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A Maturity Model for Analyzing Strategic IT Management from a service perspective

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ABSTRACT

This paper presents the construction of a maturity model for analyzing the strategic IT service management process of internal IT service provider's in early growth stages. This model is presented as an alternative tool for improving the understanding, from an IT service management perspective, of: (i) the strategic IT processes/practices situation in an IT organization, and (ii) facilitate the improvement task of such IT organization. The model construction is done using a combination of best practices of IT service management and IT governance together with characteristics specific to the object under analysis, e.g. internal IT service providers, municipal governments standards. The model uses a wider scope for strategic ITSM, which facilitates its applicability in IT organizations in early growth stages, giving a practical value to the model.

Keywords (Required)

Strategic IT Service Management, Capability Maturity Model, Design science.

INTRODUCTION

IT Service Strategy is relatively a recent concept in IT service management (ITSM). Usually, the focus of ITSM has been the tactical-operational level (Galup, Dattero, Quan, & Conger, 2009; Hochstein, Tamm, & Brenner, 2005); but, as part of the evolution of ITSM, we observe in recent proposals a change of approach which is consequent with the idea that "ITSM seeks to align IT operations-related activities and the interactions of IT technical personnel with business customer and user processes" (Conger, Winniford, & Erickson-Harris, 2008). Then strategy is starting to appear in ITSM frameworks like ITIL V3 (Office of Government Commerce, 2007) and CMMI-SVC V2 (Carnegie Mellon University and Software Engineering Institute, 2009).

ITSM is usually published as best practices or detailed frameworks for organizational guidance, and it has been popular among practitioners in many IT organizations. However, a full implementation of ITSM frameworks is rarely done, it is too demanding for the organizations; usually, it is applied for some organizational processes.

The lack of use of these best practices or any other management framework is clearer in IT organizations in early growth stages where the use of self-defined practices or basic elements of traditional management frameworks are observed. The lack of resources of these IT organizations, and unawareness about applicable alternatives to their constrained context are issues to consider for the improvement of their situation. For these type of contexts, service management has an important potential due to the richness in details of the frameworks which makes easier an implementation into the organization and can provide customer oriented results which helps to the accountability and improvement of the organization. Again, the need of using it in proper dosage according to such context must be considered for these organizations, as well.

In order to facilitate the use of ITSM practices into an organization, mainly those in early growth stages, are required tools to make clearer the relation between the IT management practices existent in those organizations and IT service management practices. This would help to identify those processes or activities that can be supported or improved with ITSM practices (independently of its current use in the organization) and therefore an IT organization may decide the way of using these customer oriented practice to enrich the value that IT provides to the business.

Following the previous ideas with a focus in IT strategy, we propose a tool for analyzing IT strategy management (i.e. the process for IT strategy definition) from a service perspective. This tool is intended to facilitate the understanding of the practices that have value for the definition of an IT strategy from a service perspective; and to facilitate the improvement of such situation considering the usability in the context of organizations in early growth stages. This tool is a capability maturity model that includes detailed attributes, relevant for strategic IT service management, progressed in different growth stage of an IT organization. Although, several maturity models have been developed for IT management, few of them have a contribution into the IT service management field, and this one is specifically dealing with contexts of internal IT service providers in early growth stages of municipal governments, which are not discussed in previous research.

This maturity model can help to promote the use of ITSM in IT organizations since it can be used independently of the actual use of ITSM in the organization. For instance, it can be used as a tool for: the analysis of IT organizations that are already following a service approach; or the understanding of improvement possibilities from a service perspective for those IT organizations that are not using the service approach yet. The proposed model can be of interest for IT managers and practitioners in the area of ITSM, IT management in general, or interested in an approach focused in improvement of the value for customers.

The construction of this model is based on previous research about strategic IT management, service management, and maturity models that is adapted for a context that has been studied through qualitative research previously (López-Poveda, Rusu, & Johannesson, 2010) and this is reported in the rest of the paper.

Context

The model proposed in this paper is elaborated as a complementary component to add value to a previous method for analyzing IT service strategy in internal IT service providers of municipal governments in Nicaragua (López-Poveda et al., 2010), hereafter referred as AITSS method, which looked for best practices of ITIL V3 regarding IT service strategy practices or processes. The same organizational context is used for the purposes of this paper. The result of this paper makes the scope of the analysis wider than just ITIL's best practices and provide richer results to the IT organisation's personnel, as consequence of an evaluation of the AITSS method done from the implementer perspective (López-Poveda et al., 2011). Such context was already reported in (López-Poveda et al. 2010); however it is briefly introduced in this section.

The organizations under study are internal IT organizations delivering services to decentralized public sector organizations (business organization), i.e. municipalities. In general, these are small sized IT organizations within municipalities with limited assets in a developing country. As organizations of the public sector, the market competition is not a main concern, except for cases with a lack of cost effectiveness that can be provided by other organizations. The organizational structure of these municipalities varies depending on their assets and their served population; these municipalities are autonomous from central government; IT organizations are centralized within each business organization; the main IT services generally are categorized within: IS development, IT support, IT infrastructure, and IT management. The business strategy is planned for each governmental period, i.e. 4 years approx. IT strategy is rarely a formal document; operations plan are held in the municipalities for financial execution and accountability. The formalization of the systems, quantification or measurements are incipient, consequently the decision relevant data is not using measurements but the business guidance and the managers proposals from their experiences. The top IT leader in these organizations is usually under the authority of the main business decision makers, i.e. mayor, municipal council.

CONCEPT

The model proposed in this paper discusses the use of service management as a strategic enabler in dependence of the organization maturity. Therefore, the proposal is to use the service approach for IT management as complement to governance and strategic alignment, specifically from two perspectives: (i) the implementation of the service approach as an organizational strategy; (ii) the gathering and provision of decision making information with a service approach that can be used in the strategy formation and the strengthening of IT strategy. Usually service management has been separated of the strategic level; the concept in this research is implementing a service approach with a strategic vision.

The literature's definitions about strategic IT management (the general perspective and the service perspective) include: (i) defining standardized IT services based on inputs from the customer (Carnegie Mellon University and Software Engineering Institute, 2009); (ii) "creating a customer service culture that permeates throughout the corporation" (Roscitt & Parket, 1993); (iii) it "occurs when decisions and actions at all levels are driven by a few fundamental strategies or policies that are strongly endorsed as being critical for improving an agency's performance over the long run" (Poister & Streib, 1999, p.310); (iv) it may have a "focus on IT performance and the organization of IT performance measures" (Ojo & Janowski, 2010); (v) "The most important goal of IT planning has always been alignment of IT capabilities and activities with business objectives and business requirements, including decision making on the scope, scale, and pace of IT projects" (Van Der Zee & De Jong, 1999). These statements address issues related to organizational culture, policies and procedures, the strategy in itself, the processes to the formation of strategy, metrics, etc. Then, the understanding of strategy from a service perspective would need to consider those issues to observe the effects or existent situations.

RESEARCH BACKGROUND

This section briefly presents the main the main maturity models used as reference in this paper

Maturity Models

According to (Becker & Knackstedt, 2009), "a maturity model consists of a sequence of maturity levels for a class of objects. It represents an anticipated, desired, or typical evolution path of these objects shaped as discrete stages. Typically, these objects are organizations or processes. The bottom stage stands for an initial state that, for instance, can be characterized by an organization having little capabilities in the domain under consideration. In contrast, the highest stage represents a conception of total maturity". The maturity models provide a set of criteria and characteristics and these are showed in a scale according to an evolution path that are used for the appraisal of the organization or processes, then can be derived and prioritized "improvement measures and subsequently control the progress of their implementation" (Becker & Knackstedt, 2009) based on such evolution path.

Some of the most well known maturity models in IT management are CMMI, ITIL, and COBIT (Rogers, 2009); we use these models as reference and are briefly introduced below.

CMMI-SVC (Capability Maturity Model Integration for Services)

This maturity model is specifically designed for IT service management and draws on concepts from other standards and best practices such as: ITIL, ISO/IEC 20000, Cobit and ITSCMM. This framework includes 24 process areas for IT service management; one of them is specifically "Strategic Service Management" (STSM). These process areas are analysed using two types of levels: capability levels and maturity levels (see Figure 1); the capability levels "apply to an organization's process improvement achievement in individual process areas", and the maturity levels "apply to an organization's process improvement achievement across multiple process areas" (Carnegie Mellon University and Software Engineering Institute, 2009, pp.21-22)

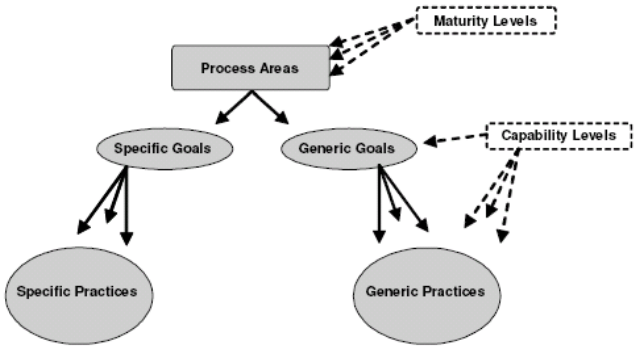

Figure 1. Structure of the continuous and staged representations of CMMI-SVC (Carnegie Mellon University and Software Engineering Institute, 2009)

ITIL (Information Technology Infrastructure Library)

For the implementation of ITIL is suggested the use of several maturity models for assessing the maturity of the service management processes of ITIL individually or as a whole. The most generic of them is the Organization Growth Model

(Office of Government Commerce, 2002) that we decide to use as input because it describes the evolution stages that has an IT organization (see Figure 2).

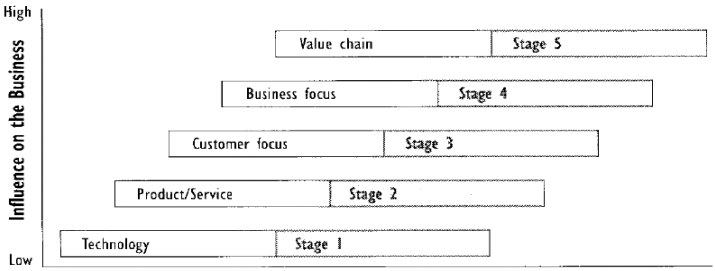

Figure 2. Organization Growth Model (Office of Government Commerce, 2002)

COBIT (Control Objectives for Information and related Technology)

According to their publications, "COBIT provides good practices across a domain and process framework and presents activities in a manageable and logical structure. COBIT's good practices represent the consensus of experts. They are strongly focused more on control, less on execution. These practices will help optimise IT-enabled investments, ensure service delivery and provide a measure against which to judge when things do go wrong." (IT Governance Institute, 2007). As a part of this framework there is a maturity model that uses a scale from non-existent (0) to optimised (5) which measures a series of principles in an incremental way, which are: Awareness and communication; Policies, plans and procedures; Tools and automation; Skills and expertise; Responsibility and accountability; Goal setting and measurement (IT Governance Institute, 2007).

DESIGN OF MATURITY MODELS

Design science as a paradigm for developing artefacts in a scientific approach has two main pillars: the "construction" (or development) of the artefact and its evaluation (for improvement and validation of the scientific result) (Iivari, 2007) (Hevner, Ram, March, & Park, 2004). The creative process of designing a solution for a practical problem is as relevant as its further evaluation in order to guarantee the rigor and relevance of the results. This paper presents the development of a maturity model; evaluation of the resultant artefact will be required later. According to (Iivari, 2007) the construction process should be made as transparent as possible to be considered a design science activity, and that is our interest for this model.

The development process uses a simplified version of the "procedure model for developing maturity models" (Becker & Knackstedt, 2009) with a top-down approach, specifying firstly the levels and their description, and after determining the corresponding characteristics (Lahrmann & Marx, 2010). The procedure followed for the model development is described in the following sections and summarized in Figure 3:

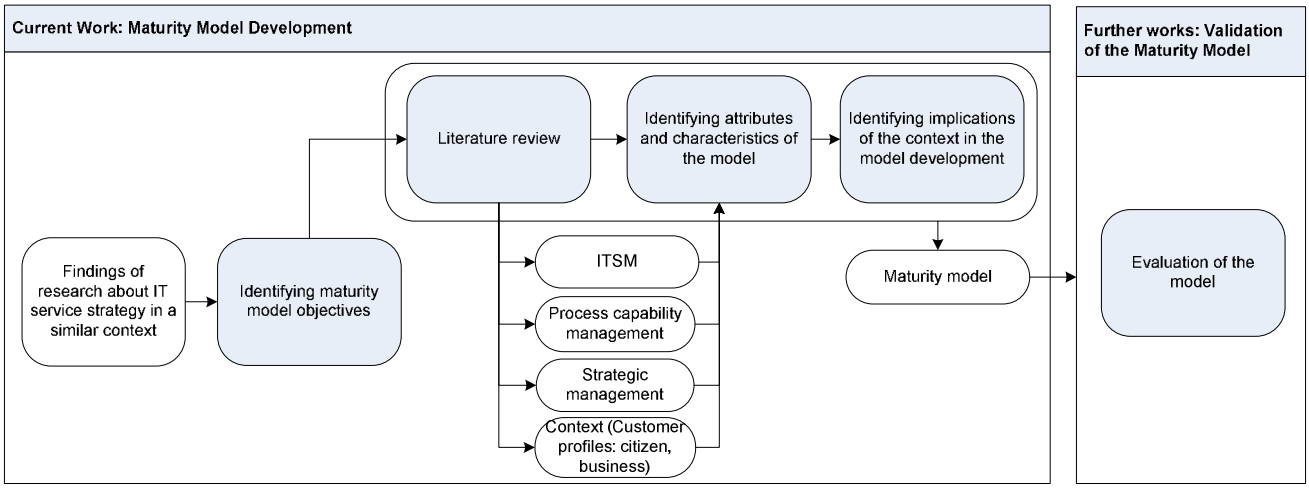

Figure 3. Research process

Identifying maturity model's objectives

The objective for this maturity model is: to enable the understanding of the strategic IT service management situation and improvement opportunities of an IT organization in early growth stages. A purposeful artefact is, according to design science concepts (Hevner, Ram, March, & Park, 2004), an attribute of the utility that such artefact, i.e. its practical use or ability to satisfy needs. Some guidelines that we add for this specific maturity model are the following ones:

1. Use a flexible perspective of IT (service) strategy management according to the maturity level of an IT organization.
2. Since this maturity model is for the analysis of a process, then the attributes that must be progressed (i.e. evolve in each maturity stage) into the model must consider three dimensions: objects, process and people abilities (Mettler, 2009).
3. Include attributes relevant for the analysis of IT service strategy management the different perspectives of interest: IT strategy, service approach, and IT processes (and perhaps standards of municipalities).
4. Include elements to ensure the suitability for the implementation in the context under study, i.e. internal IT organizations of municipal governments.

Developing the maturity model

The guidelines are used to guide specific activities for the development of the model.

Literature review

In order to determine the characteristics or attributes that are considered relevant for (guideline 2, 3 and 4) this model the following areas are used as main reference:

- Organization and Process improvement literature: i.e. Process capability management literature, since the object of analysis is a process; and organization improvement in other maturity models: since the interest is to observe the issue in dependence of the maturity of an organization;
- IT Service management literature: the service approach has main relevance for our objective; this also includes the internal IT service providers characteristics;
- Strategy management literature: in order to consider the aspect of strategy from different perspectives; and
- Municipal governments' standards with applicability for IT organizations that can be used to consider the citizen-customer in the model.

These concepts are used for the maturity model development. The literature used for the gathering of these characteristics or attributes is the following: the Maturity Model in COBIT 4.1 (IT Governance Institute, 2007, p.21), the IT Organisation Growth Model from ITIL (Office of Government Commerce, 2002), the service strategy processes of ITIL V3 (Office of Government Commerce, 2007), and the capability maturity model of CMMI-SVC (Carnegie Mellon University and Software Engineering Institute, 2009). The general foundations used in this model are shown in Figure 4.

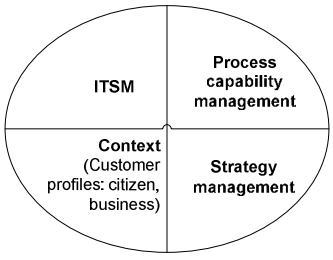

Figure 4. General concepts used for the development of the model

Identifying attributes and characteristics of the model

Most of the COBIT's and ITIL's attributes are consistent with the ones mentioned in the definitions of strategic IT management (see "Concept" section), and they are also useful to show the organizational and process growing in terms of objects, process, and person's abilities; therefore, they were adapted to the strategic IT service management process.

The Framework for Change of the early versions of ITIL has an organizational scope. The attributes from this framework were adapted as follows:

- Vision and strategy - the overall direction as it relates to the role and position of IT within the business" – Minor adaptations with the same concept

- "Steering - the objectives and goals of IT in relation to realising the strategy"- Minor adaptations with the same concept
- "Processes - the procedures needed to achieve the goals and objectives". This was changed to the way of doing the activities or processes to steer the organization and labelled "Processes for SITMS"
- "People - the skills and abilities needed to perform the processes". This was changed to skills and competencies required for the development of the strategic ITSM process and labelled "People regarding SITSM"
- "Technology - the supporting infrastructure to enable the processes to be carried out". This was changed to IT systems to support and enable the people and process for strategic IT service management, and labelled "Technology for SITSM"
- "Culture - the behaviour and attitude required in relation to the role of IT within the business."- Minor adaptations with the same concept

The COBIT 4.1 maturity model has a process scope. The attributes from these frameworks were adapted as follows:

- Awareness and communication: The "awareness" factor was traduced to "culture". The "communication" factor was included within the "Organizational structure/Reporting structure".
- Policies, plans and procedures: were added as a separated element
- Tools and automation: this was added to the "technology" attribute.
- Skills and expertise: this was added to the "people" element
- Responsibility and accountability: this was included into "organizational structure/reporting structure"
- Goal setting and measurements: this was reduced to "measurements" and "goal setting" included in "vision and strategy"

Some of these attributes remained with the same or similar concept; the attributes focused in concerns that are more closely related to process management suffered more drastic changes, i.e. the sentences of the original model of ITIL and COBIT were transformed for the strategic IT service management process using ITILV3 concepts and other complementary literature, e.g. characteristics of the "performance index" (time, cost, number of citizen visits) suggested in the IFC standard for latin-american municipalities (International Finance Corporation/The World Bank Group, 2009) and internal IT service providers characteristics. Our focus is to provide scenarios of strategic IT service management from an almost inexistent maturity towards a fully developed one.

The resultant attributes are summarized in Figure 5. The process of strategy development and the steering focus of the organization is diagnosed the strategy formation according to the organization maturity; and also the state of the whole IT organization capabilities are used to diagnose the state of alignment with a service perspective. These two aspects are related to organizational/reporting structure, which shows the consistency on strategy implementation at operational level.

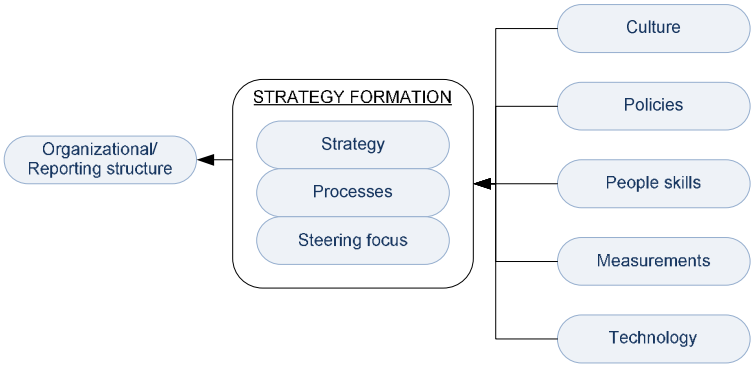

Figure 5. Attributes in the model

Finally, the Organisation Growth Model's stages were used as scale for the progressing of the attributes of this maturity model.

Implications of the context in the model

This section discusses the implications that the context has on the model development:

- Implications of the public sector characteristic: Since the model follows a service perspective, the customer is a relevant element for the model. Therefore, for the context under study (IT organizations of municipal governments), two main customers profiles are taken in consideration: citizen-customer and business-customer. The reason to consider these users as relevant for the model is to add the emphasis that public organizations' culture have about the service to the citizens; then the strategic practices performed by them must have an impact in the citizen's service, this is the reason of

existence of the municipal units; and this is something observed from the findings in the AITSS method previous research. Therefore, the artefact must be designed to present the relation existent between the attributes used to analyze IT service strategy and these customer profiles. Those attributes related with customer satisfaction and quality must have a relation with these profiles: for instance metrics dealing with customer satisfaction; improvement processes designed for the customer; the design of technology for the customer; or the culture that the organization promotes towards the customer. A more mature stage would show characteristics more concerned about each type of customer.

- Implications of the internal IT service provider perspective of the model: Issues like market competition are replaced for operational effectiveness (Office of Government Commerce, 2007).
- Since the process of IT service strategy management is analyzed with a flexible approach it is needed to have alternatives ways of maintaining the service approach into the model. Then we use the characteristics described for ITSM in ITILV3 (Office of Government Commerce, 2007-b) as a guidance of what should the model aim for:
    - Predicting needs "through preparation, analysis and examining customer usage patterns" (p.16)
    - Systematic use of service management practices that are "responsive, consistent and measurable, and define the provider's quality in the eyes of the customers.
    - Continuously analyse and fine tune services provision to maintain stable, reliable, yet adaptive and responsive services.

RESULT: THE CAPABILITY MATURITY MODEL

A summarized version of the resultant model after applying the procedure described in the previous section is presented in Figure 6 (see next page). A detailed version can be seen in http://www.alopez.uni.edu.ni/modelPC/

REVIEW AGAINST RELATED MODELS

There are many maturity models with different approaches, and some of them are related to the area of interest of the model proposed in this paper. Some of the most well-know and recent are discussed below:

- CMMI-SVC is a well-known maturity model with a set of process areas intended for improvement of ITSM processes. One of those process areas, i.e. "strategic IT service management", is specifically related to the topic proposed in this model. However, CMMI discusses this process area with a narrower scope which deals with process standardization based on customer inputs; the progression (characteristics of the attributes in the different maturity levels) of the related process is not.
- ITIL (Organisation Growth Model - OGM). This is a maturity based on service management according to the early proposals in ITIL which, therefore, lacks of the perspective of its use as a strategic asset, and focus mainly in operations; however, it has been a reference point for the model proposed in this paper.
- COBIT 4.1: In general COBIT gives support to IT Governance (i.e. leadership, organizational structure and processes required to meet strategies and objectives) through the assessment of IT process capabilities. There is a specific control objective addressing IT planning which includes a maturity model with a detailed progression. This model does not include the service approach; therefore, it implies that some concepts and attributes in the model would not be adequate, like the types of customers.
- A Maturity Model for Implementing ITIL V3 (Pereira de Sousa & Mira da Silva, 2010); this model discusses the implementation of the main processes in the whole ITIL V3 in stages depending on the organization maturity. The level of this model is more general than the proposed in this paper, including all the processes in ITIL without going to specific attributes of them and without considering the existence of these processes in different maturity stages.

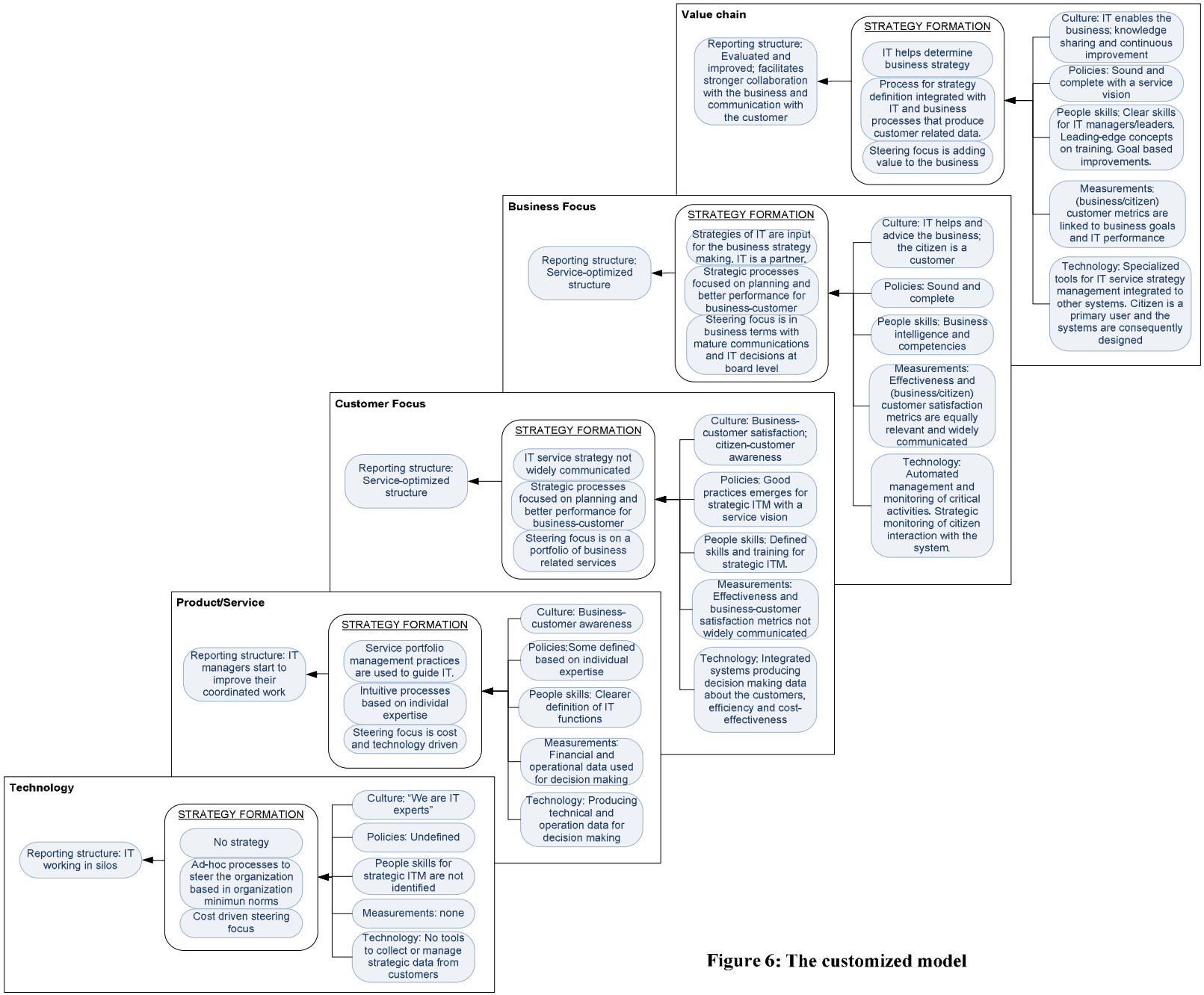

Figure 6: The customized model

- Strategic Alignment Maturity Model (SAMM): Its focus is strategic business-IT alignment (Luftman, 2003). Although the model proposed in this paper may have a relationship with the SAMM, the focus is different. The model proposed in this paper is about the use of the service approach as strategic asset or an organizational strategy (not the unique one); but the attributes are the relationship between strategy and service management within an organization. Since the SAMM model deals with strategic concerns, some common concepts can be observed between both models, as it also happens between the different maturity models in IT management; however, the priorities of both models are separated. Moreover, the proposal of this paper addresses a context related solution that is not considered in the SAMM that has implications in the model progression.
- The situation is similar with the Customer-Provider Strategic Alignment Maturity Model which focus is strategic business-IT alignment for services in the cases of outsourcing, i.e. the alignment of outsourcing relationships. Additionally to the differences previously described with the SAMM, the main difference between the proposed model proposed and this model is the focus in external/internal relationships, i.e. outsourcing, against internal providers relationships.

Therefore, the model proposed is better suited for contexts of organizations in early growth stages with situations similar to the ones in developing countries that are interested in using service management to improve their IT management in a strategic perspective.

IMPLEMENTATION SUGGESTIONS

The maturity models generally suggest an implementation approach for their scales. For the assessment of an organization with the capability maturity model proposed in this paper, a flexible approach would be more consistent and facilitate the understanding of the organization's situation. Therefore, the suggestion is to apply it considering the maturity scale (technology to value change) as a representation of generic organizational stages but considering that the organization situation regarding each attribute can have characteristics within several of these stages, which also has to be taken into account for the improvement planning.

In addition, for the gathering of empirical data for each of the model attributes, in case of using a case study approach must be considered they type of data required therefore different actors or interviewees must be considered for each attribute. For instance: "Vision and strategy" might require interviews with IT leaders, IT managers, business managers involved with IT, and business decision makers; other data sources like documentary evidences or observations of their existent practices should be gathered to triangulate the results. Another example is the "technology" attribute which might require interviews with IT decision makers, IT operations personnel, and business users; together with other sources like documentary data regarding the citizen's use of IT, or observation of processes in which the customer use IT.

DISCUSSION

Although this model was designed for IT organizations of municipalities in early growth stages, it does not mean that it is exclusively applicable in these contexts. However, if the model is intended to be used in other context that does not share the same type of customer profiles then a customization of all the attributes dealing with customer issues must be re-adapted. For instance, if the model is considered for application in other public sector organization instead of municipalities, the elements should be still valid (if the organization serves the two customer profiles); in case of a change to a private sector environment, the model would need a customization.

CONCLUSIONS AND FURTHER WORKS

A prototype model for analyzing IT service strategy management was presented which combines approaches from IT service management and IT governance. This artefact facilitates the recognition or use of service management concepts in the strategic management of IT organizations. The model was designed for analyzing the situation of internal IT organizations in early growth stages, of municipalities; but can be used for organizations in any growth stage. This model might promote the use of ITSM practices for IT strategy management as an alternative that can be used alone or as supportive tool for other IT governance frameworks in order to take advantage of the business value of IT for the customers.

From the development process of the proposed model, it can be observed the relevance of the context for the design of an artefact and how to use it in the design process. In order to validate the proposed model an evaluation with end-users is required as a further step, which can be done through a test in real life.

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