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GREETINGS

Head of Committee IC-Itechs

For all delegation participants and invited guest, welcome to International Conference on Information Technology and Security (IC-Itechs) 2014 in Malang, Indonesia.

This conference is part of the framework of ICT development and security system that became one of the activities in STIKI and STTAR. this forum resulted in some references on the application of ICT. This activity is related to the movement of ICT development for Indonesia.

IC-Itechs aims to be a forum for communication between researchers, activists, system developers, industrial players and all communications ICT Indonesia and abroad.

The forum is expected to continue to be held continuously and periodically, so we hope this conference give real contribution and direct impact for ICT development.

Finally, we would like to say thanks for all participant and event organizer who involved in the held of the IC-Itechs 2014. We hope all participant and keynote speakers got benefit from this conference.

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LIST OF CONTENT

Conceptual Methodology For Requirement Engineering Based on GORE and BPM

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Abstract

The main measure of the success of a software system is the degree to which it meets its purpose. Requirement Engineering (RE) is a process for discovering the purpose.Nowdays, the complexity of e-governemnt applications is grown significantly in the government environment.E-government applications should be developed based on regulations in order to achieve the goal model of government entitties. However, the goal model could not used directly to identify the features of applications.In order to solve this problem,this paper presents and proposed conceptual methodology for requirement engineering based on GORE and BPM Alignment.It can support the phase for identify features of applications. In order to support this phase, we align goal model and business process model.This conceptual methodology consists of four methods, there are (1)Method for convert document regulations to goal model, (2).Method for convert goal model into business process model, (3).Method for convert business process model into feature model,and (4).Method for convert feature model to orthogonal variability model

Keywords : *Requirement Engineering (RE), Goal Oriented Requirement Engineering (GORE), Business Process Modeling (BPM), e-government applications*

Introduction

Requirement Analysis is the phase in Requirements Engineering (RE) with main focused on discovering user requirements. The main measure of the success of a software system is the degree to which it meets its purpose **Error! Reference source not found.**, which of course would be obtained in the systems analysis phase. Therefore, in the last decade, there was a new discipline known as the Requirements Engineering (RE), which cover activities in the feasibility study, investigation, and analysis system, also in desain phase. RE is the process of discovering that purpose, by identifying stakeholders and their needs, and documenting these in a form that is amenable to analysis, communication, and subsequent implem*entation.*

In RE, Goal and Actor orientation has been recognized as an approach more promising than other system- and functionality-based techniques used in most of the traditional Software Engineering methodologies**Error! Reference source not found.**. GORE is an approach of RE based on Goal dan Actor orientation that increase dramatically. One of the reasons of GORE emergence is the inadequacy of the traditional systems analysis approaches when dealing with more and more complex software systems**Error! Reference source not found.**.

Busines Process Modeling (BPM) is a concept which able to use for a wide variety of situations and also for many goal.Business process models are a crucial prerequisite for business processes analysis ,representation goal andobjectives, and also finding the information structures better in the form of a compound of distributed, integrated systems which support structure organization [4][5][6].

Nowdays, the complexity of e -government applications is grown significantly in the government environment. It causes a continue unpredictable changing in government regulations. The ability to respond government regulation changes.In order to response to the change, providing variant of business processes are a challenge. The challenges are how to identified and manage the commonality and variability business processes.The identification variability patterns involving activities within processes sharing a sig nificant amount of similarity [7].

Theoretical Foundation

Requirement Engineering (RE)

RE is all about the needs to discover, understand, formulate, analyze and agree on *what* problem what should be solved, *why* such a problem needs to be solved, and *who* should be involved in the responsibility of solving that problems**Error! Reference source not found.**. *Why*, *what*, dan *who* have been known as three dimensions in RE.

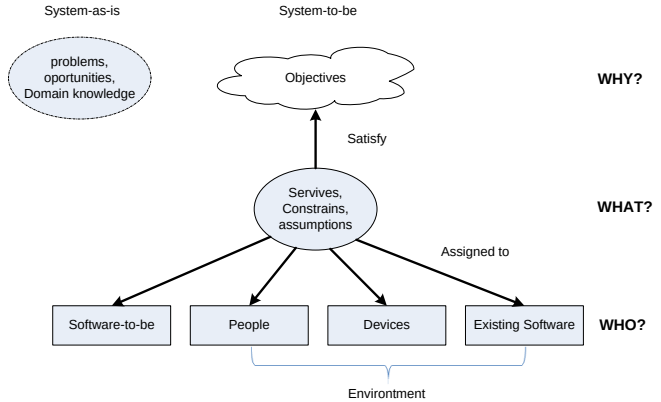

Fig. 1. Three Dimensions of Requirements Engineering

(Source: **Error! Reference source not found.** Van Lamsweerde, A., "Requirements Engineering, From System Goal to UML Models to Software Specification", John Wiley & Sons Ltd, 2009)

The *why* dimension focuses on the contextual reason for a new version for a system must be made explicit in term of *objectives* to be satisfied by it. Such objectives must be identified with regard to the *limitations* of *system-as-is* and the oportunities to be exploited[8]. The *what* dimension is concerned with the *functional services* that the *system-to-be* should provide to satisfy the objectives identified along the *why* dimension **Error! Reference source not found.**. Some of the services will be implemented by the *system-to-be* whereas others will be realized through manual procedures or device operations.

Goal Oriented Requirements Engineering (GORE)

GORE is an approach in the RE that having orientation of Goal and Actor recently has the popularity that increased dramatically. The main reason for this is the inadequacy of the traditional systems analysis approaches when dealing with more and more complex software systems**Error! Reference source not found.**. The most traditional approaches more emphasize the modeling requirement in the form of low-level in the data, operation, and other that are more many understood by other internal programmers & developers, while the stakeholders/users/customers tend to be less concerned with the modeling like that, while Goal model (GORE) is also equipped in the its high-level side**Error! Reference source not found.**.

Goal is a condition or state of affairs in the world that the stakeholders would like to

achieve. There are concepts of goal: *goal type, belief, constraint*, levels of abstraction, taxonomies, *requirement*, assumptions, attributes, and *link*. The goal type is based on functional requirement and non-functional consisting of 3 types: *achievement goal*, *soft goal*, and *maintenance goal*. *Belief* is associated with Agent being interpretation or viewpoint of an agent about its own state and the state of its environment **Error! Reference source not found.Error! Reference source not found.**. Whereas *Constraint* is defined as the limit on the achievement on a goal **Error! Reference source not found.Error! Reference source not found.**.There are 3 levels of goal **Error! Reference source not found.**: *highest level*, *high level*, dan *low-level*. *Highest level* is related to the survival of company/organization, *high level* is related to the '*strategic concern*', and *low level* is related to the '*technical concern*'.

Goal analysis is about the exploration of information sources for goal identification followed by organization and classification of goals[**Error! Reference source not found.**. Gil Regev & Alain Wegmann **Error! Reference source not found.** give summary of techniques to identify the goal: Understanding stakeholder's problems and negating them, Extracting intentional statements (from: interview transcripts, enterprise policies, enterprise mission statements, enterprise goals, workflow diagrams, scenarios written by stakeholders), Asking "How" and "Why" questions about these initially identified goals in order to go up and down the goal hierarchy, Asking "How else" questions to identify alternative goals.

Goal refinement concerns the evolution of goals from the moment they are first identified to the moment they are translated into operational requirements for the system specification **Error! Reference source not found.**. *Goal refinement* includes: Decomposition of goal becomes sub-goal, where each sub-goal will has relation to more slight agent. *Refinement* stops when the goal attained a condition where it is assigned under the responsibility of single agent.

Business Process Modeling (BPM)

According to Martin Schedlbauer (2010, Business Process Modeling are the set of activity for eliciting, documenting, visualizing, and analyzing work procedures within an organization[ipct,. According to Champy and Hammer, a business process is "*a collection of activities that takes one or more kinds of inputand creates an output that is of value to the customer* ". A business process model captures the activities an organization has to perform to achieve a particular business goal [11,12]. A base process can be adjusted in different ways to configure a specific process variant [11, 12].Business process modeling tools provide business users with the ability to model their business processes, implement and execute those models, and refine the models based on as -executed data[13]. As a result, business process modeling tools can provide transparency into business processes, as well as the centralization of corporate business process models and execution metrics [13].

Results And Discussion

According to background and state of the art, we proposed the conceptual methodology in RE which is focused on requirement analysis phase.The proposed of conceptual methodology has criteria that are described in table 1 below

Parameter / GORE Methods	Source Information	Graphical notation	State "Government's Regulation" as source	State "Extracting Method" from artefak	Goal Model to BPM	BPM to FM	FM to OVM
GBRAM	various sources of information (use existing diagrams, textual statements, interview transcripts, etc.)	No (use textual form)	No	No	No	No	No
GRL	Not specified	Yes	No	No	No	No	No
KAOS	Not specified	Yes	No	No	No	No	No
F3	Not specified	Yes	No	No	No	No	No
GSTH	Stakeholder-driven	Yes	No	No	No	No	No
GOIG	Stakeholder-driven	Yes	No	No	No	No	No
Proposed Methodology	(artefact-driven) Government's Regulation	Yes	Yes	Yes	Yes	Yes	Yes

Table 1. Proposed Conceptual Methodology

Visualization and the steps of the conceptual methodology can be seen in figure 2 below. The fig 2 below consists of four methods, there are :

1) Method for convert document regulations into goal model
2) Method for convert goal model into business process model (BPM)
3) Method for convert BPM to feature model (FM)
4) Method for convert FM to orthogonal variability model (OVM)

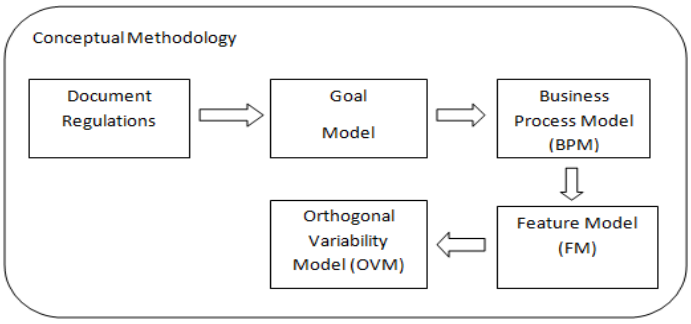

Fig. 2. The Steps of conceptual methodology

For the experimental object, we choose Indonesian Government system.Government as a service provider should be aware that information is an asset and it must be managed properly.A better information management means a better service for the citizens and customized service to meet personal needs, and greater participation to determine what, how, and when service is provided. Indonesia has central government and local government. Local government consists of 33 provinces and 497 districts, which has common as well as specific business processes, policies, and rules [14].

This conceptual methodogy would be implemented in Indonesian e-government applications.Indonesian e-government applications has characteristics of features commonality and variability [15].Features commonality means here are common and features variability means specific [15]. This conceptual methodology are suitable for the characteristics Indonesian government system or similar with it described in figure 3 below

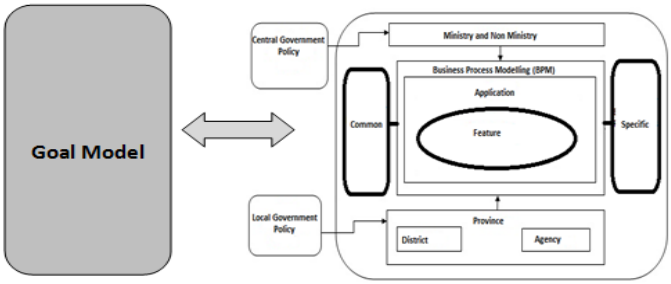

Fig.3. Goal Model and BPM Alignment

Government document regulations describe the thematic, objectives and rules.The documents consists of dependency and independent of rules. The documents also consists of constraints among the level in the hierarchy government policies. There are M...N relation between theme, rules and objective.Then, based on theme and objective, it will representation rules that will described in fig 4 below:

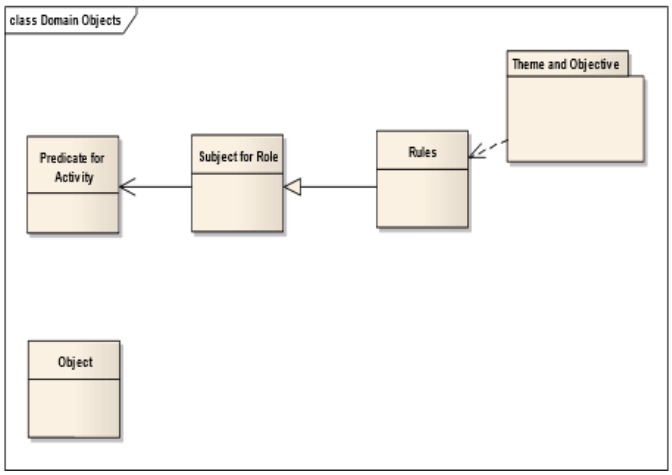

Fig.4. Document Structure Hierarchy

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Conclusions

Requirement Analysis is the most significant phase in Requirement engineering for software development succesfull.In order to gathering requirement fit with the purpose, we proposed the conceptual methodology based on Gore and BPM.We use document regulations acting as input driven.The coceptual methodology consists of four methods.We use indonesian government system for experimental object.

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