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Foreword

These proceedings include the papers accepted for the *First International Workshop on Model Driven Service Engineering and Data Quality and Security (MoSE+DQS 2009)*, which was held in Hong Kong, on November 6th 2009.

This workshop included two different tracks focusing on Model Driven Service Engineering (MoSE track) and Data Quality and Security (DQS track).

Regarding the first issue we can see that Model-Driven Engineering (MDE) deals with the provision of models, transformations between them and code generators to address software development. One of the main advantages of model-driven approaches is the provision of a conceptual structure where the models used by business managers and analysts can be traced towards more detailed models used by software developers. This kind of alignment between high level business specifications and the lower level Service Oriented Architectures (SOA) is a crucial aspect in the field of Service-Oriented Development (SOD) where meaningful business services and business process specifications are those that can give support to real business environment usually changing with increasing speed. SOD has become currently in one of the major research topics in the field of software engineering, leading the appearance of a novel and emerging discipline called Service Engineering (SE), which aim to bring together benefits of SOA and Business Process Management (BPM). SE focuses on the identification of service (a client-provider interaction that creates value for the client) as first class elements for the software construction. The convergence of SE with MDE holds out the promise of rapid and accurate development of software that serves software users' goals.

On the other hand, Information technologies are becoming one of the most important aspects for organizations. The business value of the data stored in the company databases has been growing to become one of the most important assets of the company. These data represent one crucial asset for tactic, strategic and operational decisions. Due to this important role of the data, companies should assure the access to the data to several users guaranteeing the right levels of quality they need to accomplish the task they have to do.

Data Quality is a crucial issue in assessing the quality of business decisions support systems. Many aspects are related with the quality of the data, such as integrity, completeness, actuality and several other factors that make this kind of quality a multidimensional issue and a difficult issue. Data Security is another crucial aspect on information systems, not only because it affects Data Quality, but also because current information systems store sensitive and private data that should be treated rightly. Also, as Data Quality and Data Security are not independent concepts, the relationship between both concepts is worth being analyzed in order to give organizations some tools that can help in assuring both data dimensions.

The Workshop on Model Driven Service Engineering and Data Quality and Security intends to provide a forum for researchers and practitioners working on different issues related to SE in conjunction with MDE, boarding open research problems in this area as well as practical experiences. The workshop is also focused on auditing, measuring, predicting, evaluating, controlling, assuring and improving the quality and security of data. Particular interests include methods, modelling languages, development methodologies and techniques in these fields.

The six full papers (an acceptance rate of 54.5%) and four short papers were selected very carefully by the Program Committee in order to ensure a high quality workshop.

We wish to thank all the contributors to MoSE+DQS'09, in particular the authors who submitted papers and likewise, we acknowledge the time and effort contributed by all the members of the Program Committee who have very carefully reviewed the submitted papers.

We hope that you will find this program interesting and that the workshop will provide you with a valuable opportunity to share ideas with other researchers and practitioners from institutions around the world.

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Towards Framework Definition to Obtain Secure Business Process from Legacy Information Systems

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ABSTRACT
Nowadays, enterprises deal with Legacy Information Systems (LIS) that are very important to carry out their daily tasks. These systems that are mission critical and very difficult to replace, contain much information about the Business Processes (BP) that support the operation of the enterprise. In most cases, this information is not easy to obtain and on the contrary, the effort in time and money required to obtain it discourages any attempt to carry out this task. In this paper, we present the preliminary definition of a framework that, through model transformation, will allow us to obtain information about the BP from the LIS, paying special attention to security requirements. Thus, it will be possible to have Secure Business Processes (SBP) that, besides providing an additional view of the information that underlies the LIS, could be used as a starting point in a process of creation of information Systems.

Categories and Subject Descriptors
D.2.7 [**Software**]: Software Engineering – *Distribution, Maintenance, and Enhancement.*

K.6.5 [**Computing Milieux**]: Management of Computing and Information Systems – *Security and Protection.*

General Terms
Documentation, Security, Standardization, Languages

Keywords
Legacy Information Systems, Business Process, Secure Business Process, Security Requirement, Model Transformations.

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1. INTRODUCTION
At present, many organizations are highly dependent on information technologies. Although this fact can be considered an advantage, it is not really such an advantage when the information systems supporting the operations of the organization are rigid. This rigidity, typical of Legacy Information Systems (LIS) not only represents an obstacle to advance in the technological strategy but also blocks the advance of the business processes with the consequent erosion of competitiveness [24].

This scenario has favoured that organizations pay more attention to their Business Processes (BP) because they have understood that BP are an important resource for their performance as well as for maintaining competitiveness. Consequently, it is important to have a description of BP in a language that lets us have the models available for their understanding, adaptation and improvement. Due to this need, during the last decade, the BPMN (Business Process Modeling Notation) [7] has appeared and the UML (Unified Modeling Language) [27] has been improved to allow the representation of business processes. Both of them, the notation and the language constitute valuable tools for the description of BPs because they fulfil a double purpose: firstly, to facilitate the work of business analysts (graphical language) and secondly, to serve as a starting point for a software development process for system analysts [22].

On the other hand, enterprises have a set of information systems that allow them to carry out great part of the tasks that support their performance in the market. An important number of those systems can be classified within the category of Legacy Information Systems. These systems have much more than a technical dimension since they cover elements of the organizational structure, the strategy, the processes and the workflows of the enterprise. An important component of LIS is the legacy software. This legacy software is impossible to modify and maintain at reasonable costs. Generally, the cost of replacing this software is higher than that of continuing operating with it. In this way, enterprises assume the coexistence with of this kind of systems and the legacy software as part of their daily operation although, obviously, they know that this represents a problem. Indeed, a problem is the fact that the BP associated with them are not always accessible (visible) through a model and when they are, they may not be updated [40]. We think that, due to the

characteristics of LIS, probably there are not models representing the business process associated with them. Although the relation is clearly established, the achievement of them is a great challenge [40].

Therefore, our concern is centred in obtaining the maximum profits from LIS using them to obtain the information that allows us to visualize (describe) the business processes they are linked to. In this sense, in previous works [32], we have presented a framework called LIS2BP (from Legacy Information Systems to Business Process) in which we have defined all the elements that allow us to obtain in a semiautomatic way, the business process or processes associated with LIS. Moreover, the obtained BPs will contain a set of requirements that can be refined for their further use in the creation of information systems.

Particularly, the early identification of security requirements represents a quality improvement and saves costs in the software creation process. For that reason, we have considered that it is appropriate and pertinent to use LIS2BP paying special attention to security aspects. This will allow us to have a framework specifically oriented to the achievement of Secure Business Processes, previously defined in [33, 35].

The adaptation of LIS2BP to the security environment is based on an approach Model Driven (MD) that essentially considers model transformation from and towards different levels of abstractions. Having this framework available, we will be able to carry out these transformations in an ordered, repeatable and evaluable way because it can be improved from the experience obtained from the application to concrete cases.

The rest of the paper is organized as follows. In section 2, the basic concepts on which the proposed framework is supported are described. In section 3, the framework itself will be shown. In section 4, we will present related work and finally, in section 5, we will put forward our conclusions and future work.

2. Concepts related to the our proposal

In this section, we will present a brief description of the most important concepts supporting our proposal. Therefore, in this section, we will deal with concepts related to Legacy Information Systems, Secure Business Processes, the approach Model Driven Architecture and the Architecture Driven Modernization.

2.1 Legacy Information Systems (LIS)

Among the information Systems of an enterprise, normally we can find some of them that present very particular characteristics. These systems are called Legacy Information Systems and they are defined as any information system that significantly resists to changes and modifications [8]. In Figure 1, the elements composing a LIS and their relations are shown.

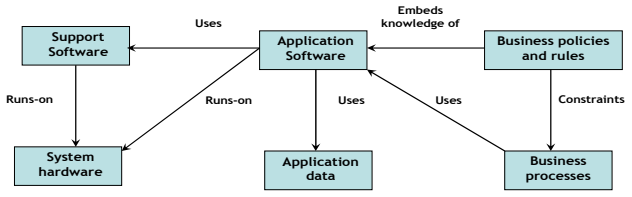

Figure 1: LIS Components [37]

The Legacy Information Systems are normally mission critical within an Enterprise [4]. This means that if any of them fails or stops, this will have serious consequences for the performance of the enterprise. For that reason, we establish that these systems are the main part of the information flow in an organization and the main vehicle for the consolidation of information about the business of this organization [39].

Currently, these kind of systems present numerous and important problems in the organizations where they are. Among these problems, we can mention the following ones [29]:

- Usually, they are performed over obsolete hardware that is slow and expensive to maintain.
- The maintenance of software is generally expensive since finding failures is a slow and expensive process due to the lack of documentation. This situation becomes more serious because generally there is not a complete understanding of the internal functioning of the system.
- The efforts of integration with the new systems is usually hindered by the lack of clear interfaces,
- And, finally, the legacy systems are very difficult or even impossible to widen.

Nevertheless, these systems are useful and important because, among other things, contain Business Rules that cannot be found anywhere else [37]; for that reason, they are paid attention by researchers and practitioners related to software engineering.

2.2 Secure Business Processes (SBP)

A business process is a set of activities and procedures that fulfill a specific objective or longer-term goals in the context of an organizational structure, defining functional roles and relations [38]. The essential point of BPs is that they are linked to the enterprises and that, as a whole, define the way in which enterprises reach their objectives [1]. In other words, a business process is a part of the business where its functions are described and involves the resources that are used, transformed and produced [13].

The importance of BP is that they constitute an essential tool for the control of the activities directly related to the competitiveness of organizations. According to [17], business processes are oriented to market. For that reason, they must be permanently adjusted to incorporate improvements that allow us: to increase customer satisfaction, to improve the efficiency in their operation, to increase the quality of the products, to reduce costs and/or to find new businesses or opportunities to change the existing services or introduce new ones.

To have the control of business processes implies to be able to register them, through any notation, in a way that it is possible that several actors within an enterprise understand and modify them with the purpose of incorporating improvements. For that reason, it is necessary to make them visible for enterprises. In that sense, the fact of having a notation or language allowing this gains importance. Nowadays, the most used notation for BP representation is the BPMN Business Process Diagram (known as BPMN-BPD) [31]. The main contribution of this notation is that it allows a detailed and graphical representation and also, improves the definition and use of BPs by business analysts and system analysts. These last ones will obtain the advantage of early capturing requirements that directly benefits the construction of information systems.

Given the importance that security has (in the past and nowadays) in the performance of organizations, in previous works, we have proposed an extension of the semantic capacity of BPMN with the purpose of incorporating security requirements into the BPs' definition. Through this extension [33], it is possible to represent Secure Business Processes that consider security requirements definitions that are understandable for business analysts and not ambiguous for security experts. We took as a reference the taxonomy proposed in [14] and from it, we selected a subset of requirements taking into account: (i) the clarity of the definition, (ii) the potential meaning in the field of business and (iii) to what extend the definition is not related to security specific solutions. The subset, not limited, of security requirements that are used for the description of security requirements is composed of: Access Control, Attack Harm Detection, Security Auditing, Integrity, Non Repudiation and Privacy.

2.3 Model Driven Architecture (MDA)

In the last years, software engineering is being influenced by model transformation because, this way, we attempt to solve the problems of time, costs and quality associated with software creation. The way to solve this problem is included in the general denomination of Model-Driven Engineering (MDE). MDE is a tendency that has become relevant in software engineering and that, as a fundamental aspect, considers models as first class entities whose purpose is their development, maintenance and evolution through the performance of model transformations [25].

Particularly, Model Driven Architecture (MDA) is a framework that has been defined for software development. MDA is found in the field of MDE and its main objective is that of allowing the creation of models that are totally independent of technological implementation.

Business process models created by business analysts are considered as computation independent models [36]. Through transformations of these models, they can be converted into platform independent models [34]. At this level, platform independent model, the main users are architects or software designers. The platform independent specifications can be transformed into specifications for a specific platform and finally into a software component.

In this context, languages for model transformations are a fundamental aspect. Transformations must be expressed clearly and precisely and that's why it is advisable to use a language defined for that purpose. Among the most widespread languages, we can find VIATRA (Visual Automated Transformations) [12], ATL (Atlas Transformation Language) [3] and QVT (Query/View/Transformation) [30], among others.

Due to the above exposed reason, a business process model built by a business analyst can be used in a software construction process because from it, important requirements of the system can be obtained as a starting point for all modern software development processes.

2.4 Architecture Driven Modernization

Architecture Driven Modernization (ADM) is an OMG (Object Management Group) proposal oriented to the obtaining of new software applications from the existing software (see Figure 2). ADM considers the application of reverse engineering to the existing solution, adding new goals and business requirements oriented to create and optimize the new solution [20].

ADM is an alternative for the analysis of the existing software architecture oriented to improve the initiatives of code maintenance and additionally, it provides advantages for the migration from obsolete or old languages or platforms towards more modern environments. An important aspect of ADM is transformation [19]. Three types of transformations are established: (i) the formal one, that establishes the need to have a formal description of the initial artefacts, the changes that will be implemented and the rules/processes that will manage the application of the changes, (ii) the extended transformation that incorporates the non-formal description of artefacts and rules and, (iii) the abstraction levels of the transformations, that are used for the description of rules and artefacts that are found at different abstraction levels.

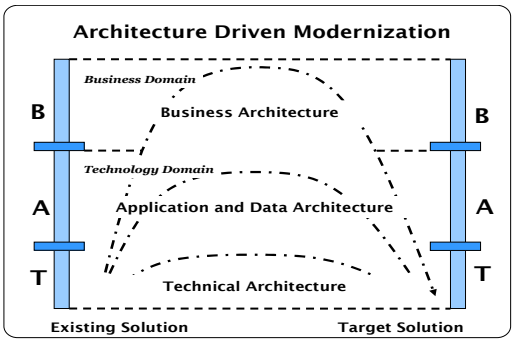

Figure 2: ADM Approach (adapted from [20])

ADM is still under development (see http://adm.omg.org/) but it has been mentioned in this paper because we hope to achieve more precise definitions that allow us to incorporate it into the development of this framework.

2.5 LIS2BP Framework

LIS2BP defined in [32], is supported by MDA and ADM. The MDA approach provides us with the conceptual framework for the specification of model transformations from "*code*" to *CIM* (LIS→BP). ADM provides the reference framework in order to, once the reverse engineering has been applied, make improvements over the product with the aim of achieving a target solution.

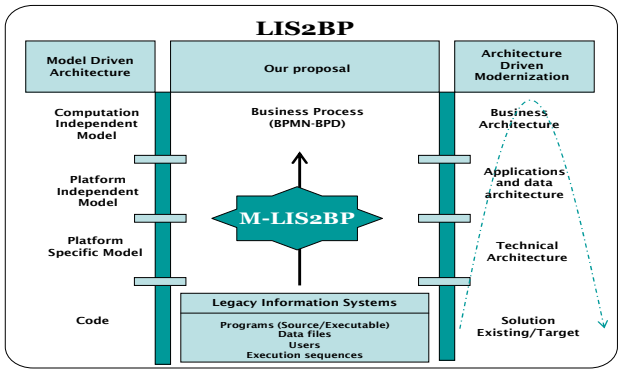

Figure 3. LIS2BP Framework

According to the above-exposed ideas, and as we can see in Figure 3 (central column), LIS2BP will be applied to a legacy information system (considering all relevant elements and artefacts that can be obtained from the LIS) and through a process of extraction, analysis and transformation, we will obtain the business process or processes embedded in the LIS.

The essence of LIS2BP framework is formed by the transformation of information that can be obtained from the legacy information system into one or more business process models (Figure 3, central column). This transformation is carried out following the M-LIS2BP method that allows the identification of all components of the LIS information and determines their equivalence in a business process. This last operation is performed through the application of a set of rules that transform the information components of the elements that compose the business process.

3. Our proposal

In this section, we will present the main components of our proposal, in other words, the method that allows us to extract information from the LIS for the creation of SBP models, the performed transformations and the repository that will contain LIS and SBP information.

3.1 M-LIS2BP-Sec Method

The central element of our proposal is the method called M-LIS2BP-Sec. This method combines a set of stages, workers, tools and artefacts that, under an engineering approach, allow the creation of secure business processes from the information available in legacy information systems. M-LIS2BP-Sec is composed of four stages, three types of workers, two types of tools and three artefacts as shown in Figure 4.

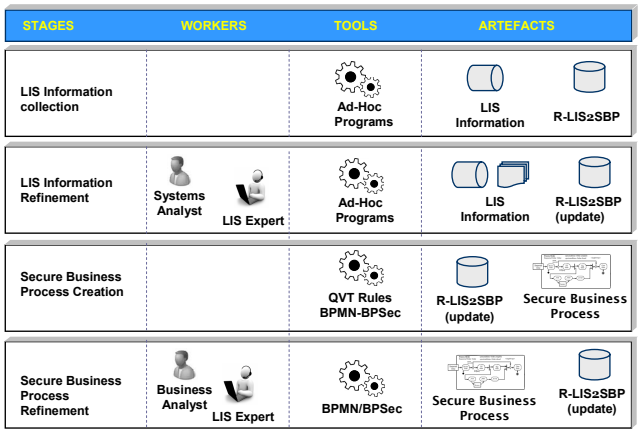

Figure 4 M-LIS2BP-Sec Method

At the first stage, called LIS INFORMATION COLLECTION, tasks are automatically performed; so, workers do not have to participate. The tools used at this stage correspond to a set of ad-hoc designed programs that allow the extraction of the information available from the inherited information system.

These programs act over files resident on the computer and from them, we can obtain, for example, names of programs, names and structures of files, program execution sequences (always if the source programs are available), input and output formats, among others. With this information, we make an initial filling of the LIS repository; the artefact generated at this stage that will contain the automatically extracted information.

At the stage of LIS INFORMATION REFINEMENT, the main task corresponds to the following workers: system analysts and the expert in LIS. They, as users who know the system, have the responsibility of completing the information about the legacy system. This information is mainly relevant when dealing with systems without source programs available. The information provided by workers will be used for updating the repository. Besides, the documentation available in the system will be very useful too because from it, we can obtain some of the LIS information components directly.

The third stage, called SECURE BUSINESS PROCESS CREATION, is automatically carried out. At this stage, we will apply the set of transformation rules (see section 3.2) in which we will establish the equivalence between the different information components of the LIS model stored in the repository and the components that will be part of the secure business process embedded in the LIS. Transformations must be described using QVT (see example in Table 2) and will have to implement equivalence relations as those that have been described in Table 1. The tools for this stage are the QVT rules and the business process modeling language BPMN is complemented with BPSec for security definition. The artefacts used at this stage are the LIS repository that is used as input and the Secure Business Process model that is automatically generated.

At last, at the fourth stage called SECURE BUSINESS PROCESS REFINEMENT, we proceed to improve the automatically obtained specification. The secure business process or processes will be revised and refined by the workers that take part at this stage. These workers are the business analyst and the expert in LIS who, having knowledge of the business and the system respectively will analyze and complete the Secure Business Process. The tool used at this stage is the business process modeling language BPMN together with the BPSec extension and the generated artefact is the improved Secure Business Process.

3.2 Transformations in M-LIS2BP-Sec

Transformations are the central element of M-LIS2BP-Sec method. They correspond to the application of a set of rules that transform the components of the LIS information into the elements composing the secure business process.

These rules will implement a set of heuristics that will be applied to actual data available in the legacy information systems from a rural electricity enterprise. Among these systems, we can mention the following ones: Invoicing, Inventory control, Electric project follow-up and control of electric meters (in total, there are more than 20 legacy systems that, as a whole, include around 380 data flat files and more than 1600 source programs).

For the identification of the information components of a LIS, we have used as a reference the KDM v1.0 (Knowledge Discovery Meta-Model) specification of OMG [26]. This specification defines a metamodel for the representation of the software assets existing within an organization, their associations and operational environment. This is the first one of a series of specifications related to software guarantee activities and Architecture Driven Modernization. KDM is organized into four layers (infrastructure, program elements, execution resources and abstractions) and for

each one of them; it defines a group of packages through which the knowledge found about an existing application is represented.

The metamodel specified in KDM constitutes the origin of a transformation process and the destination is represented by a Secure Business Process whose metamodel is shown in Figure 5. Here, it is possible to identify the BPMN-BPD elements (upper part) and the security requirements (grey coloured): Attack Harm Detection, Integrity, Privacy, Access Control, and Non Repudiation. Other security elements are Audit. Register, Security Role and Permission definition.

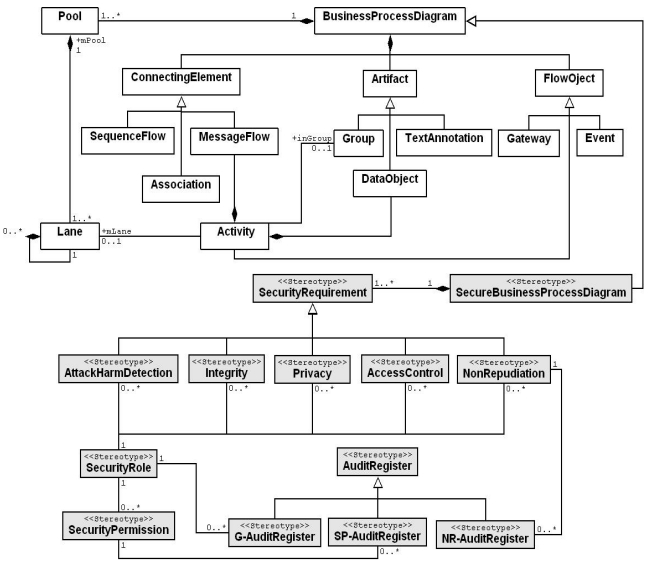

Figure 5. Secure Business Process Metamodel

Taking into account the own elements of the Secure Business Process and based on expert opinion, we have elaborated Table 1 in which the equivalences between LIS and SBP elements are shown.

Table 1: Equivalence between LIS and SBP elements

LIS information	Secure Business Process	BPMN-BPSec
LIS_SC: Sources Programs		
LIS_SC01 Files (Keys)	Data Store	Data Object
LIS_SC02 Programs calls	Activities Sequences	Sequence Flow
LIS_SC03 Inputs	Documents	Data Object
LIS_SC04 Outputs	Documents	Data Object
LIS_SC05 Access Menu	Access Control	SR-Access Control
LIS_SC06 Changes Control	Audit Register	SR-Audit Register
LIS_XC: Execution Programs		
LIS_XC01 Roles	Roles	Pool/Lane
LIS_XC02 Executions Sequences	Activities Sequences	Sequence Flow
LIS_XC03 Inputs	Documents	Data Object
LIS_XC04 Outputs	Documents	Data Object
LIS_DF: Data		
LIS_DF01 Business Rules	Activities	Activities
LIS_DF02 Access Keys	Access Control	SR-Access Control
LIS_US: Users		
LIS_US01 Roles	Roles	Pool/Lane
LIS_US02 Geographic Distributions	Roles Communications	Message Flow
LIS_TM: Time		
LIS_TM01 Execution Sequences	Timing	StartEventTimer

In this table (first column), we can see the information components of a legacy system that have been classified into: source programs (LIS_SC), executable programs (LIS_XC), data files (LIS_DF), information about the system's users (LIS_US) and information about the periodicity of execution of the most relevant tasks of the legacy system (LIS_TM). Each one of them provides other more specific information elements over which the equivalence to the components of a Secure Business Process (second column of Table 1) is established. Furthermore, on the last column of Table 1, we can see how each one of the components of the Secure Business Process described with BPMN-BPSec is represented. We have highlighted those equivalences related to security aspects although they are still preliminary. We can extract access control security requirements from access menus and data files with access control keys and audit register requirements from change control programs over specific files.

To specify transformations, M-LIS2BP-Sec will use the QVT language. This language allows us to specify in a clear and not ambiguous way the equivalence between dominions; in this case, LIS and SBP. An example of this type of rules specified in text QVT where there is a transformation from LIS to BPMN-BPSec is shown in Table 2.

Table 2- Transformation Rule in Text QVT

```
transformation LIS2BPMN
top relation R1
{
   checkonly domain lis_file ff:flatfile {name=n}
   enforce domain bpmn_bpd dsn:DataObject {name=n}
}
top relation R2
{
   checkonly domain lis_file ak:accesskey {name=n}
   enforce domain bpmn_bpd p:pool {name=n}
   enforce domain BPSec sr:SecurityRequirement {sr="AC"}
}
```

The first rule establishes that a data file of the legacy system will be always equivalent to a DataObject in BPMN. In both cases, the name that identifies each element is the same. The second rule specifies the transformation of the registers of a file with access keys into security roles that will have the same name as the user registered in the file. In addition, each new role will be associated with Access Control security requirement.

3.3 R-LIS2SBP Repository

R-LIS2SBP repository is the most important artefact of the M-LIS2BP-Sec method because it is the database where the information obtained from the inherited information system as well as the obtained secure business processes will be stored, manipulated and maintained.

Figure 6 shows the repository's class diagram that defines the classes representing the information components associated with the LIS. Following KDM line, this model will be the *inventory* of the LIS information components.

According to this model, from a LIS, it will be possible to obtain the following information components

- *Programs*. A LIS, in general, has many programs that can be available in source code and executable code. Depending on this condition, we could obtain more (sources) or less (only executable) information about the LIS. If source programs are available, we will be able to obtain: the files that it works with, files called for execution to other programs (with this, the execution sequences are obtained),

inputs and outputs of the program. From the executable programs, we could only obtain and analyze their interfaces when they have them and from them we could identify: roles, execution sequences, inputs and outputs.

- *Roles:* A role corresponds to one of the users of the system. A system can have many roles that will later be equivalent to the participants in a secure business process.
- *Files:* They correspond to LIS data files. They will be equivalent to the data warehouses of a secure business process. Moreover, they must be processed with tools for data (e.g. data mining tools) with the aim of capturing rules and relations existing between them. Likewise, these rules will be equivalent to the activities of a secure business process
- *Business rules*. They are either derived from the analysis of data contained in the inherited files or obtained from the documentation existing in the LIS. Business rules are equivalent to the activities of a secure business process.
- *User interfaces:* From user interfaces, it will be possible to specify LIS inputs and outputs. Also, we can capture the documents involved in the business process from them.

Together with the above-mentioned ideas, and as shown in Figure 6 diagram, there is a class called Secure_Business_Process associated with the LIS. This is not a simple class but it represents a set of classes that are equivalent to the metamodel defined in BPMN-BPD specifications (see Figure 5).

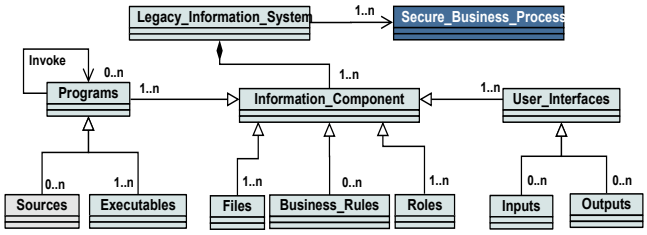

Figure 6. R-LIS2SBP Repository Class Diagram

The R-LIS2SBP repository will be used at the LIS INFORMATION COLLECTION stage where all automatically extracted information from the LIS is stored in the repository. Besides, it will be used at the LIS INFORMATION REFINEMENT stage in which the system analyst and the expert in LIS have access to the information components of the LIS through an application that allows them to access the Repository. They can add new components or complement and/or modify those already existing in the repository. As a result of this stage, R-LIS2SBP is updated. At the third stage, SECURE BUSINESS PROCESS CREATION, the repository is used as input to the process of transformation of the information components into the equivalent elements of a secure business process. At this point, a preliminary version of the secure business process or processes embedded in the LIS that are stored in R-LIS2SBP is generated. Finally, at the SECURE BUSINESS PROCESS REFINEMENT stage, the business analyst as well as the expert in LIS will access R-LIS2SBP in order to obtain the secure business process or processes extracted from the LIS information at the previous stage and they will proceed to refine it or them. After that, the secure business process or processes are stored in the repository again, now in its/their final version.

4. Related work

In this section, we will present a relation of works that have faced the obtaining of business processes from inherited systems in general and particularly those works that have considered security aspects.

In the last years, the use of inherited information systems linked to business processes has been the focus of researchers and practitioners. In 1996, a research program about system engineering issues related to the change into business processes; SEBPC, Systems Engineering for Business Process Change) [23] started in the United Kingdom. Around 1999, we can mention the appearance of several works related to inherited systems and the change into business processes [15, 18, 24] and a work [2] that dealt with this subject considering the obtaining of business events from inherited systems through the follow-up of the events in a database through the use of inductively learnt rules.

Moreover, the way in which inherited information systems can be modernized considering a technical perspective [11] or evaluating the inherited systems within a framework that combines the business perspective and technical considerations [9] has been widely studied.

In [6], this subject is considered taking into account the use of inherited information systems under a business process approach in which a workflow that allows us to link LIS and BP is adapted. Authors are based on the premise that establishes that it is always possible to identify a subset of processes and integrate them into the existing information systems. They also consider that this partial integration generates a profitable link that is associated with the business process approach. However, this proposal does not suggest a way to give support to the new information system based on the definition of business processes.

Regarding works in which security aspects extracted from a LIS are mentioned, we have found those that make reverse engineering over secure data warehouses with the purpose of detecting new security requirements [5], the definition of a methodology for the obtaining of administration of security roles obtained from legacy system files [28], a model for the analysis of authorizations and an associated method for the extraction of authorizations from a LIS database [10] and aspects related to the migration of legacy systems emphasizing authorization subjects [21].

In spite of the diversity of works that attempt to solve this problem, we cannot find a proposal that considers the definition of a framework that, under an approach driven by models, allows us to obtain secure business process from the information available in the inherited information systems

5. Conclusions and Ongoing work

In this paper, we have presented the preliminary definition of a framework that, through model transformation. will allow us to obtain SBP from the underlying information of a LIS. To do so, we have based on a previous proposal whose aim was to obtain business processes in general. In this proposal, authors proposed the use of the QVT language with which a set of rules that allowed the performance of the transformations were defined.

In this work, our main objective has been that of obtaining Secure Business Process models, useful for enterprises in a way that they could obtain information about the way their tasks are being

carried out as well as for software developers that could have a source of requirements that, for being early defined, favour the software creation process.

Our future work is oriented to the search of more information about the legacy system, more precision in the specification of equivalences and therefore in the transformation rules and to the performance of experiments in actual environments that allow us to contrast and improve our proposal.

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