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**A FRAMEWORK TOWARDS AN INTERNALIZATION STRUCTURE USING
DOCUMENT REPOSITORIES IN THE CONTEXT OF A KNOWLEDGE
MANAGEMENT STRATEGY: A CASE STUDY OF FIRST COLORADO TITLE**

A THESIS PROJECT

SUBMITTED ON 19th OF MAY, 2010

TO THE DEPARTMENT OF INFORMATION SYSTEMS, INFORMATION

TECHNOLOGY, COMPUTER SCIENCE

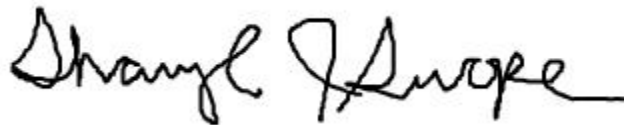
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OF REGIS UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF MASTER OF

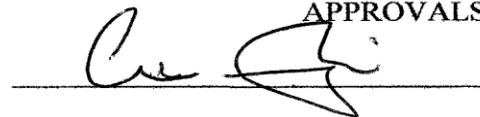
SCIENCE IN COMPUTER INFORMATION TECHNOLOGY

BY



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Abstract

Knowledge management is a key to creating efficiency and consistency within an organization. Title examiners review documents that may affect the issuance of title insurance. Some documents may affect many properties and thus are reviewed many times. This paper seeks to develop a framework that will enable the knowledge gained by the first review of the document to be captured and shared. Exploring the ontology of the title insurance industry with respect to title searching and examinations through the development of a concept map was the first step. Surveying the members of the title department provided the specifics for the framework. This study can be useful to any title insurance administrator that is seeking an ontology model for knowledge management.

Acknowledgements

I would like to use this space to thank my co-workers at First Colorado Title. They provided details through the pile-sort activity and responding to survey questions and by answering additional questions to clarify matters. I would also like to thank my family, especially my children, Danielle and Peter, for their patience while I worked on this project. Lastly, I would like to thank all those that prayed for me during this process and provided endless encouragement.

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Chapter 1 – Introduction

Thesis Statement

Given the need for a knowledge management strategy within title insurance companies, what is a framework that can be used towards an internalization structure using document repositories, in order to effectively compete, innovate and add value to the organization?

Statement of problem

A review of the public records to determine the significance and effect of each historical document is one of the basic steps of title examination for insurance purposes. These documents, when viewed in combination, contain the chain of ownership, the restrictions and covenants that have been placed on the property, easements and rights of way, encumbrances and miscellaneous other information. Given the fact that the information contained in the documents never changes, having a structure to retain the knowledge gained by the examination of the documents would be advantageous to the company.

Statement of Goals and Objectives

The goal of this research is to create an ontology for use by title insurance companies. The research will include an examination of the use of concept mapping methodology as a suitable option for sorting and grouping data. The research will include determining through surveys what type of information would be useful and in what type of format. The objective of the research is to develop a framework that will match the needs of the title insurance company.

Chapter 2 – Review of Literature and Research

Knowledge Management

Background and definitions

Plato defined knowledge as a “justified true belief”. Albert Einstein defined knowledge as experience, whereas anything else is just information. In Becerra-Fernandez, Gonzalez and Sabherwal (2004) the focus of many businesses is currently described as being the management of the organization’s knowledge. They want to retain the knowledge gained from previous experience, whether it is a lesson learned or the ability to track stages of development, for use in future work. Becerra-Fernandez, et al continue by defining the driving forces behind this focus as the increase in domain complexity, the acceleration of market volatility, the intensified speed of responsiveness and the diminishing individual experience. In the title insurance industry, the continual sale and subdivision of property and the creation of new easements or encumbrances cause the increase in complexity of the domain. Real estate is a volatile market and therefore so is the title insurance industry. The ability to respond quickly and accurately to customer inquiries is tied closely with the ability to access the data to provide the answers. Diminishing individual experience in the title industry is caused more by the ever changing real estate market and the vast number of documents and properties than by the longevity of employment. The title examiner can retain detailed knowledge about several subdivisions or properties, but handles title commitments for many counties or even states.

Knowledge management has become an increasingly important focus of all types of business. According to Chan & Chao (2008), knowledge is a strategic asset which is valuable and cannot be imitated by the competition and therefore provides a competitive advantage. According to Davenport and Prusak (1998) knowledge can provide a sustainable competitive advantage. Specifically they state that because competitors will eventually match an organization's quality and price, the company that is managing their knowledge will have moved on in quality, creativity or efficiency. Rebernik and Sirec (2007) express knowledge as "a living asset; dynamic and volatile, often difficult to observe and understand." The creation, capture, dissemination and use of knowledge are the primary focus of many articles and books. Zack (1999) expresses as lost opportunity any knowledge that has not been captured and effectively shared throughout the organization.

Through their research, Chan and Chao determined that in small and medium-sized enterprises the main goal of knowledge management was to manage resources. One resource in the title insurance industry would be the title examiners interpretation of the documents found in the public records. The next three most common responses discovered in the research were increase profits, reduce redundancy and finally to gain a competitive advantage. By retaining the knowledge from the title examiners review of an individual document, the title insurance company will be able to reduce redundancy and gain a competitive advantage through faster production and will thus be able to increase profits. Chan and Chao also determined that small group teams that shared knowledge were much more productive as individuals. Many of these small group settings are informal and unplanned, but still provide sharing of knowledge within a limit group. A

more formal knowledge management system would provide all members with access to same knowledge.

Knowledge can either be explicit knowledge or tacit knowledge. Explicit knowledge is formal and systematic according to Nonaka (1987) and “is also easily communicated and shared.” Examples of explicit knowledge would include product specifications, a scientific or mathematical formula, or details contained in recorded documents. Nonaka describes tacit knowledge as “highly personal ... the kind of informal hard-to-pin-down skills captured in the term “know-how”.” Tacit knowledge is gained by experience and observation and within the title insurance industry would include the knowledge held by the examiners. Rebernik et al (2007) mention that tacit knowledge is often the knowledge that allows us to perform at a higher level. Tacit knowledge is the basis of our individual decision trees.

In the table below, Collis and Winnips (2001) defines the differences between learning explicit knowledge and tacit knowledge. The last comparison is a good summation of the difference in that explicit knowledge is learned from predetermined content and tacit knowledge is about learning from experiences. Various employees may gain the same tacit knowledge but they will generally not take the exact same path to obtain that understanding.

Table 1 Learning from explicit content approach compared to learning from tacit knowledge approach (Collis and Winnips 2002, pg 140).

<i>Learning from explicit content</i>	<i>Learning from tacit knowledge</i>
Content is preselected, prestructured, and delivered.	Content is encountered from a variety of sources, and partially is contributed out of one's own experiences.
Learning relates to hours of time spent on reading or listening or attending face-to-face sessions.	Learning relates to finding and interpreting examples from practice, seeing how they relate to important competencies and objectives, and contributing to the collective knowledge base.
The starting point of a course is its content, prepared by in advance by professionals, perhaps not even having any contact with the organization.	The starting point of a course is the activities that learners will do, resulting in bringing new resources into the learning setting.
To be time and distance independent, a course must be instructor independent; tutors need to be available to answer questions relating to the pre-defined study material. Perhaps a forum can be available if some wish to use it (must will not). Content and standards determine quality.	The good instructor should be extended over time and distance. His main task is to lead learners to making the connection between theory and practice, starting with their own practice. The instructor is not replaced, but extended.
Standards are necessary to make use of materials produced elsewhere, and to sell your own materials elsewhere. "Offering instructor-neutral courses on the Web" is the guiding theme.	Building on and contributing to the learning resources and learning community of the organization determines quality. Standards are necessary but need to be a combination of externally shared indices and also locally meaningful indices.
Learning is completing courses.	Building on and using the experience base of the organisation is the guiding theme of learning activities.
Learning is studying pre-written content.	Learning is becoming an active member of a professional community, knowing how to locate appropriate knowledge (also in human form) and apply it in one's work. Peer-to-peer learning is central; pre-written content is a resource, but may also sometimes be contributed by one's peers in the form of examples from their own experiences.

Nonaka (1991) discussed the perpetual process of knowledge conversion as the knowledge spiral. The spiral begins with the acquisition of tacit knowledge for oneself from the tacit knowledge of another as in an apprenticeship, known as socialization. The next stage is called articulation or the translation of the newly gained knowledge into

explicit knowledge that can then be shared. The third stage is to take this new explicit knowledge and mix it with explicit knowledge already held by an individual or a work group to create a combination of knowledge. Internalization, the fourth stage, is achieved by individuals taking this combined explicit knowledge and making it a part of how they think. In the title insurance industry, tacit knowledge is gained by a new employee working alongside an experienced examiner and gaining experiences as they work through title searches. This employee then makes notes of the things they have learned (articulation) and compare their notes with others to verify the correctness and completeness of his understanding (combination). The employee then works at making all of this explicit knowledge a part of the everyday thought process of title searching and examination.

Becerra-Fernandez, Gonzalez and Sabherwal (2004) define the translation of explicit knowledge into tacit knowledge as internalization. Internalization is learning, as we generally know it. Memorizing math functions, putting pieces together to create something, reading textbooks or white papers to learn from experts on a subject are all forms of internalization. Explicit knowledge is defined easily within a rule structure. In the title industry the rule structure is applied during the examination process and might appear as an exception to the policy created by a mineral reservation in the chain of title. This allows the knowledge to be easily captured and shared throughout the organization.

Becerra-Fernandez, et al (2004) defines the conversion of tacit knowledge to explicit knowledge as externalization. Externalization is the difficult task of articulating tacit knowledge in the form of analogies, concepts, metaphors or models, according to Nonaka, Takeuchi and Umemoto (1996). Gathering knowledge that was learned by an

individual through his own unique experiences, and attempting to express that into terms that can be codified and input into a system can be an enormous feat. Breaking the knowledge into pieces that can fit within a rule structure often requires too much time and effort to be viewed as productive. Minsky (1974) describes his method for dealing with groups of facts and details and allowing them to be viewed together while still providing flexibility for the user to apply other resources and previously gained knowledge. Minsky named this representation scheme Frames. Frames provide the structure for capturing specific knowledge about a physical or contextual thing. By obtaining many of the elements that fit into the tacit knowledge puzzle, others can view the parts and learn how they affect the outcome.

Knowledge management is defined by Atwood (2009) as doing what is necessary to reap the greatest reward from an organization's knowledge resources. Atwood suggests that managing knowledge is identifying useful knowledge that exists in the organization and making it available to others to use or build on. Individuals and organizations inherently operate this way. We learn not to touch something hot by experience, and then we retain that knowledge to use in the future in similar situations. This type of knowledge management is unconscious and is easily a part of human nature. The knowledge management that is of interest at this point is more deliberate and thoughtful. With the retirement of many post-World War II baby boomers, organizations are looking at the loss of much of their knowledge base as the individuals leave and take their tacit knowledge with them. Atwood states that in an effort to retain this intellectual capital within the organization, many are taking a more deliberate approach to managing knowledge.

Wang and Ahmed (2004) succinctly state “To succeed in the competitive business arena, companies must leverage their existing knowledge and create new knowledge that favorably positions them in their targeted market.” Many organizations have massive amounts of knowledge within their employees, processes and databases. The key to competitive advantage is in knowing what there is and how and when to utilize it. Knowledge gained previously from both successes and failures can be used in future projects to avoid duplicating work and previous pitfalls.

Processes of knowledge management

Becerra-Fernandez et al (2004) define knowledge management as four processes. They are knowledge discovery, knowledge capture, knowledge sharing and knowledge application. These processes together are known as the Knowledge Management Life Cycle. The figure below from Becerra-Fernandez et al shows the flow of the processes and indicates the several named activities that are key to that particular process.

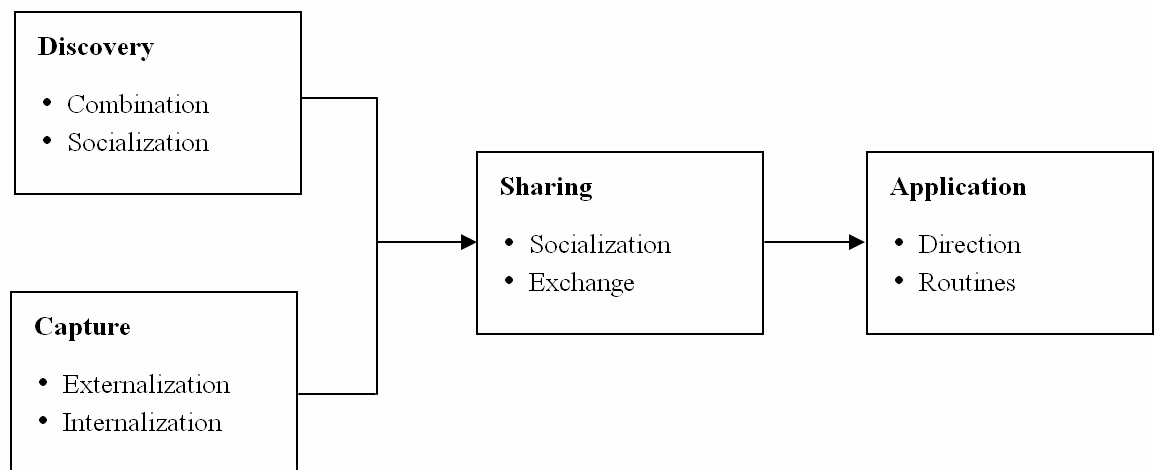


Figure 1 Knowledge Management Processes (Becerra-Fernandez, et al 2004, pg 32)

According to Becerra-Fernandez, et al (2004) knowledge discovery is the creation of new knowledge, either tacit or explicit from data, information, previous knowledge or

a combination of any of these. The combination activity uses multiple pieces of explicit knowledge or data synthesizing them into new explicit knowledge. In handling tacit knowledge, Becerra- Fernandez et al use the term socialization to represent the synthesis of multiple individuals' tacit knowledge into something new. During the discovery process consideration of relevance to others is a major factor. If the knowledge is not applicable on a wider scale it may not need to be managed. Accuracy and completeness of the knowledge must be verified during the entire process. The creation of the title plant would be an example of knowledge discovery. The title plant is a database that contains data from recorded documents. Arrunada (2002) states that these databases are organized to provide faster and more reliable access to information about each individual property.

According to Becerra-Fernandez et al (2004), knowledge capture is the process of retrieving knowledge from individuals, artifacts or organizational entities. Capturing the lessons learned previously and storing them for future use and sharing with others can be one of the most beneficial tasks of any organization. Organizations are able to create efficiency through capturing and sharing what they have already experienced. In situations such as product development, knowledge capture is the retention of results from each iteration of the development cycle and with this stored knowledge, development teams are able to avoid repeating previous issues. In the title insurance industry, knowledge capture is provided through previous searches done within a subdivision or section of land.

Collis and Winnips (2002) focus on the fact that the capture of tacit knowledge is complex. Collis and Winnips continue by stating that the efficient extraction, concrete

expression and manner of codification for retrieval and reuse are the primary obstacles with tacit knowledge. The main point is to understand how to gather knowledge that is based on years of one employee's personal experience, that employee's ability to weigh the factors and determine the best possible choice, and express it in the form of a check or no check within a database structure.

Knowledge sharing in much of the current literature focuses on the benefit of leveraging this intellectual asset. This can be seen in the shared knowledge that prevents the redundancy of repeating an activity that has already been performed only to discover the same result. A title search would begin by pulling copies of previous work as a starting point for the current project. Socialization as mentioned before is the synthesis of the tacit knowledge of multiple individuals. In order for this to occur the individuals must express their tacit knowledge such that it becomes useful to the others, thus it is shared. Becerra-Fernandez et al (2004) state that explicit knowledge sharing is referred to as exchange. This transfer of knowledge can be in the form of design specifications, a database or verbal communication. The knowledge conveyed must provide the recipient with an adequate understanding of the knowledge to utilize it effectively. The goal of sharing knowledge is that others will be able to make decisions or take action based on the knowledge provided because they have internalized it.

Lee (2003) investigated knowledge sharing effectiveness through several metrics. Examples of the metrics are as follows:

- Number of shared documents published
- Number of presentations made
- Number of suggestions for improvement

- Number of searches on the document repository
- Size of databases
- Frequency of advice seeking
- Percentage of contacts internal vs. external

In the research considered here the number of searches on the document repository and the number of additions or changes to the repository would provide the best feedback on the effectiveness of the shared knowledge. According to Lee, the use of metrics is a good way to check effectiveness, it is more important to keep possible metrics in mind to provide direction for development of the sharing process.

The final process, knowledge application, depends extensively on how well the discovery, capture and sharing processes were completed. The more accurate the knowledge is the better the value at the point of applying that knowledge to decisions made or actions that must be executed. This research is focusing on a more efficient method of delivering the knowledge gained by previous examinations. Becerra-Fernandez et al (2004) do not anticipate that the party using the knowledge at this point understands the knowledge, rather that the knowledge is available in the form of direction and routine. The term direction meaning the activity undertaken by an individual with a specific knowledge that provides to another individual or group the steps necessary to complete a task without sharing the reason behind each step. Procedures and rules are examples of routines that have knowledge as their basis but do not necessarily disclose the knowledge. Knowledge is often the reason behind many rules or procedures. The individual that creates the routine knows why an activity must be done in a certain

manner, and can cause this to happen without the need for explaining the basis to each individual.

Ontology

Ontology is described in numerous articles as a representation vocabulary within a certain domain. Abu-Hanna and Jansweijer (1994) express ontology as an interface between the knowledge base and the external world, with four major uses, which are sharability, knowledge acquisition, knowledge organization, and reasoning. An ontology provides domain specific terms for describing objects and their properties and relationships. An ontology in the title insurance industry would include such terms as requirement, insured, reservation, exception, risk and covenant. According to Chandrasekaran, Josephson and Benjamins (1999) ontology is the representation vocabulary that provides a set of terms with which to describe the facts in some domain while the body of knowledge using that vocabulary is a collection of facts about a domain, and that the main contribution of an ontology to knowledge management is the identification of specific classes of objects, properties and relationships that exist in some domain, thus clarifying the underlying structure. Ontologies provide a common language for the domain, so that users know exactly what is meant when a specific term is used. White and Lutters (2007) state that the most difficult problems in forming an ontology are vocabularies and hierarchical coding. Additionally, White and Lutters found that because people think and organize in many different ways, obtaining a useful ontology requires several iterations. According to Chandrasekaran et al, there must be as little gray area as possible within the structure. The knowledge that is captured must mean the same when it is shared with and used by others. Ontologies provide the user with the ability to

locate the needed information quickly because they are familiar with the domain representation vocabulary. O'Leary (1998) sites the following as possible variables to consider when structuring an ontology:

- Cost-benefit
- Decomposable
- Easily understandable
- Extensible
- Maintainable
- Modular and interfaceable
- Theory/Framework based
- Tied to the information being analyzed
- Universally understood or translated

According to Chandrasekaran et al, a domain's objects, properties and relationships are at the very base of structure development, and therefore a careful analysis must be made of the domain. This analysis should at some point or even better at several points involve as many users as possible to ensure that the terms are consistently utilized. After the analysis, syntax for encoding knowledge must be devised using the ontology.

Chandrasekaran et al state that although ontologies are not task dependent, the aspects that are chosen for inclusion often are based on the desired outcome.

According to White and Lutters, one of the challenges in creating an ontology is deciding how many layers should be present. If there are too many layers, the layers become meaningless on their own and difficult to navigate down to the proper level,

whereas if there are not enough layers too many topics are included within a layer and finding a relevance is difficult.

According to Schwartz (2006), an ontology is a tool that can be utilized in knowledge management. From the knowledge management point of view the fundamental aspects of ontology creation are the recognized need for tools to generate a shared vision of corporate knowledge and the value of ontologies as artifacts for current and future use.

Concept Maps

Becerra-Fernandez et al (2004) explain that concept maps are an effective means of organizing and creating structure for the knowledge capture and sharing phases of the knowledge management process. Concept maps graphically display the concepts within a domain and link them together with explicitly labeled arcs. Bryson, Ackermann, Eden and Finn (2004) state that mapping replicates the way that humans think and make sense of their world, emphasizing that concept maps allow people to literally see what one another is saying. With this type of visual aid knowledge management designers are able to pull details from the domain being considered. According to Crandall, Klein and Hoffman (2006) concept mapping is coming to be used widely as a method for eliciting and representing the knowledge of domain practitioners. Concept maps were originally based on the work of Novak and Canas (2008) during his research program at Cornell University. Novak & Canas (2008) define concepts as perceived regularity in events or objects, and records of events or objects, designated by a label. The label is usually a single word or a short descriptive phrase, such as *Mineral Reservation* or *Exception*,

enclosed in a box or a circle. Concepts are tied to other concepts by lines with a word or phrase that describes the connection between the concepts, such as *Create an*. Two or more concepts that are linked together as a meaningful statement are called propositions or semantic units. Becerra-Fernandez et al (2004) state that concept maps are characteristically designed in a hierarchical method showing the general concepts at the top and gradually moving down with more and more specific concepts toward the bottom. The diagram shown here is a concept map of concept maps from Novak, et al.

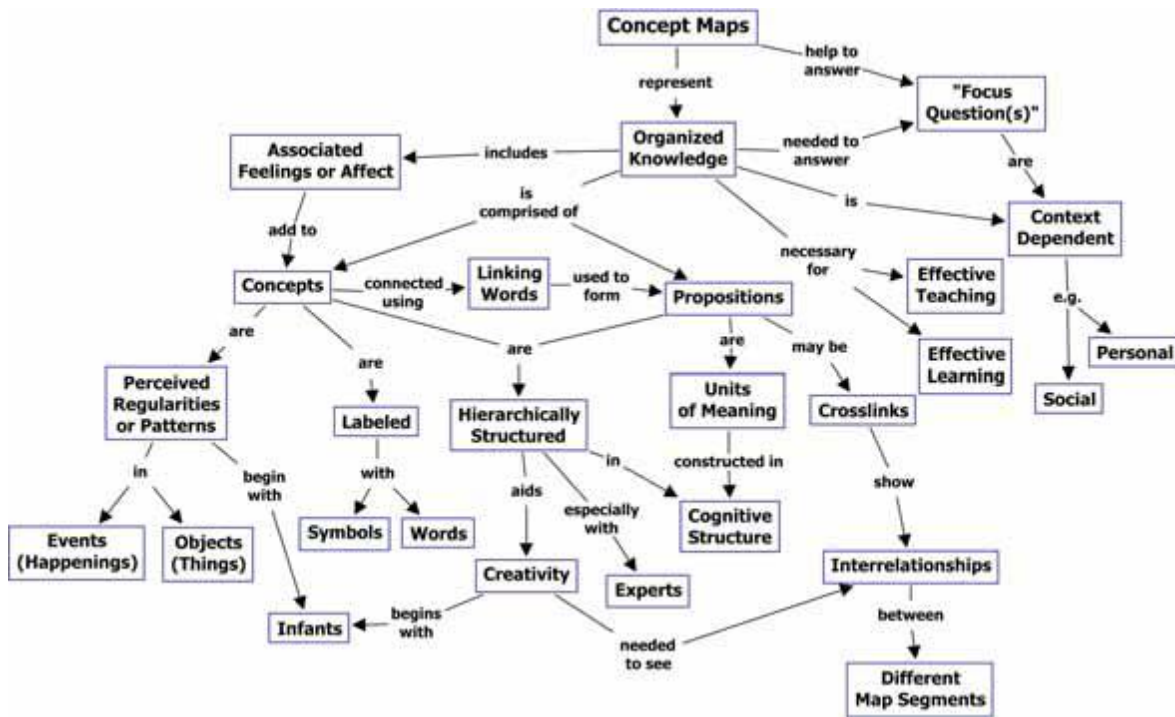


Figure 2 A concept map showing the key features of Concept Maps (Novak and Canas 2008, pg 2).

This diagram shows that the most general concept, *Concept Maps* is located at the top and is linked to *Organized Knowledge* and *Focus Question(s)* by meaningful words or phrases to create two separate propositions. Emphasis is placed on the broader concept by supporting it through the use of propositions to more specific concepts.

Another feature utilized in concept maps is cross-linking. Cross-links connect concepts that lie within different domains within the same map. *Creativity* linked to *Interrelationships* in the diagram above is an example of cross-linking. Novak et al (2008), state that knowledge in any domain is built upon the concepts and propositions that can be shown in a concept map. Concept maps are a useful tool in the capture phase of knowledge management, providing both organization and formalization to the domain being studied as stated in Becerra-Fernandez et al (2004).

Concept maps were originally created with paper and pencil, but according to Hilbert and Renkl (2009) there are a variety of computer generated mapping tools to aid in the project. The computer software created for mapping allows greater flexibility when revisions are required. Adding or deleting concept boxes or moving boxes or linking propositions or changing labels is quicker with the software package. Plotnick (2001) likens creating a concept map to a brainstorming session, where as you add concepts and attempt to link them the process triggers new ideas and associations. The flow of thoughts and related ideas are displayed visually thus generating a more complete diagram. Concept maps whether drafted by an individual or a group provide a basis for the furtherance of design through communication. Plotnick also points out that a by-product of creating a concept map is the ability to locate and correct misconceptions. Oppl and Sary (2009) focused on using concept maps for generating ideas, communicating ideas and the design of a structure. The use of a concept map to show the researcher's basis for the framework allows others to see what the researcher was working from and allows an arena that can be discussed and manipulated to create a cohesive basis for the framework.

Frameworks

Wong and Aspinwall (2004) suggest that the cause of organizational struggles with and utilization of knowledge management is due to the lack of support provided by a strong theoretical foundation. Defining a framework as a means of plan development and presentation is, according to Dale (1999), an appropriate guide to the organizations course of action. Wang & Aspinwall state that frameworks create links between theory and practice and direct the development of knowledge management. A framework is similar to a prototype built prior to actually beginning to produce the product. Wang and Aspinwall continue with the fact that the organization that utilizes a framework will be more likely to stay on track as they develop and implement a knowledge management solution. The purpose of a framework is to provide a common vocabulary or language, provide project scope and allow coordination of systematic and controlled efforts, according to Holsapple and Joshi (2002).

McDermott (1999) states that when attempting to leverage an organization's knowledge assets, with the development of a knowledge management system it should be tied directly to those that will use the system. By learning the jargon, culture, needs, thought processes and various abilities of those that will be the ultimate users, a developer will be able to provide a system that is more likely to be utilized as intended. McDermott lists the following as the keys to a successful system:

1. To leverage knowledge, develop communities.
2. Focus on knowledge important to both the business and the people.
3. Create forums for thinking as well as systems for sharing information.
4. Let the community decide what to share and how to share it.

5. Create a community support structure.
6. Use the community's terms for organizing knowledge.
7. Integrate sharing knowledge into the natural flow of work
8. Treat culture change as a community issue.

McDermott focuses his paper on the need to work with the users and understand exactly what knowledge will be helpful, how much are they willing to provide to the new system, discover how much the users already share and how they go about that, what terminology is used by the community and how can the implementation become a part of the everyday tasks.

Bukowitz and Williams (1999) developed a knowledge management process framework that provides for the management of tactical and strategic processes. The tactical processes are the day-to-day activities carried out by the workers, while the strategic processes are the activities that ensure alignment with business strategy. They supported the thesis that the management of both types of processes would provide business with a balance of knowledge assets and the ability to utilize them.

Another group, Wong et al (2004) suggested that a framework must fit within their five guidelines to be effective. These guidelines include having a clear structure within the framework; addressing the different types and sources of knowledge to be managed; including the processes that are necessary to manipulate the knowledge; identifying influences that will affect the management effort; and assuring the balance within the areas of technology, culture and human behavior.

According to White and Lutters (2007), dysfunction is the result of the inability to obtain answers to problems efficiently and in usable form from internal sources. Many authors stress the importance of careful planning in the development of a knowledge management system. If a system is not easily accessible or does not contain the information that employees are looking for then the system is not going to leverage the knowledge or provide the intended benefit. McDermott (1999) relates just such a story about a company that created such a system and notes that the outcome was an “information junkyard.”

In the paper Structuring Cross-Organization Knowledge Sharing by White and Lutters (2007), the authors focus on ontology development within a small organization. They stress that understanding the current processes prior to beginning the design of a new system is critical. They also focus on the types of details required by the knowledge seeker. And finally they state that the goal is to “develop an ontological framework within which captured knowledge can be organized to provide an intuitive process for (re)finding captured information.” The anticipated research will follow a similar path through a survey to determine the details that are most important and a pile sort to gain an understanding of the possible connections between objects, properties and relations within the industry.

In designing a knowledge capture and sharing database, Collis and Winnips (2002) stressed that much of the value in tacit knowledge stored is in its idiosyncrasy. In order for the knowledge stored to be of value and increase productivity it needs to retain the in-company style in both format and expression. The employees of the organization will find the database to be a greater asset if it falls in line with the normal tone of the

workplace and day-to-day activities. In describing their technology-based knowledge sharing system, Hirai, Uchida and Fujiami (2007) concentrated on the storage and reuse of process knowledge. Process knowledge was explained as the algorithm, which describes how to behave given a certain situation. Process knowledge in the title insurance industry would be the knowledge of how to handle specific details within the documents as recorded in the public records. They were specifically interested in the storage of previously gained knowledge in an attempt to sustain the competitiveness of the organization. The system would collect relevant information from prior jobs that could be applied to the current situation. The proposed research is intended to collect the knowledge gained from the examiners review of a document and make it available to others the next time it appears in a chain of title.

According to Arrunada (2002) the title insurance industry focuses on loss avoidance rather than risk spreading or loss compensation. The title insurance policy covers risks, whether known or not, from the past, so a thorough examination of the records is critical to financial success. Sirmans and Dumm (2006) state that due to the nature of the business, avoidance of loss, the major expense of title insurers is in the title search and examination. Sirmans & Dumm state that the current literature on the title insurance industry covers five broad categories:

1. importance and function
2. characteristics of the insurers
3. evolution or history of the industry
4. financial performance
5. image problems associated with title insurance

The researcher found no literature on knowledge management that specifically focused on title insurance organizations or title searches or examinations. Arrunada mentions the use of a title plant which is keyed on individual property. These title plants allow title examiners to obtain a list of the documents that possibly affect the title examination, but they do not contain the specific details such as if they create an exception to coverage or cause a requirement to be listed within the commitment to resolve an issue. This research is designed to investigate what type of knowledge management framework would create efficiency and cost savings within the organization.

Chapter 3 – Research Methodology

Overview and Framework

In considering the research method to be used for this project, the single case study method was chosen as a match to the exploratory nature of the research. In reviewing different types of research methodology the researcher determined from examining several sources on the subject of research design and the specific area of interest that the case study was the best fit. First, the researcher's ability to access a group or organization for the case study was simplified by the fact that she is employed at a title insurance company. Marshall and Rossman (2006) state that this type of study is favored in situations such as research that elicits tacit knowledge and subjective understandings and interpretations and research that seeks to explore local knowledge and processes. They further list that the strengths of qualitative studies are demonstrated in research that is exploratory or descriptive in nature and that stresses the importance of context.

In further study on case study research, the researcher found the paper by Soy (1997) to be very helpful in breaking the method down in to six steps.

1. Determine and define the research questions
2. Select the cases and determine data gathering and analysis techniques
3. Prepare to collect the data
4. Collect data in the field
5. Evaluate and analyze the data
6. Prepare the report

These steps guided the researcher through the process and the implementation will be shown in the balance of this chapter.

Determine and define the research questions

The first step of the research was to develop a specific list of questions that would be used to guide the research and keep it focused. Marshall and Rossman (2006) stress that in determining appropriate research questions they should be both sufficiently clear to guide and focus the research, but with the flexibility that is the hallmark of qualitative methods. The research questions for this study are:

1. Can a concept map be used to help define the ontology creating a basis for the framework?
2. Can tacit knowledge be stored for future use with regard to title examination of public records?
3. What do the examiners view as important to include in the repository?
4. What flexibilities would be required for the storage to be successful?

These questions were a guide to the selecting literature on knowledge management in general and specifics on knowledge capture and sharing processes, ontology description and development and concept maps usage.

Select the cases and determine data gathering and analysis techniques

As the researcher began to investigate the possible approaches to gathering data, a paper by White and Lutters (2007) was recommended as a reference. Reviewing their paper on knowledge sharing and the development of an ontology and looking at their approach to gathering information, which included focusing on how knowledge is currently captured and organized and the techniques most often used by study

participants to locate information, the researcher determined that similar steps could be utilized for obtaining answers to her research questions. Although the setting of the White and Lutters study was dissimilar the desire to reduce duplication and redundancy is the same for both studies.

The case to be studied was a small local title insurance company. This company provides the same services as title departments of much larger companies and therefore the results can be utilized as a step to improving the entire field of title insurance. The title department of a title insurance company is responsible for reviewing the entire history of each parcel of land through the documents that make up a chain of title of the property that it is asked to insure. This process is currently handled by following the ownership of a property from the present back to the issuance of a patent by the federal or state government. During this process not only documents that convey the ownership but also other types of documents are reviewed to determine the effect if any on the fee or easement ownership. Many of the documents affect more than one property and therefore are examined multiple times, despite the fact that the details in the document are the same. As a member of the title department of the title insurance company, the researcher gained insight into the views of the other members of the department through the use of an online survey, a review of the results of a modified pile sort of sample documents and observation and discussions within the department.

Prepare to collect the data

A case study database was created for assembling the data gained through the modified pile sort, literature review and results of the online survey. The survey data was collected by the service of SurveyMonkey.com. This service provides many options for

sorting the data and providing reports. An additional piece to be used in the collection of data was a concept map that will be used to disseminate the data into a pattern that will guide the development of the framework.

Collect data in the field

The researcher was a member of the title department chosen for the study, as such the researcher did not participate in the survey or modified pile sort. Being fully aware of the issues of bias that are problematic in case study research, the researcher still felt that the observation of departmental discussions would provide perspective that could not be attained through the completion of surveys or document sorting. These discussions provided the reasoning behind specific decisions made by the participants.

The researcher contacted the other members of the title department through the email system of the company to provide the link to the survey. Appendix A contains a sample participant survey as presented by SurveyMonkey.com. SurveyMonkey.com provided the researcher with the mechanism to develop and administer the survey via a web-based format. The participants of the research were asked to complete a likert scale survey with the following five-level likert item format:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly Agree

All of the participants were asked to evaluate the following twenty likert item statements:

1. An image of the document must be stored within this repository.

2. Storing the section, township and range data of the document is important.
3. The ability to access the exception terminology for a document is beneficial.
4. The requirement terminology used previously for a document within the search is necessary.
5. The consideration listed on the document would be an item that must be stored.
6. A listing of documents that reference the specific document is essential.
7. Providing the Grantor's name within the framework is a requirement of the title department.
8. Storing the name of the Grantee within the document repository is necessary.
9. A place to store an examiner's thoughts and comments and reasoning for a specific requirement or exception would be useful.
10. The structure needs to provide storage for the complete legal description.
11. Providing a miscellaneous category within the framework of the repository would be advantageous.
12. Some documents have expiration dates on them and storing this information would be a requirement for the repository.
13. If a document has terminology about its duration and extension of the duration contained within it, having a place to record that data within the framework would be necessary.
14. It is important to store data on the number of pages within a document.
15. The structure must require the examiner that adds information to the repository to put their name, so that others know who made the entry.
16. The framework must allow for changes and updates to the record.

17. Tracking changes by keeping a tracking log within the repository would be ideal.
18. The structure must support accessing the information by document reference (Book/page or Reception number).
19. The ability to access the information by section, township and range would be required.
20. Searching the repository by Grantor or Grantee would be a necessary feature.

The researcher hand delivered the documents for the pile sort with a short letter of instruction. The documents were selected with the intention of having a wide variety, covering as many possibilities as could be covered without creating a task that would be onerous. The participants were asked to sort the documents based on the potential effect that each might have on the ownership of a parcel of land, specifically creation of title commitment exceptions or requirements. Appendix B contains a copy of the instructions.

Evaluate and analyze the data

The research focused on a specific study proposition to guide the analysis of the data collected. The theoretical proposition is that a framework to manage the knowledge about specific documents in the public records would create efficiency in the title examination process. The researcher relied on this proposition when developing the survey questions, selecting documents for the pile sort and when performing the review of literature. The data collected from the research field was then analyzed with respect to the proposition. The review of literature was specifically designed to discover knowledge that exists on the proposition. Correlating the data gathered in the research area with the information gained from the literature review was completed with this theoretical proposition as a guide.

Prepare the report

Communicating the results of the case study is the final step of this case study framework, using the theoretical proposition established early in the research as a base for combining the results discovered through the use of surveys, pile-sorts and discussions with the literature. The analysis and results are displayed in a question and answer format, using the research questions. This approach enabled the researcher to look at each question separately and then combine the answers into one framework.

Chapter 4 – Project Analysis and Results

Overview

The goal of this research was to create an ontology for the title insurance industry as a basis for the development of a framework of knowledge management. This framework would capture and share the knowledge gained by a title examiner's review of a document. This goal led the researcher to identify a theoretical proposition as a guide to the review of literature and collection of data. The researcher's theoretical proposition was that a framework to manage the knowledge about specific documents in the public records would create efficiency in the title examination process. The researcher focused on this proposition when developing questions for the online survey and selecting documents for the pile-sort and in reviewing the available literature on the subject.

The researcher planned to provide a triangulation of facts supported with data collected from multiple sources of evidence. According to Yin (2009) the use of multiple sources of evidence which converge to corroborate each other provides a more convincing study than data that run along the same lines and yet never cross each other. The review of literature includes data on knowledge management especially capture and sharing, concept maps, ontology and a general definition of frameworks. Data was also collected about the needs and preferences of the title department with respect to the potential framework. Data for creating a concept map that would graphically show the title insurance industry ontology was gathered through the pile-sort and subsequent interviews with the participants.

Analysis and Results

The analysis of the data collected was structured around the research questions that were proposed early in the research process. This question and answer format will provide detail and structure to the analysis and results of the data collected. The research questions were:

1. Can a concept map be used to help define the ontology creating a basis for the framework?
2. Can tacit knowledge be stored for future use with regard to title examination of public records?
3. What do the examiners view as important to include in the repository?
4. What flexibilities would be required for the storage to be successful?

Research Question 1

The researcher began by developing a concept map of the types of documents in the public records. There are all types of documents recorded in the permanent records of the county and they may or may not affect real property. This concept map was drafted based on the researcher's personal knowledge of the types of documents. After several revisions of the concept map it was presented to the other members of the title insurance department for their review and input. The members of the department discussed the groupings, verified that all types of documents had been accounted for and finally confirmed their agreement on the final map shown here. The literature suggests that the place to start with the development of a framework is with understanding the current workings of the organization (White and Lutters 2007; and McDermott 1999).

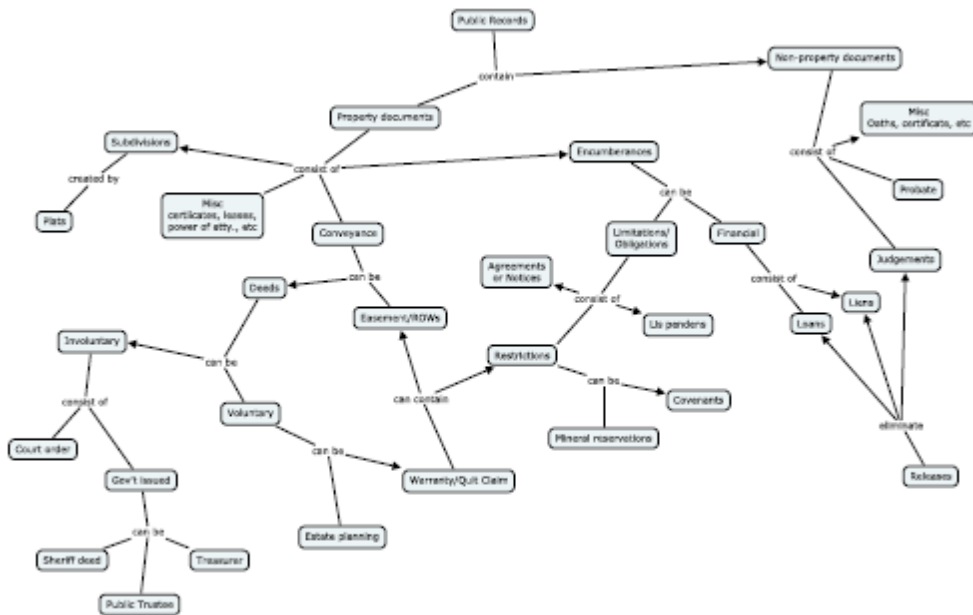


Figure 3 A concept map of the documents within the public records

Concept mapping of the public records, allowed the researcher to gain a greater clarification of the title insurance ontology. Providing a graphic allowed the members to all analyze the same objects, properties and relationships, discuss alternatives, and make suggestions. Then a revised graphic was presented for additional analysis until all felt that each document type was fully acknowledged as well as the properties and relationships that would be needed for the project. Working with the entire department provided the agreement of the users that is essential to the creation of a useful ontology. Through the concept map the researcher was able to identify which types of documents may contain details that will ultimately effect a title examination.

The literature specifies that ontology exposes the classes of objects and the properties and relationship of those objects (Becerra-Fernandez, Gonzalez and Sabherwal 2004; Chandrasekaran, Josephson and Benjamins 1999 and Abu-Hanna and Jansweijer 1994). The literature continues to point out that when developed properly an ontology

will be easily understood, intuitive for the users, and based on the underlying theory of the project (Chandrasekaran, Josephson and Benjamins 1999; and O'Leary 1998).

Furthermore the literature supported the graphical representation of information as a superior method to develop agreement of participants (Bryson, Ackermann, Eden and Finn 2004; Plotnick 2001; Crandall, Klein and Hoffman 2006; and Becerra-Fernandez, Gonzalez and Sabherwal 2004).

Research Question 2

Knowledge management is currently handled at the title company by pulling prior files of properties that are in the same subdivision or section and comparing the chain of title for the property in question with the files pulled to determine which information applies to both. This approach saves time and creates some consistency among the title commitments and policies issued by the company in that the examiner commonly uses the requirement or exception language found in the prior files to create the current title product. The main shortcoming of this method is the fact that a change of opinion of the title examiner as to how to view the details of a specific document with respect to title insurance is not always applied uniformly. Since files are pulled as background, sometimes an older file, which would contain the original decision, could be pulled because it represents property that is geographically closer to the property in question than a more recent file, which would contain the updated views of the title examiner. Although this method does work relatively well, the researcher felt that a document repository would be a more effective solution. The researcher theorized that there could be a more suitable means of capturing the tacit knowledge of the title examiner that would also include a method for updating that information so that the most current

information would be available from one source. This would allow all title examiners to have the same detailed knowledge thus creating the consistency that is desirable. With this in mind the researcher developed a modified pile sort exercise for the participants to discover further information about the types of documents within the public records and the types of details that the examiner would want to retain.

The participants in the case study were given a pile of forty documents printed from the public records of the county of Boulder, Colorado. These documents were specifically selected to match the majority of the types of documents discovered in the concept map. The participants were asked to review each document and then decide the effect if any the document could have on a title examination. The categories given to the participants for their sorting were 1) creates an exception, 2) creates a requirement, 3) creates both and 4) creates neither. The participants struggled with the category titles and after discussion, the researcher relabeled the categories as 1) can create an exception, 2) can create a requirement, 3) could create both or 4) will not create either. This discrepancy arose out of the fact that sometimes it depends on which property the examiner is interested in such as with a simple easement. An examination of the property that the easement crosses would show the document as an exception, whereas the examination of the property that the easement benefits would not show the document as an exception or requirement. The clarification in the labeling and instruction was that if the document could ever create one or both it should be placed in that pile. The spreadsheet of the pile sort results is shown here.

Table 2 Spreadsheet of the results of case study pile-sort

Document ID	Document	Requirement	Exception	Both	Neither	Classification
212	patent		XXXXX			patent
2/214	plat		XXX		XX	plat
528162	agreement		XXXXX			agreement/notice
180	patent		XXXXX			patent
404612	subdivision agr		XXXXX			agreement/notice
443052	covenant amend		XXXXX			restrictions
521979	condo plat		XXXXX			plat
638174	oil & gas lease		XXXXX			mineral lease
671990	quit claim deed		XXXX	X		easement/ROW
2843576	release of TD		X		XXXX	release
1851328	assignment of TD	X	X	XX	X	assignment
1217/78	warranty deed		XXXXX			wd w/easement
1800634	grant of easement		XXXXX			easement/ROW
812326	prot. covenants		XXXXX			restrictions
1085/234	letter		XXX		XX	agreement/notice
1040/489	restrictions		XXXXX			restrictions
195	warranty deed		XXXXX			mineral reservation
702/25	ROW agreement		XXXXX			easement/ROW
768891	notice		XXXXX			agreement/notice
484518	letter		XXXX	X		agreement/notice
1761801	notice of right		XXXXX			agreement/notice
1763944	mineral deed		XXX	X	X	mineral deed
39184	mineral lease		XXXXX			misc - lease
1671143	annexation agr.		XXXXX			agreement/notice
2771765	beneficiary deed	XXXX		X		estate deed
982219	lis pendens	XXXXX				lis pendens
1160809	deed of trust (TD)	XXX		XX		loans
1200021	election & demand	XXXXX				notice
887979	warranty deed				XXXXX	deed
992433	redemption cert.				XXXXX	NP - certificate
398	quit claim deed				XXXXX	deed
1124/424	inheritance release				XXXXX	release
1166/98	mechanic lien				XXXXX	lien
39592	prot. covenants		XX		XXX	restrictions
1998041	judgment	X		XX	XX	judgment
952601	warranty deed			X	XXXX	deed
954368	option agreement	X		XXX	X	agreement/notice
1684072	ordinance		XXX		XX	NP - certificate
1834345	TDR certificate			X	XXXX	NP - certificate

There are documents that create neither a requirement nor an exception, but are none the less vital to the records. Many conveyance deeds do not have any effect on the title examination that would need to be stored for future use, since they simple continue the transfer of the property without causing any other changes. Many of the non-property specific documents that are recorded in the public records, such as redemption

certificates, ordinances, probate letters, marriage or death certificates or notices filed by others, also lack detail that would be useful to capture and share. These documents must still be represented within the framework, so that others can easily see that the document has actually been reviewed and does not require any further action.

There are many types of documents that cause the examiner to take exception to them within the coverage that the company is willing to provide. This includes restrictions, whether created through a conveyance or through the recording of covenants, conditions and restrictions that pertain to a specific subdivision. Mineral reservations, mineral leases and exceptions listed in the patents issued by the federal or state government all create an exception to coverage that the title examiner must show on the title product. Agreements with municipalities for annexation, development or subdivision or the granting of easements for utilities or access or rights of way for road purposes also impose a type of encumbrance or burden on the land. The title insurance company must be certain that any document that limits the rights of the property owner or extends rights to someone other than the property owner is carefully reviewed and accounted for within the title insurance product.

The creation of requirements comes from the need to clean up the title to a property prior to the title insurance company actually issuing a policy. These documents often include items of financial obligations, such as deeds of trust or mechanic's liens, which are specific to the property, or judgments or tax liens, which are specific to the owner or proposed insured. Occasionally other situations arise that cause an examiner to make a requirement, such as a conveyance document that is in need of correction or recording of a death certificate to show that the other party of a property held in joint

tenancy is now the sole owner. These requirements allow the title insurance company to define the actions that must be taken in order for the title company to insure the property.

The documents that appear on the list as being possibly both an exception and a requirement would only be one or the other depending on the circumstances. In the case of a deed of trust, which most often creates a requirement, an exception could be listed in the title product if the new insurance is for a second mortgage or a buyer is buying the property and assuming the existing loan. As previously mentioned, easements would depend on which property the title product is insuring.

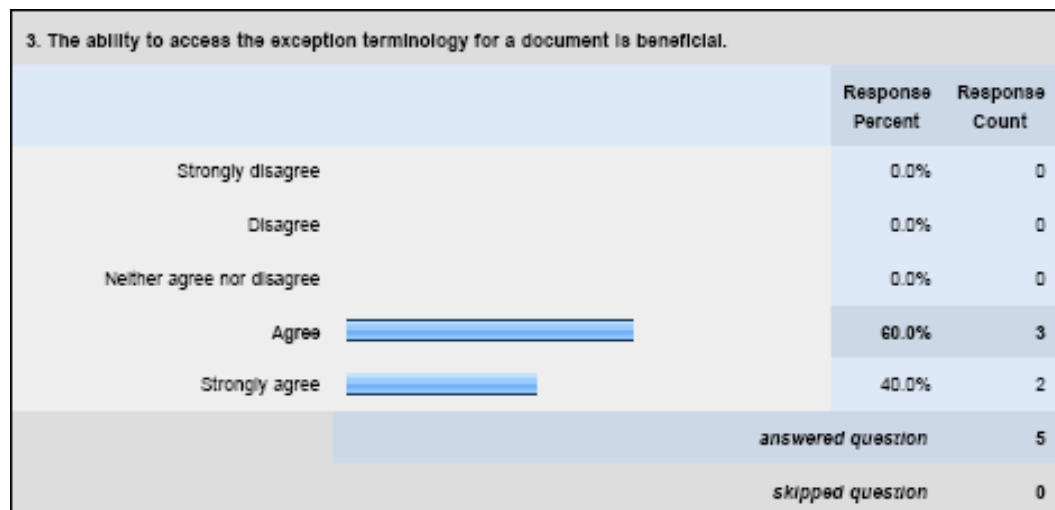
The literature on knowledge management focuses on the benefits of identifying, capturing and sharing knowledge, retaining what has already been learned or discovered for future use within an organization (Becerra-Fernandez, Gonzalez and Sabherwal 2004; Atwood 2009; and Zack 1999). Tacit knowledge of employees is especially important to organizations and developing a method to retain this knowledge is key to cost and time savings according to the literature (Becerra-Fernandez, Gonzalez and Sabherwal 2004; Nonaka 1991; Wang and Ahmed 2004 and Nonaka, Takeuchi and Umemoto 1996). The literature states that the capture of tacit knowledge in a meaningful and codifiable format is vital to the ability to retrieve and the future benefit of the knowledge (Collis and Winnips 2002; Becerra-Fernandez, Gonzalez and Sabherwal 2004).

Research Question 3

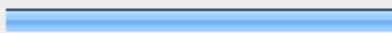

Framework development requires that data be gathered about the potential users of the end product. By following the lead of other research, the researcher designed survey questions numbered 1 – 8 inclusive, 10 and 12 – 14 inclusive as part of the online survey of the members of the title department. The goal of these specific questions was

to understand the participants' view of the details that are important for the repository to be beneficial to them and to know which details from the documents would not add any benefit. The title insurance company already has a database that is utilized to provide a chronological listing of the documents that are in some way tied to the property in question. This database is based on a property code or codes for the individual property related documents. The non-property related documents are coded by name of the party or parties. This current database does not include the tacit knowledge gained by the organization through the examiners review of the document. The literature suggests that most title insurance companies currently maintain just such a database or purchase access to one from a service provider (Arrunada 2002).

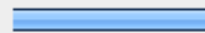

The participants were asked to respond to questions 1 – 8 inclusive, 10, and 12 – 14 inclusive, which all asked about the explicit details within the documents. Of the questions seven of them contain 100% agreement that the detail in question should be included in the proposed framework. These were questions 3, 6, 7, 8, 10, 12 and 13.

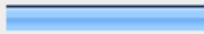
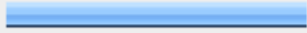


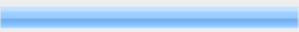
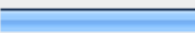
6. A listing of documents that reference the specific document is essential.

	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	80.0%	4
Strongly agree 	20.0%	1
<i>answered question</i>		5
<i>skipped question</i>		0

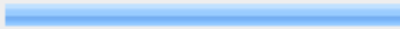

7. Providing the Grantor's name within the framework is a requirement of the title department.

	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	40.0%	2
Strongly agree 	60.0%	3
<i>answered question</i>		5
<i>skipped question</i>		0

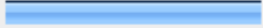

8. Storing the name of the Grantee within the document repository is necessary.		
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	40.0%	2
Strongly agree 	60.0%	3
<i>answered question</i>		5
<i>skipped question</i>		0

10. The structure needs to provide storage for the complete legal description.		
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	60.0%	3
Strongly agree 	40.0%	2
<i>answered question</i>		5
<i>skipped question</i>		0

12. Some documents have expiration dates on them and storing this information would be a requirement for the repository.

	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	80.0%	4
Strongly agree 	20.0%	1
<i>answered question</i>		5
<i>skipped question</i>		0

13. If a document has terminology about its duration and extension of the duration contained within it, having a place to record that data within the framework would be necessary.

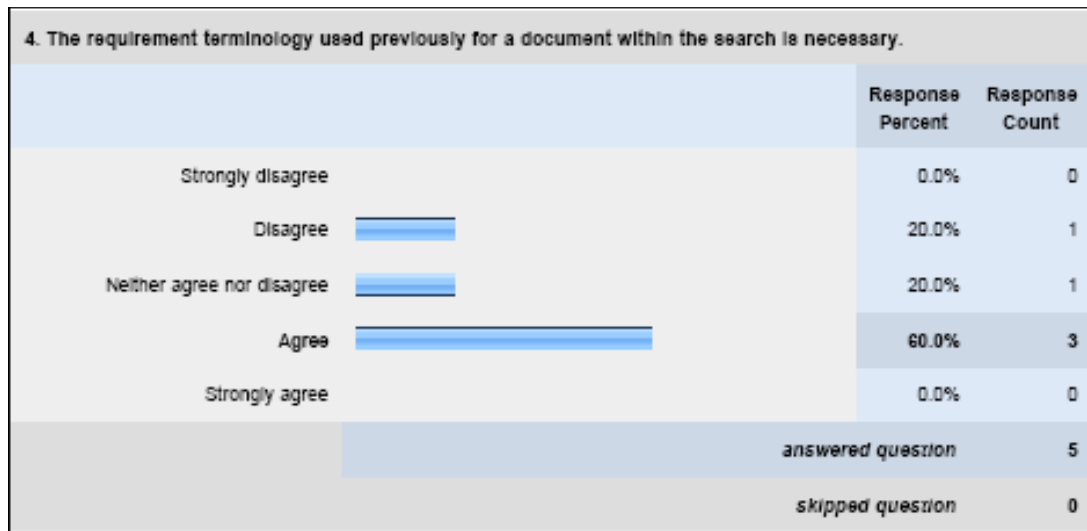
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	50.0%	2
Strongly agree 	50.0%	2
<i>answered question</i>		4
<i>skipped question</i>		1

Question 1 had an 80% agreement and the remaining 20% neither agreed nor disagreed.

1. An Image of the document must be stored within this repository.		
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	20.0%	1
Agree	80.0%	4
Strongly agree	0.0%	0
<i>answered question</i>		5
<i>skipped question</i>		0

Questions 2 & 4 contained 60% agreement, 20% disagreed and 20% answered neither agree nor disagree with the survey statements.

2. Storing the section, township and range data of the document is Important.		
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	20.0%	1
Neither agree nor disagree	20.0%	1
Agree	40.0%	2
Strongly agree	20.0%	1
<i>answered question</i>		5
<i>skipped question</i>		0



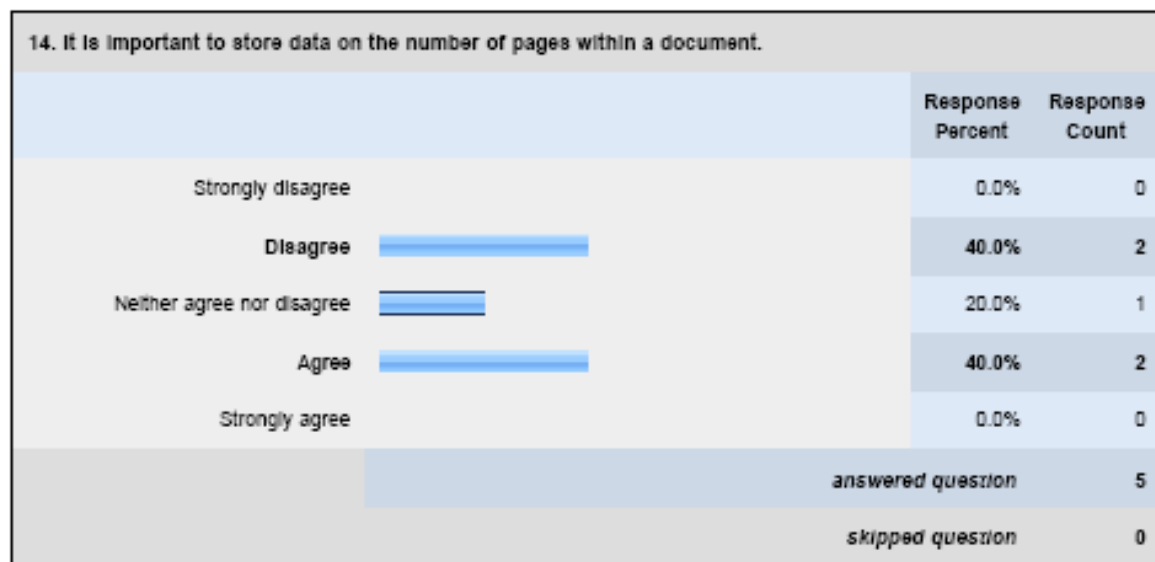
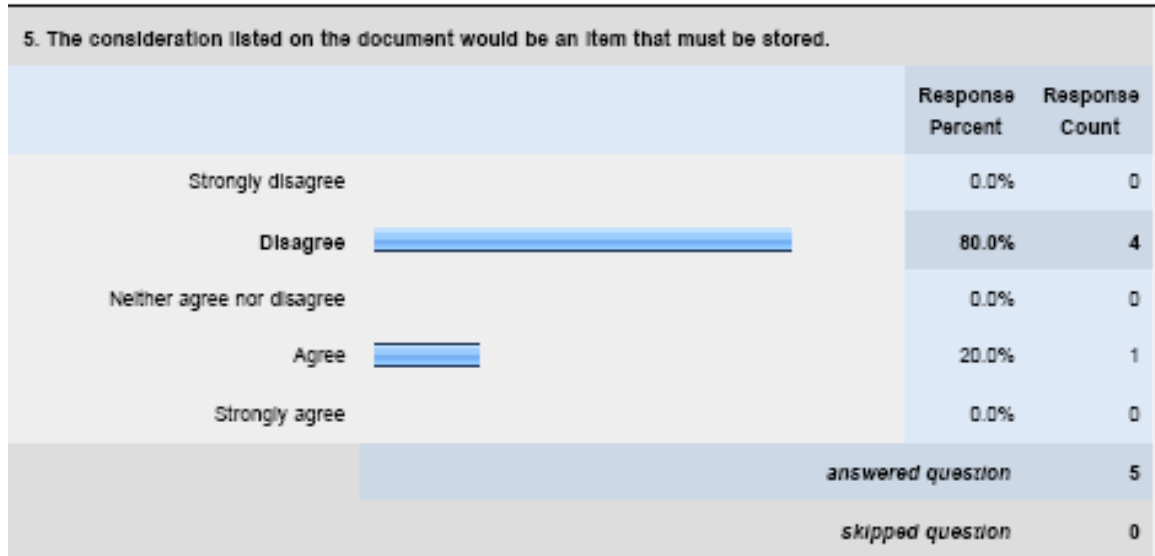
Based on the results of these ten survey questions the title examiners felt strongly about allotting space within the framework for the following data:

- An image of the document
- Grantor names
- Grantee names
- Legal description of the property
- Related documents
- Expiration date of the document together with any detail about extensions to that date
- Terminology used for exceptions or requirements in previous searches

The title company has a database of only the images of documents and a database that is keyed to a property or non-property sorting. The final three items on the list

are the details and knowledge that are not currently maintained in a state that is easily accessible or reusable.

The participants did not indicate that they needed to have the consideration or amount paid separately listed, nor was the number of pages that make up a particular document necessary. Questions 5 and 14 addressed this.

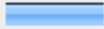



The literature on framework development focused on the importance of working with the ultimate users and understanding their needs and desires (McDermott 1999; Wong and Aspinwall 2004; and White and Lutters 2007). The storage and reuse of an examiner's tacit knowledge is the theoretical proposition of this work and by focusing on the uniqueness of the many different types of documents and the redundancy of the affect that a specific document has on multiple chains of title the research followed the guide of the literature by concentrating on the in-company style and customary behaviors of a title examination (Collis and Winnips 2002; and Hirai, Uchida and Fujiami 2007).



Research Question 4

The remaining questions were intended to discover the flexibilities that the title examiners would like to have in a document repository that provides detail about the handling of each specific document, as in does it create an exception or requirement or does it continue the chain without causing any additional effect. Questions 9, 11 and 15 – 20 inclusive seek details about how the title department actually envisions their utilization of this repository. There was 100% agreement on question 9, 11, 16, 17 and 18 as to flexibilities desired by the title department. As stated previously the literature supports knowing the users and understanding how they currently function, before drafting the framework for the proposed knowledge management system (Becerra-Fernandez, Gonzalez and Sabherwal 2004; White and Lutters 2007 and McDermott 1999).

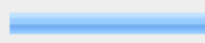
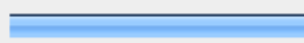
9. A place to store an examiner's thoughts and comments and reasoning for a specific requirement or exception would be useful.

	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	20.0%	1
Strongly agree 	80.0%	4
<i>answered question</i>		5
<i>skipped question</i>		0

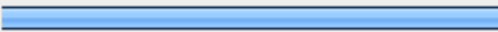
11. Providing a miscellaneous category within the framework of the repository would be advantageous.

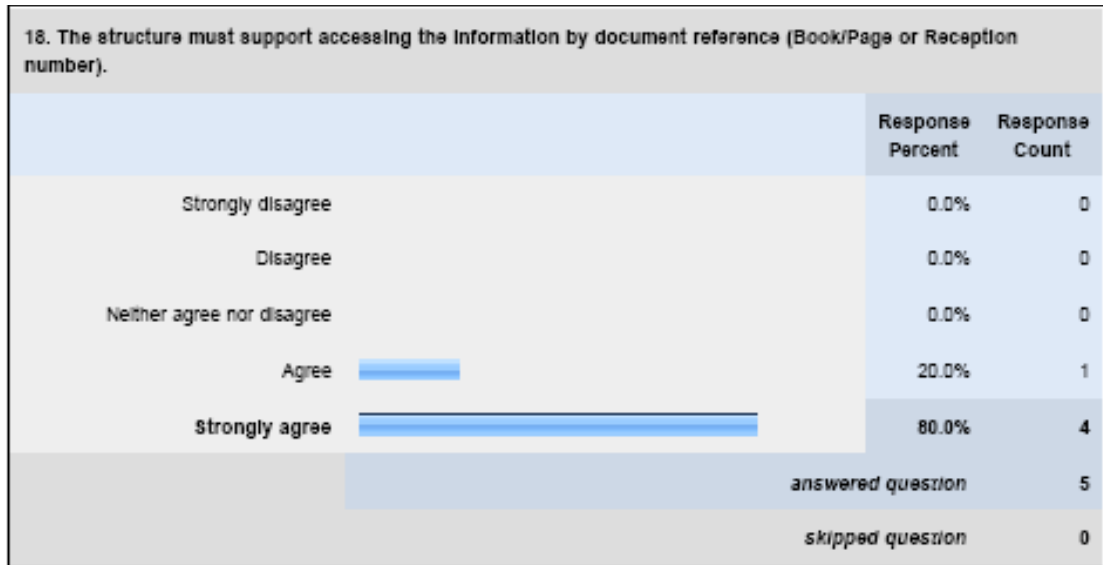
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	80.0%	4
Strongly agree 	20.0%	1
<i>answered question</i>		5
<i>skipped question</i>		0

16. The framework must allow for changes and updates to the record.

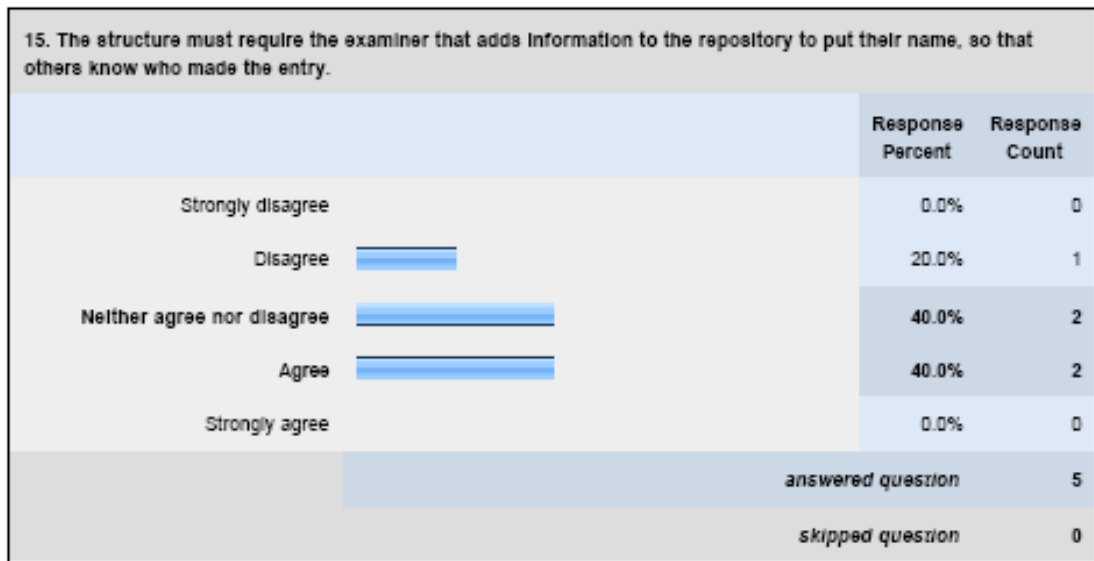
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	40.0%	2
Strongly agree 	60.0%	3
<i>answered question</i>		5
<i>skipped question</i>		0

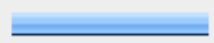
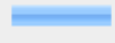
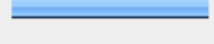
17. Tracking changes by keeping a tracking log within the repository would be ideal.

	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree	0.0%	0
Neither agree nor disagree	0.0%	0
Agree 	100.0%	5
Strongly agree	0.0%	0
<i>answered question</i>		5
<i>skipped question</i>		0



Questions 15 and 19 had only a 40% agreement rate. Thus indicating that the title examiners believed that knowing which examiner added or changed the knowledge was not going to affect the use of the knowledge. Furthermore the results showed that attempting to gain access to the repository through the more general description of the section, township and range that a property lies within would not be beneficial.



15. The ability to access the information by section, township and range would be required.		
	Response Percent	Response Count
Strongly disagree	0.0%	0
Disagree 	40.0%	2
Neither agree nor disagree 	20.0%	1
Agree 	40.0%	2
Strongly agree	0.0%	0
answered question		5
skipped question		0

The results of these survey statements show that the participants' desire is that the repository will include:

- A space for miscellaneous information and for notes that clarify reasoning for specific decisions made about a document and the exception or requirements that are listed
- The ability to update or change the specifics from the examiner about the effect of the document
- A tracking log to follow the sequence of updates to the record
- Identifying and locating the document by reference number (either Book and Page or Reception number) or Grantor or Grantee

Chapter 5 – Recommendations and Conclusions

The results of this research have guided the researcher to a deeper understanding of knowledge management, ontology development and framework creation. Furthermore in working with the local title insurance company, the researcher gained a deeper understanding of the specifics of an ontology of the title insurance industry, and the needs and desires of the title department with respect to a document repository that would store the knowledge of the title examiner's review of each specific document. The research resulted in the initial framework for the document repository.

The local title insurance company that was involved in this research has been in business for almost thirty years and over that time a lot of knowledge about the public records has been gained by many individuals within the organization. To this point this knowledge has been stored within the confines of the file that the examiner was handling at the time and in order for an examiner to use this knowledge, the previous files that may or may not contain useful information needed to be pulled and gone through, searching for any knowledge that might be of use in the current project. As a member of the title department it seemed that it would make the work of the title examiner more efficient and the products of the organization more consistent if there were a method for maintaining the knowledge attained from previous examinations of the public record documents.

The literature stressed that in order to develop a knowledge management system that would benefit an organization; those working on the development must fully understand the industry including its current method of operation (Becerra-Fernandez, Gonzalez and Sabherwal 2004; McDermott 1999 and Chandrasekaran, Josephson and Benjamins 1999; White and Lutters 2007). By working with the members of the title

department, the researcher was able to develop a concept map that all agreed represented the classifications of the documents in the public record. Thus creating an object that all understood and that would insure that all department members were working with the same understanding of the terminology. The pile-sort activity was given to the title department members to gain a better understanding of possible effects of the different classes of documents. In reviewing the results of the pile-sort it was clear that there was not a consistency of the handling of the classes, therefore each document will need to be handled on an individual basis. It was the original belief of the researcher that some of the classifications would be easily grouped and all documents within a group would have the same entries into the proposed database. The agreements/notices classification shows that these documents can be any of the choices; as can the deed and release categories. This unique handling of the tacit knowledge was supported by the literature (Collis and Winnips 2002; and Novak and Canas 2008).

The literature encourages the creation of a strong theoretical foundation for the building of a knowledge management system (Wong and Aspinwall 2004; Dale 1999; and Holsapple and Joshi 2002). The responses of the participants to the survey statements gave the researcher the specifics of the departmental needs and desires for the proposed framework. From the responses the framework includes:

- Reference number (Book/Page or Reception)
- Grantor name(s)
- Grantee name(s)
- Legal description
- A listing of related documents by reference number (if any)

- Expiration date of the document and extension data (if any)
- Terminology used for exceptions in previous searches (if any)
- Terminology used for requirements in previous searches (if any)
- Space for notes and miscellaneous data that would be helpful to future users
- A tracking log of changes and updates
- An image of the document

While the list above describes the fields that will be required within the proposed database; the majority of the members of the title department requested that certain capabilities be included as well. These involve the search capabilities available to the users and the ability to correct or update certain details within the database.

The literature supports the gathering of knowledge that already exists within an organization and making it available to others within the organization as a means of providing efficiency in job performance which will cut costs (Atwood 2009; Wang and Ahmed 2004; Becerra-Fernandez, Gonzalez and Sabherwal 2004).

The researcher's conclusion from this study is that the members of the title department are very interested in the possibility of a method of capturing and sharing the information from title examination of each document within the public records. In departmental discussions, there was a great deal of excitement about the possibilities that such a framework could provide. The department was in agreement on most of the questions. The result of this agreement determined the items to include or not include in the framework. The items that were lacking agreement, which were about including section, township and range data, the number of pages in the document and the name of

the title examiner that was making or changing the entry, were discussed further and agreement was reached that these items would add no real benefit to the department. The framework is keyed on the reference number of the document since it will be the unique field that can be tied to the property search. There is a title plant that provides a property search capability and thus gives the examiner a listing of documents that may or may not have an effect on the property. Providing a database that the examiner can use in conjunction to check for previously acquired knowledge on the specific documents, will allow faster review of individual documents and a more consistent product being prepared.

Chapter 6 – Areas for Further Research

The next step for this research would be to create the database described and begin testing its usage within the title department of the local title company. The research and positive feedback from the participants leads the researcher to believe that the next phases of the research will be well received and create the desired efficiency.

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Appendix A

The following pages are the survey questions administered by SurveyMonkey.com. The statement here is the instructions provided with the survey:

This survey is being utilized in the development of a framework for a document repository to capture and share the title examiner's knowledge about individual documents. The ultimate goal of this framework is to eliminate redundancy and increased efficiency with the title company.

Storage of examination knowledge
Survey for examiners at FCT
<p>This survey is being utilized in the development of a framework for a document repository to capture and share the title examiner's knowledge about individual documents. The ultimate goal of this framework is to eliminate redundancy and increase efficiency with the title company.</p>
<p>1. An image of the document must be stored within this repository.</p>
<p><input type="radio"/> Strongly disagree</p>
<p><input type="radio"/> Disagree</p>
<p><input type="radio"/> Neither agree nor disagree</p>
<p><input type="radio"/> Agree</p>
<p><input type="radio"/> Strongly agree</p>
<p>2. Storing the section, township and range data of the document is important.</p>
<p><input type="radio"/> Strongly disagree</p>
<p><input type="radio"/> Disagree</p>
<p><input type="radio"/> Neither agree nor disagree</p>
<p><input type="radio"/> Agree</p>
<p><input type="radio"/> Strongly agree</p>
<p>3. The ability to access the exception terminology for a document is beneficial.</p>
<p><input type="radio"/> Strongly disagree</p>
<p><input type="radio"/> Disagree</p>
<p><input type="radio"/> Neither agree nor disagree</p>
<p><input type="radio"/> Agree</p>
<p><input type="radio"/> Strongly agree</p>

Storage of examination knowledge

4. The requirement terminology used previously for a document within the search is necessary.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

5. The consideration listed on the document would be an item that must be stored.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

6. A listing of documents that reference the specific document is essential.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

7. Providing the Grantor's name within the framework is a requirement of the title department.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Storage of examination knowledge

8. Storing the name of the Grantee within the document repository is necessary.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

9. A place to store an examiner's thoughts and comments and reasoning for a specific requirement or exception would be useful.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

10. The structure needs to provide storage for the complete legal description.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

11. Providing a miscellaneous category within the framework of the repository would be advantageous.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Storage of examination knowledge
<p>12. Some documents have expiration dates on them and storing this information would be a requirement for the repository.</p> <p><input type="radio"/> Strongly disagree</p> <p><input type="radio"/> Disagree</p> <p><input type="radio"/> Neither agree nor disagree</p> <p><input type="radio"/> Agree</p> <p><input type="radio"/> Strongly agree</p>
<p>13. If a document has terminology about its duration and extension of the duration contained within it, having a place to record that data within the framework would be necessary.</p> <p><input type="radio"/> Strongly disagree</p> <p><input type="radio"/> Disagree</p> <p><input type="radio"/> Neither agree nor disagree</p> <p><input type="radio"/> Agree</p> <p><input type="radio"/> Strongly agree</p>
<p>14. It is important to store data on the number of pages within a document.</p> <p><input type="radio"/> Strongly disagree</p> <p><input type="radio"/> Disagree</p> <p><input type="radio"/> Neither agree nor disagree</p> <p><input type="radio"/> Agree</p> <p><input type="radio"/> Strongly agree</p>

Storage of examination knowledge

15. The structure must require the examiner that adds information to the repository to put their name, so that others know who made the entry.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

16. The framework must allow for changes and updates to the record.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

17. Tracking changes by keeping a tracking log within the repository would be ideal.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

18. The structure must support accessing the information by document reference (Book/Page or Reception number).

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Storage of examination knowledge

19. The ability to access the information by section, township and range would be required.

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

20. Searching the repository by Grantor or Grantee would be a necessary feature.

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

21. Please use this space to add any comments/suggestions or mention any areas that were not covered in the previous questions.

Appendix B

INSTRUCTIONS

This is the 2nd phase of the research for my thesis. As I stated before I am working on the ground work of a possible database structure that will save the information that title examiners use over and over. First Colorado Title already has a database which provides data about documents and this data is provided in print out form when a search is run on a property code. The print out provides a listing of the documents that affect the property. My investigation is into the retention of the knowledge gained or lessons learned from the examiner's review of the documents. Currently, a previous file for the property or a nearby property is pulled to locate this information. My goal is to store this knowledge in a manner that is more easily accessible and can be added to as more documents are recorded or can be revised as necessary.

There are 40 miscellaneous documents in this stack. I am asking you to sort them into piles that will assist me in developing a concept map that will be used to create the framework structure. Please carefully review the documents and put them into piles that reflect the following:

- Creates an exception
- Creates a requirement
- Creates both a requirement and an exception
- Does not create a requirement or an exception

Below are 4 sticky notes that will be the labels for your piles.

Again, thank you for your time. If you have any questions please contact me and I will be happy to answer them.

Sharyl Swope

Appendix C

IRB Approval (see next page)