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Assignment: 02

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The Summary of the Goal Approach Enterprise Model-Driven Agile Human-Centered Software Engineering

Goals defines a SDP that applies straightforward methodology that analyses the enterprise in a top-down process in order to produce an Enterprise Structure of valuable business concepts as requirements. The methodology continues by means of the detail of the Enterprise Structure components, in order to design and structure, also in a top-down process, the user interface, the business logic and the database (given an MVC architectural pattern [6]), and compose a final Software Architecture that can be used for software implementation management.

In short, our approach aims at establishing a cross-consistent bridge of enterprise and software concepts, and applies a methodology to derive them, which can be summarized in the following way (back-bone components are underlined): the human interaction is represented by means of Business Processes, User Tasks, User Intentions and User Interactions. Our approach Software Development Process (SDP) defines a Human-Centered Software Engineering (HCSE) methodology that integrates the Enterprise Engineering (EE) and Human-Computer Interaction (HCI) perspectives in the process of defining a Software Architecture for a given Business Process Improvement (BPI) problem.

Oppositely, changes to the Enterprise Structure have a bigger impact in the Software Architecture, as this model also provides input for the Interaction Model (of Step 7) concerning a specific Business Process Improvement that involves Business Process and related UTs reorganization. In any of the cases, the type of components (Enterprise Structure or Software Architecture) which are changed directly specifies the following Steps that need to be carried out.

The Goals Approach was developed by means of the continuous application of the Wisdom method [8] and its extension Process Use Cases Model [9] for the elicitation of requirements from business processes as Essential Use Cases (based on the Activity Modeling (AM) [10] method), in the process of architecting software for purposes of in-house tailored development in a medium-sized enterprise. The Analysis Phase develops the Enterprise Structure, in which the Interaction Space (IS) concept is the mechanism that establishes the relation between the User Tasks (UT) of the Business Process (BP), and Business Rules (BR) that constraint existing Data Entities (DE).

Figure 2 presents the meta-model of the BP Model, in which it can be read that only one actor can "Initiate" a BP, but an unlimited number of Actors can participate in it, and also, that an unlimited number of DEs can be used by a BP.

The identification of ISs is derived from the interaction between the sequenced UTs of the BP, in order to support one Actor request and other Actor response, as in any case the same BRs and DEs apply. Figure 4 presents the meta-model that specifies that an IS supports many UTs, having at least a consecutive relation and at most one conditional relation. The Interaction Space (IS) definition is derived from Wisdom original concept of Interaction Space, as a space (a User Interface) where the "user interacts with functions, containers and information in order to carry on a task". The Business Rule (BR) definition is provided by DEMO notion of Action Rule, which defines a structure of decision (using pseudo-code) that applies restrictions to the identified Object Classes concerning the execution of business Transactions.

The Interaction Modeling is carried out by means of the application of the Behavior Driven Development (BDD) method [13] that further specifies each User Intention as User Interactions, and also frames it in terms of used Interactions Spaces (ISs), specifying the navigation between the User Tasks (UT) of the Business Processes (BP). BDD is an agile software development method that describes the system behavior based on a User-Centered Design (UCD) perspective, producing pseudo-code for User. The Business Logic Structuring is carried out by defining the relations that each System Responsibility (SR) has to Data Entities (DEs), since the relation with the Interaction Spaces and Interaction Components is already established. Since two DEs (a and B) have been identified, and DE "Request" provides information for a given Field, it is possible to assume that DE "Request" only related to a single record in DE "Approval", yet, on the contrary, any record in DE "Approval" can be related to many records in DE "Request". The Software Architecture is the model that relates all the previously identified com ponents in a single structure. The main difference between the approaches is that Goals further defines the supporting Information System.

There are more holistic MDA approaches to software architecting, like the Living Models [26], the Formal Design Analysis Framework [27], Zikra's [28], which also structure the business logic based on business process models, that yet, do not design the user interface. Considering the enterprise-driven development, the Generic Software Development Process (GSDP) [29] is based

on DEMO models, from which it derives the business rules, data structure, and business process design.

Yet, understanding it as a whole is more difficult as it crosses the enterprise and software domains, and for that reason it needs further application in order to be possible to inspect its usage in terms of effectiveness. The introduced concept of Interaction Space (IS), as a framework of support for enterprise business-driven cooperative work is an extension of the traditional HCI interaction space that aims the simplification of the conception of the user interface. This simplification results in the specification of less implementation components and more manageable software architectures for a single BPI, resulting in more feasible and probably more successful software projects.

Future work mostly concerns the continuation of the development of the approach concerning cooperative work, more specifically: a social perspective for the patterned conception of the user interface in terms of information visualization and tool execution permissions.