

Use of sectorial essential models in organizational interventions aiming at the implementation of quality assurance processes

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Abstract

In view of the growing supply of models in various domains and in different formats, and the potential benefits to organizations using them, this article proposes to (1) present the theoretical background to the organizational developments, (2) to propose a framework for defining organizational models of quality in HEIs, and (3) situate and discuss issues associated with the use of methodological approaches that employ, “as is” and “to be” models, but also “ought to be” models and the benefits of the use of sectorial essential models, in organizational interventions. Organizational intervention is a generic designation for any activity involving organizational change, in order to achieve benefits for the organization. The interventions that adopt information technologies, or at least, the introduction of significant changes in activities with a strong emphasis in information processing, are especially relevant. This definition comprises organizational interventions, which aim at implementing quality assurance processes.

This work in progress emphasises the following representations: business processes; management indicators for a business’ sector; business conceptual model (ontology). These models correspond to good organizational practices of a specific sector, and are generally promoted, developed and disseminated by corporate associations, or professional societies within a business area. The use of these models in organizational interventions has numerous benefits, primarily those related to the use of methodological approaches that employ, not only “as is” and “to be” models, but also “ought to be” models. The combination of these models is recommended in several informational systems’ development methodologies.

Keywords: Organizational Development, information systems, models, quality assurance system, Sectorial essential models.

1. Introduction

Quality engineering and management can be presented as a form of organizational development, i.e., a course of action that aims at improving some aspect of an organization. On the other hand, the implementation of quality assurance mechanisms in an organization typically involves the implantation of IT applications. These IT applications address aspects such as: support to quality manuals production, sharing and update; record of objectives and goals; recording and sharing of documentation related to the processes that are object of quality intervention; recording of non-conformities and follow-up of measures to correct them; reporting; etc. So, in this article the implementation of quality assurance mechanisms is viewed as a form of *information systems development* – ISD. ISD is a special case of organizational development, one where the adoption and exploitation of IT applications plays an important role.

Organizational development, like ISD, inevitably involves dealing with models of the organization that is being developed. These models are used to support the reasoning and decision-making associated to the development process. In ISD it is common to consider two types of models: models of the current situation or AS IS models; models of the desired future situation or TO BE models.

The work in progress described in this article addresses the use of a third type of model, a model of a situation that incorporates the current best practices for the market sector the organization fits in – OUGHT TO BE model. OUGHT TO BE models correspond to ideal situations that will be used to critically examine the existing situation of an organization (later conveyed in AS IS models) and to support the production of TO BE models.

The production of OUGHT TO BE models is however difficult to achieve. Mature developers use the knowledge they accumulated along their professional experience. But even veteran developers didn't go through all possible situations covering all the different market sectors that inevitably bring too much diversity to the organizational configuration. Both mature and novice developers can benefit from the existence of reference models that combine state-of-the-art knowledge from both academia and professional practice. It makes sense that these reference models are adjusted to the restrictions of market sectors, thus providing an essential perspective of several organizational aspects pertinent to any organization within the market sector.

The objectives of the research work described herein include:

- Define a basic set of elements to be included in essential/reference models;
- Explain how these models can be used to produce OUGHT TO BE models;
- Appraise the benefits of using OUGHT TO BE models in organizational development projects, especially in ISD;
- Propose a form of using essential/reference models as proto OUGHT TO BE models.

The validation of the outcomes of the research will involve the production of essential/reference models for the higher education sector and its application in projects related to the implementation of quality assurance mechanisms in universities.

2. Models in organizational development processes

2.1. Organizational development

Cummings and Worley (2005) presented organizational (OD) development as proposed the following definition: "*a system wide application and transfer of behavioral science knowledge to the planned development, improvement, and reinforcement of strategies, structures, and processes that lead to organization effectiveness*". The term development suggests that it is sought some sort of grow, an increase in maturity or the achievement of more advanced status that will enable an organization to realize its potential and attain desired goals.

Organization development is any process or activity, based on the behavioral sciences, that, either initially or over the long term, has the potential to develop in an organizational setting enhanced knowledge, expertise, productivity, satisfaction, income, interpersonal relationships, and other desired

outcomes, whether for personal or group/team gain, or for the benefit of an organization, community, nation, region, or, ultimately, the whole of humanity [McLean, 2001].

2.2. Usage of models in organizational development – AS IS and TO BE models

Anderson and colleagues (1991 in Shehabuddeen *et al.*, 1999) state that “models are representations of real objects or situations. These representations, or models can be presented in various forms or format”. They categorize models into three types: (1) models that do not have the same physical appearance as the object modeled, but are an analogy; (2) models that are physical replicas of real objects; and (3) models that represent problems by a system of symbols or mathematical representations. The models we address in these article correspond to the third type of Anderson and colleagues’ models, often based on diagrammatic languages but not in mathematical formalisms.

Organizational development processes are typically conducted in accordance with a vision that involves the production of two types of models:

- Models that describe the current state of the organization - AS IS models;
- Models that describe the desired situation for the organization - TO BE models.

The AS IS model depicts the current reality of an organization. One of the main purposes of the AS IS model is to establish a baseline so that an analysis of the current business can be performed, and to identify areas that require attention. AS IS models typically address the various dimensions of an organization, including the structure, its relationship with the outside world, their workflows, information systems and machines that support execution of processes [Castela & Tribolet 2004].

The need for this model can be justified with arguments such as: i) before proceeding, it is necessary to know "where it is", ii) modeling the current situation helps the organization to understand how the existing assets - skills, organizational structures, processes and technologies - come together to support the business strategy [Pournara 2012].

AS IS models support several tasks during the development process, such as the reengineering of business processes, the implementation of quality management systems, and the capture of requirements for the development of information systems. Despite the recognition of their value AS IS models are regarded as disposable after use [Castela & Tribolet, 2004]. This means that new AS IS models have to be built whenever a new development process is launched. Because organizations are dynamic and demand recurring interventions, several AS IS models will be necessary along an organization’s lifetime [Castela & Tribolet, 2004].

To produce an AS IS model it is necessary to go through an analysis of the current state of the organization. The model will then be used to support the “design” stage.

During the design phase decisions are made regarding the desired future situation. The desired future situation incorporates the solutions for the perceived problems and whatever is considered to be necessary to achieve a more developed organization.

The TO BE model is a description of the desired future situation. It will be used during the implementation stage to guide developers on the action to carry out that will enable to attain the desired future situation.

Figure 1 illustrates the usage of AS IS and TO BE models in organizational development projects.

This approach to organizational development that involves the AS IS and TO BE models has some inconveniences as it involves considerable costs related to modeling [Owens, 2013].

Other limitations can be attributed to the approach; Owens [2013] mentions that it has proved to be inadequate to the reality of today’s institutions. Besides the cost, the approach also leads to long duration interventions due to the need of surveying the organization in order to documents its structure, ways of working and other dimensions relevant to the intervention proves. These limitations affect the necessary agility modern organizations have to exhibit.

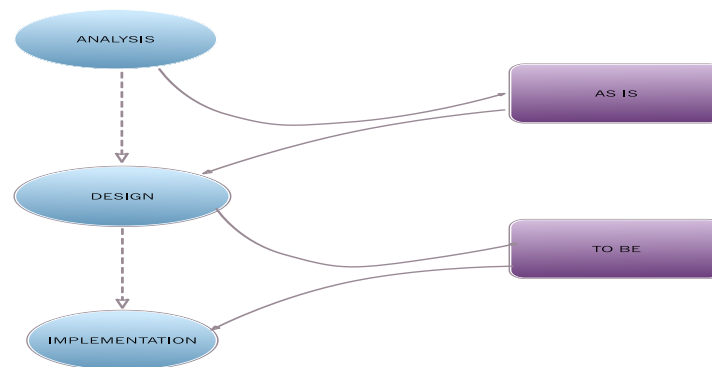


Figure 4: The usage of AS IS and TO BE models in organizational development projects

2.3. Ought To Be Models

We live in a great change era, what is new today may become obsolete tomorrow and the same is applied to the information that forms the basis for decision-making in organizations [Amaral & Varajão, 2000]. The current situation is important to assist the process of change. The problem is not the AS IS models but the mismatch of its detail and the conditions of strategic alignment that are not normally associated [Coelho, 2005].

An alternative to the approach described in section 2.2 involves a third model – the OUGHT TO BE model.

The OUGHT TO BE model describes an ideal situation for the organization. Ideal in the sense that it doesn't take into consideration the restrictions that might be imposed by the current existing situation. OUGHT TO BE models should be produced before the AS IS models. They enables developers with a powerful basis for criticizing the current existing situation and for supporting the design and planning of improvements that take into account a previously defined future desired situation.

The idea of using of OUGHT TO BE models is not new. Checkland's Soft Systems Methodology (SSM), for example, suggest the creation of such models corresponding to the root definition of each of the relevant systems corresponding to one problematic situation [Checkland, 1991]. In SSM these models are named conceptual models. In a later step of a development process following SSM, the conceptual models are compared with the existing situation as a basis for diagnostics. The outcome of the diagnostic supports the definition of changes that are simultaneously "systemically desirable and culturally feasible" [Checkland, 1991].

Owens (2013) reinforces this idea when he confirms that an organizational intervention should include a description of what the organization "should do". This model adds value to the organization, once it abandons the existing processes as a starting point and begins with an ideal situation.

Supporters of this approach to organizational development suggest that the organizational intervention should not be initiated by the traditional analysis of the current situation (leading to AS IS models), but the designing an ideal organizational model (something close to OUGHT TO BE model). The production of the OUGHT TO BE model might be based on reference models that embed theoretical principles and/or good practices. These models are then used in combination with the models introduced earlier – AS IS and TO BE models [Coelho, 2005].

3. The production of OUGHT TO BE models

To produce an OUGHT TO BE models is not an easy task. OUGHT TO BE models correspond to one supposed ideal situation/configuration for one particular organization. To be credible, OUGHT TO BE models should be justified by their proponents. Mature developers might use the knowledge they

accumulated along their professional experience to produce such justifications. However, even veteran developers did not go through all possible situations covering all the different market sectors that inevitably bring too much diversity to the organizational configuration.

Both mature and novice developers can benefit from the existence of reference models that combine state-of-the-art knowledge from both academia and professional practice. On one side, theoretical principles relevant to the different dimensions of an organization. On the other hand, good practices developed by practitioners, consulting companies or institutions interested in professional practices.

The reference models might exist at a high level of abstraction, thus being applicable to all sorts of organizations, or they may convey specializations adjusted to specific market sectors.

In each organizational development project, these reference models provide a basis for the production of an OUGHT TO BE model for that organization. In that sense, reference models can be presented as proto-OUGHT TO BE models.

The process of applying the reference model is divided into the following steps: selecting the reference model; adapting the reference model to the organization. The main goal is given by the notion of the organization's re-utilizing the information and knowledge base contained in the model for the purpose of structuring its policies, practices and processes in such a way as to achieve best performance.

Figure 2 illustrates the usage of reference models to product OUGHT TO BE Model in organizational development projects.

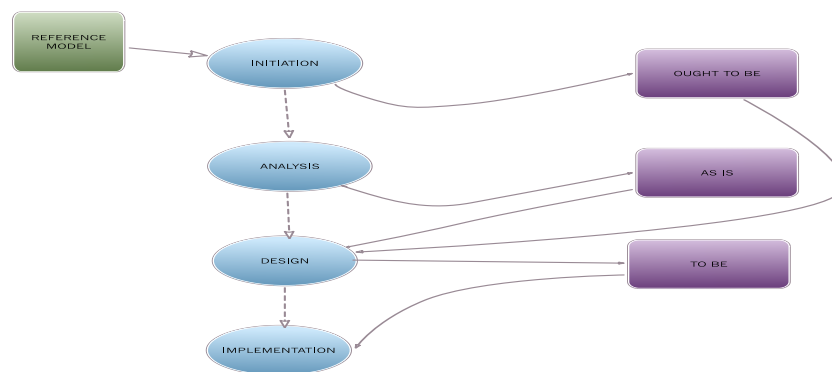


Figure 5: The usage of reference models to product OUGHT TO BE model in organizational development projects

Although their usefulness, the reference models do not provide a comprehensive basis for the production of OUGHT TO BE model. Each of the models typically covers only a few of the relevant dimensions that are relevant for an extensive description of an organization.

Furthermore, existing reference models have not been developing to focus on specific market sectors. By focusing on specific market sectors, reference models can maximize their utility to the production of OUGH TO BE models. The exemplary model addresses the essential aspects of an organization with detail enough to be adjusted to a market (economy) sector. For this reason these reference models are named in this work as essential sectorial models.

4. Reference models

There is a problem associated with the use of the term “reference model” (Fettke & Loos, 2007). In research and in practice, different types of model are denominated “reference models” [Thomas, 2005]. The term “reference model” has become very popular in recent years, and has come to be surrounded by considerable confusion [Fettke & Loos, 2007; Rosemann & Van Der Aalst, 2007]. It belongs to a class of terms that are widely used, but still not very clearly defined [Hars, 1994 *apud* Thomas, 2005].

Shehabuddeen *and colleagues* (1999) report that a broad literature review reveals that authors using this term do not define exactly what they consider to be a “reference model”. The confusion starts with

the word “reference” itself. Thomas (2005) explains that etymologically the term “reference” has a double meaning: a recommendation, and the meaning of bearing a relation to something, quoting something or alluding to something.

In this article we use the term reference model to name a model that:

- Describes several aspects of organizations embedding theoretical organizational principles and/or good practices of organization established and recognized in industry;
- Are general in the sense that they apply to a large set of enterprises; in some cases to any organizations; in other cases to organizations that belong to one sector of the economy;
- Address essential aspects, i.e., they cover aspects that are common to a set of organizations, thus abstracting from specificities of particular organizations.

Organization developers will refer to these models in search for a basis to produce OUGHT TO BE models. Reference models will hence be used as proto-models for OUGHT TO BE models.

4.1. Use of reference models

In recent years, many organizations have developed references to guide and improve management. These models are “packages” (sets of structured concepts) of guidelines and/or solutions used by other organizations, and are being known in management as “reference models”.

Normally organized as a hierarchy of functions, processes and activities, with or without interdependencies, they provide names, descriptions, indicators and other elements that can be re-utilized. However, these frameworks are not always relevant to the specific nature of the business. They may also use terminologies that clash culturally. Few organizations can expect simply to take such references and apply them unthinkingly or without some evaluation and modification [Burlton, 2010].

The fact that each model has a specific focus and poses particular needs makes them difficult to manage in isolation. Managers are realizing that using these models without integrating them can cause a lot of problems [Pagliuso et al., 2010]. For that reason, one of the present focuses of research in this field is how these reference models can be used as proto-models for OUGHT TO BE model (Coelho, 2005) for coordinated deployment of all the potential such tools have to offer.

Reference models have different characteristics: they can be made up of requirements or guidelines. Guidance reference models offer a series of recommendations on how to deal with aspects of organization management and, accordingly, can be identified as prescriptive. Requirement reference models, in turn, are made up of questions with respect to these various aspects of organization management, and can thus be identified as non-prescriptive.

Shütte (1998 *apud* Mendling *et al.*, 2005) identify three types of reference models found in the literature by their application/use: (1) process reference models: these present the stages to be completed in order to achieve specific objectives more efficiently, and are often found in the fields of Software Engineering and Business Process Engineering [Schelp & Winter, 2006]; (2) Information Systems Reference Models are systems models whose purpose is to guide the development of specific solutions for a given organization. The main reference for this category in the literature is the SAP R/3 reference model, which is much used in organizations and other information systems; and (3) Organizational Reference Models describe the different aspects of subdivisions of a given type of organization, for example, bank management, manufacturing, public administration, retail etc. [Schelp & Winter, 2006].

Another typology is proposed by Burlton (2010), who distinguishes reference models into: (1) generic models, intended to describe organizations of all types in all sectors; (2) industry-specific models, that designate a set of existing and emerging models designed to describe an industry as a whole; (3) domain-specific models, developed around specific functions in an organization and the processes within them; and (4) process, lifecycle and value chain models.

4.2. Examples of reference models

Both the scientific and professional literature provides examples of reference models that can be use as described in figures below. Among such examples it is worth to mention those described in the following sub-sections.

4.2.1. APQC's Process Classification Framework (PCF)

American Productivity and Quality Center (APQC)⁷ is a non-profit organization established for helping organizations to improve their productivity and quality in 1977. The Process Classification Framework (PCF) was developed by APQC involving its member companies in 1992 to facilitate improvement through process management and benchmarking regardless of industry, size, or geography. The PCF is supported by the Open Standards Benchmarking Collaborative (OSBC) database of APQC and their advisory council of global industry leaders as an open standard.

The PCF organizes operating and management processes into 12 enterprise-level categories, including process groups and more than 1,500 processes and associated activities.

PCF is available for both cross-industry version and also industry-specific version for the following industries: Aerospace and defense, Automotive, Banking, Broadcasting, Consumer products, Education, Electric utilities, Petroleum downstream, Petroleum upstream, Pharmaceutical, Retail, and Telecommunication.



Figure 6: The layout of PCF

PCF processes are structures in five levels:

- Level 1 – Category: The highest level within the PCF (e.g., Design and Manage Operations).
- Level 2 – Process Groups: Process areas within each category (e.g., Plan for and acquire necessary resources—requisition planning.
- Level 3 – Process: Processes within each group (e.g., Manage enrollments for programs and services.
- Level 4 – Activity: Activities within a process (e.g., Develop baseline forecasts, Collaborate with community. Some processes include one more level detail within activity which is named as task.
- Level 5 – Task: Tasks within an activity (Develop improvement-planning and goal-setting procedures.

⁷ <http://www.apqc.org/process-classification-framework>

An interesting aspect of PCF is that it presents cross-industry processes while serving for specific industries at the same time. On the other hand, processes introduced by the framework may be too generic for some organizations to apply and this may be considered as a disadvantage.

4.2.2. Enhanced Telecom Operations Map (eTOM)

The Enhanced Telecom Operations Map (eTOM)⁸ is a business process framework developed for the telecommunication, media and entertainment industries. The eTOM provides a library of business processes that are then decomposed at different levels. The amount of details in process definition increases as leveling down from corporate level to lower levels. The structure of the processes is composed of horizontally and vertically crossing processes. Vertical processes are separated as corporate management and supporting processes, and operational processes. These can be thought as covering lifecycles and include end-to-end activities involving customers, supporting services, resources and suppliers/partners. On the other hand, horizontal processes represent major programs or functions that cut horizontally across the vertical ones, i.e. an enterprise's internal business activities.

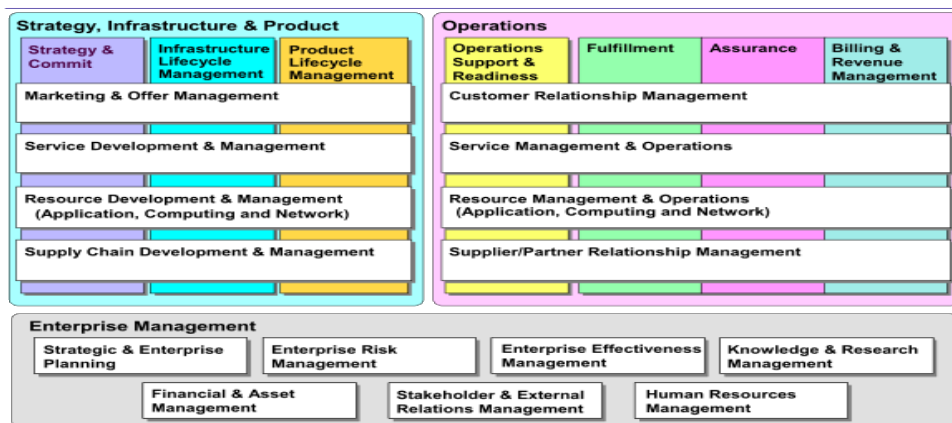


Figure 7: The layout of eTOM

The special characteristics of the telecommunication, media and entertainment industries justify the existence of a specific reference model where the typical processes of the industry are presented without the hindrance of trying to cover as well more traditional industries such as manufacturing.

4.2.3. Value Reference Model (Value Chain)

A Value Reference Model (VRM)⁹ is an integrating framework, established by the trade consortium Value Chain Group, supporting organizations for planning, governing, and executing with the objective of improving performance of all value chain. Value chain is a business management concept. Value chain is a high-level model of how businesses receive raw materials as input, add value to them through various processes and transform them to finished products, and sell finished products to customers as outputs. The value chain categorizes the generic value-adding activities of an organization [Brown, 2009]. The framework provides a semantic dictionary including processes, inputs/outputs, metrics and best practices in order to support and enable corporations to integrate their three critical domains; Global Product Developments, Global Supply Network Integration and Global Customer Success. The framework has three levels and the processes are categorized in these levels.

⁸ <http://www.tmforum.org/BusinessProcessFramework/1647/home.html>

⁹ <http://www.value-chain.org>



Figure 8: Value Reference Model

4.2.4. Supply Chain Operations Reference (SCOR)

Supply Chain Operations Reference (SCOR)¹⁰ is established by Supply Chain Council (SCC), which is an independent, nonprofit, global corporation with membership open to all companies and organizations interested in supply chain management systems and practices. SCOR is a unique framework that links business process, metrics, best practices and technology features into a unified structure in order to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities.

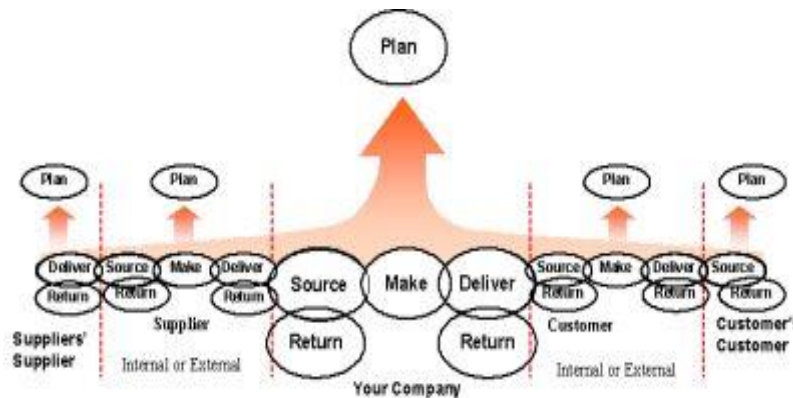


Figure 9: Supply Chain Operations Reference

4.2.5. EFQM

The Business Excellence Model introduced by The European Foundation for Quality Management (EFQM)¹¹ in order to be the driving force for Sustainable Excellence in Europe concerning Quality Management. The Business Excellence Model of EFQM is a self-assessment method focusing on five “enablers” and four “results”. The five “enablers” are Leadership, Strategy, People, Partnerships & Resources and Processes, Products & Services; and four “results” are Customer Results, People Results, Society Results, and Key Results. Enablers include what an organization does and results include what an organization’s achievements. The relation between enablers and results is the fact that enablers help for achievement in results and feedback from results help to improve enablers (Franchescini et al., 2007). This model shows the complexity in cause and effect relationship within an organization [Neely et al., 2000].

¹⁰ <https://supply-chain.org/scor>

¹¹ <http://www.efqm.org/en>

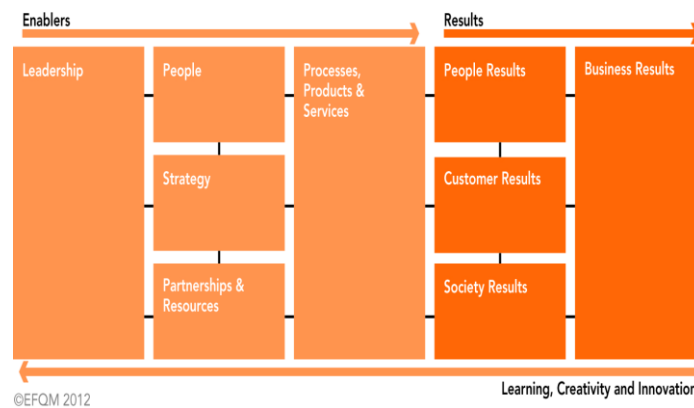


Figure 10: The layout of EFQM Model

4.2.6. HERO

Reference Ontology for Higher Education (HERO)¹² is the one of the ontology, which represents the Higher Education domain of knowledge.

The basic characteristic of an educational process is knowledge sharing. In this context it is important to have an efficient method for knowledge representation that uses the concepts specific to the educational domain [Oprea, 2012]. Ontologies provide a solution for solving the problem of knowledge representation. Educational ontologies can model the content of the course for all three phases of a didactical activity: teaching, learning and examination [Oprea, 2012].

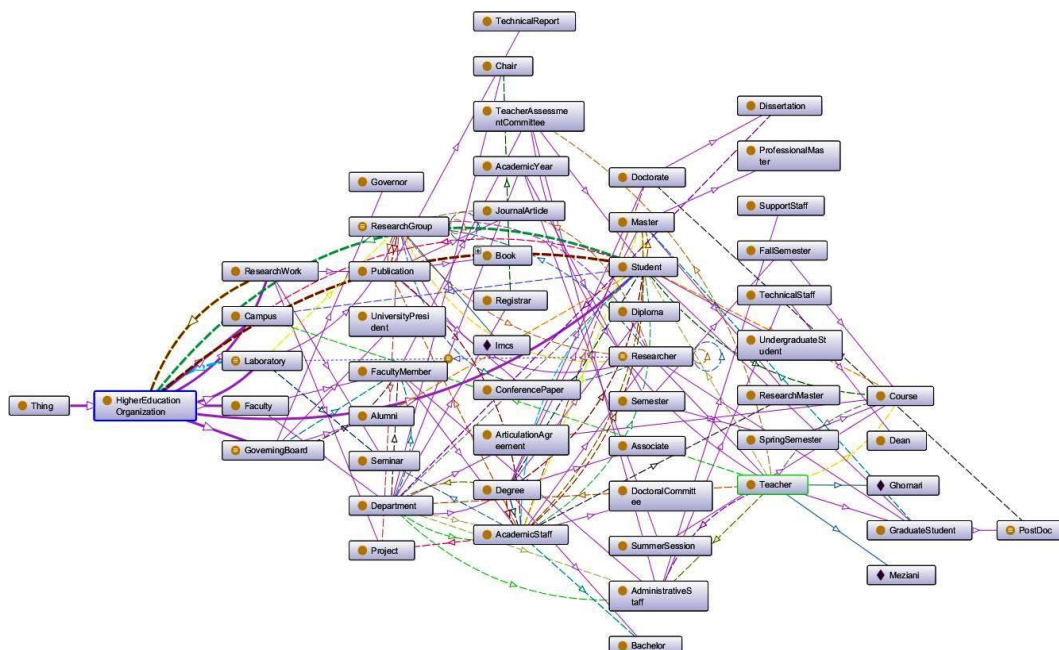


Figure 11: The ontology of higher education reference

This ontology defines elements for describing universities and the activities that occur at them. It includes concepts such as departments, faculty, students, courses, research, and publications. This ontology is a lightweight ontology (no inference rules are defined) [Ghomari, 2013].

¹² <http://www.herontology.esi.dz>

5. Proposal of a framework for defining organizational models of quality in HEIs

Fettke & Loos (2007) present a framework that organizes the process of formulating reference models into two stages: (1) the construction process, which is the first stage of reference modeling and results in a generic model; and (2) the application process, which is the utilization of this model by an organization, which results finally in its adaptation to that organization's specific situation. The goal of the construction process is to design and build a specific framework. Its main activities are definition of the problem, and the development, evaluation, and subsequent maintenance of the model. Schuette & Rotthowe (1998) note that this process can be considered a non-deterministic process, because different designs can produce different reference models of the same firm. Figure 9 illustrates the Proposal of a framework for defining organizational models of quality in HEIs.

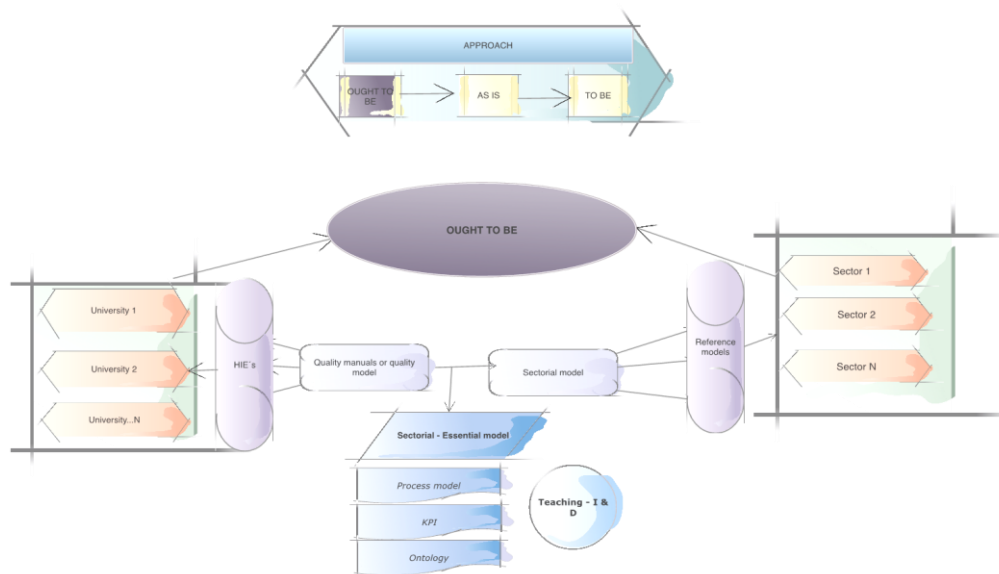


Figure 12: Framework for defining organizational model of quality in HEIs

Based on the structure shown in Figure 9, starts up to generate an OUGHT TO BE, in its original version, with 4 elements, including: clarification of the strategy, model of organizational architecture, objectives and indicators, and ontology. The representation is diverse, remaining unchanged OUGHT TO BE. All steps for this framework are described in sections 3 and 4 of the current article.

Conclusions

This article sought to highlight a real problem faced by many organizations today: their need to structure the deployment of references available on the market and in academia. It began by definitions of what is understood by “organizational development” and “reference model”, and then listed the some types in existence and their intrinsic characteristics. The article then sought to develop the conceptual structure surrounding the role of reference models in an organization's development. In the same way, this article sought to discuss about models in organizational development project namely the AS IS, TO BE and OUGHT TO BE Models. Sought to evidence that most organizations use the AS IS - TO BE approach, seeking to bring an alternative form of this approach using OUGHT TO BE model.

We suggest that instead of starting with the traditional approach AS IS then TO BE can start by OUGHT TO BE then - AS IS and finally TO BE, according the figures 2 and 9 of the present article.

Similarly, the article explained how to product the OUGHT TO BE model and how to use the reference models in this case.

The desired result was a single organization model that contemplated characteristic traits of the

organization's culture and business. No methods were found in the literature to guide the work of formulating such a model.

Here it should be stressed that the issues discussed relate to the conception of a first version of the framework for defining organizational models of quality in HEIs, which tends to be dynamic. This article concludes then, in view of the scenario of an evolving model, by mentioning the that reference model's potential in future stages of its maturation. By the fact that it defines the relationship among the themes, and states them explicitly, it can be more easily able to include new models that may come to be adopted by the organization. As soon as the focus of the new reference is identified, it will be easier to define what parts of the integrated reference model it should be "added" to.

Finally, the OUGHT TO BE approach tend to be a essential for developing models for organizational intervention and would be important if organizations could begin to adopt this kind of approach, this is simple and easy, once do not take into account what exists in the organization.

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