

Analyzing software process alignment with organizational business strategies using an agent- and goal-oriented analysis technique - an experience report

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Abstract. The continuous alignment of organizational processes with an organizations' business strategy is a key factor to its success. This paper reports on the application of the i* framework to support the continuous alignment of corrective software maintenance processes with the strategic goals of a Software Design Maintenance Organization at Ericsson Marconi Spa. Using the i* modeling framework, alignment of process elements with related business goals was successfully represented, captured and analyzed, which in turn facilitated process improvement efforts. To better deal with large i* models, a model slicing technique based on goals was introduced, which made models more readable, and contributed substantially to how the maintenance processes were analyzed and improved.

Keywords: Organization model, software maintenance organization, business process reengineering.

1 Introduction

Customer satisfaction is a key success criteria and driving force not only at Ericsson Marconi Spa, but for Ericsson worldwide also. Internal design centers world wide are as a matter of routine compared with each other on merit of customer satisfaction, effectively creating much internal competition.

While customer satisfaction is an important driving force for all departments in a local design center, it is the product maintenance department, and how it manages product maintenance requests, that are often most visible to the customer. Maintenance therefore most directly affects customer's satisfaction, and strategies employed by design centers on how to effectively design maintenance processes are key contributors to attaining the organizations most important business goals.

According to Michael Porter [2], strategy involves two main components: unique strategy and operational effectiveness, both of which are essential to the formulation of a successful business strategy.

Unique strategy concerns with what a company does differently from its rival. This includes differences in how they design their processes, use resources, etc, all of which provides a competitive advantage. Operational effectiveness is about performing activities and using technology according to known best practices.

2 Objectives of the research

The objective of this research is to provide modeling and analysis facilities that support representing, capturing and analyzing the key business drivers of Ericsson Marconi Spa's maintenance organization, and how these drive strategy formulation, and consequently the manner how maintenance processes are designed. This research adopts the i* modeling framework as the modeling technique for this purpose.

3 Scientific Contributions

This research offers two main contributions. First, it applies the i* modeling framework to represent, capture and analyzing the alignment of business goals and strategies with processes of Ericsson Marconi Spa's maintenance organization. Second, it introduces a model slicing mechanism to better support the modeling and analysis process.

Discussing the second contribution first, the slicing mechanism helps cope with the large amount of information typically found in i* process models. Instead of dealing with one large diagram, several smaller diagrams are produced, each capturing how a specific operational business goal or particular maintenance related purposes, are achieved. Operational goals are derived from business strategies identified earlier, while maintenance related purposes are derived from the maintenance organizations mission.

Operational goals and purposes serve as structuring criteria for the modeling of maintenance processes, effectively establishing different concern or viewpoints over the overall processes.

Furthermore, using goals and purposes as slicing criteria leads to the partitioning of the overall process descriptions into relatively independent viewpoints, with clearly defined intentional dependencies between the different views. In addition, we observe that by slicing along the lines of goals and purposes, no duplicate information is captured in different viewpoint diagrams, thereby eliminating the need for consistency checking across viewpoints, which improves the maintainability of these diagrams (changes in one diagram does not affect other diagrams). Finally, navigating process descriptions through the use of single views results in easier way to understanding the reasons (the "why") certain process elements were introduced (the "what") to the process.

Following additional advantages to having viewpoints can be identified:

- a) each viewpoint is dedicated to a particular operational goal or maintenance purpose; this helps to further distinguish between whether process elements contribute to a business goals, or to particular maintenance purpose;
- b) each viewpoint is dedicated to supporting a particular customer need; this helps identify whether processes exist that address particular customer needs;
- c) with operational and maintenance goals derived from higher level business strategies, a clear link between process, goals and strategies can be identified
- d) each viewpoint is independently be aligned to associated goal; misalignments within each viewpoint can thus more easily be identified.

Slicing process models into viewpoints therefore not only helps in overcoming the information overload problem found in large process diagrams, but also offer a better way to understanding, managing, changing and improving processes.

Considering the first contribution, following is a partial description of a corrective software maintenance process, as defined in one Ericsson Marconi Spa Design Maintenance Organization (DM).

Figure 1 captures relevant roles and positions identifiable within the Design Maintenance organization, while figure 2 captures one viewpoint of a maintenance process that specifically deals with the operational goal of keeping the approved correction cancellation rate less than 2.5% percent.

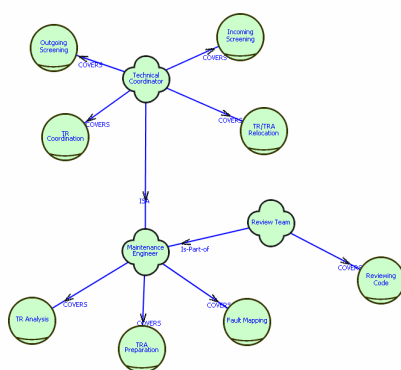


Fig. 1. Roles covered by some of DM positions

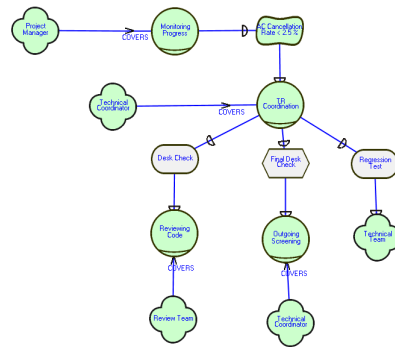


Fig. 2. Strategic dependencies to achieve the business goal to have a reduced AC cancellation rate

A different viewpoint (not shown here) was produced to capture the business process related to the operational goal to obtain a “TR” closure rate < 3 days (TR standing for Trouble Report, a formal notification of a fault).

4 Conclusions

Using the i* framework assisted in understanding how business process relate to operational business goals, which in turn were derived from business strategy. By slicing process diagrams along the lines of operational goals, guided the analysis process and helped improve the understandability of individual diagrams. Utilizing these diagrams help maintenance team members to better understand the maintenance processes, and offered opportunities to make suggestions for process improvements.

The increased understanding of the maintenance processes was particularly important for the engineers, in particular gaining insights into the reasons why certain process elements were needed, since it further motivated them in executing the process in the manner they were specified.

As an overall result this lead to the better management of corrective maintenance, to decreased lead time; and thereby, to increased productivity [4].

5 Ongoing and future work

Future work would focus on extending the framework as more experience is gained in modeling and analyzing processes in light of business strategy and process improvement. Another avenue of interest is aligning the framework with Object-oriented development processes and methodologies already established within Ericsson Marconi Spa.

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