

CONTRACT MANAGEMENT ON
MICROSOFT SHAREPOINT SERVER 2007

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Yue Zhou Contract Management on Microsoft Office SharePoint Server

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ABSTRACT

The purpose of this thesis is to develop a contract management method and design an electronic contract management system based on Microsoft SharePoint Server 2007.

The contract is an important type of document in an organization. It is the link between the organization and its customers and partners. Implementing an effective contract management system helps to organize resources and provide a framework that assists the monitoring, reporting and management of the contracts. Managing contracts in an information system that can provide relevant services can lead to enhancement of the ease of management, centralized and secured storage and accelerating the business process. An action research is conducted for a large local brewery company to boost into the first practice of contract management activities. Contract management method referring to the characteristics of the case company is developed and the design of such a system is concentrated on. Microsoft SharePoint Server 2007 is used as the potential platform for some experiments. The focus is not on the platform itself but how the features it can provide can have impact on the method of contract management and the design of such a system.

Key words: Contract management, service-oriented system, Microsoft Office SharePoint Server 2007

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1 INTRODUCTION

Nowadays, most organizations have already recognized the importance of managing information and knowledge as they realize that this is their big opportunity for accelerating business process, improve employees' working efficiency and cost saving etc.

The management of knowledge includes acquiring or creating knowledge, transforming it into a reusable form, retaining it, and finding and reusing it. Large organizations have difficulties in finding and reusing knowledge. Sometimes, even determining if the knowledge exists within the organization can be difficult. Digital technology seems to be an obvious way to improve enterprise knowledge management. Information that is represented digitally and placed on an intranet can be accessed by anyone in the organization any time. (Grudin)

Enterprise document management is often viewed as a component of enterprise content management and related to digital asset management, document imaging, workflow and record management. Document management is the process of handling documents in such a way that information can be created, shared, organized and stored efficiently and appropriately. (Contentmanager.eu.com)

More precisely, one type of document, the contract is very important for an organization as they are tightly related to business partners, customers and service providers etc. Implementing an effective contract management system helps to organize resources and provide a framework that assists the monitoring, reporting and management of the contracts. It includes the establishing of an archiving facility for document reference and administration of the ongoing maintenance and management of contracts. In addition, an effective contract management system may allow employees to extract key information that can help in decision making process. And systematic report and alert can help to reduce cost, increase productive efficiency and reduce the potential risks related to the contracts.

2 RESEARCH APPROACH

2.1 Research problem and research question

The case company is the leader in the beverage industry in Finland and at the same time is a member of an international beverage group. It has a long history in developing document management systems with various tools in the office sector, technical documents sector, projects sector etc. In 2010, the beverage group which the case company is a member of has taken in a new tool, Microsoft Office SharePoint Server (MOSS), the case company also has taken action in this IT strategy, started to search for better solution for document management. The chance to figure out an electronic management system for growing a massive amount of contracts in logistics and sales sectors has shown up. With the tools provided by MOSS, the possibilities exist in developing a system to manage the whole lifecycle of contracts with certain business functions. Under this general background, the research question is developed as what is the efficient design for the case company to develop an electronic contract management system in MOSS. The research study scope is set in sales and logistics sector.

2.2 Qualitative research methods as a relevant

The author participates in the design of contract management method and the system based on MOSS. Qualitative research methods is able to understand users' perspectives of the system, real business needs and the context of the system architecture itself via literature reviews, interviews, recorded ideas and plans and the observation of current document management systems.

Action research is recognized as a relevant. Action research associates research and practice, so research informs practice and practice informs research synergistically. Action research combines theory and practice (and researchers and practitioners) through change and reflection in an immediate problematic situation within a mutually acceptable ethical framework. Action research is an iterative process involving researchers and practitioners acting together on a particular cycle of activ-

ities, including problem diagnosis, action intervention, and reflective learning. (Brydon-Miller;Greenwood;& Maguire, 2003)

To explain more detailed, action research includes problem diagnosis, action planning, acting, observing and reflecting. And these processes are done in consequences of cycle. During the process of the last concept reflecting, if there are new problems or needs then the research is brought to a stage of re-planning. Originally according to Kurt Lewin, a sociologist, the process of action research is illustrated as in figure 1.

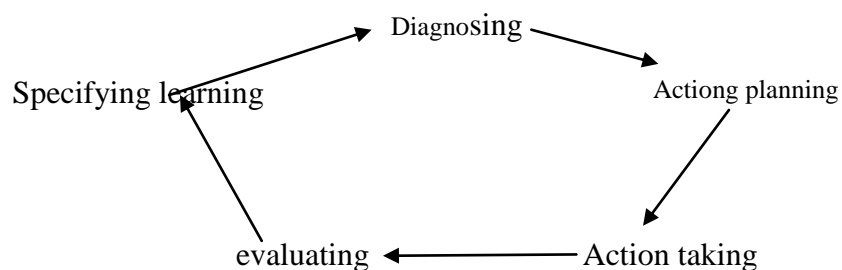


Figure 1 Action Research Study process

In the first block, action research begins with identifying and defining a problem. Secondly, in acting planning, alternative sources of action for solving the problem are taken into consideration. As a consequence, one source is selected and carried out. Then the consequences of the output phenomena are studied. At last the output of the action research is distinguished

2.3 Research framework

The whole study begins with a literature review on contract management. In this concept, the factors that are related in contract management as a business process are summarized.

The second concept is contract management system. The features, architecture characteristics, of such a system are studied. In addition, the practical guidance on the process of developing an electronic contract management is studied. This creates the theory background of the topic, and summarizes the implementation

procedure of contract management system and the factors that are needed to be addressed in designing such a system. And these summarized theories will be used in the later concepts.

The third concept is the case company's practice of contract management. It includes a certain analysis of the users' perspectives and the organizational needs. The guidance summarized from the literatures is tailored according to the characteristics of the case company into a method that can be applied.

The fourth concept is contract management by MOSS. This is a tool set concept. The study of MOSS itself is conducted and how it can impact with the method of contract management is described. From here it is very important to dig out the possibilities by modeling methods.

At last based on the previous four concepts, it will come to a concept on the result of design with some experiments.

The concepts diagram is illustrated in figure 2.

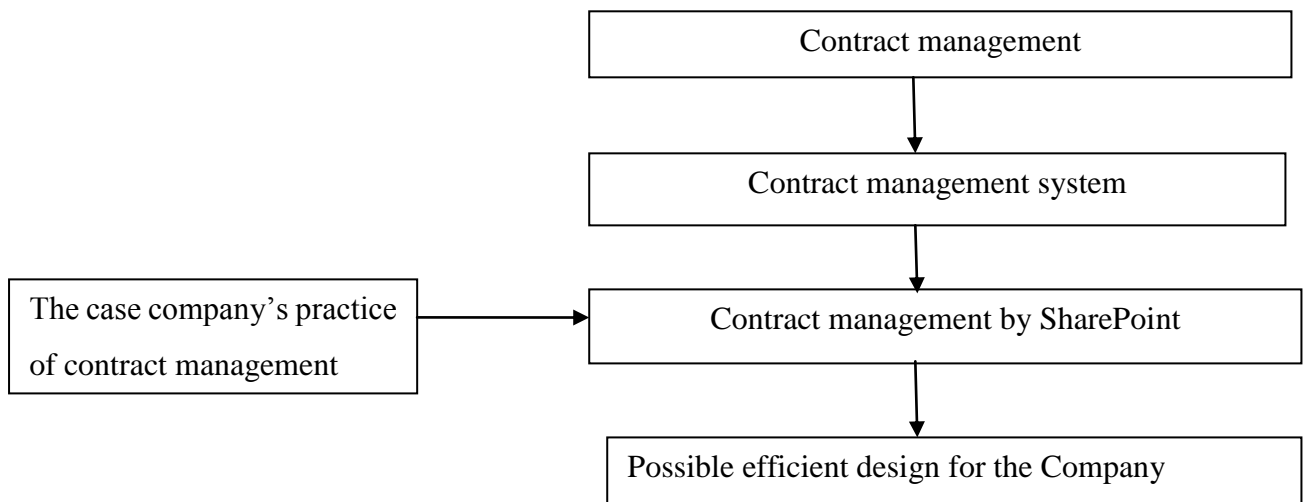


Figure 2: Research study concept diagram

2.4 Data collection methods

Referring to the characteristics of action research, there are three methods in data collection.

The first method is summarizing the important factors on contract management and contract management systems in literature review. The second method is recording and summarizing the interviews of key users of the future system. The third method is recording the reflections during the whole research study process.

2.5 Data analysis methods

Two groups of data are needed to be analyzed. One is the group which is the potential target for gaining user and organizational requirements including literature review notes, interviews summaries and meeting memos. The other group is the records of ideas in the study process and the study notes of MOSS 2007 which can contribute the design of the system and the impact potential of MOSS 2007.

First all the records summarized from interviews and meetings are read through. Special attentions are paid to words such as need, want, necessary, improve/improved/improvement, and share, manage and search. Then the contents of these sentences are reviewed aiming at creating an overview of users' needs. Then they are compared to literature review and the study result of MOSS 2007 as a product. There are two aims of comparison, one is to distinguish actual system requirements from the user's needs, and the other is to prioritize the gained requirements.

2.6 Applying the action circle to the study

Diagnosing:

The need of an efficient contract management system for improving business process is highlighted. But there is no organization wide method of contract management in the case company. Contracts are stored in paper form in physical folders in each business unit. As a suitable contract management system existing in the

organization, the contracts can be managed in a centralized way, shared and controlled with classifications applied to different priorities of users. Based on this, the problem diagnosed is: the case company needs a contract management system with relevant functionalities for improving the contract management process.

Action planning:

MOSS 2007 has been selected as the tool of solution. The action plan is developed based on the literature reviews, analysis of interviews the ideas during the study process and the study of features on MOSS 2007.

Action taking:

The action is the design of the system including tailoring the method summarized from literature to fit with the case company, developing services and functionalities the system will provide.

Specifying learning:

The reflection stage is carried out according to the comments of key users from the case company and some experiment on MOSS 2007. Also guidance of evaluate such a system from literature is referred.

3 LITERATURE REVIEW

3.1 Contract management

“A contract is a binding agreement between two or more parties, defining the set of obligations, duties and rewards in a business process, which is important for attaining interoperability of business processes and enforcing its proper enactment” (Chiu, Cheung, & hung, 2002)

Contract management process involves several employees in several departments, even it can be an inter-organizational activity such as change makings, approvals etc. The process of contract usually starts with an initial agreement with the partner. The organization receives the document and passes it onto an internal review process. This process possibly goes through several individuals in several

departments across the organization. In this process, many organizations carry it out with several phone calls, email attachments and meetings. Once the internal signoff is done, the contract is mailed, faxed or emailed to the partner. If the partner requires any changes in the contract, then the internal signoff process will have to be carried out again. Maybe after several times of same way, the final version is printed and signed then moved to a physical folder stored in some cabin. (Rhodes, 2010)

“An electronic contract is a special kind of contract which is modelled, specified, executed, controlled and monitored by information system with EDI (Electric Data Interchange) tools” (P.R., Karlapalem K, & D.K.W, 2004)

3.2 Importance of Contract management

The traditional contracting process has certain shortcomings and challenges. Rhodes comments that typical challenges are the participants may have very little insight view of the current status of the contract, and they may be hesitating in making sure if they are working on the latest version of the contract. The approval stage is difficult to be made clear such as who the approver is or when it should be approved. By this way, it is usually very difficult for the organization to have a central repository of the contracts and it is too difficult to find needed contract information. In addition, any edition, periodic reports are done manually. (Rhodes, 2010)

The recent study IACCM indicates that the current contract is often in situation of disconnected activities rather than a process leading to poor visibility and metrics for the control. (The International Association of Contract and Commercial Managers(IACCM), 2003) The common factor of all present and future business is the pace of change which can be seen in many ways including increased competitions, increased regulation, and increased innovations and so on. And the enterprise wants to be more adaptable. In a networked world, the organizations are essentially about managing group of information, people assets financial assets linked together and governed by contracts. Based on these issues, contract management is the core

of running competitive enterprise. In addition, business environment and law are getting more complicated. The creation of enterprise value depends on a network of suppliers, business partners and other stakeholders, so the operational risks changed to contract risks.

In fact, the contract management should be viewed as a process. Contract approval, tracking, storing and management can be shown to audit workflow. Enterprise needs contract management process and supporting tools so that better contract can be created in less time with decreased cost, increased profits, better risk management and increased value for the entire enterprise considerations, risks, downfalls, benefits and risks.

3.3 Contrat management system

3.3.1 Service-oriented architecture

Service-Oriented Architecture (SOA) is an evolutionary architecture. Organization for the Advancement of Structured Information Standards defines Service-oriented Architecture as “A paradigm for organizing and utilizing distributed capabilities that may be under the control of different ownership domains. It provides a uniform means to offer, discover, interact with and use capabilities to produce desired effects consistent with measurable preconditions and expectations.” (Organization for the advancement of structured information standards)

Research study from Shahid Rajaee University comments on the benefits of applying such architecture that it provides a simple scalable paradigm for organizing large networks of systems that require interoperability to realize the value inherent in the individual components. (Valipour, Bavar Amirzafari, & Daneshpour) And Chieu, Nguyen, Maradugu and Kwok point out that the SOA concept is to share and exchange the runtime results of executing software as service. And the Simplicity, reusability, interoperability and flexibility are addressed as the benefits for SOA. (C.Chieu, Nguyen, Maradugu, & Kwok, 2010)

In a system that applies SOA, the services may include content repository service, workflow and routing service, security service, notification service and integration service. The content repository service is the foundation of search and retrieval of documents. The contract management automation can be done based on the workflow and document routing service. The security service is mainly aiming at user authentication, document access control etc. Notification service can help employees to reduce the monitoring work. Integration service provides the possibility to connect the system to other functions heading to business intelligence. (C.Chieu;Nguyen;Maradugu;& Kwok, 2010)

In content repository service, the contracts are organized in a hierarchical data model regardless of the physical location on file system or enterprise content repository database. The content repository store and retrieval of structured and unstructured content and enable the full text search, versioning and transactions. The items stored in the repository are considered as objects which can be documents and folders. This provides the possibility to exchange documents between client and server and pass the document between different functions with retrieved metadata for example via XML schema.

Document routing is a document-based workflow. Each work unit in the route is created and associated along with other necessary information. The definition of the process and route should start from the contract lifecycle. Traditionally, there are four stages during the lifecycle of contracts: preparation, negotiation, fulfillment and termination. But this is not detailed enough to manipulate the suitable workflow design. Chieu, Nguyen, Maradugu and kwok illustrate 8 stages of contract lifecycle: contract template, draft contract, middle contract, valid contract, accomplished contract, terminated contract, revising contract and cancelled contract. (C.Chieu;Nguyen;Maradugu;& Kwok, 2010). The process consists of group of actions such as submit, approve, sign, and reject and so on. One important issue that should be considered the integration of process and the security service including access control to each work step, checking, user role assigning and privileging and general system management.

The notification service sends reminders, other messages to user or informs user that there are certain tasks waiting to the stored email address in user profile. The message can include the starting of an activity, or the completion of an activity or an activity has encountered error etc.

The integration service enables effective sharing, seamless movement of information to gain operational advantages.

3.3.2 Contract management system development

Jaakkola pointed out that three main steps are involved in developing contract management system:

Step one is to establish the basic contract management operation. This step includes centralized contract repository, assign persons responsible for each contract, develop the contract management handbook and company contract template and define the required proactive alarms on the contracts.

Step two is to make the contract alive and be a part of the business. The contract management process get into deeper involvement of business units. And they are used in operations for example in project management. In addition, the contract management is used actively as a business tool.

The third step is a strategic step including evaluating the entire organization's contract and partner network, integrates contract management as a valuable tool for long-term planning strategy formulation, strategy implementation. (2004,Jaakkola)

The starting point is one of the major aspects in the operation and process in the organization. It is mapping the development path for managing related workflows and process in contract management. The consideration on the starting point should be put on the most important resource allocation. The scope of contract management should be decided, if it is a single type or full scale. The wider the scope is, the bigger benefits can be gained but the narrower the scope is the easier it is to develop

the system. The considerations can be carried out in aspects such as process definitions, Contract templates, software selection, scanning and storing the contracts, interest groups, responsible persons etc. The starting point is the order of progress, organizationally and operationally. The selected sector as the starting point should be an isolated business unit and large enough aiming at deciding what type of contract will be included.

To describe more detailed, there are three major considerations. First, the large amount of contracts should be mapped somehow. There are different approaches. The simplest way is to leave the old contract as it is and apply the new way of management from this day and forward. It is important to select which contract should be included, find the originals and scan and put it into the process. Second, the contract management process requires a flexible tool that enables de-centralized usage. Contract management compromise two key elements, one is process the other is tool. The key issue in process definition is taking the notice to the lifecycle of contracts to approval procedures, to information distribution and to restrictions. The chosen tool must support each of the process as each phase of contract lifecycle. The relevant functionality should provide the possibility of proactive management, searching and collecting contracts, pointing the responsible person etc. The goal is to get things organized in order to generate cost saving in contract management, administration work and reduce unnecessary costs related to uncontrolled continuance of contracts

The expanding is to expand the concept to business people. Everyone in the organization knows how to deal with contracts using common principal. On the way of achieving this training and time is needed. The goal is to further decrease cost, increase profits and benefits, increase quality of operation essential for partner and customer relations.

The strategic control step is about using information that is included in the contracts to support business activities such as decision making, reports etc. (Jaakkola, 2004)

4 CONTRACT MANAGEMENT ON MOSS IN THE CASE COMPANY

4.1 As is situation

The case company is always working on developing a suitable document management system and has already succeeded in some point. For example, the implementation of eRoom as document management system for TPM (total productive management) can be considered as good practice. Recently all the technical documents are unearthed by being moved from a low speed legacy system to a newly developed system. But specifically for contract management, investigation is needed. Applying Jaakkola's suggestion on developing contract management system, the three steps, Contracts from Sales sector and logistic sector are chosen as the starting point.

The reason for choosing sales sector as the beginning point is that the contracts in sales sector take role as the link between the case company and its customers and partners. The sales contracts provide the important production information of manufacturing firm including the attribute of the user request, specification and delivery time and the information which enterprise formulation and in the execution production plan process involves. (Ni & Zhong, 2010)

The key reason for choosing logistic sector is that logistics is also the link between the case company and its customers. Without a proper contract management in logistics sector, the case company could not deliver the products to its customer and transfer them in proper inventory locations.

In addition, both of the sectors still store their contracts in file folder system in cabinets, and there's very few reviewing process, no clear definition of the responsible persons and no expiration alerts etc.

In the sales sector, an interview is conducted with the potential key user for study on the current situation and for analysis of the system requirements. The current situation is summarized as follow: the management tool used is a contract list in

word document including data about the partners, contracted date, reference to products. The types of contract including for example bank contract, purchase contract, service contract, marketing and media contract etc. In addition of the complexity of the contract, there are problems such as the contracts of the daughter companies haven't been transfers, validated and no references about the partner company's name change etc. (KeyUserFromSales, 2010)

In logistic sector, same kind of interview is conducted. The as-is situation is summarized as: the contract type is fewer complexes, including contract with lorry drivers, premises contracts etc. And the contract itself stays steady which means that the contract itself doesn't change. The changing point, for example the transportation price list is handled in SAP. But the most highlighted needs in logistic sector are the reminder of the expiration date of the Lorries' commercial use license (KeyUserFromLogistics, 2010).

4.2 The perspectives of potential key users

After reviewing the interviews with the key users their needs address in easy access, automated workflow, security, expiring alert, termination alert, When the personnel change the assigned contract change to new person. Both logistics and sales sectors are in need of developing a workflow in managing their contract and people who have right can share and collaborate in a common location. Some key factors are needed to be taken into the workflow: the supervisor and reviewer of the contract and their assistants, the contract executors in different business units, the contract dispatch path, contract status including done, delivered, the reference to the related documents and contracts and expiring alert.

Developing solutions with SharePoint in the end user development level does not require a highly detailed technical specification document before the building practice, but it is necessary to have a good idea of how the system needs to function. According to the instructions from support of Microsoft there are five "whats" that are needed to be considered. First, what are the actors or roles in the business process? Second, what are the user interface needs for different actors? Third, what

does the business process look like? Fourth, what is the location of data? Fifth, what are the relationships among data? (Microsoft)

For the contract management system, the five “whats” are considered to gain the functional requirements based on the perspectives of the key users. First, there are roles such as lawyer, manager, contract owner, contract executor etc. And the contract owner maintains the information about tasks, issues and assigns the tasks to executor. Manager and lawyer need to see the roll-up information about the contracts. Second, manager and lawyer need the highest level overview while the owner and executor need to have more detailed task tools available. Third, the contract management process is tightly related to contract lifecycle, the workflow of contract lifecycle will be covered in details in later section. Fourth, the data of contract management system should be stored in a secured database for example Microsoft SQL server 2005. Fifth, the data in the contract management system is mainly contract and more detailed data about contract that may be organized in hierarchical structure.

In conclusion, the way how the contract management system should function can be described as: being able to provide lawyer, managers, contract owners and executors a central managed place to work on the contracts with an automated contract lifecycle process and the tools for their relevant management tasks.

4.3 Microsoft Office SharePoint Server 2007 and contract management

4.3.1 Overview of Microsoft Office SharePoint Server 2007

The target tool that is considered to adopt in the near future is Microsoft SharePoint Server 2007(MOSS 2007) which is one of the IT strategies from the organization that the case company is involved as a member.

MOSS 2007, which is referred as SharePoint in this paper if not specified, is a Microsoft product that is used for facilitating collaboration, providing content

management features, implementing business process and supplying access to information that is essential to organizational goals and process. It works effectively with other programs servers and technologies in office 2007 release.

Before entering contract management on the platform, it is necessary to distinguish MOSS 2007 with other versions of SharePoint products for example from SharePoint Service 3.0. SharePoint Service is the technology that is included in Microsoft Windows Server 2003. It can help teams stay connected and being productive by providing easy access to people, documents and information that they need to make well informed decisions, and get work done. MOSS 2007 is tightly related to SharePoint Service 3.0. It relies on SharePoint Service 3.0 technology to provide consistent familiar framework for lists and libraries, site administration, and site customization. All the features that are available on SharePoint Service 3.0 are available on MOSS 2007. However, Moss 2007 provide much more. For example, MOSS 2007 provides a number of additional site templates that are related to enterprise and publishing scenario and provide the possibility to access data on other business applications such as SAP in search and reporting. As a product MOSS 2007 provide feature categories regarding collaboration, people and personalization, search, content management, business process and form and business intelligence. (Micorsoft)

4.3.2 Potential for MOSS 2007 in contract management

Contract management resident in content management feature in MOSS 2007 and can make use of other features such as collaboration, search etc. Specifically for contract management, the potentials that MOSS 2007 provides can be sorted into three aspects.

First potential is from the contract itself. Features such as version history, customizable metadata, the ability to restore to previous version and site recycle bin provide an enhance capability in contract management. One more important feature is the single source of information such as use document center as central repository for contracts when the management practice expands to wider range of business.

In addition, the workflows related to contract can be assigned to individual or groups automatically and can be delegated or escalated based on predetermined criteria. Workflow dashboard is also possible in providing a view of all current workflows with their status along with workflow tasks assigned to and initiated by the current user. Workflow report is available on each workflow, graphical web parts for viewing workflow statistics like average run time, amount of workflow in progress, user performance, average workflow completion time, user respond time.

Second potential is from the user's side. The user interface is customizable at the same time the view and menu are enhanced in providing simplified navigations. Tools that are familiar to end users such as Microsoft Office can be integrated into SharePoint sites. Users can actually create workspace to post and edit documents, view and update calendars etc. For super users such as site owners, there is a comprehensive set of administrative options available. In addition, there are some interactive features such as wikis and blogs and self-service can be developed for site members to assign tasks. In addition, external users can be invited with a unique username and password for online meetings and negotiations.

Third potential is from the security side. With SharePoint, the contents going in and out to the business domain can be controlled and monitored. The permission can reach as deep as single item level. There are controls to manage the site life-cycle, site member ship, permissions and storage limits. Any changes of the electronic content can be tracked and monitored. (Bunker, 2010) (Anderson, 2009) (Features and benefits)

In addition, specifically for the management, it can be automated utilizing key features of SharePoint to provide a more streamlined process. All incoming and achieved contracts are housed in contract library via revision control and customized views. The library item provides the possibility of metadata for searching, grouping and classification. Information of the contract can be accessed and found quickly. If a contract is added to the library, the system can automatically kicks off the review work flow. The notification, task alert automatically go onto the route of assigned process participants. The benefits from automating the contract man-

agement process includes also the latest version of contract is involved in contract related works and activities.

4.4 Service-oriented system on MOSS

The development path follows Jaakkola's three steps instruction. In this research study, only the design of the first step will be carried out and partly prototyped and some discussion on the expansion will be illustrated. The objectives of the first step, establish the basic contract management operations, includes establish a centralized contract repository, establish the responsibilities of involved people, develop a contract template, define the organization's workflow of controlling contracts' lifecycle and define the proactive alarms on the contracts.

In this section, the features that can be used in developing service-oriented contract management will be illustrated. In addition, there will be discussions about how the features impact with contract management.

4.4.1 The control repository

In this first step of developing contract manage system, the key user from sales unit who has worked in document management field for years suggests that the concentration should be put on new coming contracts first then moved back to the legacy contracts. Based on her suggestion, the contracts that going to be uploaded to the central repository are recently newly created contracts which are scanned. And this primary contract management system will only take inner organizational contract management process into account.

Traditionally, file shares give users one path through folders to the documents. In SharePoint, the other path to expose content is provided. The user can access documents directly through the browser, and bubble them up in Web Parts. Sorting and filtering are also allowed. All the features of this new path are based on SharePoint document libraries. It allows user to store and share file securely. The central repository for contracts in this first step design is based on SharePoint li-

library. On the issue of how contracts get into the central repository, document library provides multiple choices. Contracts can be saved with the document library's URL as well as being emailed to the document library or drag and drop from windows explorer. (L.Williams, 2010)

In order to develop a central repository and define a contract template for the case company's contracts, it is important to find the common characteristics and attributes that the contracts share in the organization.

Yu, Liu and Chai pointed out that contracts are complex sets which involve parties, exchange values, clauses, activities and signatures. And they developed conceptually specified elements with essential attributes and relationships shown as in figure 3. (Yu, Chai, & Liu, 2009)

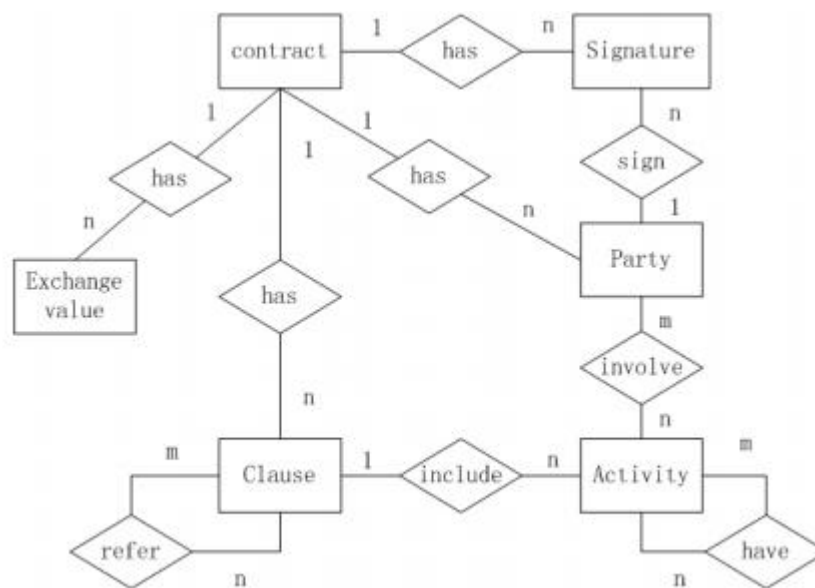


Figure3 Entity-Relationship Model for E-contract

This model roots from the entity contract with four sub elements: party, exchange value, clause and signature. Exchange value is the most sensitive part of the contract for including the information of exchange products and services, exchange process and payment. Clause is used to specify to obligations, responsibilities and benefits. A set of activities by parties carry out the clause. A clause can refer to other clauses and an activity can involve other sub activities. A contract can consist of several exchange values.

Metadata is widely accepted as ‘data about data’. As Sicilia summarized that metadata is a referential description of another thing or resource as well as a purposeful description as a medium to an end aiming at facilitating retrieval, stating intellectual property rights, claiming authorship, driving the behavior of online information systems or easing the combination of information resources. (Sicilia, 2006) The use of metadata in contract management is the foundations of search, aggregate, calculate, test, report and the information may become more powerful in an operational sense. Using metadata in MOSS is very important. The contract central repository, Document library if SharePoint term is used, is organized around files that exist separately and are described by their metadata. Metadata is attached to MOSS content that provides contextual clues to contents. Adding context gives the user a view of the content when they are looking at it as well as improves the discoverability of the content so that it can be easily categorized, crawl and indexed. Searching of contracts also has strong dependency on metadata; the contract central repository treats contracts as contents and requires the association of certain information (metadata). So the contracts can be found based on the similarities described by metadata, not just by the search option users have on traditional file share. The content gives MOSS search engine more contexts around the content so that it can accurately display it when it is relevant to a user’s search.

Based on the entity relationship model provided by Yu, Liu and Chai, the metadata design for the contract central repository is retrieved by extending and customizing the ER model for the case company as shown in figure 4.

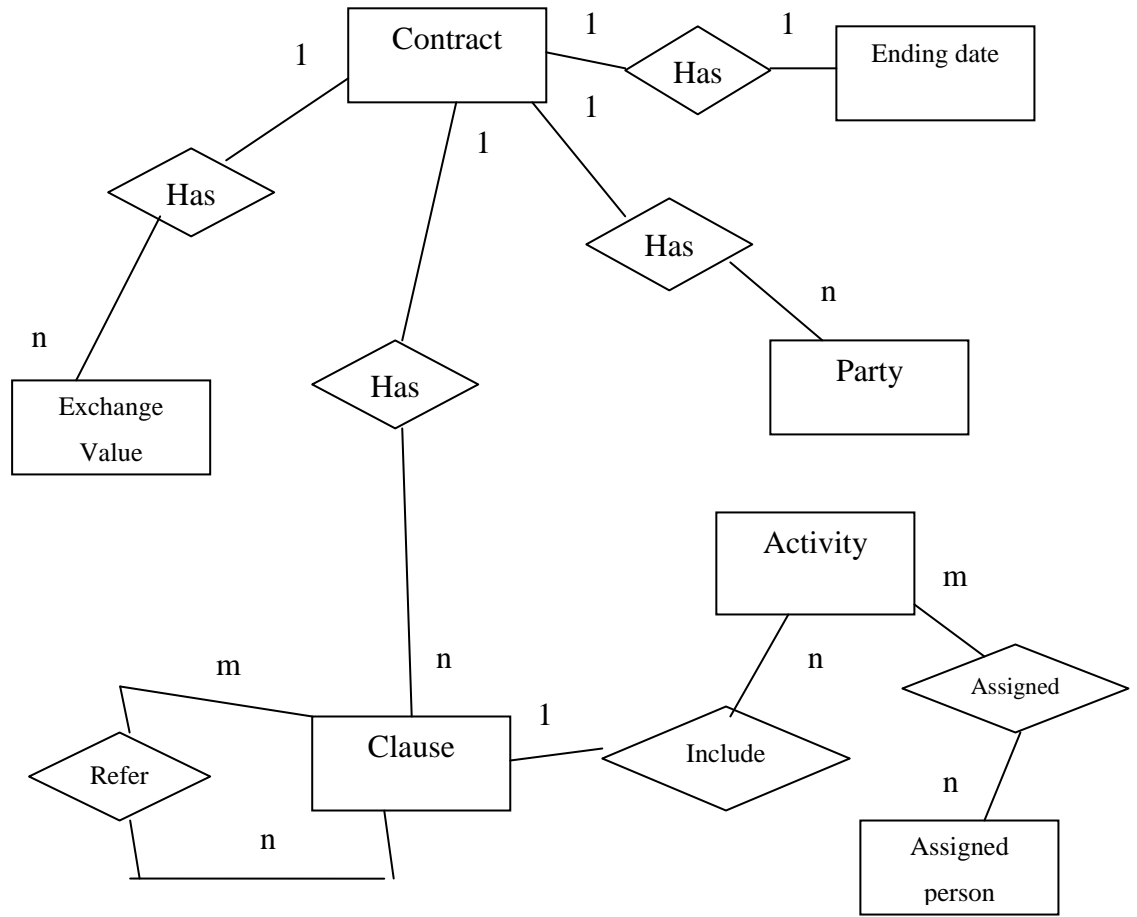


Figure 4: contract entity relationship model

The Signature entity is removed because in the design of contract management, the coming contracts are accepted by the organization already. But the Party entity remains, because the information of with whom the contract is signed is needed. Two entities are added into the ER model. The ending date model is a part of the design for one of the objectives in the first step of Jaakkola's instruction, proactive alarm. And the entity assigned person refers to person who is executing the activity. Two reasons for adding this entity, one is the convenience for the supervisor to track the contract the other is for further designing of workflow and personal site's tasks.

In SharePoint document library, metadata are referred as columns. There are four default columns including Type (what type of document it is, word, excel, picture, pdf so on) Name (the file's name), modified (the date and time the file is modified), Modified by (who has modified). Then if other columns are needed, they can be

added into the document library by specifying the data type, description for it, defining if it allows null value and optionally default value.

The metadata setting for the contract central repository is based on the customized ER model including Name (the contract entity), exchange value, clause, activity, party, ending date and executor. But there seems to be one problem for the one-to-many relationship. The temporary solution for this is that when the column is added into the contracts central repository, “multiple lines of texts” is specified for the type of information which will be included in the column. The columns of Metadata implementation is experimented as shown in figure 5.

type	name	modified	modified by	party	activities	clause	exchange value	executor	ending date
1	NEW	3/22/2011 11:35 PM	WIN-01XDW90SY2Q\administrator	XX trade	Receive the order dispatch the order to inner organizational process deliver the products	Deliver Sininen based on order request.	Receive sales revenue based on the actual delivered products each time after the delivery.	Staff A Staff B Staff C Staff d	4/1/2011
2	NEW	3/22/2011 11:45 PM	WIN-01XDW90SY2Q\administrator	XX Bank	monitor the enterprise's bank account transactions.	XX bank should provide XX services etc etc	Pays XX service fee	Financing manager A	6/4/2011
3	NEW	3/22/2011 11:47 PM	WIN-01XDW90SY2Q\administrator	XX Lorry	monitoring the lorry licences monitoring the delivery	XX lorry do XX	Outsource service fee XXX	Logistic manager A	3/17/2011

Figure5 : metadata columns

4.4.2 The e-contract template

The ability to readily create contracts with enforcement measures is critical success factor of managing the contracts. Contract template is a reference document that forms the basis on which a new contract can be customized from. By using contract template, the effort in development and support of the contract's whole lifecycle

can be streamlined and reused. The main component in contract template is the contract clause which specifically concerns in business interactions. The specific business interactions not covered by the clauses found in standard template can be provided as contract variations or contract escalations that are being negotiated during the enactment of contracts. (K.W.Chiu & S.C.Cheung, 2003)

Chiu, Cheung and Till analyzed the contract template in three layers including document layer, business layer and the implementation of the system. Document layer refers to the contract itself, concentrating on contract parties and clauses consisting of obligation, permission, prohibition. The business layer views the contract from the business point of view, comprises, business rules, business events, business action and business entity. The implementation layer refers to using certain technology to carry out the analyzed model as e-services.

Both in document layer and business layer, the authors used Unified Modeling Language (UML) developing a meta-model and an instance of contract template based on the meta-model. Also, in the research study of Yu, Cai and Liu, they have carried out an object-oriented analysis, UML, for e-contracts to illustrate the detailed attributes in addition of the entity relationship model. 'Unified Modeling Language (UML) is a modeling language for visualizing, specifying, constructing, and documenting the artifacts of a software-intensive system. Since first introduced in 1997, UML has quickly become the standard modeling language for software development. It consists of nine diagrammatic notations, which can describe static or dynamic performance of a system. The standardization of the notation and the wide acceptance by software practitioners is the main advantage of UML'. (Yu;Chai;& Liu, 2009)

Chiu, Cheung, Till illustrated their analysis result in the figure meta-model of an e-contract template in UML. (K.W.Chiu & S.C.Cheung, 2003) as shown in figure 6.

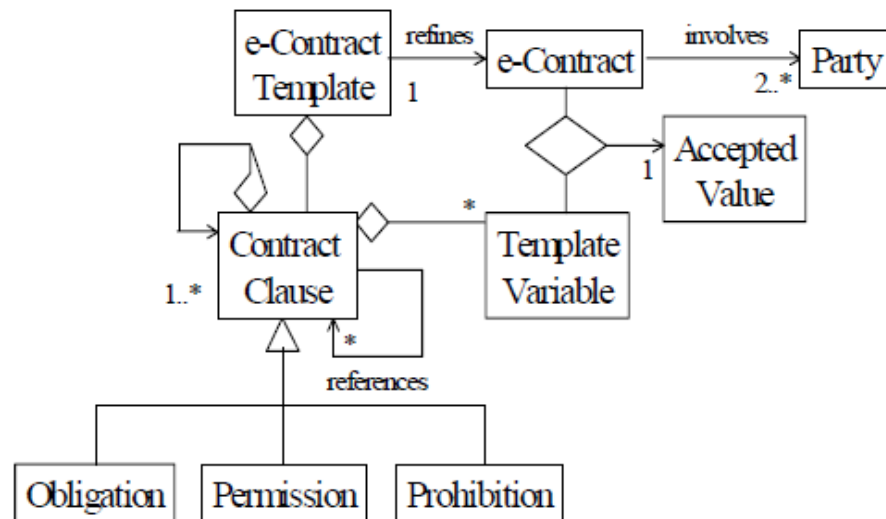


Figure6: Meta-model of e-contract

A template consists of number of contract clauses which concerns at least two parties bound by the e-contract. The contract clause is inherited or divided into the contractual constraints (obligation, permission, prohibition). A contract clause can consists of other sub clauses or refer to other clauses. There may exist template variables that concerning specific contract type. After the negotiation and approval process, accepted value comes.

Based on the meta-model from literature, as move onto the model of business process point of view, the instance templates for typical logistics and sales contract are developed.

In the customized model of basic sales contract template, the parties are referred to as supplier and purchaser. By doing this, this template can be use when the case company plays both roles which enables the template use with customers and partners. Two of the Template variables, Unit price and Freight, the source is mainly from the price list stored ERP system not via negotiation. Figure 7 shows the customized model for the sales sector in the case company

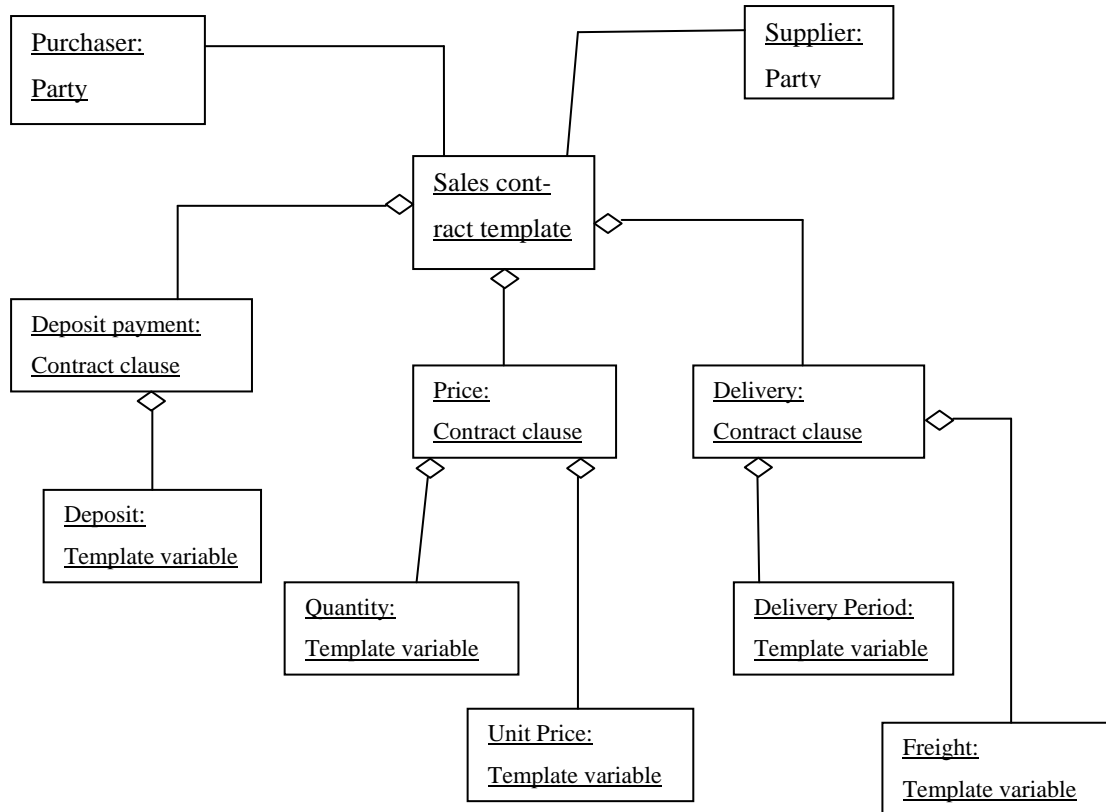


Figure7: the customized meta-model of contract template in sales sector

The template variables, Listed Price refers to the price list that are stored in EPR system which will change periodically, Negotiated Price refer to the prices that are not directly retrieved from EPR system, for example the rentals for warehouse etc. The contract clause License is mainly designed on the concern of the commercial lorry transportation license. The template viable ending date will be the background of proactive alert service. Figure 8 shows the customized meta-model of contract template in logistics sector.

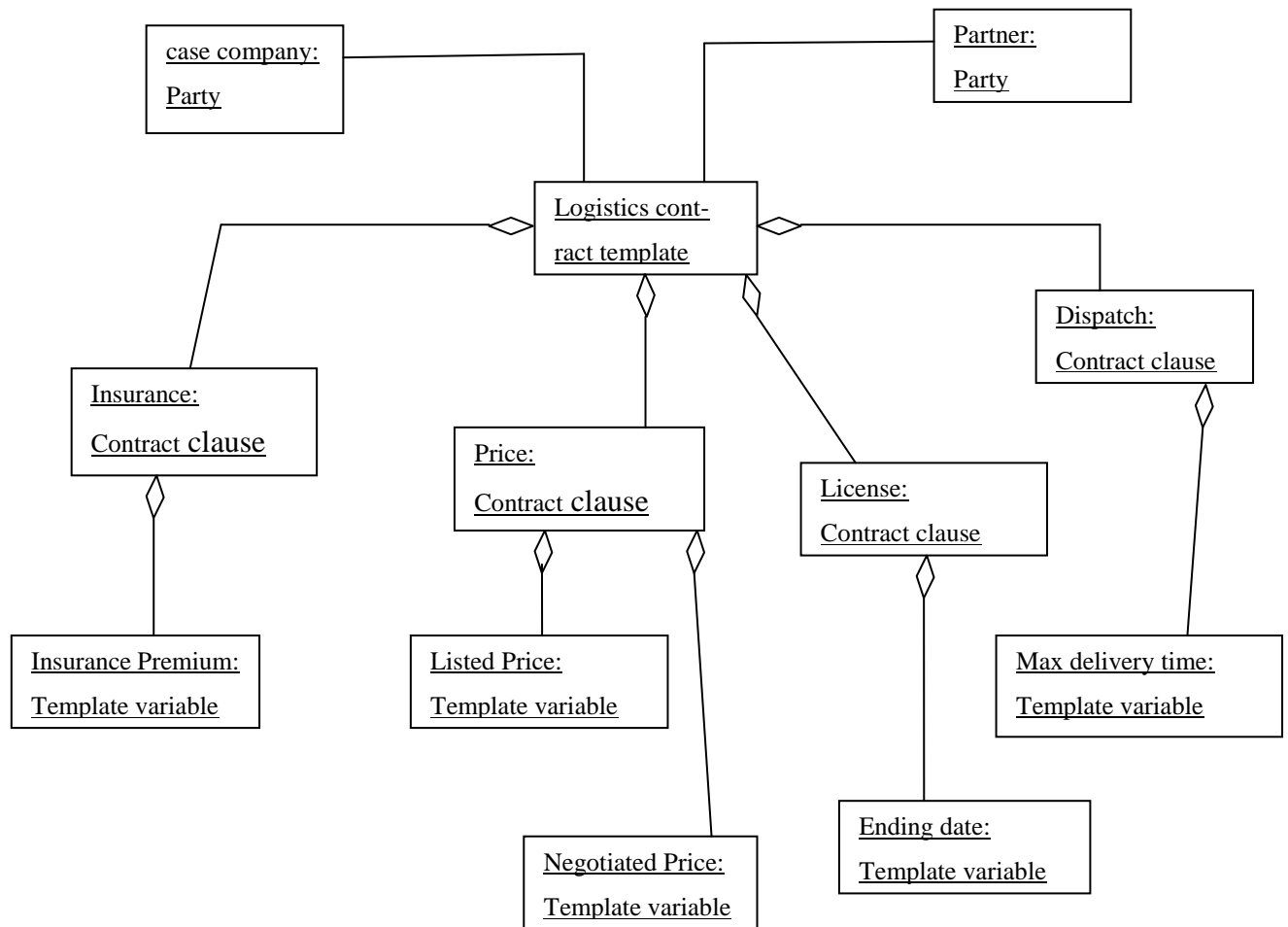


Figure8: customized meta-model of contract template in logistics sector

In this research study, the actually reference document will not be implemented. The analysis is the suggestion for the company's lawyer and contracting expert from the ICT perspectives of view illustrating in e-service level what are useful factors can be involved in. In the future, the models can be used for the automated contracting process when the contract management system development starts to expand. For this first step there will be only places, a contract template URL, in the contract central repository reserved for saving the downloadable template.

4.4.3 The proactive alarm service

Being proactive in contract management is important. Facing contracts proactively mainly brings the opportunity to break down systems and processes to find flaws

and control problems before they become out of control. One service that can add proactive feature to the contract management systems is the alarm service.

In the case company's contract management practice, there are points that alarm service are obviously needed for example the expiration of commercial lorry transportations license, contract activity due date etc. In addition, users who are processing multi tasks may need reminder of certain tasks.

In SharePoint, there is an alert function. This is a little bit different from what is mentioned as alarm here. The alert is mainly used to inform users about the content changes. This will be covered more in the section of security.

The most critical alarm needed in the first step of contract management development is the alarm of expiring: the expiration of commercial lorry transportation license for logistics and the contract ending date for sales. The solution for this requirement is to add customized workflow into the contract portal sites where the contracts are stored in this first step of development. The alarm workflow is defined with one variable with the operation of getting the current date minus the ending or expiring date. If the result is 30days, 20days, 10days, 0days, there will be emails sent to the contract owner with the duration before expiration. In SharePoint, customized workflow can be added into sites using SharePoint Designer or Visual studio.

In addition, as for being proactive in contract management, SharePoint provide the possibility to prioritize tasks for the users when the task is assigned. And every user can have the task view in their personal sites. This helps the users to organize their daily work more properly.

4.4.4 The Contract lifecycle control workflow

The contract workflow is developed aiming at providing a detailed overview of the activities associated with managing the lifecycle of e-contracts. Chieu, Nguyen,

Maradugu and Kwok defined eight statuses for e-contracts. Based on their descriptions, the e-contracts statuses are as follow:

Contract template: predefined according to the analysis of metadata which leaves the negotiation variables empty.

Draft Contract: filled with the negotiable variables which will be sent to the other party.

Middle Contract: negotiated contract with at least one signature but not all the signature.

Valid contract: contract under execution.

Accomplished Contract: contract the relevant matters, exchange values etc are fulfilled.

Terminated Contract: contract that is stopped in the middle of execution.

Revising Contract: contract terminated for the purpose of revise.

Cancelled Contract: Contract all the related matters, exchange values are cancelled.
(C.Chieu;Nguyen;Maradugu;& Kwok, 2010)

In UML, the activity diagram is used to describe the business and operational workflow behavior of a system which shows the activity and the event that causes the object to be in the particular state. UML activity diagram is used to analysis the contracting activity workflow. (W.Ambler)

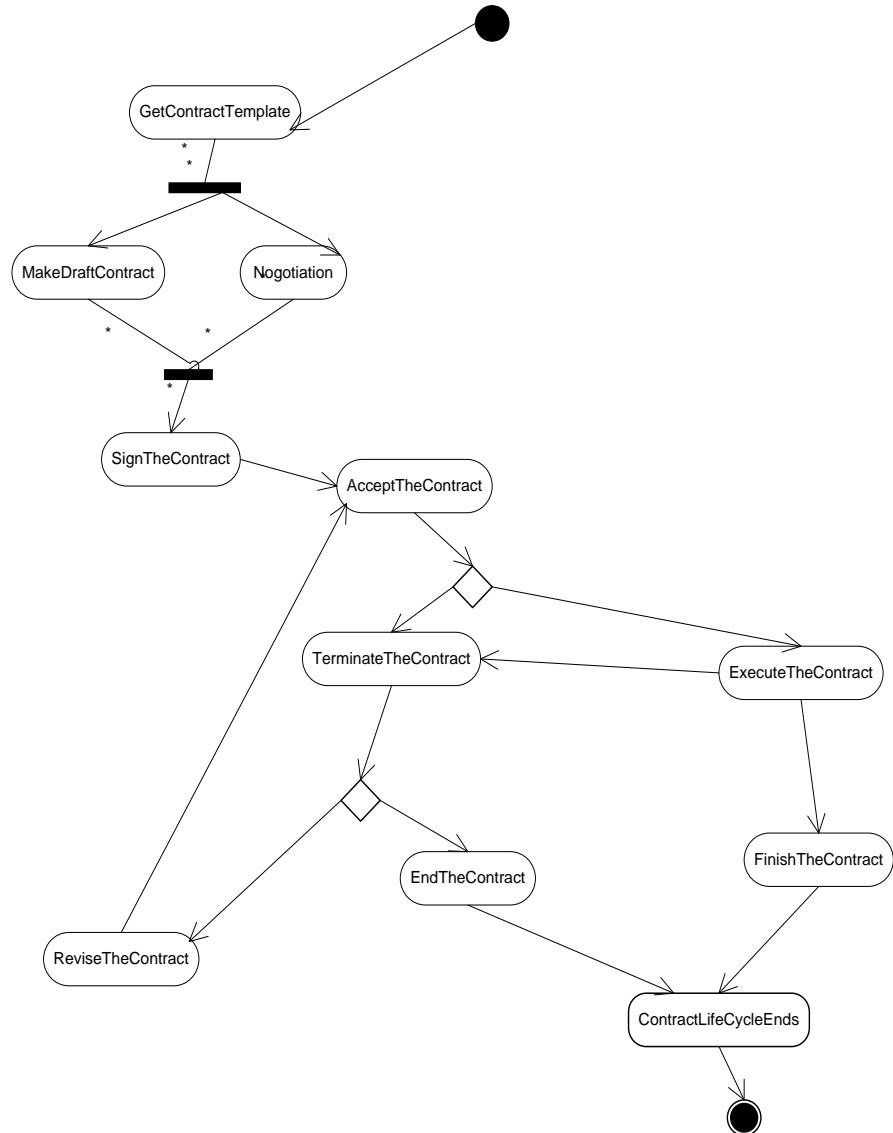


Figure9: Contract lifecycle workflow

The UML activity diagram shown in figure 9 describes the workflow, the process and activities concerning contract lifecycle. The initial state can be considered as the beginning of the contract lifecycle while the final state is the end of the lifecycle. The fork transition sign (bolded line in between of the actions of “GetContractTemplate” and “MakeDaftContract”, “Negotiation”) means that after getting the contract template, the draft making and negotiation can happen in parallel level. The joint transition sign (bolded line above “SignTheContract”) means after the parallel activities happen, it will continue to the activity “SignTheContract”. The activity “AcceptTheContract” means that the physical paper contract is uploaded to

MOSS. The decision sign (the diamond sign) indicating the choice, in this particular case, it means that a contract can be either terminated or executed. If the contract is terminated, it can be immediately cancelled or being revised. The revised contract has to be accepted by MOSS again. If the contract is under execution, it can be fulfilled or terminated. If it is fulfilled, the contract is heading to finished state. Both cancelled and finished contracts go to the state of the end of the lifecycle. After the lifecycle ends, the contract is not involved in the contract management unit anymore, it moves to historical document management function unit.

4.4.5 Security and backup

The effective information security can only be gained via a comprehensive IT security program. The main aim for security control is to ensure the business continuity, minimize the damage. The company's business information and the system that supports it are very important business assets. Their availability, integrity and confidentiality should be always taken into serious account when developing new business system.

In developing a contract management system based on MOSS, the most critical security issue is the consideration of site security. Site security refers to assigning permissions for individual securable object including two key factors: to what degree the permission is and how the users are categorized and managed. There are five site security elements. First, individual user permission is used to grant the ability to perform specific actions such as read, edit, delete etc. to users. Second, permission level is used to pre-define the set of permissions that grant users such as limited access, read, contribute, design etc. Third, User is the person with user account that can be authenticated through the authentication method used for the server. Fourth, group is a group of user which can be members of a department or SharePoint Groups. Fifth, securable object is the site, list, library, folder, document in SharePoint. In MOSS 2007, groups and users are separated from permissions which mean users and groups will not have permissions if they are not assigned a permission level for a specific securable object. Microsoft has illustrated how users and groups are assigned specific permission level for particular securable object.

Based on their diagram, the description of the five elements of site security (Plan site security (Windows SharePoint Services), 2008) and the description of user permissions and permission levels (User Permissions and permission levels, 2006), the diagram shown in figure 10 is customized to illustrate the suggestion of security consideration of the first step contract management system on MOSS.

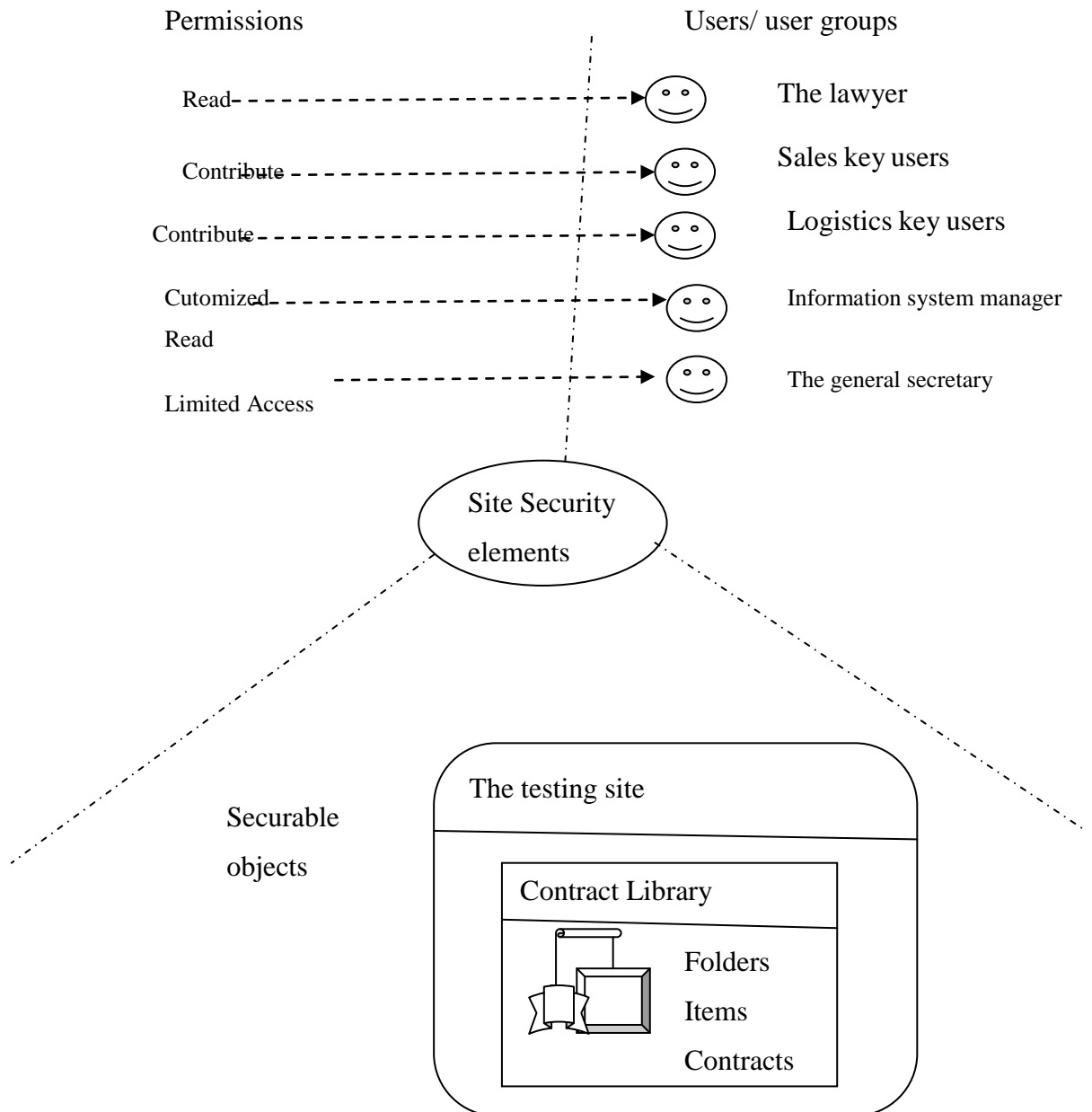


Figure10: Security consideration

The users or user groups in this first practice of contract management system on MOSS include the company's lawyer, key users from sales and logistics sector, the information system manager from IT department, and the general secretary. There

is no doubt that key users from sales and logistics sector are involved since this system is mainly aiming at providing services for them. The company's lawyer is involved because he is the person who is reviewing and checking all the contracts in the company. Information System Manager is involved because she has the control for all the information system in the company. The general secretary is included because she has experiences on technical document management from years of practice and she is the person who interacts most with different business function in the company. The permissions suggested to them is default permissions followed the instruction for beginning MOSS by Microsoft: find the balance between ease of administration, performance and the need to control specific permissions for individual items. (Plan site security (Windows SharePoint Services), 2008)The details of rights that are needed by the users in this contract management practice are explained as follow:

Limited Access (View Application Pages, Browse User Information, Use Remote Interfaces, and Use Client Integration Features) assigned to the general secretary so that she can have a general consideration for the system from the view of users with non-technical background.

Read (View Items, Open Items, View Versions, Create Alerts, Use Self-Service Site Creation, View Pages) assigns to the lawyer because he only need to review and check the contracts that has already been accepted by the company.

Customized Read (based on read permission but the view of actually contracts is excluded) assigns to the information system manager so that she can test the system from an IT expert point of view.

Contribute(Read permissions plus: Add Items, Edit Items, Delete Items, Delete Versions, Browse Directories) assigns to key users so that they can actually carry out the work activity with the contracts and contract management system (User Permissions and permission levels, 2006)

As for the search function which will be covered in the next section, the contracts should be excluded from the search result page.

The need of protecting valuable information needed in performing business activities is critical. Saving up the information in information systems, or more specifically in the database for this case, does not guarantee that all information will be

saved. It is important to be aware that accidents and system failures do happen. In such a case, the need of recover the lost information comes in. The outsourced consulting company who is taking care of the physical server and configuration of it should be responsible for backups of the system, for example, execute full backup, service backup, and database backup each week. The weekly frequency should be taken under negotiation. And disk backup should also be moved to tapes in a certain frequency. As to the user action of deleting document, the deleted documents should stay in user's waste basket for a certain period so that they can be restored easily within the period. In addition, after the basket duration, the consulting company's support should be able to restore the document still.

4.4.6 Other functions

Other functions related to and can be involved in the first practice of contract management system are described and illustrated below.

Most web sites provide the function of search, there is no exception on SharePoint sites. The search box is located in the upper-right corner which can be used to search the site or list the user is viewing. By default, the search box executes a contextual search, which means it searches the particular site or list where the browser is sitting.

If the search center template is going to be used the search scope should be customized to provide a more appropriate search. Site search dropdown mode can be activated. Setting for the default for all search boxes in the site can be chosen, individual search boxes to behave differently in the page or page layout can be configured. Target result page by entering the path to a custom search results page in the text box.

Search center template for building up the search result page. Search Web parts that are used to display search results can be configured to meet almost any search requirement the users can dream up.

Search Scope: SharePoint uses as a way to filter the content index. By limiting the user's query to filter subsets of the content index, SharePoint increase the probability of returning a relevant result set. MOSS has a single content index that stores text form all the crawled content sources. SharePoint has two kinds of search scope: Shared Scope shared across site collections, each site collection can have its own set of scope that is available for only that site collection. Search scopes are built by creating a set of rules that determines what content is included from the content index.

Web address is the build rules based on locations i.e. a site, list, or folder in a document library.

Property query is based on managed properties like author. Managed properties define the set of metadata terms that can be used to build search scopes and queries. Every metadata term used in list and site columns can be used to build a property query if they are added to manage properties by the search administrator. The operator used is "IsExactly",

Content source is only available for search administrator to limit the scope to a specific content source for shared search scope.

Search result can be a web address can be matched to search keywords, when the keyword is searched; the web address will appear in the search result as best bet. Lists and libraries can be removed from the search result (L.Williams, 2010)

As users are very familiar with Microsoft Office Excel in the case company, in the situation such as they need to view contract signed with one particular partner, they may easily remember the filter function in Excel. SharePoint also provide the possibility of this. The actual data will appear in the column if the user clicks on the column as shown in figure 11.

TestingTeamSite

Central Administration > TestingTeamSite > Contracts

Contracts

This is the library for contract management

View: All Documents

Type	Name	Modified	Modified By	Party	Activities	Clause	Exchange Value	executor	Ending date
	1	3/22/2011 11:35 PM	WIN-01XDW905Y2Q\administr		Recieve the order dispatch the order to inner organizational process deliver the products	Deliver Sininen based on order request.	Receive sales revenue based on the actual delivered products each time after the delivery.	Staff A Staff B Staff C Staff d	4/1/2011
	2	3/22/2011 11:45 PM	WIN-01XDW905Y2Q\administrator		monitor the enterprise's bank account transactions.	XX bank should provide XX services etc etc	Pays XX service fee	Financing manager A	6/4/2011
	3	3/22/2011 11:47 PM	WIN-01XDW905Y2Q\administrator	XX Lorry	monitoring the lorry licences monitoring the delivery	XX lorry do XX	Outsource service fee XXX	Logistic manager A	3/17/2011

Figure 11: Filter tool

And the comparison value for the filter can be chosen, after filtering, a view with the matched results with the comparison value will be shown and the filtered column will appear with a filter icon on it so that the user knows the view is a filtered one as shown in figure 12

TestingTeamSite

Central Administration > TestingTeamSite > Contracts

Contracts

This is the library for contract management

View: All Documents

Type	Name	Modified	Modified By	Party	Activities	Clause	Exchange Value	executor	Ending date
	2	3/22/2011 11:45 PM	WIN-01XDW905Y2Q\administrator	XX Bank	monitor the enterprise's bank account transactions.	XX bank should provide XX services etc etc	Pays XX service fee	Financing manager A	6/4/2011

Figure 12: Filtered view

A view can be created by the users. For example the Financing manager wants to create a view for herself to illustrate all the contracts in which she is involved as executor. She can choose create view function view click on the “Settings” drop-down list. She can choose the format that the view will be created including standard view, datasheet view, calendar view and Gantt view. After choosing the format, she needs to name the view define sorting order, filter the executor column compare with her title. Figure 13 is a datasheet view created in such a case.

Type	Name	Modified	Modified By	Party	Activities	Clause
	2.docx	3/22/2011 11:45 PM	WIN-01XDW90S120\administrator	XX Bank	monitor the enterprise's bank account transactions.	XX bank should provide XX services etc etc

Figure13: datasheet view

Except the customized workflow, SharePoint also provide out-of the box workflows such as Approval workflow, Collect Feedback workflow, Collect Signatures workflow, Disposition Approval workflow and Group Approval workflow. The approval workflow can be used when a contract need to be approved as a prerequisites to publishing the contract. The user can set up the workflow to be serial (people one by one after each other) or parallel (everyone at the same time) and present the approvers. Collect feedback workflow can be used when related feedback is needed for example from executors, when the workflow completes all the feedback is aggregated and sent to the originator of the workflow. Disposition approval workflow can be used when the contract lifecycle ends and needed to be

moved to record management center for example archive documents send out notifications etc. (DocumentManagementWorkflowInfo, 2008-2010)

As described in the potentialities, Microsoft Office applications such as Word, Excel, and PowerPoint can be integrated to SharePoint. This exposes SharePoint functionality directly within the office user interface. With the integration, users can open, edit, save, and collaborate on any documents not only contracts in office format without leaving SharePoint sites.

4.5 Use of SharePoint Designer

Two tools are available for further customizing SharePoint sites, one is Visual Studio 2005 the other is SharePoint Designer. SharePoint Designer appears to be easier for end users who don't have experiences on traditional procedural coding language or technology to creating and customized websites and workflows built with SharePoint products and technologies. SharePoint Designer 2007 is the relevant version for MOSS 2007. It is the tool that IT professionals and solution actors need to develop SharePoint-based applications and workflow solution that enhance organization agility and business process automation. With SharePoint Designer 2007, the users can: create no-code data views and forms on a variety of data source such as XML files, SQL database etc; create sophisticated dynamic no-code workflow; perform page layout and designing; create master page; edit and apply Cascading Style Sheets.

In the first practice of developing contract management system, the aim of using SharePoint Designer 2007 is the possibility to create sophisticated dynamic no-code workflow. Two Workflows are implemented, one is the proactive alarm for the expiration date the other is the contract lifecycle automation.

5 DISCUSSION

5.1 Considerations of the expansion

Content types can be used in the expansion. Content type is defined by Microsoft as Properties to associate with items of its type; Metadata to associate with items of its type; Workflows that can be launched from items of its type; Information management policies to associate with items of its type; Document templates (for document content types); Document conversions to make available (for document content types).

Aiming at reusing the metadata in expanding the contract management practice into other business unit, it can be packed as a content type and then associated to the content type with other libraries.

Contracts are stored in the central contract repository, a library. If the contract is going to be shared in project work or in any collaboration case, a copy of the contract is sent to the desired address, the collaboration site. When the original document is update, it can be reminded the update document in other locations.

Using of a document center as contract central repository instead of document library should be address, if the amount of contract gets to huge size. Then the sharing and collaboration could be done via sending link, copies to authorized people. And the search Scope should be reconsidered for the security issue. Defining the permissions for each contract and contract list may be more complex.

Considerations of a search center should be addressed with the growth of the amount of contracts.

A self-service site could be considered to enhance to proactive aspect of the working environment for employees to create, assign tasks by themselves.

Training should be addressed also in the expansion. Training helps users to get familiar with the system and the tools available so that they can adapt to the new working environment as soon as possible. Training for key users should be considered first. Then the key users from each department could be a first-aid for other users in the later part of expansion.

One other factor that is needed to investigate is the compatibility of SharePoint and VPN. If there's any difference for example in speed of action of SharePoint sites when using local area connection from via VPN.

5.2 Integrate to other SP service

In contract management practice in SharePoint, the collaboration services can be made use of. Document workspace is a site that enables the coordination of the development of one or more related documents with others. The site members of document workspace can add or edit document, add or edit related task, create email alerts, add announcement and provide link to related information etc.

In the traditional way of sharing a document with multiple author or editor for example by email or file sharing may head to a confusing situation of working. It is too difficult to identify the latest version of the document. Multiple users may edit same file at the same time that lead to the conflicting version. Such a situation in contract management system should definitely be avoided. In SharePoint, this situation is saved out of the danger. If one editor checks out the contract for editing, other editors cannot make any changes to the contract before it is checked in again. One thing needed to be aware of is that the editors should have edit item rights to benefit this function.

In the inner organizational review process of contracts, the related contracting team often needs to discuss and review the contents of contracts. Traditionally, the discussion and reviewing is carried in meetings. But if the team members are in different physical locations which are very common in the case company, the team members may use emails to respond. SharePoint provides a possibility of better

solution: inline discussion tool in Office 2007. Reviewers can add their comments directly to the contract document; review comments are stored and managed centrally. So it is available whenever an editor reviewer opens a contract document from the SharePoint site.

6 CONCLUSION

6.1 Reflection

As the adoption of MOSS 2007 in the case company is still in the planning and negotiation stage, the organizational testing environment is not yet set up. The testing environment used in this study is a MOSS 2007 trial version installed on a laptop. Most of the services and functions described in this paper are tested. But certain features such as alert via email cannot be tested because it is not email server configured.

There are two kinds of comparison rules used in the reflection of the design. One is from the practical view which is the problems the new designed system solved and the fulfillments of the key users' perspectives. The other is from literature's guides.

A contract management system should ease the contract enactment and monitory process for efficient transactions and lead to enterprise access to the potential two dimension benefits. The first dimension is the benefits obtained from effectively managing the risk inherent in the contract. The second dimension is the potential additional value that can be obtained from effective contract management such as cost reduction through process development. (Good Practice Contract Management Framework, 2008)

The information system manager from the case company comments that this study has summarized a method of contract management from literature and tailored it according to the company's characteristics. The functions that are tested are ac-

tually useful in the management practice; especially the contract lifecycle workflow model is a good analysis. The theme of service-oriented architecture actually matches the company's perspective of such a contract management system. But more consideration is needed when designing the central contract repository, for example, inside the contract library there should be some way to organize the contracts, for example, a hierarchical structure or use of folders etc.

The general secretary comments on the user interface: it is not very interesting but it is simple and tools can be found without huge difficulties.

Both of the key users from the logistics sector and the sales sector are impressed that it is possible for them to have an actual central repository for their contracts and the contracts can be classified in different levels. The key user from the logistics sector is very satisfied with the proactive alarm for the expiring date of the commercial lorry license, but he suggests that the contract variable of price which is read from the SAP system in the logistics contract template should be removed because from his perspectives, the price which exists in SAP is enough, no actual billing or paying transaction will be done based on the contract itself, instead they are done via the price list. The key user from the sales sector also comments that there should be some way of organizing contracts in the contract library so that the management work will be even easier. And she also suggests that the standard for those legacy contracts that already exist should be addressed in the near future.

6.2 Problems found

In general, the case company has a fundamental requirement to only allow certain approved terms from a central list to be used as metadata. The metadata solution in this study experimented with a MOSS 2007 is an option that are limited by the available version. In the version MOSS 2010, term store is used to provide the capability of managed metadata. It is configured through the managed metadata service application. The new feature of the newer version arranges metadata in hierarchical structure. The metadata defined as term can be grouped into term sets

for management. So it is better for the management and more effective use of metadata.

As contracts particularly, they contain sensitive data that must be more secure, permission can be granted to a specific group or individual user. However, there is no way to view all the permits specific to the contracts within the TestingTeamSite. It is difficult to quickly check who has permission and to which level of permission to a specific contract.

Alert function works better with Outlook. Even though, the email alert is sent to the email address that is stored in the user profile, if the emails in the organization are served by Outlook, the way for handling the alert can be customized for example, you can choose to move Alerts to a special folder, forward them to a mobile device, or store them in a file. But the case company's emails are served by an application from IBM, so the benefit of this cannot be boosted to the maximum level.

In implementing the workflow of proactive alarm, the conditions and actions in SharePoint designer 2007 cannot fulfill the needs; use of visual studio with procedural codes is needed.

6.3 Potentials

After the expansion to other business sectors, the contract management system will face the challenge of the strategic use.

One thing for Contract management is that when the contracts' lifecycle workflow ends, then what happens? The contracts themselves become assets and knowledge of the case company. The first thing should be considered here is moving the lifecycle ended contracts to the record management service which residents on the same platform. Further, the data in the contracts can be retrieved for analytical use.

For information worker, they usually have more data than they know what to do with. Business intelligence and performance management come into the desires of

being able to make sense of the massive amount of data. In SharePoint, business intelligence functions provide the possibility to share, control and reuse business information. It can link to other business applications such as SAP for publishing reports, lists. Report center is a site that provides a central location for storing reports that are common to a group. It is a special document library, store reports, lists and connections to external data source. As to the office integration, excel service can be extend to a business function. Excel workbook can be saved on the server, any part of the excel workbook can be published on web page. All the calculations occur on the server, logic in the workbook is never exposed. So there's only one copy of the workbook saved in central secure place. Key performance indicator (KPI) is also a business intelligence function on SharePoint. It is a visual cue that communicates the amount of progress made toward a goal so that teams, managers and businesses can evaluate quickly the progress made against the measurable goals. Also, dashboard is available as a business intelligence tool. It is used to communicate status and to drive action. It can display information from disparate source, reports charts, metrics and KPI as well.

6.4 Further study field

Specifically for sales contract management, it is worthy of carrying out further study on adopting data mining technology in production forecasting and the adoption of client management theory aiming at an external system integration with customers and partners. The reason is that the job instruction can be made, the market demand can be mapped, and the reaction to market change of the enterprise can be enhanced. (Ni & Zhong, 2010)

For the contracts that are already existing in the case company's business archive, it is worthy of a study on find an approach to unearth the legacy contracts for example to develop an organizational object model and regulation rules.

More generally, for the contracting system for the case company, investigation on developing an inter-organizational contract management system may be carried out

which is aiming at developing the ability to create e-contracts with enforcement measures via web services. By doing this the case company can explore the possibility to totally automate the contracting process with its customer and client which means the contract process is done in the contracting system instead of physical paper contracts. The system designed in this research study only manages the contract when the physical paper contract is imputed into the management platform. By doing this, the contract's intricate details and implications explicit can be emphasized, and the detection of clause violations and respond appropriately relevant information from audit trails can be included.

REFERENCES

Book and research paper resources:

C.Chieu, T.;Nguyen, T.;Maradugu, S.;& Kwok, T. (2010). *An Enterprise Electroinc Contract Management system Based on service-oriented Architecture*. New York, USA: IBM T.J Watson Research Center.

Chiu, D. K.;Cheung, S.;& hung, P. C. (2002). A meta-model for contract template drive e-negotiation process". *The proceedings of 6th Pacific Asia Conference on Information Systems* , ss. 854-868.

K.W.Chiu, D.;& S.C.Cheung, S. T. (2003). A Three-Layer Architecture for E-contract Enfroment in an E-service Environment. *Proceedings of the 36th Annual Hawaii International Conference on System Sciences*. IEEE Xplore.

Jaakkola, K. (2004) *A way to successful and strategic contract management*. Efect Corp.

P.R., K.;Karlalalem K;& D.K.W, C. (1 2004). An EREC framework for e-contract modeling, enactment and monitoring. *Data&Knowledge Engineering* , ss. 31-58.

Sicilia, M.-A. (2006). Metadata and Semantics research. Teoksessa M.-A. Sicilia, *Advances in Digital information services and Metadata Research* (s. 122). Emerald Group Publishing Ltd.

Ni, J.;& Zhong, L.-w. (2010). Study of sales contract management system based on WEB. *Mechanic Automation and Control Engineering(MACE), 2010 International Conference on* (s. 3420). Wuhan, China: IEEE Xplore.

L.Williams, V. (2010). *Microsoft SharePoint 2010 For Dummies*. Hoboken: Wiley Publish, Inc.

Valipour, M. H.;Bavar Amirzafari, K. N.;& Daneshpour, N. *A brief Suvey of software architecture concepts and service oriented architecture*. Tehran, Iran: Shahid Rajaee University.

Yu, X.;Chai, Y.;& Liu, Y. (2009). A secured model for electronic contract enactment, monitoring and managemnent. *2009 Second International Symposium on Electronic Commerce and Security*

(2008). *Good Practice Contract Management Framework*. London, UK: National Audit Office UK.

The International Association of Contract and Comerical Managers(IACCM). (2003). *Contract Management: An Opportunity Still Being Missed?*

Internet resources:

User Permissions and permission levels. (16. 11 2006). Microsoft TechNet: [http://technet.microsoft.com/en-us/library/cc288074\(office.12\).aspx](http://technet.microsoft.com/en-us/library/cc288074(office.12).aspx)

Plan site security (Windows SharePoint Services). (18. 12 2008). Microsoft TechNet: [http://technet.microsoft.com/en-us/library/cc287752\(office.12\).aspx](http://technet.microsoft.com/en-us/library/cc287752(office.12).aspx)

DocumentManagementWorkflowInfo. (2008-2010). *Standard out-of-the-box workflows in WSS 3.0 and Office SharePoint Server 2007*.

DocumentManagementWorkflowInfo.com:

<http://www.documentmanagementworkflowinfo.com/workflow/standard-out-of-the-box-workflows-wss-3-sharepoint-2007.htm>

Anderson, T. (2 2009). *Using SharePoint for document management for the small office*.

<http://www.itexpertmag.com/server/using-sharepoint-for-document-management-for-the-small-office>

Rhodes, E. (August 2010). *Abel solutions INC*. SharePoint Tip of the Month:
<http://www.abelsolutions.com/Newsroom/SharePointTOTM/Pages/TOTM2010208.aspx>

Bunker, P. (11 2010). *What advantages does SharePoint bring?*
<http://www.ljmu.ac.uk/cis/SharePoint/99744.htm>

Features and benefits. MyHosting:
<http://myhosting.com/sharepoint/features.aspx#contentmanagementfeatures>

Micorsoft. *Introduction to Microsoft Office SharePoint Server 2007*. Microsoft Office:
<http://office.microsoft.com/en-us/sharepoint-server-help/introduction-to-microsoft-office-sharepoint-server-2007-HA010173217.aspx>

Microsoft. *Introduction to building SharePoint applications*. Microsoft Office:
<http://office.microsoft.com/en-us/sharepoint-designer-help/introduction-to-building-sharepoint-applications-HA010239046.aspx>

Organization for the advancement of structured information standards.
<http://www.oasis-open.org>

W.Ambler, S. *UML 2 Activity Diagramming Guidelines*. Agile Modeling:
<http://www.agilemodeling.com/style/activityDiagram.htm>

Interview resources:

KeyUserFromLogistics. (2010, 11). As-is situation in contract management in logistics sector. (t. author, Interviewer)

KeyUserFromSales. (2010, 12). As is situation of contract management in sales sector. (T. author, Interviewer)