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Capturing Activity Diagrams from Ontological Model

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Abstract— *Activity Theory Diagrams is a useful enterprise model to capture the exclusive features of people's work that incorporates mediation, work division, tools and social rules. Although there are several methods of using Activity Theory Diagrams to model people's work, it is considered difficult to obtain useful Enterprise Activity Diagrams. This paper explains how to build Activity Diagrams from an ontological model of an enterprise. The ontological model is described in DEMO (Design & Engineering Methodology for Organizations). The proposal links DEMO Diagrams and Activity Diagrams proposed by Engeström. The link covers various components of a particular activity: the participants, work rules, social tools, goals and motives. The proposal uses a real case study to validate the proposal.*

Keywords— *Activity Theory; Enterprise Ontology; processes; Organizational Modelling*

1. INTRODUCTION

Activity Theory (Y Engeström 2000) can be valuable to organization modelling because it introduces an intermediate concept between individual and social system, i.e. a minimal meaningful context for individual actions, which must form the basic unit of analysis. This unit is called an activity. Activity can be linked together to form an activity Diagram System that describes some aspects of an organization.

Activity Theory has been used to describe people interaction, in specific fields such as: cooperative work (Bardram 1998), analysis and reporting the capture rich interaction between the organization participants (Y Engeström 2000), using activity systems to address the complex interactions between the human and the computer interface as a tool (Kaptelinin & B. Nardi 2012), requirements elicitation (Martins & Daltrini 1999), description of organization people's work (Mwanza 2001), system development (Collins et al. 2002) and planning solutions to complicated work-based problems (Marken 2006).

Activity theory, like many other theories, has a number of critical reviews and unresolved problems. Reviews include issues related to the fullness of activity theory as a theoretical framework, the difficulties involved in accepting and conducting activity systems analysis, and using human activity as a unit of analysis in research. Davydov (Davydov 1999) presents eight unclear problems related with Activity Theory, where we emphasize the problems of finding Activities, difficulties of defining the general structure of activity and finally the linking with other theories. Finding Activities and its structure are rooted in the notion that different disciplines have different bases for the identifying activities.

We suggest to use an essential ontological organization modelling, e.g., DEMO methodology (Dietz 2006), to guide the finding and construction of the activity diagrams and the linking between them. Since DEMO only represents the essential aspects of an organization we are aware that it cannot help to describe an entire Activity Diagram, but give guidelines to help the finding of the principal elements of an Activity Diagram.

Our proposition will be illustrated by means of a case study of a describing activity diagrams of a real service, called KEEPITSECURE24 (http://www.keepitsecure24.com),. From the case study we can observer how easy is to capture Activity Diagrams and the linking between then in useful network of organization activities from DEMO model.

The rest of the paper is organized as follows: Section 2 describes DEMO and Activity Theory. Section 3 presents a formal mapping of the meta models underlying DEMO and Activity Theory Diagrams using ORM[1]. The results will be present as a set of guidelines that encompass mapping rules from DEMO into Activity Diagrams and a method of using the guidelines. Section 4 discusses the result of applying it to a real case study. Finally the last section suggests other areas of research that need to be explored; its conclusions and the future work

2. DEMO AND ACTIVITY THEORY

DEMO

DEMO models human ability to produce goods or services through commitments, abstracting from the technology used, the particular actions performed and people that perform such actions. DEMO model of an enterprise

[1] Object-Role Modelling.

fulfils explicit quality requirements, referred to as the C4E quality requirements, which are listed as: coherent (i.e. constitutes a whole), consistent (i.e. contains no logical contradictions); complete (i.e. includes all ontologically relevant elements); concise (i.e., is as minimal as possible) and essential (i.e., is independent of realization and implementation). A more detailed description of C4E quality requirements can be find in (Dietz 2006).

Demo is based on the stable Ψ theory. It recognizes the dynamics, the incompleteness and uncertainty of the reality of the organization, as well as the multiple connections between the components of this reality, and focuses on the use of language to achieve mutual agreement and understanding between people. The Ψ theory consists of four axioms (e.g., operation, transaction, composition and distinction and one theorem (e.g. organization theorem). A complete overview of the theory and associated methodologies is available in Dietz's book (Dietz 2006).

DEMO encompasses four aspects models that model the business of an enterprise as "a coherent structured of transactions ".(Dietz 2006). For the purpose of this work we will describe the Construct Model (CM) and the Process Model (PM).

The CM states the association between the following types: transaction, actor roles and the information banks. It specifies the identified transaction types and the associated actor roles, likewise the information links between the actor roles and the information banks. Briefly, the CM specifies the construction of the organization. A transaction indicates that the acts performed by actor occur always only in universal standards and business transactions and call for the result of the execution of a transaction, which is a fact (Dietz 2006).

The PM details the transaction of CM into a sequence of process steps. It describes the set of lawful or possible or allowed sequences of steps. For every process step, the information used to perform the step is included in PM and the responsibility areas.

Activity Theory

In Activity Theory it is assumed that to understand the work done by a community, i.e. a group of people, there is a minimum context that should be known. That social and cooperative context is called an Activity and it proceeds within a division of labour. The collective activity is linked to a common purpose, i.e. the objective of the activity and the subjects performing it, of which community members (individually) are not often aware. The connection between the each person work and the work of his colleague workers follows a division of work and is regulated by different more or less explicit rules and norms (Y Engeström 2000).

According Activity Theory people's work is done though a hierarchical division of work (see

Figure **1**): activity, actions and operations. An activity answers the question why things happen and is developed over a long period of time within a socio-historical process. Actions answer the question what it is made of and are temporary and have a clear beginning and end, linked to specific goals of which people are aware. Actions that are performed in an automatic, unconscious fashion, are called operations, and answer the question how they are done. Engeström (Y Engeström 2000) organized the activity theory in a model, named Activity Diagram (see Figure 2) where the elements of activities and their inter-relationships are graphically illustrated.

According the Activity Diagram, the constituent elements of activities are:

Subject: Represents the individual and the social nature of human activity to achieve a common result. Subjects are involved in the activity that is guided by a purpose, i.e. the objective;

Tools: The relationship between subjects and the object is mediated by the use of tools (e.g., hardware, software, models, methods, etc.). Tools are resources used to transform the object in order to get a result;

Object: This component reflects the nature of human activity, which enables the control of behaviour in order to meet the identified results;

Rules: Boundaries, i.e. rules and regulations, affecting the direction of the development of activities;

Community: The community consists of all individuals sharing the same object and, hence, including all activity stakeholders and

Division of labour: Refers to the allocation of responsibilities. Framing the role to be played by each subject in the development of an activity in the community.

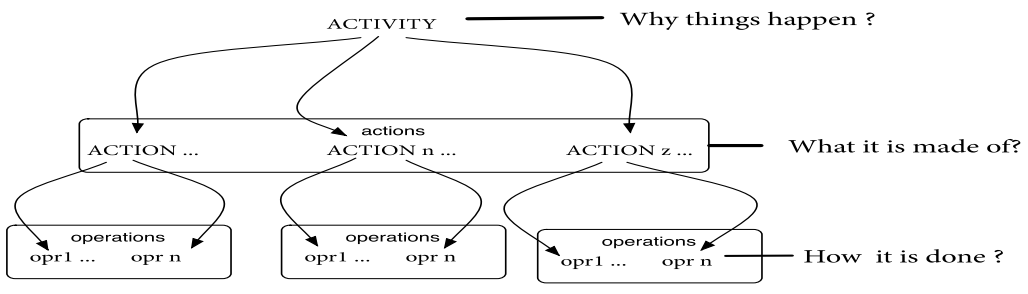

Figure 1. Hierarchical structure of an activity

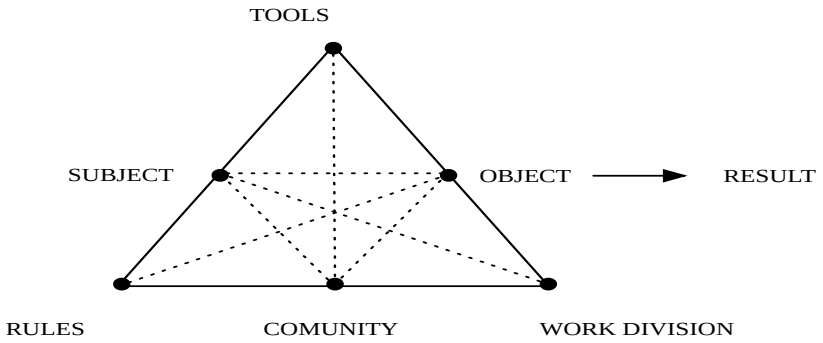

Figure 2. Engeström Activity Diagram

The Activity Diagram suggests the possibility of multiple relationships within the triangular structure activity. However, the main task is always to understand the whole rather than their separate connections. We can use Activity Diagram to model parts of an organization, identifying activities relevant to the organization and using interrelationships among them. A line connecting one activity result to the object of other activity represents a relationship that means: that the results of one activity will be the space problem (i.e. object) of the other, or can be a way to show the coordination between activities. The relationship between Activities are represented in an Activity System Diagram.

3. MAPPING FROM DEMO & ACTIVTY META-MODELS

Mapping from DEMO, using meta-models technique (Zivkovic et al. 2007) has been used as a transformation approach. Examples can be found in Wang (Wang et al. 2011) where DEMO is transformed into an exchangeable format and Kinderen (De Kinderen et al. 2012) presents an example of transformation from DEMO to ArchiMate model (Lankhorst et al. 2009).

We choose to express either the metal-model of DEMO or the Activity Diagram with the fact modelling language Object-Role Modelling (ORM) (Halpin 2010). ORM describes in a graphical notation, the elements of interest in the domain (i.e. fact types), expressed as a combination of objects, predicates, constrains and associations, catering for unary, binary, or longer associations. The elements are called objects that play roles (i.e. parts of association). Predicates define the association between the objects.

Figure 3 shows a graphic example of ORM diagram. It states two binary facts type: " a PERSON **holds a** LICENSE" and "a PERSON **drives a** CAR". The fact type: "a PERSON holds a LICENSE" has two constraints. A or mandatory constraint or dependency law, represented as a solid dot, connected to a role of LICENSE, denotes that if a LICENSE exist it must held by a PERSON. An arrow-tipped line across one or more roles denotes uniqueness constraints or unicity law, indicating that instantiations of that role sequence must be unique. For example the unicity law of picture denotes that each PERSON can only have a LICENSE and visa-versa.

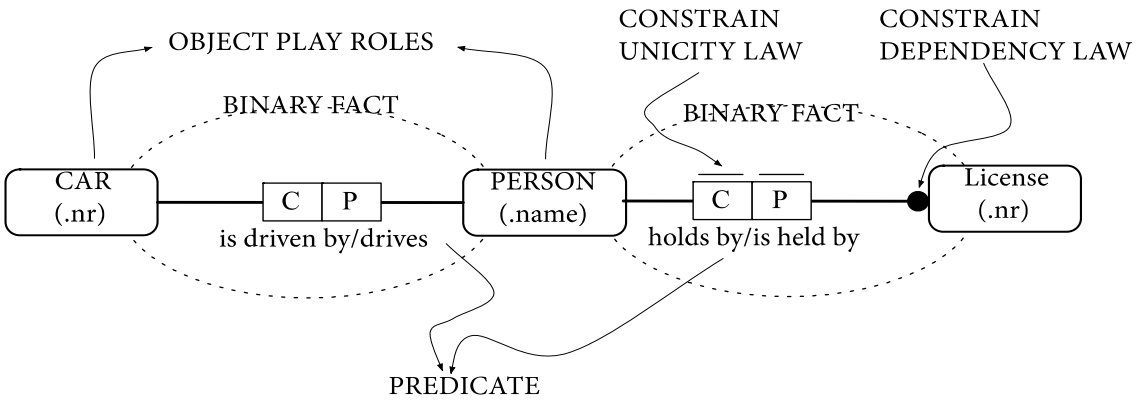

Figure 3. Example of ORM model

3.1 DEMO CM and PM Meta-Models

Figure 4 outlines the core components within DEMO Construction Meta-Model (DCMM), expressed using ORM. The main components are: transaction, actor role, fact and information banks (i.e. production bank and coordination bank). Several correlations can be observed from the DCMM, such as between actor role and transaction, actor role and information bank, transaction and fact and finally between Information bank and transaction.

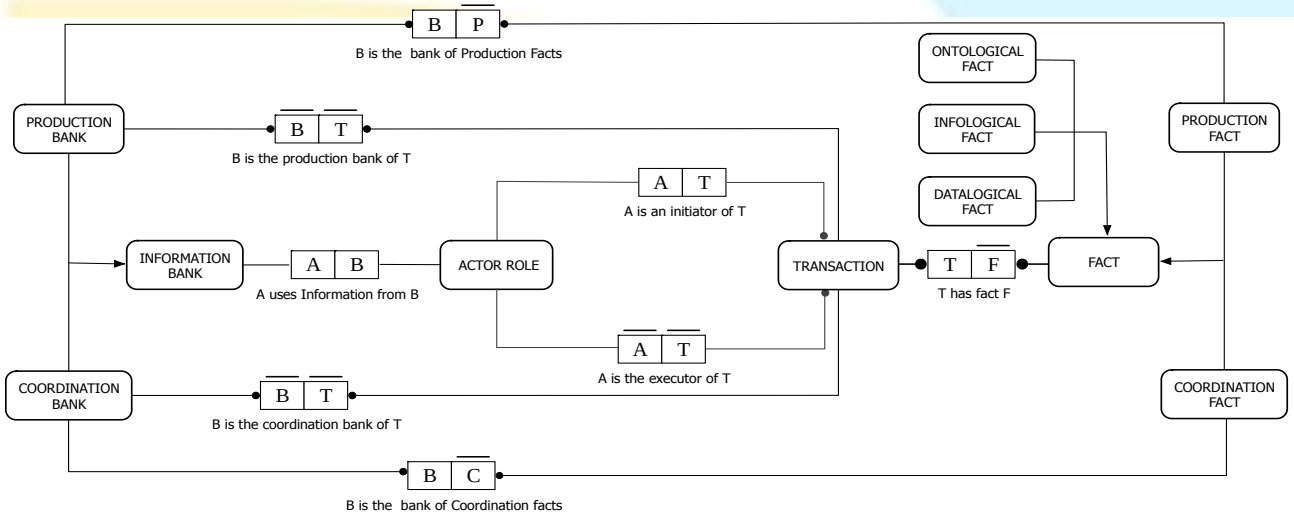

Figure 4. Meta-Model of Construction Model

Figure 5 outlines the core components within the meta-model of DEMO Process Model (DPMM). The core components within are: transaction, phase, rule and step. Constrained by the dependency law and by unicity law that holds for both Transaction (T) and Phase (P) phase can only be one of the three transaction phases and occur exactly once in a transaction. The unicity law that holds in the correlation between phase and step means every step must only occur once in one of the phases. Correlation between step and rule means that for each step there must be a business rule that that serve as guidelines to an actor role deal with their agendas, containing one or more rules for each type of scheduling. Each step could be one of kind: quit, stop, decline, reject, request, state, accept and promise. Each steps are interrelated with each other in a causal way, S1 has to wait to S2 to start

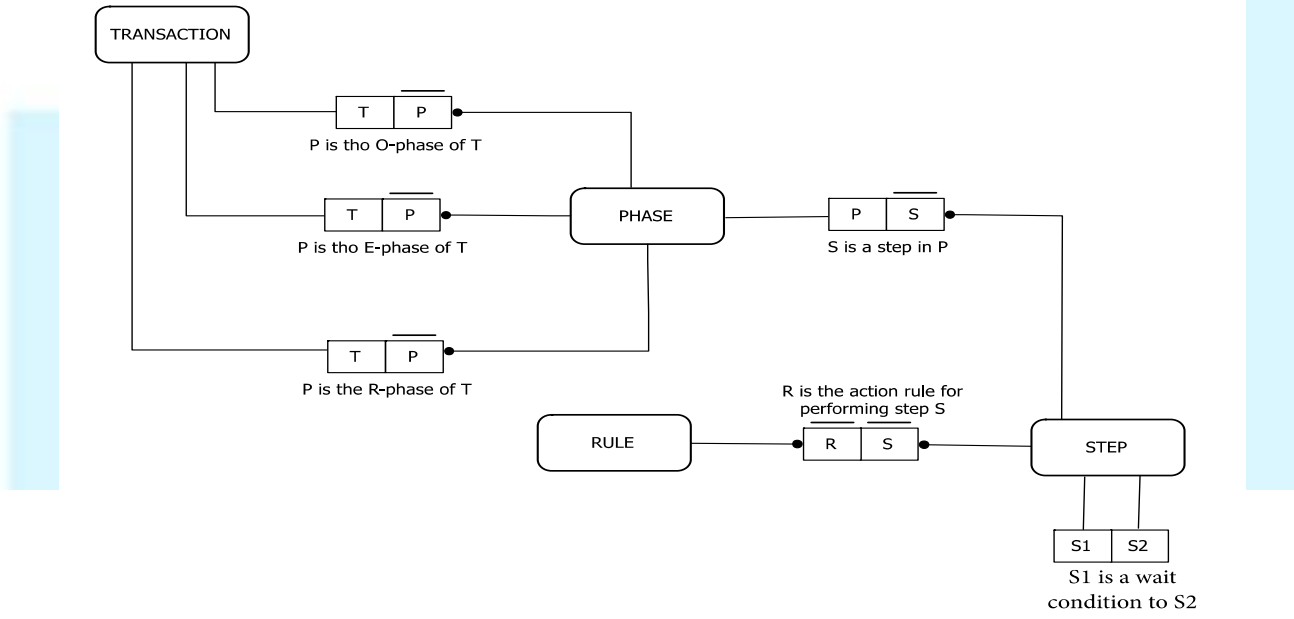

Figure 5. Meta-model of DEMO Process Model

Activity Diagram Meta-Model

Figure 6 outlines the core components within meta-model of Activity Diagram (MMAD). The core components within are: activity, rules, subject, tools, object, result, community and division of work. Constrained by the dependency law and by unicity law holds for both Activity (A) and Result (R) can only be one result for each activity. The Subject manipulates the objects using tools. The unicity law holds in the correlation between subject and community means every subject must belong to the community of the Activity. Correlation between subject, rules and community means that for each subject there must be a rule in the community. Correlation between community, division of work and object means that to manipulate the object, each subject, that belongs to the community, must follows a division of work

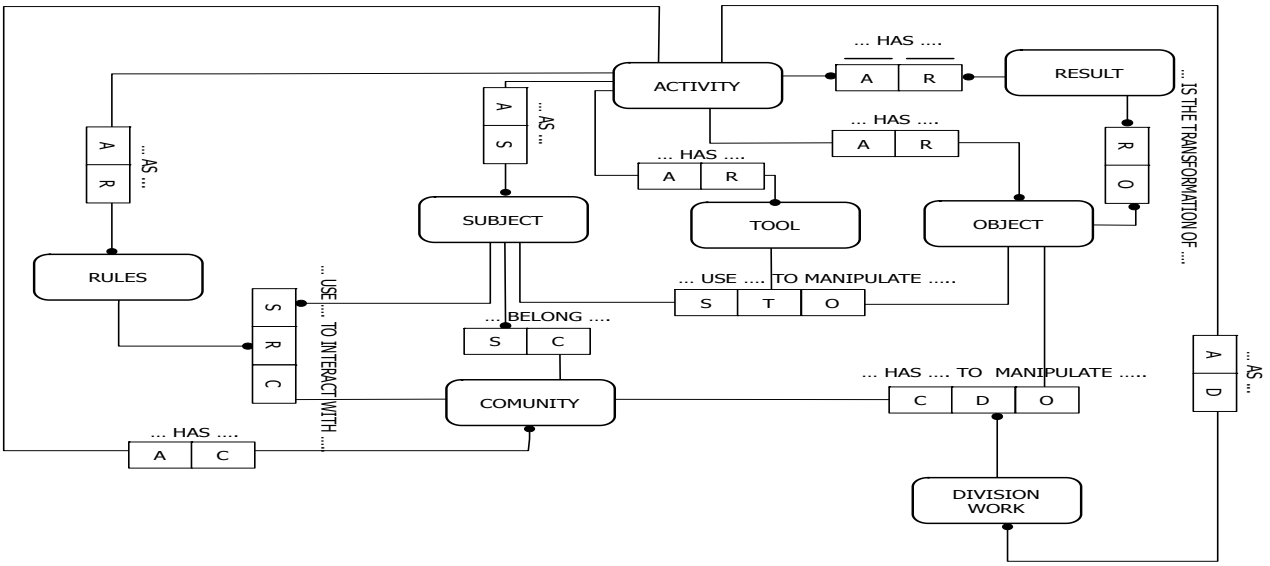

Figure 6. Meta-Model of Activity Diagram

Figure 7 summaries the core components within meta-model of Activity Diagram Division of Work (MDW). The core components within are: Actions, goals, subject, operations and condition. Constrained by the dependency law and by unicity law holds for both Actions (A) and Goal (G), each Actions has one expect and well defined goal. The division of work is composed of several actions. Each action can be decomposed in other actions. An action is conscious linked to the subject. An action is executed through a set of operations. Each operation is done automatically by a subject and depends of the conditions to be executed.

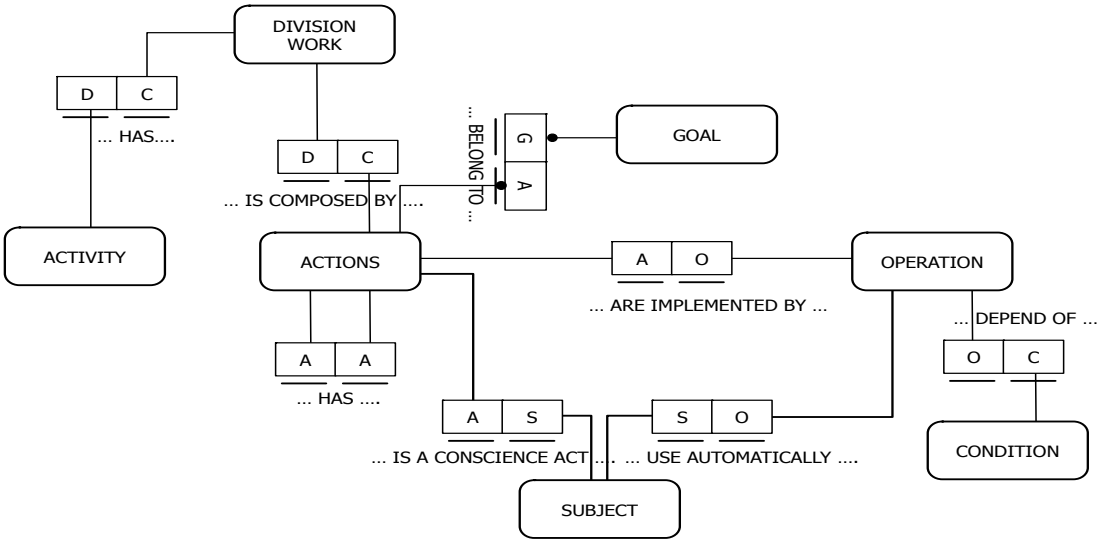

Figure 7. Activity Diagram Division of Work

4. MAPPING RULES FROM DEMO INTO ACTIVITY DIAGRAMS

To find mapping rule from DEMO Meta-Model into Activity Diagram meta-model we use two concepts proposed by Zivkovic (Zivkovic et al. 2007): 1)Object-to-object mappings, which reports concept from DEMO meta-model to concept from Activity Diagram meta-model at the same level of abstraction. and 2) facts-to-facts mappings, which reports facts and object roles from DEMO meta-model with object facts and object roles from Activity Diagram meta-model. We also take into consideration the difference in abstraction level between DEMO and Activity Diagrams and additional Activity Diagrams elements not present in DEMO, for example for the tool element.. The mapping techniques can be expressed as a set of guidelines to promotes sharing explicit and tacit knowledge that each individual possesses and which is normally difficult to be formalized or explained to others, because it is subjective and it is an inherent ability of a person. The set of guidelines are derived from Table 1, which expresses the result of analysis of DEMO and Activity Diagram Meta-Model.

Table 1. Mapping between demo and Activity meta-models

MAP	DEMO META-MODEL CONCEPTS	ACTIVITY META-MODEL CONCEPTS
M1	DCMM defines a transaction as operation principle, where actor roles enters into and comply with commitments, regarding the products.	MMAD defines the focal point of the analysis of an activity is the production of a result.
M2	DCMM defines a transaction as operation that produce a fact. Constrains from unicity law and dependency law indicates that different transaction produces different facts.	MMAD defines, from unicity law and dependency law that different activities have distinctive outcome.
M3	From DCMM when an actor role uses information from information banks, it could be from production bank or coordination bank.	MMAD and MDW defines that information is attached either to actions or operation.
M4	DCMM defines that all transaction information is hold either in a production bank or in a coordination bank.	There is no information how it is hold in the models.
M5	DCMM and DPMM describe an organization as a collection of transactions linked together in different phases of the acts.	MMAD describes an organization as Activity Diagram System, where the outcome of one Activity is the object of interest of other Activity.
M6	DCMM features of actor role, as actor with a distinct responsibility. The initiator, who initiates and completes the transaction and the executer, who performs the act of production acts.	MMAD describes a subject and community. Represent the individual and social nature of human activity. Subjects are involved in the activity that is guided by a purpose.
M7	DCMM features the distinct human ability expressed in the distinction Axiom of PSI theory: performa informa and forma. Each one supported by the following ability.	MDW defines a dependency between activity, actions and operations.
M8	DPMM defines that a transaction can have the following phases: Order-phase (i.e., the actor roles agree with the intended production fact), Execution-phase (i.e., the agreed production fact is brought out) and Result-phase (i.e., the actor roles agree that the production fact come into existence).	MDW describes the relation between actions, operations and Activity has part of division of work, where an activity encompasses actions. Each action encompasses operations. Each action has different goals well known by the subject that accomplish it (i.e., the person that execute it).

4.1 Guidelines

From analysing the achieved mapping between DEMO and Activity Meta-Model it is presented a set of guidelines that aggregate the identified mapping as follows: **Guideline G1** (Identification of Activities): Every Ontological Transaction is mapped to an activity diagram where the result of the Transaction is accepting the fact of production is mapped with the outcome of an activity. This is

obtaining from mapping rules M1, M2 and M5; **Guideline G2** (Operational Rating of Activity Actions): For each coordination act (e.g., quit, stop, decline, reject, request, state, accept and promise) it associates an Activity Diagram Action. The corresponding actions goals are mapped to achieve the results of performa coordination acts i.e. Coordination fact in DEMO. This is obtaining from mapping rules M3, M4, M7; **Guideline G3** (Classification of Operations): Activity Diagrams operations are the procedures associate to Actions. We link operations to the informa and forma acts of an Enterprise; this is obtaining from mapping rules M7; Guideline G4 (Life Cycle of an Activity): In Activity, actions and operations are organized according to transaction pattern phases (O-Phase, E-Phase and R-Phase); this is obtaining from mapping rules M8; **Guideline G5** (Subjects and Community): The people who initiate and execute a transaction are mapped on the subject of the activity and the rest is part of the Community. This is obtained from mapping rules M6 and **Guideline G6** (rules policy): The people that execute the actions and operations follow an agenda that follows the guide rule of transaction.

These guidelines aims to interpret the access to information in the original facts and derivatives as well as actions and operations, associated with acts of coordination and production. The result is the identification for each activity of actions, operations, subject community and its articulation. The use of rules promotes sharing explicit and tacit knowledge that each individual possesses and which is usually difficult to be formalized or explained to others, because it is subjective and is an inherent ability of a person.

5. PROPOSED METHOD

To apply the guidelines to conductor, to identify and obtain the elements of Activity Diagram from DEMO there is a proposed method. The method follows Boyd Decision Cycle (Brehmer 2005) concepts. According to Boyd, continuous improvement occurs in a recurring cycle of observe-orient-decide-act. Based on this perception, we define a method that encompasses following steps that incorporate the guidelines rules:

1) **Observation:** includes the collection and compilation of information about an organization, including the ontological DEMO model of the organization. Particularly, with ontological model, we start with the information present in the Construction Model (CM), Process Model (PM) From the CM we map each DEMO Transaction to an Activity Diagram as defined in the **Guideline G1**;

2) **Orientation of organization context:** The orientation results in the identification of some missing elements (i.e., subjects, tools, rules) for each Activity diagram that represent the reality context, in order to make sense of the actions to be performed. The orientation is highly dependent on the existing view of the subjects and the community, which in turn is dependent on the tacit knowledge that each element has of a team. Helping a team to observe and get a global sense of what is observable, respecting the particular vision of each element is a key task. Through observation of each identified Activity Diagram from DEMO transactions, it decomposes the stages of the cycle of DEMO acts (O-step, E-step and R-step) in the list of people who perform the actions (i.e., conscious fashion acts). In the system under study is considered as well as the Client KEEP-IT-SECURE actors as subjects of each Activity Diagram. This implied the use of **Guideline G2, G4 and G5**;

3) **Establish the operation scenario:** This step encompasses: 1) finding the operation associated to each action identified in the orientation step and 2) defining the conditions that should be present in order to be able to accomplish the operation. The outcome of the decision may flow in two directions: immediate identification of the proposed operations and conditions, or a return to observation if there is not enough information for a decision. This step, for finding the operations, uses the **Guideline G3 and G6** and

4) **Orchestration of Activities:** Identification of casual linking between contiguous activities that define the immediate context of use, and are expressed in an Activity System Diagram.

The method encompasses different concerns: the identification of Active Diagrams, identification of Actions and Operations in the finding of Activities and identification the casual linking between activities.. The method also encompasses continues adaptation of identified activities, rules, subjects, actions, operations and conditions, since the Activity are on-going development systems.

6. CASE STUDY

Description

KEEP-IT-SECURE-24 is a service, provided by INTEGRITY (www.integrity.pt), which is an ISO 27001 certified organization specialized on Information Security. KEEP-IT-24-SECURE is available to companies in order to audit, manage and reduce the risk and potential impact that threats to information and technology represent to the business of its customers. Within the service provided the technological infrastructures and respective applications are audited to timely identify and correct any vulnerability in the infrastructure of customers that may pose risk to the confidentiality, integrity or availability of information. The service is composed of a platform, which facilitates communication between INTEGRITY and organization where the security tests are performed. This service emerged to eliminate the shortcomings of current systems,

through the definition and the introduction of a completely new and radical concept, with respect to existing solutions in the market that adds a platform that facilitate the communication with the customer, and supports client change management on a continuous mode.

KEEP-IT-SECURE-24 offers a Web Management platform to communicate the state of security of clients assets. It allows to escalate vulnerabilities inside customer organization. The service cycle is composed of a service enrol where the client subscribe, with the help of a service designer, choose which model fits it needs. Follows by a service start here it take care of legal and financial aspects. During this stage client will receive a login for the web-platform so it can start configuring technical scope (i.e. which hosts and applications are going to be audited). After service start process, keepitsecure24 team starts executing Security Tests on client services and applications. The service is composed of two processes: one that keepitsecure24 team identifies and declares to client found vulnerability and it is necessary that the client agree that it also considered as vulnerability. The other encompasses that the client declare that the vulnerability is fixed and keepitsecure24 team validate it. Keepitsecure24 team and client security controller team will be able to manage the service and vulnerabilities through a web based platform.

6.2 Method applied

After the description of the service and relationship between the enterprise and client the method will be applied, as described in section 4.2, following its steps.

6.2.1 Observation

Starting from observation step we will capture the Activity Diagrams from the analysis of DEMO construction model. The mapping will be a one to one relationship between transaction and Activity diagrams where the outcome of an activity diagram will be the result of a transaction.

Ontological Model

Following the proposed method the first step, the observation step will begin from the analysing the collection and compilation of information from the following organization ontological model, developed in DEMO: construction model (Figure 10) and process model (Figure 15).

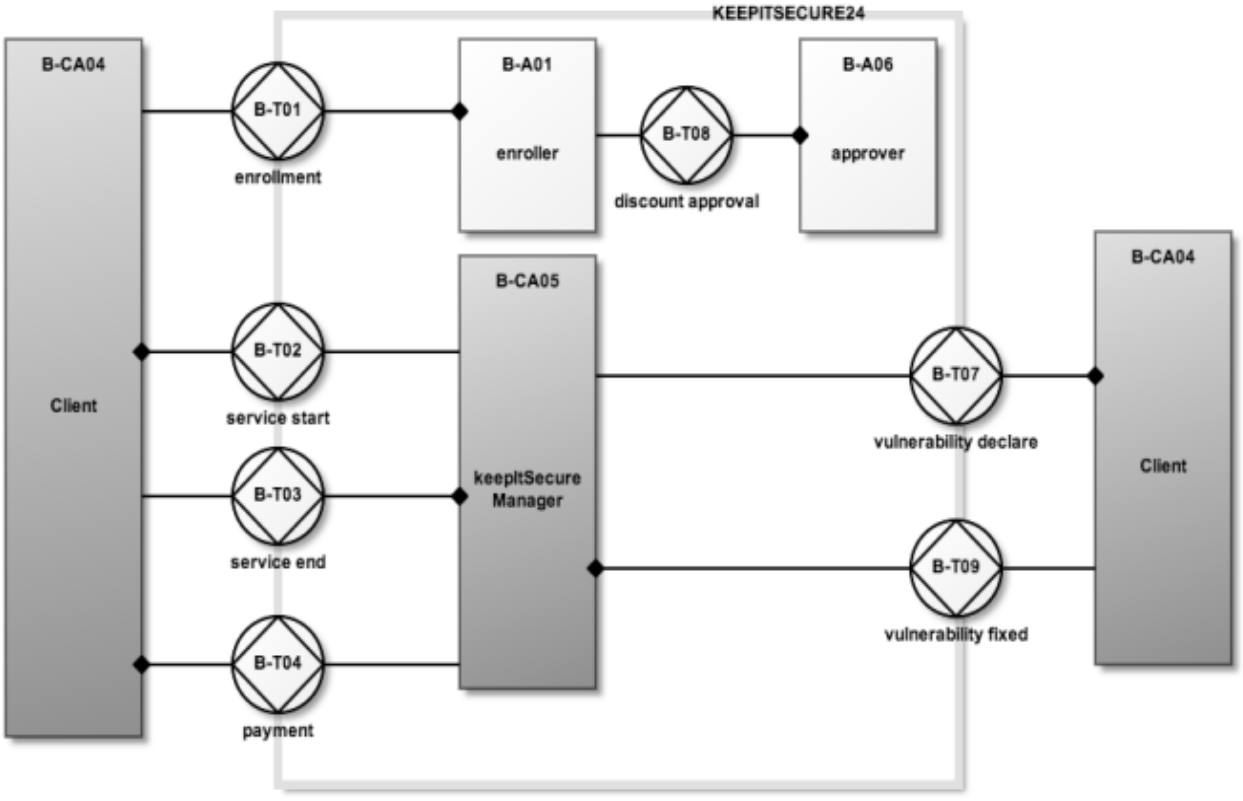

Figure 10. DEMO Construction model of KeepItSecure24.

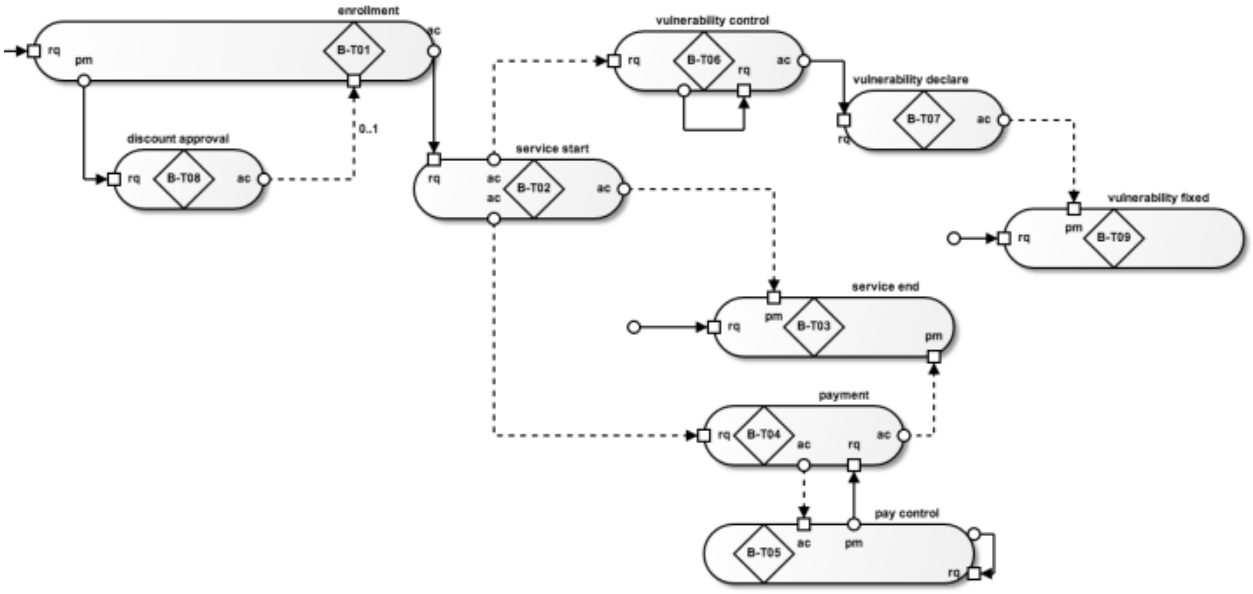

Figure 11. DEMO Process Model of KeepItSecure24

Mapping Ontological Transactions into Activities Diagrams

In this step all available DEMO transaction types are identified. That helps to delimitate of the domain, the activities diagrams to be developed are explored with DEMO. The seven identified transactions types are listed in Table4 together with their corresponding resulting name. Based on the transactions and result facts, the Activities Diagram to be explored should be selected through mapping one to one transactions and Activity Diagram. We also try to find the object and the outcome of each identified Activity. This is not an easy task since we have to use other available knowledge, including natural language descriptions object of interest and outcome. We try to describe the outcome in natural language to be possible to share among the participants of each activity. Relevant DEMO transaction actor and their roles (i.e., as a initiator or an executor) are also used to fulfill the subjects of each Activity in the next step of the method. All this is depicted in Table2.

.

Table 2. Identification of some Activities

Ontological transaction	**Activity Diagram**		
Type	Name	Object	Outcome
B-T01 Enrolment	Service enrol	Service model	It is a established security service model that fits the client needs.
…..	…..	…..	…...
B-T03 Service end	Service End	Service	The service is stopped either by the clients or the KeepItSecure24 team.
B-T09 Vulnerability fixed	Vulnerability fixed	Vulnerability	Client fix the weakness and KeepItSecure24 testing team confirm it.

6.2.1 Orientation of organization context

The information on Table 3 shows objects and outcomes for Activity Diagram. Since the purpose is just explanatory, only some of the Activity Diagrams are considered. We consider the service enrol Activity Diagram.

6.2.2 Establish the operation scenario and conditions

The information on Table 4 shows operations and conditions for Enrol Activity Diagram. We consider the actions from service enrol Activity Diagram

6.2.3 Establish the operation scenario and conditions

The information on Table 4 shows operations and conditions for Enrol Activity Diagram. We consider the actions from service enrol Activity Diagram.

Table 3. Description of elements Enrol Activity

INDETIFICATION Of ACTIVITY ELEMENTS			
SUBJECT	Organization Chief Security (**OCS)**		
	KEEP-IT-SECURE planning service tester (**KPT**)		
TOOLS	KEEP-IT-SECURE management plans module that includes the pre-defined penetrations scope plans and allows designing specific plan to client needs. Phone and email is also used in the begging phase		
OBJECT	Technical scope of KEEP-IT-SECURE plans.		
RESULTS	The scoping of the service enrol test is done by identifying the machines, systems and network, operational requirements; staff involved and agree in the price list.		
ACTIONS	**ORDER PHASE**	**Request (OCS)**	**OCS** asks for scope of the penetration test as well as the parties involved. **OCS** asks for **NDA** to confidence the change information.
		Promise (KPT)	**KPT** negotiate with **OCS** the NDA document items. For the scope of the test, **KTP** has to get the agreement of the service designer approval.
	EXECUTION PHASE	**Execute (KPT)**	The **KPT** prepare the information and the agreement document to be signed by the **OCS** and send the
	RESULT PHASE	**Deliver (KPT)**	The **OCS** send the signed The **OCS** send the signed agreement to **KPT**
		Accept (OCS)	The **OCS** send the signed agreement to **KPT**

Table 4. Description of operations and conditions of each action of Enrol Activity

ACTION ORDERING	**ACTiON RATING**	**#**	**OPERATIONS**	**CONDITIONS**
ORDER PHASE	**Request (OCS)**	**1**	Fulfilled web form with information regarding the client infrastructure	The ability to access the web form
		2	Download KEEP-IT-SECURE NDA template Send NDA with proposed changed items to KPT Ask for the price list	Have access to the web page Have access to email of KPT Have access to phone number of KPT
	Promise (KPT)	**3**	Receive the NDA Request to discount approval which price should be proposed to the client Agreed with the conditions of changed items or proposed a news one.	Have access to email of OCS Have access to phone number of OCS NDA has normal conditions that KPT is allowed to accepted
EXECUTION PHASE	**Execute (KPT)**	**4.**	Fill the NDA agreement Get the signature from KEEP-IT-SECURE24 responsible Request for the price list from the discount department	Have access to the person that will sign the NDA.
RESULT PHASE	**Deliver (KPT)**	**5.**	Send the NDA and the price list of service that can be offered to client	Has access to the NDA Has access to the price list
	Accept (OCS)	**6.**	Accept the NDA and price list of services offered by KEEP-IT-SECURE24	Has access to the NDA Has access to list of service

6.2.4 Orchestration of Activities

Figure8 presents an Activity System Diagram that represents activities relevant to the organization. The activities were obtained from the ontological model. It describes the Activities and the interrelationships among them. We consider the most relevant, that are those activities that include interaction between them, which are referred to as adjacent activities. Adjacent activities define the immediate context of use. In the system diagram of Figure8 are represented two kinds of adjacent activities. Activities that are coordinated and connected in time, where the outcome is the object of interest of the other activities and activities that are part of some elements of other activity, which describes the structure of enclosed ontological transaction (e.g., discount policy is an enclosed activity of service enroll).

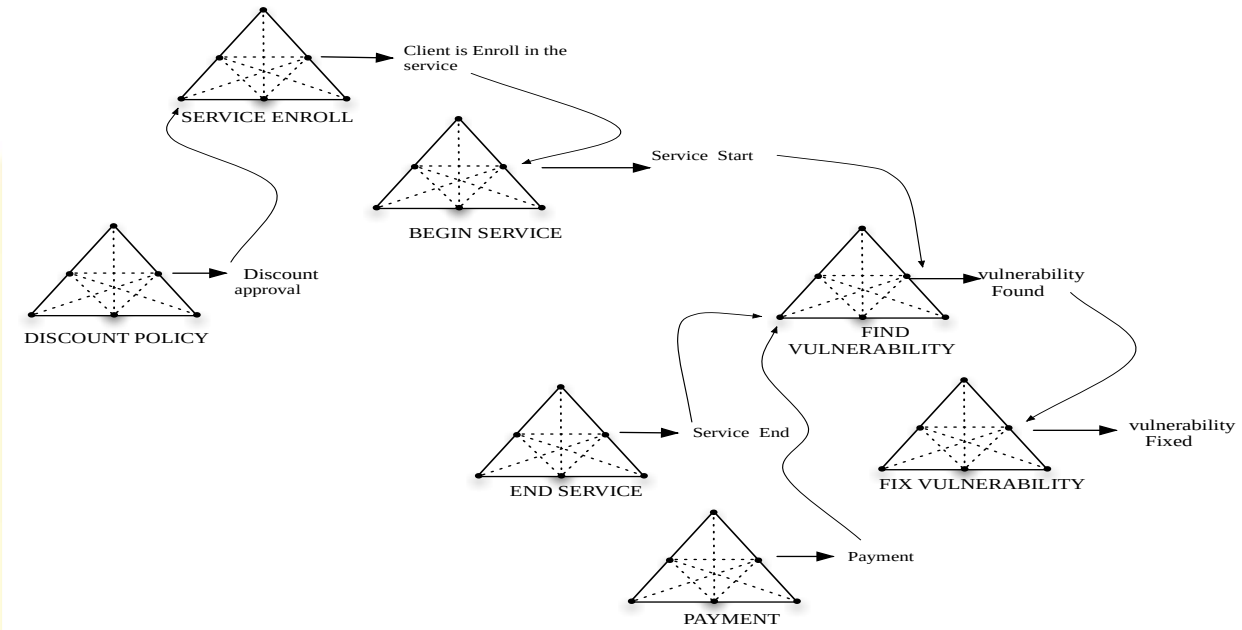

Figure8. Proposed Activity Diagrams System that contains the activities orchestration

7. CONCLUSION

In this paper is suggested a way to construct Activity Diagram System from DEMO Ontological model (root in the Ψ theory). We propose a method that helps to find organization significant activity diagrams and the articulation between them. For such, we adopted a set of guidelines to construct a set of related activity diagrams. The method is the implementation of a set of mapping for transforming DEMO Transactions process into Activity Diagrams. The aim is to have a baseline of collective work of people through the concepts present in Engeström diagrams, obtained from information contained in the following DEMO aspects model: Process Model and Construction Model methodology. The use of the proposed method has the following benefits to capture the Activity Diagram: 1) Helps to delimit the identification of organization activities through the concepts of components, environment and structure; 2) It is a helpful means to identify subject views in the dimension of Activity Diagrams, recognising those, who initiate and accept requests and those, who execute and deliver a service or one product capture from DEMO Construction Model; 3) It allows to understand the articulation of activities, when the outcome form one activity is the object of interest of the other and when one activity will be part of the element of other; 4) It helps to identify actions and operation of an activity, from the mapping of some human abilities to actions and operations, following the proposed policy: The ability to negotiate is associated with actions, that should be done in a conscious way and the ability to manage information and documents are associated with operations, that can be accessed in a automatic way.

In summary, we can state that defining the activities from the Ontological model provides a basis for an initial analysis of people´s practices within an organization. However, some aspects are not present at DEMO model, including the tools that mediate the action of subjects with the objective activity.

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