International office. Are the faculty or staff member primarily responsibl

1.3 - Curriculum, Co-curriculum, and Learning Outcomes



As a result, there is a suggested Framework, and a roadmap is embedded as it also declares the environments that must be established by IES.

4.6 FULLY PROCESS

Diagnostic is a part of the evolution process. As a process there are some stages that must be done.

I. What Internationalization means to the institution

Get responses with MODULE I FRAMEWORK. To do this, select a significant group of professors and staff (students can be included of course, but they are not permanent).

Definition:

i. Focus Group (FG)

- A selected definition focus group (usually to 3rd level hierarchy)

- They will define each evaluation should be done

ii. Priority Definition Group (PDG)

- An extended group will define matters considering the previous choice of Focus Group.

b. Elect which are the focus with FG questionnaire

c. Define priority with PDG and chosen questionnaire

II. How far we are: controls, structure and procedures

a. Get responses with MODULE II Framework

Beyond diagnostic

After diagnosis the HEI must go further and appropriate all information in a strategic decision process. During this step a consulting service, external experts is recommended.

- How to transform diagnostic in actions
  - Weaknesses must be defined and lessened.
  - Identify each weak point and cause. The use of Ishikawa fish bone is recommended.
  - Define projects, activities and actions using 5W2H (start with what, why and how, and define Who, When, How much). Why is previously defined and means getting better results in the weak points.
  - TOOLS: Ishikawa, 5W2H, etc.
- Consolidate a Strategic View of Internationalization using SWOT and 5 xx porter.
- Consolidate an action plan. Follow-up, monitoring, evaluating and review the plan.

Frame 50 – Summary of the project

Step	Main	Goals / Purpose	Tools and procedures
	Who are we? **Our identity.** **Which are our outcomes?** **Our purpose?** **Mission, Vision and Value.**	Where are we? Where do we intend to be? Strategic Planning and Management.	Study internal and external factors. Demands, Buyers, Suppliers, Products and Services. Apply and use: ● SWOT ● Porter's Five Forces
	What is the meaning of our Internationalization? **Which are our priorities?**	As internationalization is a choice and not prescriptive, so which are the internationalizations we need, and we want? Which structure should we build? Innovation and Organizational Knowledge needs. Controls, procedures, and structure.	Select a significant and engaged group to choose our focuses in internationalization. Define the core evaluation theme. Apply and use: ● HEID focus (web-based software)
	How far are we concerning our internationalization focus?	Perceptions of how far we are in each focus. Adequacy of Controls, procedures, and structure we have. Each focus must be detailed and evaluated.	Establish an extended group to evaluate how they felt about our detailed focus and goals. Apply and Use: ● HEID – assessment ● sheet Sheet
	Analyzing results Determining: Causal motivation of problems Actions to be done (minimize risk and keep a good job)	After evaluation, each area must be studied. Radar graphics will indicate visually stronger and weak aspects. We need to analyze causes, motivations. We need to establish actions to get better results – that means evolution. Compare results from one year to another and among areas.	Define a group to analyse results and establish causes of weakness, and actions to mitigate risks and keep good results. Apply & use: ● FISH ● 5w2h
	TRANSFORM PLANS IN ACTIONS AND EVALUATE EACH FOCUS PERMANENTLY.		

Source: Author creation (2020)

5 FRAMEWORK VALIDATION

Purpose and goals: As seem in the previous sections, verification and validations have some singular issues and some techniques were addressed (p. item 3.1.10). This 5th section brings up the verification and validations executed by experts using questionaries and interviews. A Concept Proof was conducted to the constructed web-based software.

During the Framework Validation Guide – item 3.1.10 , it was explored the specific meaning of “validation” and “verification” depending on the object to be checked. Validation is commonly assigned to models since models must be a representation of reality. Thus, validation refers to an external process to verify a model's adherence to reality, theories, and predictions. As frameworks are model and theory based, only verification is needed: that means an internal check of coherence and adherence to models (since models are already externally validated).

After preliminary adjustments (professors, colleagues) and based on the revised preliminary assessment requisites, content framework issues were designed and sent to experts.

The expert evaluation and comments were used to demonstrate the accuracy of the development, quantification, and implementation of the HEI Diagnostic framework.

The Expert method validation is plenty justified when evaluating frameworks. Certainly, it is not quite simple and an immediate task. It requires attentive analysis of criteria and factors, mainly considering a large number of issues.

Factors criteria and sub-criteria were designed (qualitative and quantitative), and decision-makers act according to their own (subjective) perspectives. Multi-criteria decision analysis allows an integrated and comprehensive decision and analysis.

During the validation section studies, some evidence was found about success in the use of scoring methods, generally using them structured as a hierarchy method.

All the way results of experts' judgments are discussed and validated again and also the first part of the questionnaire which defines the experts' profile.

5.1 EXPERTS' ACTIONS

Despite the fact that validation is external, and verification is internal, considering the purpose of this thesis it can be considered similar, because the use of experts can evaluate not only adherence to models but if the framework is applied to their institution's reality, as well.

It was asked to experts to analyze the relations from one dimension to another (that means structural and functional approaches). In each part, clearness, adequacy, reliability, and completeness were observed and cited by the experts. Of course, it is not an easy task to determine the correctness of a framework, mainly concerning its needs and requirements. After all, the Internationalization theory brings up the evidence that it depends on each Higher Education Institution and it is not prescriptive.

As suggested, the framework was built using very specific questions and we could test the intermediate results produced. Some statistics tools were applied, and three pilots' versions were done. Small groups with colleagues, professors, and internationalization experienced people, could analyze and suggest enhancements. Metrics were changed too, especially when the software application was developed. Questionnaires, surveys, interviews, and other interactive tools were applied using social media (THABANE, 2010; LANCASTER; DODD; WILLIAMSON, 2004).

As frameworks are model based, they were validated by Experts. Aiming to evaluate and obtain some contributions to the framework, it was intended to reach out to HEIs with 3 years of experience in Internationalization, at least.

From 6 indicated specialists, 5 answers were completed, and 4 respondents have full answers and this given condition (3 years of experience at least). All the people were invited by e-mail and the invitation was reinforced with a second email sent by an Internationalization notorious expert.

The evaluation was accomplished using web forms, from March 8th to May, 22th (2020). It examined the full checklist (Module I Framework). It is important to

note that it refers to the Internationalization focuses, which is a particular issue to each HEI.

The first module of framework is a perception and subjective questionnaire, and the second module of framework is objective with specific parameters required. Both of them must be verified against theory and compared with the Higher Education Institution reality.

The respondents were from public IHE and two of them were connected to the Federal Government and one to the State Government. One of these HEIs is considered a University Center, with secondary, post-secondary (college and master graduated). The respondent's information and affiliations are not revealed.

One final software testing was conducted with a conceptual proof (eleven respondents, with 2 for focus choices).

5.2 SURVEY (COMPLEMENTARY QUESTIONNAIRE)

These are main answers:

FOCUS OF HEI: Experts evaluation – aspects to consider:

During section 3.10, it was explored the specific meaning of "validation" and "verification" depending on the object to be checked. Validation is commonly assigned to models since models must be a representation of reality. Thus, validation refers to an external process to verify the model's adherence to reality, theories, and predictions. As frameworks are model and theory based, only verification is needed: that means an internal check of coherence and adherence to models (since models are already externally validated).

In spite of validation being external and verification being internal, considering the purpose of this thesis it can be considered similar, because the use of experts can evaluate not only adherence to models but if the framework is applied to their institution's reality.

It was asked to experts to analyze the relations from one dimension to another (that means structural and functional approaches). In each part, clearness, adequacy, reliability, and completeness were observed and cited by the experts. Of course, it is not an easy task to determine the correctness of a framework, mainly concerning its needs and requirements. After all, the Internationalization

theory brings up the evidence that it depends on each Higher Education Institution and it is not prescriptive.

As suggested the framework was built using very specific questions and we could test the intermediate results produced. Some statistics tools were applied, and three pilots' versions were done. Small groups with colleagues, professors, and internationalization experienced people, could analyze and suggest enhancements. Metrics were changed too, especially when the software application was developed. Questionnaires, surveys, interviews and other interactive tools were applied using social media (THABANE, 2010; LANCASTER; DODD; WILLIAMSON, 2004).

EVALUATING FOCUS RANGE:

When asked about Higher Education Internationalization focus (free text): All responses were explicit about student's mobility as a focus. Two of them mentioned students and professors' mobility. No one was about other staff positions.

When the destinations were mentioned it emerged the prevalence of Spanish and Portuguese-speaking countries and preferences for Mercosur countries and Latin American routes.

Only one answer mentioned that there is no preference for destinations.

Considering the language barrier, just one informed me that China is one of its preferences, although it is the biggest market for Brazilian products today.

Only one reported that its process of selecting candidates is accomplished twice a year.

It is worth to highlight the detail that one institution detailed its performance in a comprehensive and coherent way with the scope of the internationalization focuses:

(a) support technical, scientific, and cultural cooperation regarding international and national actions.

(b) promote the exchange of undergraduate, graduate, professors and technical students.

(c) host foreign students benefiting from international agreements.

--- Asking about scope and completeness of the framework (Likert scale and free text). In this case completeness was defined as the degree to which entities and attributes are defining the boundaries of the Internationalization process.
Do you consider that this list adequately covers the Internationalization of Higher Education?
In this case all the answers were maximum: “I totally agree”.

--- Do you consider that other items must be included (Likert scale and free text)?
-- Make your suggestion considering which foci should be removed

When asked about the need to include other focuses or aspects we had the answers:
3 partially agree
1 disagree, and suggest the inclusion of a new item
1 preferred not to opine.

SUGGESTIONS

Make your suggestion considering which foci should be removed or included.

When asked which focus to include, the suggestion was:
Social responsibility should be included in the context of internationalization
I believe that this answer will be in accordance with the reality of each institution. In the institution where I work, it would be important to clarify to the entire internal community about what internationalization and its importance is.

-- Do you consider that some of these outbreaks should be abandoned?
In this case everyone disagreed (in full or in part) with the exclusion of some topic. Of course, as Internationalization theories define, this topic will depend on each institution.

-- When asked to comment, suggest or criticize the framework, the following answers were obtained:

a) I consider the proposed evaluation complete; it meets several areas that intend to advance in the HEI that I am linked to. Depending on the level of internationalization of the HEI, there will probably be an expansion of the aspects to be considered, but for HEIs in the process of international development the issues and foci are sufficient.
b) Congratulations on dedicating yourself to this theme. Extremely relevant.

When it was focused on the actions of their Higher Education Institutions, some questions needed descriptive answers. They are summarized in the next Frame 50.

Considering the comments and answers of experts, a fully functional program to capture these answers was adjusted and finished. The system specification and developments were done in six months after some prototypes. It was carried out by a master's degree student.

Frame 51 – A list of summarized contributions of Experts arranged by subject

	Currently HEI's focused actions and projects	Responses
I.	Flexibility of the curricula of the courses	1
II.	Internationalization at home	1
III.	Internationalized classroom (in another language - such as English or Spanish)	2
IV.	Joint network research	2
V.	Language qualification program (students, professors and staff)	2
VI.	Mobility (undergraduate and graduated)	4
VII.	Mobility including students, professors and staff	1
VIII.	Mobility (students and teachers)	
IX.	Receptive Mobility - to welcome foreign students benefiting from international agreements	3
X.	Short-term programs	2
XI.	Strategic project of governments: Bioceanic Route and the Latin American Route (Argentina, Paraguay and Chile)	1
XII.	Supporting technical, scientific, and cultural cooperation (national and international)	2
XIII.	Online international courses.	2
XIV.	Internationalized classroom (in foreign language)	1
XV.	Joint research (graduated programs)	1
All mentioned cooperation agreements with countries (in alphabetical order):		

Angola, Argentina, Canada, Chile, China, Colombia, Colombia, Cuba, European Union, France, Mexico, Mozambique, Paraguay, Portugal, Spain, USA.

Source: Created by Author from questions and answers

Most of the countries involved in cooperation are Portuguese or Spanish speaking countries (and Portugal was explicitly mentioned in 2 answers). The European Union is a desired goal for agreements and France and Spain was directly listed. The USA and Canada were mentioned, and Latin America was represented by Argentina, Chile, Colombia, Paraguay and, of course, Brazil (even if it is not a foreign country).

Despite new concepts, priority actions are turned to mobility. When asked about focus areas and countries of interest, these are direct responses:

- “Currently the main actions are mobility among students and teachers, joint research in master's and doctoral programs with international partners and joint online courses” (response 4).
- Another (response 1): “The University acts as a secretariat to meet academic mobility, mainly of undergraduate and graduate students”.
- “Mobility of students and teachers. We do not have priority countries” (Response 1),
- “We have no defined priority area and priority countries vary with the activities developed, for example, mobility is usually Portugal, Spain and Colombia for research beyond those mentioned we have an approximation with Canada” (Response 3)

We have no defined priority area and priority countries vary with the activities developed, for example, mobility is usually Portugal, Spain and Colombia for research, besides those mentioned we have an approximation with Canada.

Evaluating the completeness of the framework:

The opinion of all experts is that the proposed checklist fulfills the requirements of Internationalization and any topic should be excluded. All the way, they were asked to include another topic, and these are the answers:

- One of them has suggested a specific topic about “Social responsibility should be included in the context of internationalization”.

- When asked what should be included in the framework, another suggestion has a full adherence to the new concept of Internationalization and states: “I believe that this answer will be in accordance with the reality of each institution”.

There is no discordance among experts about the completeness of the checklist: all answers were “Totally Agree[39]” about “Do you consider that the list adequately covers the Internationalization of Higher Education?”.

Referring to Social Responsibility Internationalization, a specific suggestion was made. In spite of social responsibility being not explicit in a comprehensive internationalization focus, this issue must be contemplated in each process and action.

Based on Responsible Internationalization, Social responsibility was included directly in the objective framework. Questions about Responsible Internationalization on (BASIC acronym) **B**alance of opportunities, **A**ccountability, Sustainability, **I**nclusion, **C**ompliance was included for a formal evaluation and not only the perception framework.

As a final evaluation of experts about the framework one of them states: “I consider to complete the proposed evaluation, and meet several areas that are intended to advance in the HEI that I am linked to”.

Probably the checklist can be applied to any HEI, depending on focus and stage. This is a previous approach and an expert states: “**Depending on the level of internationalization of the HEI, there will probably be an expansion of the aspects to be considered, but for HEIs in the process of international development the issues and foci are sufficient**”.

Do you consider that this list adequately covers the Internationalization of Higher Education? Concerning this question, a common answer can be considered like this: “*Currently the main actions are mobility between students and teachers, joint research in master's and doctoral programs with international partners and joint online courses*”.

[39] LIKERT was constructed with a five points scale, from “totally disagree” to “totally agree”.

5.3 INTERVIEWS

After the survey, the experts answered two questions: Talk about the internationalization process in your own Institutions and free comments and suggestions.

After analyzing responses there are some perceptions and we must say they are in accordance with HEI literature:

a) Staff are not usually involved (or cited at least).

   Please consider a foreign student getting in touch with HEI. An administrator will make a first contact (probably). Folders are usually addressed to an Internationalization Central Office.
   Professors in other countries do not talk directly with mobility candidates until final choices.

b) Internationalization at home is not cited and should be a continuous goal.

   It means inclusion of international and intercultural aspects into curricula in a purposeful way. Full institution engaged is supposed.

c) As other countries, mobility is still the main goal of Brazil's HEI.

d) International research is not a priority or a goal.

   After this questionnaire, I got in touch again with 2 of the interviewed, asking about why not? Listed (all Brazilian universities) reasons are:

   - Hard access of funding supporting research abroad.
   - Expenses for travelling, events and other participation.
   - Publication expenses as translations and reviewers etc.
   - Scholarship for graduated students is not accessible in a practical mode.
   - An excessive bureaucracy involving all acts of a research group.

e) Co-curriculum and (diploma) were not mentioned and this can be a good advantage for students and HEI.

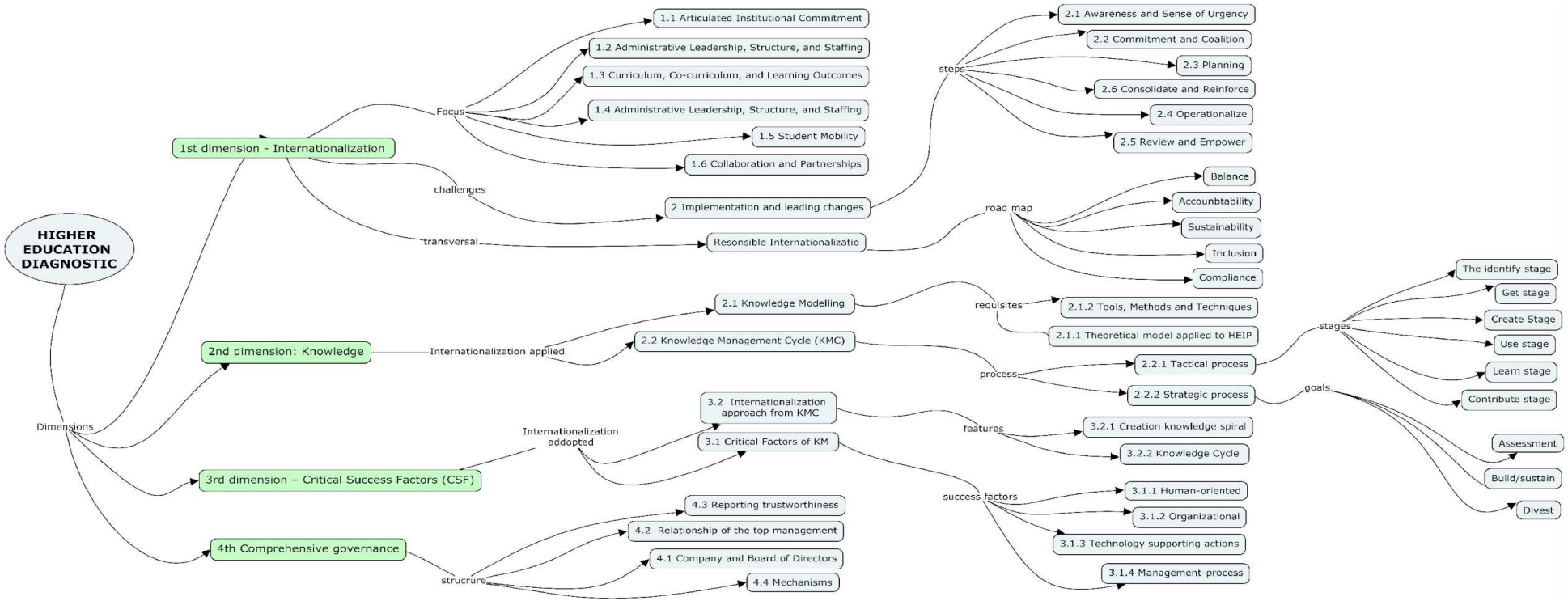
f) No institutional program for awards; no formal crediting for deep contributions to the Internationalization area (neither people nor organizations were considered).
g) Priority countries are not defined to carry out efforts in agreements, mobility, cooperation, research collaboration, language training, abroad logistic questions, and answers. If you don't know where you're going to, any path can be nice or the worst, or as Lewis Carroll[40] states: "If you don't know where you are going, any road will get you there".

[40] Charles Lutwidge Dodgson (Lewis Carroll), was an English writer notably by Alice's Adventures in Wonderland.

5.4 FINAL FRAMEWORK DESIGN

After all adjustments, several questions are reformed and one initial dimension was suppressed. Items are grouped and the framework is represented in Figure 51.

Figure 51 – Final Framework



Source: created by Autor (2020)

5.5 THE HEID SOFTWARE VERIFICATION

This framework was expressed in an executive checklist concerning the different dimensions. Checking an extensive list of questions is sometimes a boring task. Therefore, the use of the Technology of Information and software engineering is a reliable way to put it into practice.

After having the experts review the questions, a software was designed and constructed. Any software project must define Requisites (what must be done) as cited by O'Brien e Marakas (2011) and Laudon e Laudon (2018). So, requisites were specified and using web interface and modern technologies of software engineering the system was constructed using Python language and the Django constructor interface. The system has 35 programs in a responsive way.

A lot of technological enhancements should be implemented, mainly when referring to Human-Computer Interface (HCI), but in this academic version, all artifacts are fully functional. The system is installed and functional in a CNPq Research Group – Grupo de Modelagem do Conhecimento (GMOC) and GNI – Gestão, Negócios, Inovação e Internacionalização (GNI).

Even though deep and extensive tests were done using new versions, the current version 0.6-1 is satisfactory.

The main comments are turned to be more instinctive and user friendly. Adaptations were done, but we can remember that this system should be used by consultants performing Knowledge, Governance, Higher Education internationalization activities.

By reading several authors one can consider the following steps to an adequate validation, regarding an academic proposal:

i. Present and seek comment from advisor/professors etc. to review your conceptual framework (underpin on theory, empirical research, model, etc.)

   DONE

ii. Verify if framework concepts are aligned with your research (question & objectives).

   DONE BY EXPERTS

iii. Evaluate how validation of the conceptual framework's artifacts can be operationalized with the certain instrument (survey questionnaire, experiments, case study, etc.)

DONE USING CNPQ RESEARCH GROUP AND COLLEAGUES

iv. Check the use of instruments and measures

DONE BY USERS AND AUTHOR

v. Evaluate results and adjust framework.

DONE BY AUTHOR AND TECH DEVELOPER

6 FINAL CONSIDERATIONS

About the theoretical approach findings

The theoretical study ran to establish relevant roles to be performed to a diagnoses construction mainly when dealing with changes and organizational culture it becomes relevant to explain this knowledge.

Several approaches have been studied and after careful analysis, harmonization, elimination, one dimension was eliminated (auditing due rigid external and external rule to be observed). Other aspects were adjusted and four **dimensions** were established as essential to the success of the Internationalization process and of course the Institution itself: (i) Comprehensive Internationalization and its foci, which is the central point and object of study, (ii) the Knowledge that is the reason of this study, oriented to the cycle of knowledge management and subsequent incorporation into organizational culture, (iii) the Critical Factors of Success of the whole process and (iv) The Comprehensive Governance structure (Governance, Risk and Compliance). This whole theoretical framework was appropriate and translated in practical terms through two checklists that will be called modules when they intend to use a Diagnostic Framework.

Framework – Diagnostic concerns

The first (Module I) establishes the objectives/focuses desired by the Higher Education Institution carrying the community perception about this path to be accomplished. A second checklist (module II) establishes a degree of

evolution (at four levels) indicating through effective actions, the procedures adopted and structures disregarding perceptions, desires and intentions (as Module I).

Once the Framework was proposed, they were observed in accordance with the verification criteria of experts and the suggested adjustments were made. To enable a user-friendly utilization, some questions of the framework were transformed into web-based applications, which collected the data, applying ed MCDA and Pareto criteria (80/20). Through proof of concept, these results were adjusted and improved visually, revealing the diagnosis of what is intended and where the HEI is located.

Framework and considerations about validation and verification

Literature review about frameworks brings up the concepts of Models (external validation) and Frameworks with the model's adherence verification, as models are validated by themselves. All the way, applying a Framework in real life is the most useful instrument for frameworks verification and validation. Validation and verification have the same meaning according to several authors and this is the meaning adopted here.

During this research, the framework for Higher Education Institutions Internationalization Diagnostic was built from the Knowledge Management perspective, considering its own focus, and concerning the advisory roles. The knowledge cycle considered was (1) identified, (2) created, (3) represented and stored, (4) shared and (5) applied.

Models of internationalization were studied, adopted, and validated on a large scale by HEIs. Based on these models and frameworks, procedures were defined, routines and good practices were constructed generating frameworks and practical checklists.

Checking results of theory and practice in a Framework

The expert's validation results in the improvement of the Framework of Internationalization Diagnostic for High Education Institutions called HEID: Higher Education Internationalization Diagnostic.

Considering facilitating Framework application and evaluating HEI focus, it was implemented in the form of programming resources on the web, with two

programs. Module I - records and selects focus, analyzes it according to (Pareto & MCDA criteria) and constructs radar graphics to represent it: – it was developed in modern language (Python with Django and a common Relational Database). Module II, through a Google Spreadsheet, records the path accomplished by the Institution during the various evaluation periods. Both feature visuals for identifying foci, priorities, and stages. For these modules, a “Proof of Concepts" was carried out and software was enhanced.

Internationalization concerns

Several theoretical concepts were appropriated in the proposed framework, incorporating theories, models, and other frameworks, consolidated into a diagnosis of Internationalization. Despite verification and validation presenting distinguishing concepts (one internal and the other external) both were applied to the diagnostic instrument proposed through experts and proof of concept in a functional application that implemented a full framework in a web-based software. In all approaches the general objective is always permeated by knowledge management in the search to explain the dimensions, indicators, and levels to support the decision process and become part of the organization's culture.

Two approaches guide the whole process to a HEI internationalization. The first one, obviously refers to the internationalization features where the Comprehensive Internationalization Model, with a proposal of six focuses of action and involves a complete menu of action according to the objectives established by HEI. Framework in the first topic explores each focus, with several questions, delimiting with success the actions performed.

In a strict sense, this model covers all the theoretical and practical aspects involved but lacks a vision involving Inclusion, Compliance, Balance of Opportunities, etc., as Responsible Internationalization set as “BASIC” (it is a humanistic vision of the process and may act in each Comprehensive Internationalization Model focus)

When applying proofs of concept, and even among experts (all Brazilians) there was a general concern with "**what type of internationalization we intend in our** Institution?". This question endorses the concept that Internationalization

is no longer prescriptive (cake recipe that everyone must follow) and becomes a choice of the Institution.

One second consequence is that this question brings out Responsible Internationalization (RI) with a cross-sectional factor to be observed in all focuses of Comprehensive Internationalization. Thus, RIs “BASIC”, means the balance of opportunities, and the introduction of programs that should be able to contemplate not only north-south exchange but also regional exchanges (example of Latin America). Budget balance to events, and programs are fully asked in the framework. In the same way, mobility opportunities should be balanced too.

A second aspect to be highlighted in BASIC refers to accountability (accountability), which represents not only the retribution of the investments to the process, but also its appropriation in terms of knowledge. This is a neglected aspect since there are no regulatory and even internal normative mechanisms for the transfer of this know-how to sectors of society. It is worth mentioning that in the public area there are a large number of recommendations, but they only contemplate the requirements for mobility when leaving the country, but not the transfer of knowledge after the return.

Several questions are inserted in the framework to the third item of BASIC which refers to the sustainability (sustainability) of the internationalization programs as well as the ecosystem that supports it and also includes the explanation of the knowledge obtained by the program participants. There is also the aspect of structuring programs that allow individuals in mobility a greater use of opportunities such as: training, support for the preparation of documents, preparation of candidates for coexistence in another environment / country, formation of research groups, collaboration and networks. All of these will give sustainability creating the program's priorities. Training and travel have severe funding limitations in the in-development countries (according to experts).

The fourth letter of BASIC, is the inclusion (Inclusion) of individuals and institutions without the segregation of points such as sex, country, continent, etc. Again, north-south exchanges or developed and developing countries overlap with regional ones (example of Latin America). The experts literally pointed out financial aspects that also involve this difficulty, since there is a greater availability of resources in developed countries both in the sending and reception of

individuals in mobility. Fluency in languages is another aspect that undermines inclusion by having preferences for countries, but which have few resources (exception of some countries in Europe).

Finally, the C letter of BASIC, is the Compliance that is associated with governance providing security to the institution in accordance with all regulations and legal devices; private organizations have a greater agility and confidence instead of the public area, where additionally the excess of norms and regulation, there are sometimes practical accountability difficulties. There is also the agency conflict, both in the public and private initiative. Questions about internal and external documents, procedures, tasks, functions were checked in the framework.

Knowledge and HEI's culture

Once the theme that refers to internationalization is presented, the second approach is the reason for the existence of the work – it is the possibility of explaining the knowledge involved in a diagnosis. Thus, the aspect of Knowledge Management translates the endless search of theoretical knowledge and transforming it into practical aspects.

The Knowledge Management Cycle (KMC) implementation is not easy nor a one-time implementation. KMC requires continuous enhancement to reach success. Capture, representation of knowledge, distributing and using knowledge must be done and a diagnostic of the focus that actually matters to HEI, is provided by framework. As all knowledge must be merged in the HEI culture, a list of Success Factors issues is inserted in the framework too.

Governance, Risk and Compliance (GRC) issues

In the execution of the diagnosis, the dimension of Governance, Risk and Compliance **(GRC)** was evidenced when driving issues to self-structuring. Questions to verify and report to senior management if proposed in terms of Internationalization are properly executed. It was found that ethics, transparency and aspects of communication are fundamental points of the GRC process, and they also were incorporated as another framework dimension. Of course, laws, regulations and norms, such as reports that are part of any GRC are also highlighted in the framework.

In the initial approach, the role of the **auditor** was intended to verify if actions are being done as they should be, and in the correct way. Further into the studies and practical aspects to be inserted in the checklist, it was concluded that the Audit has legal and formal (internal and external) regulations, and auditing should not be an addressed dimension. Structure, communication and audit reports, both internal and external, are fully regulated from both public and private organizations and with external controls – they must include internationalizations issues, of course.

The Experts' considerations

The questionnaires and informal conversations and the extra questions addressed to the experts were linked to the Framework verification, expressed through a checklist. However, opportunities for comments and suggestions were opened and the internationalization in their institutions were also commented on. We highlight that all participants are from Brazilian public universities and the issues commented are:

- There was no mention of a reward system in the internationalization process.
- Teachers and students' roles are clearly mentioned; there is no mention of the involvement of administrative staff.
- There are several requirements in the mobility announcements, however there is no formal training or roadmap for those involved.
- The larger effort is the responsibility of the internationalization office (all have one), and there is no engagement with the academic community.
- Collaboration and international research groups are no longer a priority due to the allocation of resources. Bureaucracy and a lack of research endowments are also negative factors mentioned.
- In general, there are no established priorities or target countries, or regions defined for mobility opportunities. As long as agreements are signed, HEI starts a search to create and meet demand.
- Co-curriculum and double certification (national and abroad HEIs) were not addressed as highlighted posts or benefits. One central point is mobility and other countries' language difficulties evidencing our preferences for Lusophone countries.

Consultant approach goals

Framework items considerations

Future studies and enhancements suggestions

Framework suggestions

As evaluated by experts, the suggested framework is a complete and exhaustive list of items involving a fully diagnostic from issues concerning HEI internationalization. All prognostic, to solve weak facts pointed by radar graphics, must be done and based in the complete Higher Education Internationalization literature and developing procedures and routine to reduce weaknesses and reinforce stronger and good results.

To a HEI's consultant or expert, Higher Education Institutions procedures and structure is a common task with no hard difficulties at all. All the way, developing a list of prognostic actions might be an increment. The main suggestion is to create a list of actions to compose a prognostic, depending on the weak factors detected and pointed by radar graphics.

Another valuable suggestion is to build an Ishikawa cause-effect diagram specific to HEI. Consequently, considering Methods, Measurement, Management, Mission etc. connected to Higher Education Internationalization will be useful as a learning base and problem listing to be used in a Problem Based Learning (PBL).

Considering the fact that external experts or consulting services can reduce time, efforts, and cost of Internationalization and also considering that consultants are paid hourly-base working, so reducing hours of work might be an improvement.

Another good suggestion is creating exclusive and quantitative indicators to evaluate the maturity of HEI. Although all cycles are subjective and top decision matters, the use of knowledge extraction could be done. The use of Artificial Intelligence and Knowledge Extraction allied to Business Intelligence dashboards will be a dreamed solution. Machine Learning might be another applied feature to be used. Thus Data Discovery, Data Mining and Knowledge Discovery in Text (as KDT) must be used to get information like total budget to internationalization divided by the number of students; total number of events about participants.

Other common indicators can be appropriated like dozens used in internationalization rankings, like “University Nobel Prizes” even if it is very far from the reality of thousands of universities. Others like the number of publications and mobility numbers are very reasonable in spite of not being a desired outcome of all Higher Education Institutions – in education there is no “one size fits all”.

HEID Software suggestions

Software has a lot of suggestions although it is fully functional. A commercial version should incorporate an authentication routine including Lightweight Directory Access Protocol - LDAP for instance. This kind of feature is the most used worldwide and dominates Linux operating systems.

Of course, all enhancements suggested to the framework can be incorporated. This will represent a lot of work, but it will reduce diagnostic and prognostic from 30-60 days' effort to a couple of days.

h) Staff are not usually involved (or cited at least).

Please consider a foreign student getting in touch with HEI. An administrator will make a first contact (probably). Folders are usually addressed to an Internationalization Central Office.

Professors in other countries do not talk directly with mobility candidates until final choices.

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j) As other countries, mobility is still the main goal of Brazil’s HEI.

k) International research is not a priority or a goal.

After this questionnaire, I got in touch again with 2 of the interviewed, asking about why not? Listed (all Brazilian universities) reasons are:

- Hard access of funding supporting research abroad.
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l) Co-curriculum and (diploma) were not mentioned and this can be a good advantage for students and HEI.

m) No institutional program for awards; no formal crediting for deep contributions to the Internationalization area (neither people nor organizations were considered).

n) Priority countries are not defined to carry out efforts in agreements, mobility, cooperation, research collaboration, language training, abroad logistic questions, and answers. If you don't know where you're going to, any path can be nice or the worst, or as Lewis Carroll states: "If [41]you don't know where you are going, any road will get you there".

Final words

Knowledge is not the benefit of a unique Science. Any branch of Science has its own valuable knowledge and field of study is considered, after all, a "branch of knowledge". KDD and KDT are a particularly good alternative and extraction of Knowledge will be a reality as long as the linked data can be adopted as a new standard of publication.

During the EGC / UFSC graduated program a large range of tools, procedures and management routines were exploited, from leadership to ontologies, from entrepreneurship to algorithms. That was a really large range of new concepts, and anyone open to new ideas will always take advantage of it.

And ideas have arisen not only during classes but mainly on collaborative work. A small talk could lead us to a brand-new perspective. Talking, studying or researching with colleagues was "the must". Besides, participating in projects, supporting the regulations of documents, or just drinking a cup of coffee after lunch was an amazing experience.

The course was incredible… all I have learned during these years is countless. It gave me the direction to do all this work.

I can remember how satisfied and happy I was during events in collaboration or supporting classes. From the local to some international events,

[41] Charles Lutwidge Dodgson (Lewis Carroll), was an English writer notably by Alice's Adventures in Wonderland.

the familiarity with EGC daily subjects – was really a rewarding experience. I am as glad as the work I had.

I have learned so much, and all this made me a better person. Friendship was great and I can remember each Master's or Doctor's degree student – each smile, each help or even each advice. Professors, colleagues, staff, from the chief department to the servants, I have made a lot of friends for my whole life or even beyond… Who Knows? Thank YOU all.

-x-

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APPENDIX A – CONCEPTS

	Concept	Authoring	Area
F	Framework (sensu stricto) is a concept originally relating to modern reefs and is defined by structural, ecological and sedimentological criteria. […] The term framework should be restricted to its original definition and used only where the criteria for framework can be clearly demonstrated.	INSALACO, 1998, p.1	Geology
F	Framework is a static model, which provides a structure to help connect a set of models or concepts.	Jayaratna (1994)	Information System
F	The framework concept is also used as a synonym to model.	Rostlinger & Goldkuhl (1994),	Information System
F	A framework is a generic design solution to a certain problem or a certain domain. The framework describes the different design elements involved in the solution, as well as their relations.	OBERG, 1998, apud CRONHOLM; ÅGERFALK, 1999.	Information Technology
F	A framework clearly represents categories and relationships and is based on a perception or paradigm. The language of most management frameworks is in the form of symbols. The user of the framework applies memory, judgment, and choice, perhaps by the utilisation of a particular approach.	Shehabudden et al., 1999, p.11	Technology
F	A conceptual framework explains, either graphically or in narrative form, the main things to be studied – the key factors, constructs or variables – and the presumed relationships among them. Frameworks can be rudimentary or elaborate, theory-driven or commonsensical, descriptive or causal.	Miles and Huberman (1994)	Research Methodology
F	Framework: a set of ideas, rules, or beliefs from which something is developed, or on which decisions are based	The Longman Dictionary of Contemporary English (2019):	General purpose
F	A framework supports understanding and communication of structure and relationship within a system for a defined purpose.	Shehabudden et al., 1999, P.9	Technology
F	A framework is a fundamental construct that defines assumptions, concepts, values, and	TOMHAVE, 2005, p.10	Information

	practices, and that includes guidance for implementing itself.		Technology
M	a model is used to “highlight, or emphasize, certain critical features of a system, while simultaneously de-emphasizing other aspects of the system.” Examples of classical tools to express models are data flow diagrams and entity-relationship diagrams	Yourdon (1989)	Information System
M	Model is as an Abstraction of something for the purpose of understanding it before building it.	Rumbaugh et al. (1991)	Information System
M	Model is a structure for the Instruction Systems Development (ISD) process. Further, a model defines and delimits specific areas within ISD that form related phases.	Goldkuhl (1991) Apud CRONHOLM; ÅGERFALK 1999	Information Technology
M	A model answers the question of what is to be done but not how it should be done.	CRONHOLM; ÅGERFALK 1999	Information System
M	A method can be perceived as a “whole” consisting of different “parts”.	Shehabudden et al.	Technology
M	The view of methods as constituted by exchangeable and reusable components.	Röstlinger & Goldkuhl (1994)	Information System
M	A model supports the understanding of the dynamic interaction between the elements of a system.	Shehabudden et al., 1999, p.13	Technology Management
M	A model may be viewed as an abstraction of reality	Eppen et al., 1987 apud. Shehabudden et al., 1999, p.12	Management
M	A model is a framework, identifying the broadest issues and considerations. It simplifies and generalizes a particular domain. […] As such, a model is a dynamic representation of reality, demonstrating how different forces, from inside to outside the system, may change the whole. [..] The most important issue might be a detail lying deep within the context of the framework offered by a model.	Harding and Long (1998, p.4)	
	A model is a simplified representation or abstraction of reality. Models help managers calculate risks, understand uncertainty, change variables, and manipulate time to		

	make decisions. MIS support systems rely on models for computational and analytical routines that mathematically express relationships among variables		
M	A normative model describes how things should be made (ideally), rather than how they are made. So constructing a model its useful for simulate a problem, and to develop and test solutions. A model is a dynamic representation of a system under study, and therefore does not in itself explain how a system should operate.	Jennings and Wattam (1998).	Management
M	A key feature of a management science model is that it represents an abstraction of a situation, and may be displayed in a graphical form or may contain mathematical relationships A model is an abstract mathematical representation of a problem situation.	Taylor, 1996 Taylor, 2010, p.3	Management
M	Models are representations of real objects or situations.	Anderson et al. (1991)	
M	A model is a set of statements about some system under study.	SEIDEWITZ, 2003, P.27	Information Technology
M	A model is an abstract, conceptual construct that represents processes, variables, and relationships without providing specific guidance on or practices for implementation.	TOMHAVE, 2005, p.8	
Mt	A methodology is a targeted construct that defines specific practices, procedures, and rules for implementation or execution of a specific task or function.	TOMHAVE, 2005, p.10	
Mt	When there is a close link between procedure, notation and concepts we call this a method component. A method is often a compound of several method components, giving what is often called a methodology [14]. These different method components together form a structure. We call this a framework. This includes the phase structure of the method. All methods build on some implicit or explicit perspective (philosophy).	GOLDKUH; LIND; SEIGERROTH, 1999	
P	A process transforms inputs into outputs.	Ellis, 1997; Smith, 1997.	

MF	However, frameworks also 'represent' particular issues, so how do models differ from frameworks? The following definitions contain some useful indicators for answering this question. […] A model may be viewed as an abstraction of reality (Eppen et al., 1987). […] It is clear from these definitions that models, in addition to 'representation', are dynamic in nature, depict reality, show relationships, and enable the prediction of the impact that a change in a variable element of the model may bring. It is clear that the characteristics of a model form part of the characteristics of a framework, although the reverse is not necessarily true. It would be reasonable to conclude that a **model is a particular type of framework**. (our emphasis added)	Shehabudden et al., 1999, p.12	TechnologY Management
M	"a model is a dynamic representation of a system under study"	Shehabudden et al.,1999, p.12	Technology Management
PTTo	A procedure is a series of steps for operationalising a process. A technique is a structured way of completing part of a procedure. A tool facilitates the practical application of a technique.	Shehabudden et al., 1999, p.p.15	Technology Management
F	[…] framework is used to reflect the underlying assumptions (i.e. paradigm). Is not the real truth. Thomas Kuhn (one of the first people to discuss the idea paradigms), regards paradigms as patterns of scientific knowledge which evolve over time (Kuhn, 1962). A paradigm is a way of thinking in a context. The type of context may be influenced by 'a basic set of beliefs'. Guba's (1990) broad description: 'a basic set of beliefs that guides action	Popper's terminology (1996) Thomas Kuhn Guba's (1990)	
C	A construct is an abstract concept that is deliberately created to represent a collection of concrete forms of behavior. These concrete behaviors, therefore, qualify as indicators of constructs.	Fox and Bayat (2007, p.29)	
Mt	Methodologies are perceived as complexity-reducing mechanisms, with a clear distinction between 'methodology in theory' and 'methodology in practice'.	JAYARATNA (1994)	

APPENDIX B- FRAMEWORK MODULE 3 - STATUS

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APA Style citation: Vianna, Cleverson Tabajara. (2020) Status Checklist - Higher Education Internationalization Diagnostic. DOI XXXXXXX.

HEID Framework Mod 2 - Higher Education Internationalization Diagnostic

	Item description or statement.	ERROR	No information, no control.	YES, but bas no formal control and statistics	The IES has a fully control/registrations of events	Data registered and can compare areas in a base value	Data is registered and enabled to compare periods.
1	Seminaries on internationalization have been executed during the period.	ok	☐	☐	☑	☐	☐
2	Training on internationalization have been carried out during the period.	ok	☐	☑	☐	☐	☐
3	Is internationalization in the Institution's Mission, Vision or Values?	ok	☑	☐	☐	☐	☐
4	Funds designated and used in the internationalization programme?	ok	☐	☐	☐	☑	☐
5	Planned and executed internationalization events?	ok	☐	☐	☐	☑	☐
6	The events contemplate the exchange of academic, professional, lifestyle and culture experiences.	ok	☐	☑	☐	☐	☐
7	Is participation in these events, is the registration of experiences part of the routine and requirements for participation in internationalization programs?	No answer	☐	☐	☐	☐	☐
8	Have leaders or internationalization leaders been appointed in each area or department?	No answer	☐	☐	☐	☐	☐
9	There are manuals, guides or folders that describe the main concepts of Internationalization and its strategic plans.	No answer	☐	☐	☐	☐	☐
10	Are there manuals, guides, and folders in other languages used to receive students of foreign origin?	No answer	☐	☐	☐	☐	☐
11	Is there tutorials and videos in languages strategies, for the presentation of the routine of campus, academic processes and academic life?	No answer	☐	☐	☐	☐	☐
12	Are manuals, guides, and tutorials updated?	No answer	☐	☐	☐	☐	☐
13	Is there an area, department or office responsible for internationalization?	No answer	☐	☐	☐	☐	☐
14	Standards, rules, policies, and papers are documented and available for consultation.	No answer	☐	☐	☐	☐	☐
15	Does the documentation make clear access to programs and funds, their requirements, benefits and obligations?	No answer	☐	☐	☐	☐	☐
16	Is there an accessible institutional repository that records the experiences of student and teacher mobility?	No answer	☐	☐	☐	☐	☐
17	Do repositories record best practices and lessons learned?	No answer	☐	☐	☐	☐	☐
18	Students of the institution participate in the mobility program in foreign countries?	No answer	☐	☐	☐	☐	☐
19	Students from other countries has participated in the mobility program within the institution?	No answer	☐	☐	☐	☐	☐
20	Have the institution's professors participated in the mobility programme in foreign countries?	No answer	☐	☐	☐	☐	☐
21	Teachers from other countries participated in the ISI mobility program.	No answer	☐	☐	☐	☐	☐
22	Technicians and administrators of the institution participated in the mobility program in foreign countries?	No answer	☐	☐	☐	☐	☐
23		No answer	☐	☐	☐	☐	☐
24	There is a tutoring for students and foreign teachers	No answer	☐	☐	☐	☐	☐
25	There is a formal program for the setting of foreign students and teachers.	No answer	☐	☐	☐	☐	☐
26	Are there foreign teachers invited participating in campus activities? (events, teaching or research)	No answer	☐	☐	☐	☐	☐
27	Publications made with the participation of at least one researcher from another country?	No answer	☐	☐	☐	☐	☐
28	IES Research Groups that have a link but a researcher from another country.	No answer	☐	☐	☐	☐	☐
29	Foreign students received in exchange participate in research groups?	No answer	☐	☐	☐	☐	☐
30	Is there incentives for researching of intercultural and international themes in the various modalities of academic works?	No answer	☐	☐	☐	☐	☐
31	Are there financial resources made available for research?	No answer	☐	☐	☐	☐	☐
32	Researchers at the institution participate in research groups from other countries?	No answer	☐	☐	☐	☐	☐
33	Do IES students participate in Research Groups in the countries of destination? During or even after visiting foreign countries.	No answer	☐	☐	☐	☐	☐
34	Publications in other languages.	No answer	☐	☐	☐	☐	☐
35	Free training in other languages.	No answer	☐	☐	☐	☐	☐
36	Classes and curricular units in other languages.	No answer	☐	☐	☐	☐	☐
37	Equivalence with other credit universities in academic disciplines and activities.	No answer	☐	☐	☐	☐	☐
38	Training for foreigners in native language.	No answer	☐	☐	☐	☐	☐
39	Official program to encourage students and teachers to participate in international events.	No answer	☐	☐	☐	☐	☐
40	Official program for recognition of the best experiences of students and teachers in the international area.	No answer	☐	☐	☐	☐	☐
41	Are there awards and incentives as recognition in excellence performances in the international area?	No answer	☐	☐	☐	☐	☐
42	Official program to stimulate students and teachers for the use and dissemination of techniques and tools auxiliary to the internationalization process.	No answer	☐	☐	☐	☐	☐
43	Is there the formal recognition of meritorious external collaborators?	No answer	☐	☐	☐	☐	☐
44	Is there the formal recognition of meritorious internal collaborators?	No answer	☐	☐	☐	☐	☐
45	Is there adherence to government internationalization policies?	No answer	☐	☐	☐	☐	☐

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HEID Framework Mod 2 - Higher Education Internationalization Diagnostic

	Item description or statement.	ERROR	No information, no control.	YES, but bas no formal control and statistics	The IES has a fully control/registrations of events	Data registered and can compare areas in a base value	Data is registered and enabled to compare periods.	
46	Is there the preparation and submission of projects to obtain funds for the internationalization program?	No answer	☐	☐	☐	☐	☐	
47	Is there guidance for the preparation of proposals for funding agencies?	No answer	☐	☐	☐	☐	☐	
48	There are resources from promotional agencies designated and used exclusively in Internationalization.	No answer	☐	☐	☐	☐	☐	
49	Are there scholarships for foreign students?	No answer	☐	☐	☐	☐	☐	
50	Is there an adequate offer of their own and/or affiliated accommodation so foreigners?	No answer	☐	☐	☐	☐	☐	
51	Are there scholarships for IES students to other countries?	No answer	☐	☐	☐	☐	☐	
52	Is there the planning and periodic review of goals and challenges for internationalization?	No answer	☐	☐	☐	☐	☐	
53	Is there a periodic evaluation of the results?	No answer	☐	☐	☐	☐	☐	
54	Are there objective and subjective factors/indicators established, as well as their periodicity of evaluation?	No answer	☐	☐	☐	☐	☐	
55	Is there a self-assessment of students and teachers (received and sent)?	ok	☐	☐	☐	☐	☑	
56	Is there a balance of opportunities, funds and activities between the various areas of the university?	Error	☑	☑	☑	☐	☐	Only one, please
57	Are there periodic reports of accountability in the international area that are accessible to the whole community?	ok	☑	☐	☐	☐	☐	
58	Do reports have easy visualization use graphics and online web features?	No answer	☐	☐	☐	☐	☐	
59	Are internationalization programmes sustainable?	No answer	☐	☐	☐	☐	☐	
60	Do internationalization programs seek equity of opportunities between people and environments, backgrounds and destinations?	No answer	☐	☐	☐	☐	☐	
61	Is there a definition of priorities adherent to the public policies and mission, vision and values of the HEI?	No answer	☐	☐	☐	☐	☐	
62	Is there a clear and formal description of assignments, roles and responsibilities involving internationalization?	ok	☐	☐	☐	☐	☑	
63	Is there adequate dissemination of internationalization priorities, goals and plans?	ok	☐	☐	☐	☐	☑	
64	Is there a sustainability of processes, people, resources and expected return?	ok	☐	☐	☐	☐	☑	
65	Is there a periodic program for employee and, attendants providing qualification in other languages of interest?	ok	☐	☐	☐	☐	☑	
66	Is there an experiment study aimed at establishing critical requirements and factors of success in international experiences?	No answer	☐	☐	☐	☐	☐	
	You can use freely for non profits purpose.		0	1	2	4	5	
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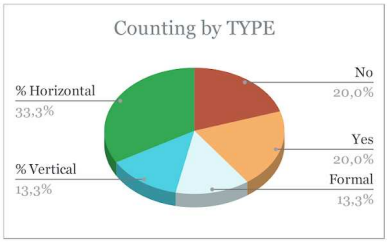
	Please verify each answer is once checked	**40**	**Beginners. A challenge was started.**					



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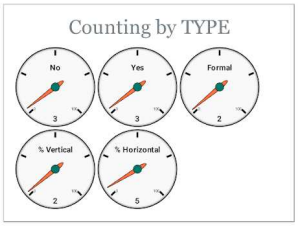

Can be accessed as a web page at: shorturl.at/iwEGP or

https://docs.google.com/spreadsheets/d/e/2PACX-1vSab50Wl0bH-koYnYbHyyhYOcNdEGNbWMczWAqpK6Od3xAD0GDNJZLoohq0ojXtl2AtBsuaDsPklJJd/pubhtml