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Abstract

Process improvements within ITSM are guided by prescriptions of frameworks like ITIL and ISO 20000. Since improvements cause costs, they need to be beneficial to the respective organization. This means to implement ITSM process improvement frameworks according to the specific needs of organizations.

In this research in progress a concept is presented that supports this approach by sharing knowledge to facilitate process improvements. The concept is successfully validated by an industry case for the ISO 20000 standard.

Keywords

IT Service Management (ITSM), ISO 20000, cost efficiency, organizational needs, concept

1. Introduction

Process improvements within ITSM are guided by prescriptions of frameworks like ITIL and ISO 20000. They take a holistic approach towards improving the entire value creation chain of IT based service provision. Since process improvements cause costs (Deutscher & Felden 2009), planned improvements need to be beneficial to the respective organization. This means to implement process improvement frameworks in a case dependent and suitable intensity as demanded by Cater-Steel et al. (Cater-Steel et al. 2006). Since a recent literature scan did not reveal any solutions, the aim of this research in progress is to investigate in this issue.

Therefore, a concept is presented that supports the identification of improvement opportunities provided by ITSM frameworks to address the specific needs of an organization. The concept is based on creating a shared understanding regarding the improvement options given by ITSM frameworks. This is achieved through gathering knowledge in a structured conduct by the application of certain interpretation techniques. The concept supports the creation of a single point of truth, regarding meaning, benefits and prerequisites of each improvement option. It successfully passed an industry validation case.

In the remainder, the concept and the validation case are presented. The paper is concluded by a summary of results and future perspectives for research continuation are given.

2. Concept

The concept is based on sharing knowledge that provides transparency to control processes (Beimborn et al. 2009; Eppler et al. 1999). This is understood as key to continuous innovation and process improvements, which leads to competitive advantages (Nonaka & Takeuchi 1995).

In the specific case of this research, the sharing of knowledge is used to support the identification of improvement opportunities provided by ITSM frameworks. Such opportunities will be further denoted as *objectives* that comprise one or several requirements defined by an ITSM framework. If the requirements are fulfilled, new provisions become available to the organization. However, it is part of the presented concept to analyze whether objectives are beneficial depending on each organization's individual case.

The sharing of knowledge is implemented in a two-stage process following Nonaka's dynamic theory of organizational knowledge creation (Nonaka & Takeuchi 1995):

1. The *externalization of knowledge stage* is performed by using certain interpretation modes. Each used mode is intended to elicit certain aspects of the subject under consideration. This approach is based on interpretation modes used in roman and specifically German jurisprudence (Larenz 1991). The following interpretation modes are used:
    a. A *literal interpretation* of the objective provides a fundamental starting point for further analysis. The leading questions for elicitation of this aspect is "what is the meaning of the objective?".
    b. A *purposive interpretation* provides insights regarding the aims connected with the implementation of the considered objective. The main question for elicitation is "which capabilities will the organization gain by attainment of this objective?"
    c. A *hierarchical interpretation* elicits prerequisites of an analyzed objective. The main question for elicitation is "which capabilities are required to attain this objective?" and "which capabilities support the attainment of this objective?" This interpretation mode supports the identification of dependencies among interrelating objectives, which is specifically useful for implementation planning.
2. The *internalization of knowledge stage* supports access to the gathered knowledge by a structured documentation that follows an approach as depicted by Figure 1. Thus, the knowledge is not bound to individuals and individuals can independently internalize the knowledge as desired.

Each objective is enriched by the knowledge gathered in the first stage. Furthermore, the purposive and hierarchical interpretation allow the identification of cross dependencies. This is achieved by linking required capabilities with capabilities gained through implementation of other objectives as depicted in Figure 1. Therefore, the creation of implementation sequences is supported by a capability based identification of interrelations among objectives.

3. Validation

The validation's intent is to confirm whether the proposed concept is capable of solving assigned tasks (Balci & Sargent 1982; Carson 2002). It was conducted in cooperation with an

industry firm[1] that aims to reduce service disruptions caused by operational incidents. The approach taken for improvement is based on the ISO 20000 framework. Therefore, the objectives to be analyzed are requirements defined by ISO 20000. Several certified experts were available for interviews, which eased the validation process. The interviews were conducted by following the interpretation modes defined in the concept. The results are documented in a structured word document. A sample is shown in Table 1:
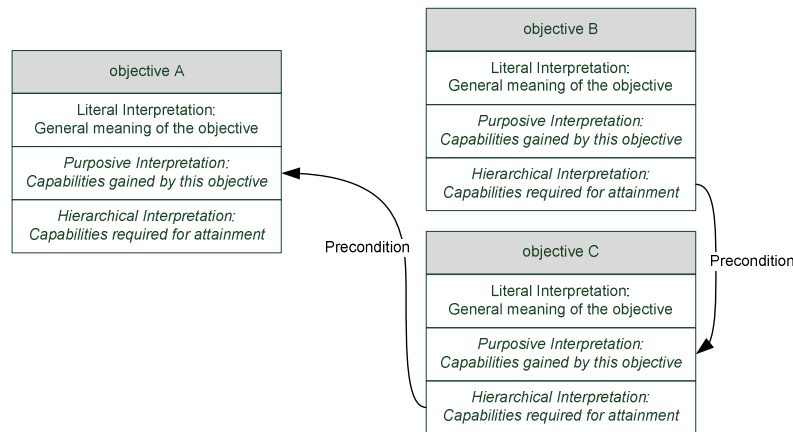

Figure 1: Structured documentation of gathered knowledge and dependencies identified among objectives.

Objective no. 3.1.3: "Procedures shall define the recording of all incidents" (ISO 20000-1)	
Interpretation mode	*Interview results*
Literal interpretation:	The recording of incidents should be defined by procedures. A bypass of event message processing is to be excluded. An incident is provided by a customer, for example via mail, telephone or fax. The incident will initiate the opening of a new ticket and all required information will be recorded by the service desk.
Purposive interpretation:	Incidents embodied by the same message type will be recorded uniquely and the recording is independent of individuals. The procedures serve as foundation for a workflow that can be supported by IS. Furthermore, statistical analyses can be conducted, for instance to document the fulfilment of service level agreements (SLA's).
Hierarchical interpretation:	The requirements for incident processing are to be available and reviewed on a regular basis. Furthermore, input from service level management and operations management is required.
Objective no. 3.1.2: "All incidents shall be recorded" (ISO 20000-1)	
Interpretation mode	*Interview results*
Literal interpretation:	All incidents are to be recorded. An incident may be a false report (a non-agreed service or performance is not met), fault (an agreed service characteristic is not met) or a note (the agreed services are delivered, but the customer addresses from his point of view a proposal for improvement).
Purposive interpretation:	No incident gets lost. The complete recording allows creating reliable statistics for the coordination of improvements. Accumulations of quality deviations can be identified and the issue can be clearly addressed to responsible units / teams.
Hierarchical interpretation:	It is to be defined how and what is to be recorded. This information is to be updated, if changes occur.

Table 1: Sample result of applying the concept's interpretation modes to objectives defined by the ISO 20000 standard.

[1] T-Systems Multimedia Solutions GmbH,
Corporate Unit Innovation & Internationalisierung,
Riesaer Str. 5, 01129 Dresden, Germany.

It can be deduced that the second objective requires capabilities that can be provided by implementation of the first objective. This is determined by scanning capability provisions of other objectives that match capabilities required of an objective under consideration. Preconditions are identified after interpretation of objectives. An objective may have any number of preconditions.

Furthermore, the results were visualized in a map following the idea provided in the concept stage. The map's relevant part to the validation case is depicted in Figure 2.
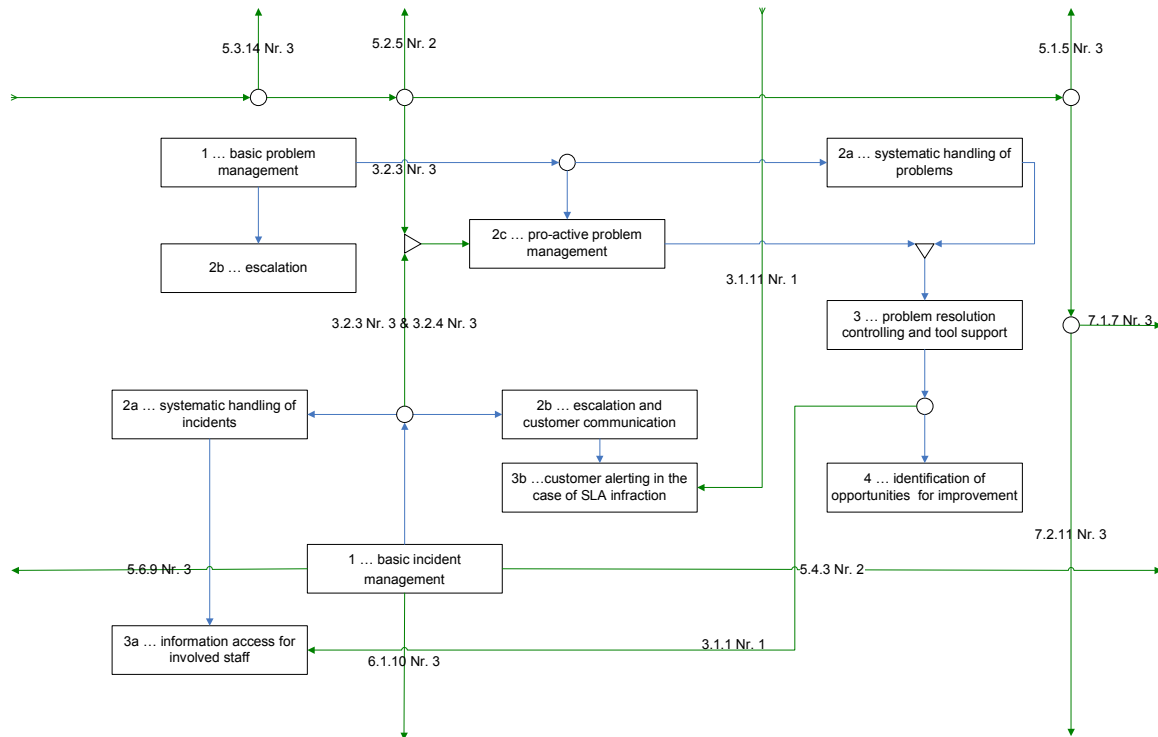

Figure 2: Excerpt of created dependency map that visualizes objectives and dependencies of the ISO 20000 standard.

The directed graphs between the boxes represent dependencies between objectives. They are inferred based on the gained knowledge by purposive and hierarchical interpretation modes. The shown boxes represent groups of dependent objectives that provide relevant capabilities to the IT and its organization. They are identified with domain experts of the cooperation partner based on dependencies in the ontology. For example, *basic problem management* consists of the following ISO 20000 requirements (ISO 20000-1): Procedures shall define the recording of all problems; All identified problems shall be recorded; Procedures shall define the updating of all problems; Changes required in order to correct the underlying cause of problems shall be passed to the change management process; Procedures shall define the formal closure of all problems. Creating such groups of dependent objectives provides two benefits: *First*, the visualization of complex ontologies is eased due to a reduced number of elements to be drawn. *Second*, more high-level capabilities are defined by creating groups that ease the selection to solve the needs/lacks that are identified. The circular shaped line connector serves as distribution point for one dependency. For example, *basic problem management* serves as precondition for *pro-active problem management* and *systematic handling of problems*. The rectangular shaped line connector denotes an alternative regarding the path that can be taken for implementation (understood as logical or). For example,

problem resolution controlling and tool support can be implemented by *pro-active problem management* and/or by *systematic handling of problems*.

The analysis at our cooperation partner revealed the need to improve the resolution processes that are intended to resolve service disruptions and thereby restore usual service provision according to ISO 20000 (ISO 20000-1). In particular, options were considered that could reduce costs of resolution processes. The results highlight a lack of support in documenting *known errors*. A *known error* is a service disruption for which the cause is found or a workaround exists. Without documentation of *known errors*, issues cannot be identified as reoccurring for which solutions are on hand. This results in high-resolution times through not using gathered experiences. Therefore, the specific need in this case is to reduce costs by an improved support in documenting *known errors*. In order to reduce costs, an access to a database that embodies all known errors can reduce time required to restore service operations. This capability can be provided by implementation of a *known error* database that is provided by the objective *problem resolution controlling and tool support* (see Figure 2).

However, the implementation of the objective *problem resolution controlling and tool support* has several preconditions (see Figure 2). They can be fulfilled by other objectives within *problem management*, a sub-process of the *resolution processes* (ISO 20000-1). The map is used in order to identify additional objectives – representing required capabilities: Several dependency-paths can be traced by starting the navigation at the identified objective *problem resolution controlling and tool support*. Required objectives are *pro-active problem management* and/or *systematic handling of problems*. Since *pro-active problem management* itself requires *basic problem management*, the latter objective was taken as initial point for a process development within the resolution processes. Therefore, the following path was chosen: *basic problem management -> systematic handling of problems -> problem resolution controlling*.

Our cooperation partner conducted improvements by following the prescriptions derived by the concept. As a result, costs of resolution processes were lowered by 13 percent. Therefore, the validation case provides indication of the concept's ability to support the identification of improvement opportunities within ITSM that address specific needs of an organization.

4. Conclusion

The contribution of this research in progress is the presentation of a concept that supports the identification of improvement opportunities provided by ITSM frameworks to address the specific needs of organizations. The concept is based on sharing knowledge that provides transparency to control processes, which is understood as key to continuous innovation and process improvements. Furthermore, the concept supports the creation of implementation sequences through a capability-based analysis of interrelations among objectives.

The concept eases the identification of improvement opportunities within ITSM by providing an explicit and shared understanding of framework objectives. As a result, improvement options are identified in less time and implementation planning is eased by the identification of objectives' preconditions.

The validation case provides indication of the concept's ability to support the identification of improvement opportunities within ITSM. However, the industry validation case is a single case study used for validation, whereas general conclusions regarding the validity of the

concept are to be drawn with caution. Therefore, a further research perspective is a repeated application of the concept that will allow further improvements. Specifically, experiences are to be gathered with teams that are less familiar with ITSM. We expect the results will provide further insights on how to improve the concept concerning the requirements of domain experts.

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