Study of Management Method Network-based for Moral Information

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Abstract. Nowadays,Study of management method for moral information needs to make use of network learning tools to complete, by this way, we can improve efficiency and effect of moral information management implementation. We discussed the concept of the Management Method (MM) for moral information. We started by representing important feature of moral information and continued by explaining the rule life-cycle in Network-Based Study (NBS). We argued about our definition of moral information concept and found different elements of it. Moreover, we pointed out the importance of defining a concept model as part of the management method for NBS. Our design process of moral information should include a new method phase that somewhat differs from the traditional Management Method.

Introduction

Classical Management Method (MM) is based on the assumption that the environmental concept is static and can be understood sufficiently. In the presence of these two factors of environment namely being static and well-understood, traditional management method could be performed well. This might be still possible due to the speed of change tendency. This means, where such context changes slowly enough, existing techniques are capable of capturing, managing and adapting these conceptual changes. The dynamicity and uncertainty of the environmental concept are the main two obstacles in under-standing demand for moral information. These make it difficult to understand, discover, reason and manage the demand both at design at runtime.

This design process should include a management method phase that somewhat differs from the traditional one. Also, the identification of these demands for regulation requires a good knowledge of the concept in which the system will be executed. At one side, we argue that what is missing now is a structured and robust design process for MM. However, the design time decisions need to be done in the situation of incomplete and uncertain knowledge about environmental concept. This way, we need to understand to what extent the demands are being satisfied and this can support regulation strategies at run-time. Therefore, at the other side, we argue that demands for moral information should be supported not only at design-time but also at run-time. The ability of an adaptive system to be a “demand- aware” system inspired by [1], in which the authors argue that demands for moral information should be run-time entities that could be reasoned over at run-time.

Therefore, the need for some methods and techniques to develop some kinds of systems capable of automatically reconfiguring and dealing with any faults and attacks is vital. Research on self-adaptive system is a response to this need, and results in systems able to detect any internal faults and environmental changes and accordingly adapt its structure and behavior [2].

This work focuses on Management Method, as a basic rule in developing each system, and aims at presenting the content of the art of this fundamental rule for moral information and in particular NBS.

In realizing the adaptive behavior of NBS, the role of the concept is very important. Requirements modeled at design time can be vary over the time, therefore, they may not be satisfy when the concept changes. The term concept may vary from different perspective as different literatures define various definitions and factors for concept. We argue about our definition of concept and classify different factors of it. It is necessary to define a concept model as part of the management method for NBS. Such concept model provides information for starting conditions for the regulation of NBS.

We explain some key challenges in supporting management method techniques for dynamic systems in presence of volatile and uncertain environmental concept. We argue that management method activities should be supported at run-time to handle demands for dynamic systems.

Dynamic Moral Information

The propagation of dynamic moral information in various fields has provided opportunity in conducting research in different development phases from preliminary analysis to implementation. Such systems have been applied in autonomic computing, pervasive systems, ubiquitous computing and service-oriented computing. Although there are some definitions for moral information, the existing concepts in various domains such as pervasive systems and autonomic computing need to be clarified. In order to explain the boundary of moral information, we present some well-known definitions and features moral information should support.

By operating environment, we mean anything observable by the software system, such as end-user input, external hardware devices and sensors, or program instrumentation". The term operating environment is stressed in this definition. Furthermore, the fact that system needs to be aware of its environmental changes is underlined. Therefore, one main characteristic of moral information is checking continuously for possible changes in their operating environment as well as internal factors. The system is required to respond to such changes to satisfy its main goals.

A New Structure for Dynamic Life Cycle in NBS

In this section we explain the S-cube life-cycle for adaptive NBS [8]. The life-cycle covers both cycles of design-time and run-time such that they coexist and support each other. The design cycle is specified for permanent and important change while the run-time cycle is for temporarily regulation of the NBS. Different phases are involved: management method and design, construction, deployment and provisioning, operation and management, identify regulation needs, identify regulation strategy and enact regulation. For the rest of the work we only focus on the phases.

At the management method and design phase the regulation and controlling demand are used to perform the design for regulation and controlling. The run-time controlling is executed at the operation and management phase. Concept changes of NBS are detected in this phase. Concept information captured from the controlling provides the regulation triggers. Such triggers identify regulation need at the next phase. Each regulation need can be satisfy be a set of regulation strategies. In the following we discuss about issues need to be incorporated into the structure in order to support regulation in NBS.

Concept aware systems are capable to detect changes and are able to change their behavior to adapt to the changing concept. In such systems, changes are not only performed by users by also other sources are involved. Therefore, good understanding of the concept is necessary. Furthermore, there is a need for user and concept modeling in the MM design phase. This should be done through precise concept engineering, identifying different concept factors and their dependencies. Distinguishing between stable and non-stable concept is important and useful for the decision phase. With respect to regulation, the needs and strategies for regulation should be identified. Model-based MM such as scenario-based approaches could be applied in order to link concept information to regulation strategies. Scenario-based approaches are useful for the development of systems when the concept changes are predictable or at least have a low degree of uncertainty. Additionally, user modeling techniques are useful to present the participant aspect of the usage concept. The so far activities should be done at the demand and engineering design phase through a demand presenting and modeling.

After this, management method is to support which regulation need to be done given a situation. At the operation and management phase, the concept changes should be monitored and detected. Understanding the degree and scope of change and uncertainty level are important and help to come up with the right decision for regulation. This information provides triggers for the next phase to define regulation demands. It should be identified whether the regulation is going to be automatic or semi-automatic. As in the case of semi-automatic, the user may involve in the process of regulation decision. This can be done by providing appropriate feedback to users.

The characteristic of concept aware systems bring the need to elicit, model and monitor demand for such systems. Thus we discuss management method activities and corresponding techniques to support afore-mentioned issues. Besides, we provide a concept information model to support the regulation of NBS.

Moral Information Systems and NBS

Management method for moral information and in particular for Network-based study can be categorized into three parts: demands presenting, demands modeling and definition, and finally demands controlling. In the following we present an over-view on related work discussing main contributions in each part.

Requirements presenting: includes activities to identify stakeholders, goals, and demands in general. Regarding moral information, demands are dependent on the concepts the software system under consideration belongs to. Therefore, moral information has to adapt their behavior according to concept changes. For such purpose, applying concept engineering during demand presenting can be beneficial.

Requirement Modeling: Goal-oriented management method approaches have been mainly considered as a key solution for demands modeling and definition in moral information. Stakeholders' goals and system objectives are relatively stable whereas demands define one of the possible ways that a goal can be realized which means goals are operational through demands.

Goal-oriented approaches allow analysts to obtain and define goals as well as demands. They are also able to identify constraints that environment enforces to demands. Hierarchical goal models and refinement approaches can be used for regulation techniques and developing of moral information in which they allow analysts to describe various conceptual demands in order to achieve a goal.

Requirement Monitoring: In order to ensure that the demands are properly fulfilled, moral information need to be able to monitor the environment. Therefore, demands definition and system design are based on a set of assumptions which their stability cannot be guaranteed.

A common limitation of above approaches is a lack of proper concept model that provides information for regulation decisions. The demand that identified at design-time, may not be satisfy when the concept changes. This can affect the performance of NBS. However, concept is a very broad term and understanding it requires a special care. Different factors of the concept need to be accurately sorted. Moreover, dependencies between concept factors need to be identified in order to prevent propagation of changes from one concept factor to the other one. In the following we first of all present our definition of the term concept and then classify concept factors into different categories.

Here we present our definition of concept as such: "concept" is any information that influences the interaction between users and a Network-based Study.

We classify concept factors into six distinct categories: resource, user, provider, environment, web service quality and web service functionality. This provides us a comprehensive view of information that influences Service-base study. The concept information model drives situation that triggers regulation. These factors are subject to change during the life-cycle of NBS. We explain each of them in the following briefly.

Resource concept: It includes hardware and software properties that influence NBS. Availability of the resources has an impact on satisfying the demand. The information of resources and their availability could be updated during changes. The resource concept also contains features of network and operating systems for accessing the NBS.

User concept: The user concept includes the user's demand and preferences. Requirement priorities from user perspective are expressed in this category. For ex-ample, regarding QoS demand it shows which properties will be maximized among others. It also contains the information about the role of the user in the Study e.g. guest or administrator.

Provider concept: It covers information from the provider side on the usage of the NBS. Provider may change the offered demand during the execution. For example the provider may increase or decrease the computational charge and this will have a direct impact on the perceived demand of NBS from the used side.

Environment concept: It has information about the time in which users access the NBS or the information about where the user is located. It also covers the surrounding environment such as the current date, temperature and weather. The modification of this concept is performed by either users or external events.

Challenges and Discussions

In this section, we discuss and highlight some issues and challenges in order to support regulation for NBS.

Requirements of moral information need to be represented at run-time (run-time entities) to support regulation. This involves modeling demands at design time and reasoning them at run-time according to changing concept to support regulation. Therefore, the selection of the best regulation strategy will be postpone at run-time by reasoning the existing demands model and run-time data acquired from the concept changes. This way, it is possible to revise and re-evaluate design-time decisions at run-time.

Goal-oriented approaches seem to be a promising method for supporting demand reflection. For example KAOS provides a modeling language with formal semantics that allows automated reasoning over demands and goals.

Due to the dynamicity of the demands, it is necessary to specify the evolution of the demand model. There are some challenges and research issues that need to be taken into account when the demand model changes at run-time.

In order to overcome such challenges we argue that two consideration need to be taken into account. First is a move from binary satisfaction of the demand. Degree of the demand satisfaction need to be evaluated (e.g. using a fuzzy approach) and corresponding regulation actions should be selected accordingly. Second is defining critical and non-critical demand. Therefore we can distinguish between vital and trivial demand. For example, it is possible to temporarily ignore some demand with non-criticality in favor of other critical demand (demand trade-off approach).

Dealing with uncertainty has been recently treated as a hot issue in the literatures. Initial solutions for overcoming uncertainty limitations are reported which later resulted in development of a new language named RELAX. It provides the system with the flexibility to trade-off the demands at run-time and allows some certain demand to be temporarily relaxed.

There are issues that need to be taken into account as following. First of all, the controlling data should be used to evaluate the concept properties identified in the concept model. Therefore the concept changes need to be detected and the degree of changes need to be evaluated. Under-standing uncertainty level as we explained earlier is also necessary. The aggregation of this consideration will result to identify the regulation triggers. The triggers are the base to define regulation needs. The existing rules and links between the concept and regulation strategies need to be updated according to the information obtained at controlling. Apart from these, the user preferences could mainly affect choosing the right regulation. Furthermore, regulation purpose need to be identified in the early stage whether is it for optimization, recovery or prevention as each may have different demands.

Feedback Loop: From Control Theory to Software Engineering. The notion of feedback loop has been widely used in the field of control engineering. Actually the control loop is recognized as the central factor of control theory. Cheng et al. upgraded the generic model by identifying properties of control for each activity which were ignored in the generic model. For example in the analyzing part, we need to know how much past content may be needed in the future. In the decision part, we need to know how the future content of the system is inferred. Or what are the priorities for regulation across multiple control loops. And finally in the last part, action part, we need to know when the regulation should be performed.

Applicability of using control theories for moral information is still under investigation. However, in order to address changes in the concept, borrowing theories from control engineering and apply them from moral information could be beneficial. There is a similar discussion about the need of the control loop to be explicit. Additionally the authors argue that one explicit loop in not enough and in order to support various changes the system is required to have different nested loop.

Conclusion

Requirements of software systems tend to change over time. The speed of this tendency depends on the Study domain the software system under consideration belongs to. If we consider novel concepts such as pervasive systems and systems supporting dynamic B2B interaction, demands change so fast that the research community is studying how to build systems that are able to self-adapt on the fly to some of these changes. When this happens, the system does not need to undergo through a new development cycle thus increasing its availability and, to a certain extent, its robustness. So far, the research in the area of moral information has been focusing on the definition of the mechanisms for supporting self-regulation. We argue that what is missing now is a structured and robust design process associated to these mechanisms. This design process should include a Management Method (MM) phase that somewhat differs from the traditional one. However, the identification of demands for regulation requires a good knowledge of the concept in which the system will be executed. In this work, we consider the modeling of such concept as part of the MM phase and we particularly focus on Network-based Study (NBS). We argue that MM activities should be supported at run-time to handle concept changes and to support regulation for NBS. We survey the content of the art for what concerns the presenting, modeling, and analysis of demands and will highlight some issues and challenges in order to support regulation for NBS.

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