BPM Model of GQIMP for ISO 9001:2008 supported by CASE tools

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Abstract – Abstract - This paper describes a methodology which combines Goals, Questions, Indicators, Measures and Procedures (GQIMP), aimed at the implementation of ISO9001, to structure the operation of a Service Center, in a context of Business Process Modeling (BPM). The methodology GQIMP was structured based on BPM approach. In this case, the BPM modeling was used to define the scope of Service Centers. The GQIMP methodology is a form of integration that uses a heuristic process of Causal Analysis and Resolution (CAR). In this context, a CAR was used to identify the necessary components to enable BPM Service Centers. The conceived model was systematized by means of a CASE tool which allowed the integration of Quality Management System (QMS) in an integrated way into a ISO 9001:2008 real case. The results through the selection of this strategy presents is lean and concise, for obtaining ISO certification. In this context, this model is driven by process indicators that support a CASE tools instrumentalization.

Key Words - GQIMP, ISO 9001:2008, BPM, Service Center, and Quality Certification driven models.

I. INTRODUCTION

This article tackles a Service Center comprised by physical structures and staffing, aiming to centralize a range of activities and services of interest to public attendance and general government. This Service Center has been generalized, in order that the model can be reused in other localities, aimed at maintaining the lowest possible customization established standard of quality.

The identification of processes in a Service Center is a key part in any form of model implementation process of ISO 9001:2008 [1].

Figure 1 presents a way to integrate the Causal Analysis and Resolution (CAR), an Process Area (PA), the Capacity Maturity Model Integrated (CMMi) [2] with GQIMP [3] in the composition of the Business Process Modeling (BPM) [4] for Service Centers.

II. CAR

In this context, stabilized by heuristic processes, the candidate process must be identified, conceived, selected, and modeled, using heuristic techniques. The use of this CAR was applied to solve operational problems in the Service Center.

In this case, the opportunity to implement ISO process was performed in Service Centers and identified how its products, procedures and processes composed the BPM Service Centers.

The PA CAR provides guidelines to search for goals and solution for problems and, in this case, the problem identified was the process definition of BPM Customer Service. An analysis of PA CAR followed with applied research; basically a framework, as seen in Figure 2.
I. GQIMP

The concept for the Quantitative and Qualitative Control was originated in the report of the U.S. Department of Defense - DoD (PARK, GOETHERT, and FLORAC, 1996), creating a manageable environment. For the management effectiveness, collecting and analyzing metrics are needed to improve the measurement process. At this point, the concepts of PA Measurement and Analysis (MA) were used, working with the GQ(i)M methodology [5].

Following the suggestion of GQ(i)M, contained in specialized work as the Goal-Driven Software Measurement - A Guidebook CMU SEI96-HB-002, it was not found any direct reference to the GQ(i)M, and the same to the PA MA of CMMi [5]. However, it was adopted that in this proposal a GQ(i)M use describes how to complement each other.

The use of GQ(i)M is focused on specific problems of implementing database. In this context, for the identification of objectives, a process of inference to characterize, understand, and use questions and answers was conducted. This process is based on derivations of metrics GQ(i)M to create indicators for each process area scope, set to obtain the certification of ISO 9001:2008.

These concepts were developed for software factories and a set of indicators was created to embedded processes, to improve Software Development Life Cycle (SDLC). These needs were observed during the selection process metrics, GQM and practices was proposed by Basili [6].

Case studies were used to analyze the vulnerabilities of this information and to check which were the gains and/or losses. These studies have been possible to relate the concepts provided from GQ(i)M with the guidelines of ISO 9001:2008.

In order to integrate the objectives of these concepts it were developed some questions, metrics, and indicators in order to monitor the testing phase and approval into lines of production software [7].

For this phase the process was considered in the same development environment and it were not selected metrics, difficult to collect [5].

Figure 3 shows the levels of GQ(i)M that can be applied to the products, processes, and resources lifecycle of the system. The GQ(i)M vision is applied to the MA control of the products database dimensions. The GQ(i)M vision referenced is a top-down approach.

The GQIMP methodology is an extension of GQ(i)M [5], with the primary difference the fact of having a heuristic process for identifying goals, as well as the processes that supported it by CAR.

In order to identify the administrative needs, an analysis was conducted for the CAR context of Service Centers. Figure 3 shows an exemple of GQIMP.
Based on the procedures performed and defined by PA CAR, data and information obtained by the methodology GQIMP were used to perform a BPM Customer Service Center [4].

II. PDCA

Structurally, BPM modeling organizes macros concepts PDCA [8] [9]. The methodology used CAR [10] to identify the fundamentals of the processes that were selected in order to define the scope of ISO 9001:2008 [1], as well as providing the necessary information to enable the structuring the GQIMP.

The concepts were incorporated into the PDCA process modeling, containing indicators GQIMP, Customer Service Center. Each of processes GQIMP it were organized, using a concept of PDCA. In this case, follow the definitions of the areas of PDCA process.

• PLAN - The plan of the activity was established according to the objectives, indicators and indicator parameters GQIMP defined processes.

• DO - Implementation of the plan occurred through the implementation process mapped. It is this step which is performed the acquisition of data and information in order to provide the necessary elements for the checking phase of the data.

• CHECK - Step fundamental, which aims to analyze the results of an investigation and was obtained and verified by the indicator GQIMP.

• ACT - Acting in corrective action is expected at this stage. After identifying problems in the activities to be realigned, the significant differences between actual results and planned needed to be addressed.

In each instance of the processes conducted, a new PDCA cycle was performed. After several recurrences of this cycle processes it could be refined for continuous improvement of each specific point investigated in the respective phases.

III. BPM

The methodology GQIMP is structured in the way that modeling BPM [4] was used to define the scope of Service Centers. This organization enables the BPM process organization as shown in Figure 4. This tool permits the creation of web sites automatically.
The model BPM Process Opening Unit was implemented through the Bizagi Process Modeler Suite [11]. The Bizagi is a CASE tool for process modeling BPM [4]. The visualization of modeling is easy by the availability of the model via the internet browser. The use of such a tool BPM enabled an understanding, a detailed and objective, each of the steps, and connections of processes, their relationships and solutions. This tool enables the identification of activities to be performed and documents to be used in the process.

However, the problem was reworked, generated by the use of obsolete records. Documents updated and obsolete were stored in the tool under version control, and could be recovered. This version control exists to prevent conformance points, second the guidelines developed by ISO9001:2008.

To solve this problem versioning artifacts, integration [1] [12] was held in the tool case DCONIX ® [13], a suite designed to instrumentalization of Quality Management System (QMS). This integration was to enable secure access to the latest version of the artifacts configurable process.

IV. DOCNIX

The main features of the DCONIX ® CASE tool were used for integration of the concepts of the QMS, the Quality Management System., In this context [1], the tool provided the integration of process models in the BPM Service Centers within an organization established by the PDCA and control records.

One of the main attributes for this integration was obtained with the control systems of information, obtained in operation [14] [15]. This control enables the management of the QMS through a centralized repository, containing reliable and updated information on the progress of the operation activities [1].

Remote access over the internet enables the control of tools, enabling the monitoring activities and reporting emissions. This visibility in project management provides checks and inspections necessary for the maintenance of ISO 9001:2008.

CASE tools BIZAGI ® and DOCNIX ® enabled the operationalization of the proposed model to test the concept of call centers, meeting the need for control of QMS Customer Service.

The integration of the concepts of BPM BIGAGI ® with register control tool DOCNIX ® on a single platform was performed with low aggregation, facilitating maintenance. The developed web interfaces can be viewed in Figure 5.
V. RECOMMENDATIONS AND SUGGESTIONS

It is recommended to use the Model BPM GQIMP to ISO 9001:2008, using CASE tools for organizations that wish to really get certifications.

In this scenario, it is suggested to start with the implementation of the certification rules, since its inception, using the methodology discussed in this paper.

Using this methodology, it was possible to adequately measure the quantitative controls and organize the activities to be performed. The extent of these processes and the proposed methods is at the discretion of research groups interested in the concept of quality improvement, using management information systems supported by CASE tools [14][15].

It is suggested using the conceptual model GQIMP for database projects, which is implemented for Production Lines Manufacturing Cell [7]. The model GQIMP [3] can be constantly revisited, refined, and customized for each new Production Line products and or services used.

T is also suggested the application of this model in Software Factories [7], in order to target gain scale in the production of software at the time of selection techniques during the planning phase of the project.

VI. CONCLUSIONS AND FUTURE WORK

The monitoring of current trends, through the application of concepts, as well as heuristic techniques for databases, represents alternatives for the preparation and implementation of new technologies.

In this work, the methodology discussed can be applied in the phases of start-ups to enterprises seeking certification. Currently, to enable competitiveness in globalized markets, newly established companies that have their goals standardized, its processes have statistically higher probability of success.

Depending on the business segment of the company, an ISO 9001:2008 can be a differentiator that enables business opportunities in a more rigorous way. As an example, it can be mentioned partnerships with companies already established in the market, and participation in government procurement, among others. In this case, the methodology GQIMP can be customized according to the business rules of each company, enabling defined standards of quality and compliance processes involved.

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VIII. BIBLIOGRAPHY


