A STRATEGIC ANALYSIS OF KNOWLEDGE MANAGEMENT AND ITS APPLICATION TO TELUS SERVICE DESK

by

James W. Herdy
B.Sc. Joint Major in Information Systems in Computing Science and Business Administration, Simon Fraser University, 2002

PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

In the Management of Technology Program of the Faculty of Business Administration

© James Herdy 2011

SIMON FRASER UNIVERSITY

Spring 2011

All rights reserved. However, in accordance with the Copyright Act of Canada, this work may be reproduced, without authorization, under the conditions for Fair Dealing. Therefore, limited reproduction of this work for the purposes of private study, research, criticism, review and news reporting is likely to be in accordance with the law, particularly if cited appropriately.
Approval

Name: James W. Herdy

Degree: Master of Business Administration

Title of Project: A Strategic Analysis of Knowledge Management and its Application to TELUS Service Desk

Supervisory Committee:

__________________________________________________________________________

Blaize Reich, Ph.D.
Senior Supervisor
RBC Professor of Technology and Innovation,
Segal Graduate School of Business

__________________________________________________________________________

Colleen Collins, Ph.D.
Second Reader
Associate Professor,
Segal Graduate School of Business

Date Approved: __________________________________________________________
Abstract

TELUS is facing an increasingly competitive environment wherein they have determined that it is essential to prioritize operational efficiency, in order to facilitate investment in strategic assets. Within this context, the customer facing Client Solutions Assurance team is seeking to implement a new knowledge management system, in order to support best-in-class service, realize reduced costs and support future growth.

In order to ensure this project is successful, it is vital that the true nature of knowledge management is understood, that common strategies and frameworks for development are investigated, and that applied best practices are reviewed. Leading researchers and application developers provide the insight needed to assess TELUS project work to date, and help identify key success factors.

This strategic analysis investigates knowledge management theory and best practices in order to analyze the work done to date on project Athena, and demonstrates the huge potential upside to TELUS for creating a best-in-class knowledge management system.

Keywords: Project Athena; CSA; Client Solutions Assurance; Consortium for Service Innovation; KANA; KANA IQ; knowledge management; knowledge management framework; knowledge management strategy; knowledge management system; TELUS; TELUS Service Desk.
Executive Summary

The purpose of this strategic analysis is to investigate knowledge management theory and applied best practices in order to analyze the work done to date by TELUS Client Solutions Assurance (CSA) on project Athena. This analysis is expected to help ensure success by providing a solid foundation of best practices and key success factors upon which to plan and execute the project, as well as to facilitate the incorporation of leading knowledge management theory and frameworks. These goals will be achieved through investigating leading academic theory in the area of knowledge management, reviewing the work done by The Consortium for Service Innovation (an alliance of support organizations dedicated to aligning academic research and industry), and capitalizing on the expertise of KANA Software (an industry leader in the provision of knowledge management solutions).

The Need for Knowledge Management

Operating in the increasingly competitive Canadian telecommunications market, TELUS is facing significant downward pressure on both market share and revenues. These effects are occurring across the growth wireless and internet markets as well as the mature wireline markets, and emerging data and satellite/Internet Protocol TV markets. This is a result of traditional telecommunication and cable companies evolving to provide service across all market segments including telephony (wireline), mobile (wireless), Internet and television, as well as from new competitors entering individual segments.

Within TELUS, Client Solutions Assurance (CSA) Service Desk is the customer facing business group that partners with internal and external business customers to provide cost effective and efficient “life-cycle incident management” by acting as their Single Point of Contact service desk. TELUS Service Desk handles over 60,000 individual transactions (calls, emails and problem tickets) per month and supports over 100,000 end users across Canada and the United States. CSA itself is comprised of 25 separate teams and has over 600 customer service representatives (CSR’s) who must rely on multiple different ticketing, information management and knowledge management systems in order to efficiently and effectively provide the contracted customer support.
The evolution of TELUS Service Desk has resulted in a set of heterogeneous systems that limits TELUS’ ability to provide consistent and high quality customer service. This not only hinders meeting operational efficiency targets including staffing levels, training time and service quality but also makes continuous improvement much more difficult as well. As such, senior management is interested in rolling out a single foundational knowledge management system and information management architecture for this group.

In this regard, TELUS CSA struck project Athena with the goal of investing in the “software, hardware and services necessary to execute and support a world-class knowledge management program (TELUS CSA, Sept. 2010, p.5)”. The expectation was that this project would address both efficiency and quality aspects of Service Desk, and included in the project deliverables were the creation of a knowledge management strategy for CSA, assessment of alternative technical solutions, building the knowledge management processes to govern Service Desk and proposal of a knowledge management organizational structure within CSA. However, it was evident early on that key stakeholders did not have a general agreement on what knowledge management really entailed as evidenced by the focus on technology solutions by some, confusion with document management solutions by others, and insufficient attention to the associated processes, cultural aspects and management requirements. Further, there was also disagreement over the importance of knowledge management team structure and the necessary skills and expertise these people must have. The result was that as knowledge management itself was not well defined, the scope of project Athena was also not well defined.

Knowledge Management Theory

In order to begin to define knowledge management in a manner that allows it to become the foundation for business strategy, which is the focus of this investigation for TELUS; we must first consider what knowledge itself really is. A starting point is to consider a formal definition, such as that provided by Claire McInerney who wrote, “Knowledge is the awareness of what one knows through study, reasoning, experience or association, or through various types of learning (McInerney, 2002, p.1009).” Further, as knowledge originates and is based in people, as well as being affected by their interactions, it is dynamic and will change based upon the experience and learning of individuals and organizations (ibid, p.1010). Investigation of current theory also reveals that knowledge represents both a strategic asset as well as an indispensable resource, the “creation and dissemination” of which “is vital for sustaining competitive advantage, especially in knowledge-intensive industries (Brydon & Vining, 2006, p.964).”
Following from this definition, “knowledge management is about leveraging an organization’s relevant knowledge assets to improve efficiency, effectiveness, and innovation”, and as such, knowledge management has become both an academic discipline and foundation for business strategy. While universal agreement on a concise definition does not exist, a working definition that is simple enough to serve as the foundation for business strategy and that can also be expanded to suit specific interest is, “knowledge management (KM) is an effort to increase useful knowledge with the organization (McInerney, 2002, p.1014).” Regardless of the definition used, it is important to remember that knowledge management is about managing the artefacts used to represent knowledge, not knowledge itself. Knowledge management is not solely document management or information management and further, knowledge management is not the technology used to enable any of these activities.

Effective knowledge management requires understanding of the people (culture), process, technology and leadership components of the area in which it is to be implemented. Notably, cultural issues are of critical importance for knowledge management as they can affect the quality and supply of knowledge from the employees to the company. Thus, an environment must be created to support the creation and sharing of high quality knowledge. Further, frameworks exist that can help assess the processes necessary to implement knowledge management in specific situations, as well as provide insight into potential supporting technologies and applications. Relevant examples are the Knowledge Spiral and I-Space models, which demonstrate the need for the TELUS CSA solution to create a continuous process wherein existing knowledge is used both to support the immediate business needs, as well as to support the creation and refinement of new knowledge. If this is not the case, the cycle will be broken and the process will have to restart from the beginning after each customer interaction. This would obviously be inefficient and prevent capitalization on existing knowledge assets.

Finally, TELUS CSA must also ensure the solution supports the value placed upon knowledge management, as identified by Zack’s Knowledge Strategy Types. In this regard, it is apparent that knowledge management is at the very least core to the business (required to compete in the market) but would provide more value if it were advanced (provided competitive advantage). These strategy types also tie into the value disciplines (customer intimacy, operational excellence and product leadership) that can also be used to help focus an organization’s efforts in creating a knowledge management strategy as well. This theory demonstrates that knowledge management efforts must be aligned with corporate goals and strategy in order to realize success and maximize value.
Knowledge Management Application

In order to create effective knowledge management solutions, the academic study of knowledge management theory must also be a combined with sound application practices and principles. The Consortium for Service Innovation (CSI) and KANA Software Inc. have extensive understanding of this theory and have combined this with their experience to provide guidance in the area of application. Thus, a review of their findings and conclusions is extremely valuable.

Areas where Consortium for Service Innovation provides significant insight include:

- The structure and understanding provided by their Knowledge Centred Support (KCS) Solve Loop and Evolve Loop processes, which support the design, implementation and execution of high quality knowledge management initiatives
- The KCS framework which details the processes required for both knowledge creation and knowledge management program maintenance, thereby helping to ensure project plans are complete and well structured
- An overview of the phases that a typical knowledge management implementation will go through and
- Metrics that can be effectively utilized to track progress, along with how they may change during different phases of an implementation

Areas where KANA provides significant insight include:

- Knowledge management best practices specifically related to call centre based implementations
- Critical success factors for implementing knowledge management in a call centre environment
- Best practices related to knowledge management search functionality which is vital to success

Project Athena – Gate 0 Execution & Analysis

Using the foundational theory and application principles for knowledge management, the work prepared by the Athena project team to date was reviewed in order to assess progress, identify gaps and help support successful project execution. This work includes the Athena
Project Charter and Gate 0 Business Case which present the compelling business drivers to pursue the project. Such drivers include the current state of CSA knowledge management, which is not conducive to a strong competitive position or ensured future success. Further, there are potentially lucrative business markets such as customer self-service that can only be accessed if a high quality, centralized knowledge management system is in place.

If TELUS CSA truly wants to become best in class for help desk support, they must have an exceptional knowledge management system. This is due to the following factors:

- The complexity of their customer’s environments
- The large and dynamic amount of knowledge that agents must use to support customer requests
- The need to efficiently train new staff and introduce new customers to existing staff
- The need to ensure consistent, high-quality solutions across agents and across customers
- The need to quickly resolve known issues and assign new issues to the appropriate teams for resolution

Analysis of the Athena project execution using the four components of a solid knowledge management system as a framework is as follows:

**People (Culture) Analysis**

CSA has a very good understanding of their work culture and also know their strengths and weaknesses which have been effectively integrated into preparation of the Gate 0 deliverables. Specifically, the Athena project team did a very good job of reaching out to all potential stakeholders and including them in the project. Representatives from all the individual Service Desk teams were asked to participate in the project and product reviews and feedback was elicited, validated and discussed in an open and integrative forum. This has provided a good foundation for building buy-in and commitment.

That said, it was evident that there will still be some significant cultural issues to overcome, as not all stakeholder groups sent representatives to participate in the process. Further, some Service Desk teams presented direct opposition to a new, centralized knowledge
management system and others withheld approval, possibly indicating passive opposition. Also related to this issue of obtaining buy-in and commitment, while the project team did a good job of creating and proposing the revised team structure needed to support their vision for the new knowledge management system, opposition from senior management was voiced during the Steering Committee review and this will have to be addressed as well.

**Process Analysis**

CSA has done a very good job of identifying the business drivers for the Athena project as well as the high-level processes required for knowledge management across the different Service Desk teams. This information was then effectively combined with documentation created to capture the present and future modes of operation in order to provide assurance that the proposed solution would support the expected benefits (both quantifiable and non-quantifiable). That said, this evaluation is still very high level and will require a deeper analysis and a more formalized project plan in order to make accurate projections and ensure their attainability. Finally, as the project team chose the KANA IQ product as their tool of choice, they were also able to capitalize on KANA expertise in designing the high-level processes for the knowledge management solution and determine the viability of the design.

**Technology Analysis**

In general, there has been an over emphasis on the technical component of the knowledge management solution in relation to the other areas. Specifically, the project Athena investigation began with an assessment of solution vendors and proceeded through product demonstration and review before process requirements and system design were completed. As a best practice, the technical solution should be secondary to overall system design, and used to evaluate the potential for each architectural solution to satisfy the requirements.

That said, the Athena team did a very good job identifying the technical requirements for the knowledge management system and produced a thorough and prioritized list documenting this work. This result was then used to create a solid solution design that addressed all key areas. Further, the early selection of the KANA IQ product was actually beneficial in this area, as it allowed the project team to ensure that all of the most important technical requirements could be met, and that the multiple existing knowledge management systems could be effectively integrated into the new solution. Thus, this work effectively ensured that technical limitations would not become an issue in the future.
Leadership Analysis

Athena project leadership was effective in facilitating the production of the Gate 0 project deliverables under conditions of severe time constraint and resource limitations. This helped to maintain momentum and ensure that the project did not become an after-thought to the stakeholders. Further, the Program Manager and Executive Sponsor also created a very supportive working environment by managing and prioritizing scope, not allowing early resistance to gain momentum but also ensuring it was not disregarded, and keeping the Steering Committee aware of progress. This allowed team members to envision a best-case solution and not constrain themselves to only known processes or procedures. The result was a better solution design process and not just a re-fit of the existing situation.

Perhaps the only significant area of weakness during the initial phase was the ability of the Project Manager to effectively plan, prioritize and resource specific project activities. This was likely due to a lack of detailed planning on the specific tasks that were required, not having a deep understanding of the real requirements for each task, and the continuous need to modify the schedule. That said, there now exists a solid vision for the project along with a clearly defined set of opportunities and benefits and a strong statement for the intended scope, and these will all support more effective project management in the future.

Finally, while the Athena project team has done a good job identifying the strategic drivers for the project, it still needs to generate greater momentum across TELUS CSA as a whole. In part, this will be supported through executive sponsorship if approval to begin the next phase is obtained.

Conclusions & Recommendations

The following conclusions and recommendations are again presented using the four components of a solid knowledge management system as a framework.

People (Culture)

The source of both the revealed and potential opposition to the Athena project needs to be investigated if the project moves into the solution design phase. With respect to individual people within the separate teams, resistance has the potential to arise due to possible negative externalities related to the project. These externalities include such things as loss (or even the perceived potential for loss) of individual expertise and status, effort related to the requirement to
learn new procedures, reduced individual importance related to a new team structure and hierarchy, and the reduced value of experience that has been gained through mastering the existing systems.

Further, there are also issues to be addressed around the knowledge management team design. While the model prepared and presented in the initial business case is aligned with KANA best practices, it does not align to the existing CSA structure and may not be achievable within the TELUS environment. Regardless of whether the best case team can be built as presented, all the underlying roles and responsibilities must be accounted for. If the final team structure must be changed, the associated impacts to the affected knowledge management system must be identified and addressed as well.

Finally, the cultural issues presented here also tie into the leadership and process aspects of the solution, and a solid changed management plan will need to be developed and then effectively executed through project implementation. This plan will need to address concerns across all three levels (management, Service Desk teams, and individual employees) in order to be complete and therefore effective.

Process

In terms of process, TELUS CSA can capitalize on the advantage of working with KANA and their KANA IQ product, as it is based upon and supports proven telecommunication knowledge management needs. The challenge will be to effectively develop the tool for use at TELUS and prioritize the different functionality in support of CSA’s immediate requirements and goals for the Athena project. In this regard, the processes described in the CSI Solve and Evolve models can be very helpful and should be consulted as they all serve to support knowledge management efficiency, which has been identified as the key driver for this project. Finally, adopting the role based privileges outlined by the Consortium for Service Innovation, in conjunction with the knowledge management best practices created by KANA will be very beneficial in addressing potential negative externalities that could result in the over or undersupply of content.

Technology

As the selected vendor (KANA) is an industry leader in the area of knowledge management for call centres, and has a proven track record of successfully supporting companies of similar size and complexity of operations, it is very unlikely that any major technical
limitations will arise. That said, there may still be issues related to the overall cost of software customizations required to support the final solution design and this will need to be investigated in the next phase of the project. Such costs are likely to represent a significant increase in the proposed project budget and the associated work may also require substantial time and resources to complete.

**Leadership**

At this early stage of the Athena project, leadership is the most crucial aspect and touches on issues relevant to the other areas as well. First, there remains the need for a visible project champion with a thorough and well thought out strategic plan and implementation strategy. The project champion must also be able to convey an overall vision for the project, complete with milestones and metrics that people can focus on. Then, it is critical that CSA understands the difference between document, information and knowledge management, and that all stakeholders use a common definition.

With respect to the project vision and goals, CSA must first create the knowledge management team along with the knowledge management strategy that will be employed, and the high-level processes to be used. This is necessary in order to assure the solution (including the vendor and technology) is capable of supporting it. Further, the strategy and high-level processes must be in place to dictate the expectations for the technical project solution. It is incorrect to allow the technical solution to dictate the knowledge management strategy and processes to be adopted. That said, there must still be some overlap and iteration of all work as the knowledge management system and technology do present implications regarding detailed process design.

In terms of strategy, CSA must also decide upon their primary focus with respect to the three potential value disciplines: customer intimacy, operational excellence or product leadership. While all three are key areas of concern for TELUS, operational excellence should be the initial focus, as it can become the foundation for extension into customer intimacy and product leadership as well. That is, a robust and well-designed knowledge management system will facilitate better customer service and allow for the creation of product extensions such as self-service. Further, it is likely that returns from operational improvements will be needed to maintain executive support for a program that might have a multiple year implementation window.

With respect to the knowledge management team structure developed as part of project Athena, while it is consistent with applied knowledge management best practices and principles
presented by the Consortium for Service Innovation, it may not be acceptable for TELUS. As the current business environment is extremely cost conscious, it is very difficult to create a case for the hiring of new resources or realignment of existing resources. Even if a detailed business case were to be developed that projected a strong return on investment, it is possible that senior management would still want to pursue the project using current team members and reporting structures. Therefore, the project may be well served to develop these roles around the current organizational structure and identify any strategic risks that result from this course of action.

Additional points regarding the knowledge management team include the roles and responsibilities that members will be assigned. From an overall team culture perspective, it appears there will be significant work to do in getting buy-in from the multiple CSA groups to accept direction from this centralized unit. The separate teams are used to having autonomy with respect to their own knowledge management needs and they likely hold individual goals above those for CSA as a whole. As outlined in the cultural perspectives on knowledge management discussed before, there are significant risks and externalities to be aware of in such an environment.

In addition, it is important that skilled personnel be put in place to manage and lead in all roles, especially content development. Theses resources must fully realize the higher-level requirements of quality documentation, understand overall knowledge management goals, and have demonstrated expertise. Quality content is the primary driver for success and the risk of having personnel without the necessary experience or expertise leading key areas cannot be overstated.

As related to the overall solution design and costs, detailed planning is imperative and a critical success factor is the identification and monitoring of key metrics throughout the project. Attempting to focus on ‘quick-wins’ is dangerously alluring under the current operational environment at TELUS but it can be very risky if it jeopardizes foundational aspects of the project. The detailed project design is not currently developed to the level of detail necessary to ensure successful implementation. As well, it is likely that there will be a significant increase in vendor consulting costs needed to realize the CSA wide solution. The original estimate used in financial models was based upon on the creation of a single customized workflow in the KANA IQ software and it is very unlikely that so many different groups operating at different support tiers can work from one interface. TELUS may reduce this cost if they develop in-house capabilities to customize the software and while this would be less costly than external consulting, it would still result in increased internal development costs.
Finally, while the KANA IQ software provides extensive and powerful features in support of knowledge management solutions, they all come with up front development costs. Advanced security, user roles, searching capabilities (black words, keywords, synonyms, decision rules, etc.) all require proper design and implementation. While this does not represent a differential cost between competing solutions, which all must address the technical and process related aspects of knowledge management, it is easy for senior management to assume the software takes care of all such details out of the box and that any customization is a minor detail. This of course is not the case

Final Words

In order to achieve the Athena project objectives, the following points must be considered:

- There is a huge potential upside to TELUS for creating a best-in-class KMS but it requires great leadership, planning and patience
- The project strategy must contain all the core components of a sound knowledge management system (people, process, technology and leadership) and address key issues in all areas as well
- It is critical that knowledge management project complexity not be underestimated and oversimplified in order to gain senior management approval, or the end solution will not meet expectations. Knowledge management represents a complex, transformational shift in business strategy and this must be accepted throughout project design and execution
- CSA should follow the correct sequence for project execution. First, a detailed vision and strategy must be created and then used to design the appropriate organizational structure and systems. Limitations on best-case design in any area must be determined and then worked into the overall plan
- Customers will not accept self-service options based upon a poor quality knowledge base
- While there are going to be significant costs for data conversion, the knowledge base is the most critical aspect of the system. If the knowledge base is compromised, no amount of leadership, management or process will help realize operational efficiencies
• In-depth risk, financial and sensitivity analysis based upon more refined estimates and a better understanding of the value presented by knowledge management must be conducted in order to ensure a successful project design is in place.

• Key areas of risk include the long project timeline and complexity of the solution required to cover all areas of Service Desk, the large impact this solution has on the TELUS CSA operations, customers and brand, and the need for highly skilled individuals experienced in creating these types of solutions.

• Knowledge management is a core requirement of CSA’s business but should evolve to provide competitive advantage and create new market opportunities.
Dedication

Mom
We worked hard. We are richer for it... all my love.

Shana Phillips
You are a nerd. Thanks for being you and looking after Lola, Riley and Marvin.

John Mocyk
You never let me forget my dream and helped me through some difficult times. We accomplished so much and I appreciate your willingness to be part of my journey.

Kenneth Skou
Thank you for being my mentor.

Arvin Aguilar
Thank you for all your support.
Acknowledgements

I would like to thank the many people, who gave their time, experience and support to help me through this MBA program and with the creation of this paper. Specifically:

- Deb Durocher and Carrie Young who allowed me to work with their TELUS CSA team through the initial phase of the Athena project
- The TELUS CSA Knowledge Management team members who accepted me into their team: Rob Brekke, Lorraine Gagne, Susan Metcalf, Roberta Miller, Olivier Paschke
- Shana Phillips, TELUS CSA Business Analyst who provided invaluable insight and information based upon her extensive experience in the area of TELUS CSA knowledge management
- Dr. Colleen Collins, Dr. Blaize Reich and Dr. Aiden Vining for their counsel and guidance in preparing, editing and completing this paper
- The wonderful instructors at the Segal Graduate School of Business who taught me so much and challenged me to grow: Dr. Colleen Collins, Dr. Craig Emby, Dr. Andrew Gemino, Dr. Brenda Lautsch, Dr. Elicia Maine, Bernard Maroney, Dr. Ian McCarthy, Dr. Mark Moore, Lisa Papania, Dr. Michael Parent, Dr. David C. Thomas, Dr. Mark Wexler
- The faculty and staff at the Segal Graduate School of Business who provided invaluable support: Sharan Girn, Melissa McCrae
- The students in the 2008 and 2009 MOT MBA cohorts
# Table of Contents

Approval ........................................................................................................................................ ii
Abstract ........................................................................................................................................ iii
Executive Summary ......................................................................................................................... iv
Dedication ......................................................................................................................................... xvi
Acknowledgements ......................................................................................................................... xvii
Table of Contents ............................................................................................................................ xviii
List of Figures .................................................................................................................................... xx
List of Tables ...................................................................................................................................... xxi
Glossary ............................................................................................................................................ xxii

1: Introduction ................................................................................................................................. 1

2: The Need for Knowledge Management ....................................................................................... 2

2.1 TELUS ......................................................................................................................................... 2

2.2 Client Solutions Assurance – TELUS Service Desk ................................................................. 8

2.3 Project Athena ............................................................................................................................ 10

2.4 The Need for Knowledge Management Conclusions ............................................................ 12

3: Knowledge Management Theory ............................................................................................. 13

3.1 What is Knowledge? ................................................................................................................. 13

3.2 What is Knowledge Management? ............................................................................................ 16

3.3 Knowledge Management Strategy ............................................................................................ 17

  3.3.1 Leadership .......................................................................................................................... 18

  3.3.2 People & Culture .................................................................................................................. 20

  3.3.3 Process ............................................................................................................................... 25

  3.3.4 Technology .......................................................................................................................... 27

  3.3.5 Knowledge Management Strategy Conclusions ................................................................. 28

3.4 Knowledge Management Frameworks ....................................................................................... 29

  3.4.1 Knowledge Focused Frameworks ......................................................................................... 29

  3.4.2 Business Process Focused Frameworks ............................................................................... 33

  3.4.3 Results Focused Frameworks .............................................................................................. 34

  3.4.4 Binney’s KM Spectrum ....................................................................................................... 35

  3.4.5 Selecting a KM Framework ................................................................................................. 40

3.5 Knowledge Management Theory Reviewed for TELUS CSA .................................................. 42

4: Knowledge Management Application ......................................................................................... 44

4.1 Consortium for Service Innovation ............................................................................................. 44

  4.1.1 Knowledge Centred Support (KCS) ....................................................................................... 45

  4.1.2 The KCS Process ................................................................................................................. 46

  4.1.3 KCS Framework .................................................................................................................. 51
4.1.4 CSI Theory & Application Principles Reviewed for TELUS CSA ........................................55
4.2 KANA Software Inc. ........................................................................................................56
4.2.1 KMS Best Practices .....................................................................................................56
4.2.2 KMS Critical Success Factors .......................................................................................58
4.2.3 Searching Best Practices ..............................................................................................61
4.2.4 KANA Theory & Application Principles Reviewed for TELUS CSA ..........................62
4.3 Applied Knowledge Management Conclusions ..............................................................62

5: Project Athena – Gate 0 Execution & Analysis ..................................................................64
5.1 Athena Project Charter .....................................................................................................64
5.1.1 Vision Statement ............................................................................................................64
5.1.2 Business Drivers ...........................................................................................................65
5.1.3 High Level Business Opportunities & Benefits .............................................................66
5.2 Athena Business Case ......................................................................................................67
5.2.1 Project Scope .................................................................................................................68
5.2.2 Strategic Fit .....................................................................................................................68
5.2.3 Financial Investment .....................................................................................................69
5.2.4 Non-Quantified Benefits ..............................................................................................73
5.2.5 Risk Assessment ............................................................................................................74
5.2.6 Knowledge Management Team .....................................................................................76
5.3 Project Athena – Analysis of Gate 0 Execution .................................................................76
5.3.1 People (Cultural) Analysis ............................................................................................77
5.3.2 Process Analysis .............................................................................................................77
5.3.3 Technology Analysis .....................................................................................................78
5.3.4 Leadership Analysis .....................................................................................................78

6: Conclusions & Recommendations ....................................................................................80
6.1 People (Culture) ................................................................................................................80
6.2 Process ..............................................................................................................................82
6.3 Technology ........................................................................................................................83
6.4 Leadership ........................................................................................................................84
6.4.1 Concept Alignment ........................................................................................................85
6.4.2 Vision & Goals ...............................................................................................................85
6.4.3 Knowledge Management Team .....................................................................................86
6.4.4 Financial Risk Analysis ..................................................................................................87
6.5 Final Words .......................................................................................................................89

Appendices ..........................................................................................................................92
Appendix A – CSA KMS Requirements ...............................................................................93
Appendix B – CSA KMS Vendor Feedback ...........................................................................96

Bibliography ..........................................................................................................................98
Works Cited .............................................................................................................................98
Company Documents .............................................................................................................101
Works Consulted .....................................................................................................................102
Websites Reviewed ................................................................................................................103
List of Figures

Figure 2.1  TELUS National Fibre Network ................................................................. 7
Figure 2.2  TELUS National Wireless Network Coverage ........................................ 8
Figure 2.3  CSA KM Strategy – Core Principles ......................................................... 12
Figure 3.1  Knowledge Spectrum ............................................................................. 15
Figure 3.2  Knowledge Management Strategy ............................................................ 17
Figure 3.3  Typology of Knowledge Goods ................................................................. 23
Figure 3.4  Nonaka & Takeuchi’s Knowledge Spiral ................................................... 31
Figure 3.5  Boisot’s I-Space Model ........................................................................... 32
Figure 4.1  KCS Double Loop Process ..................................................................... 47
Figure 4.2  KCS Role Development .......................................................................... 50
Figure 5.1  Project Athena Focus Within CSA Support Process ............................... 65
Figure 5.2  Project Athena – Financial Investment Summary ..................................... 72
Figure 5.3  Project Athena – High Level Risk Assessment ......................................... 75
Figure 5.4  Proposed CSA KM Team Structure ....................................................... 76
List of Tables

Table 2.1  Key Players: Canada Telecoms Sector ................................................................. 3
Table 2.2  TELUS SWOT ........................................................................................................ 5
Table 2.3  TELUS Corporate Focus ....................................................................................... 6
Table 3.1  Knowledge Management Subsystems ................................................................... 25
Table 3.2  Knowledge Spiral Modes ...................................................................................... 30
Table 3.3  Boisot's Social Learning Cycle ............................................................................ 31
Table 3.4  Emerging Business Process Focused Frameworks .................................................. 33
Table 3.5  In-Use Business Process Focused Frameworks ..................................................... 33
Table 3.6  Zack's Knowledge Strategy Types ......................................................................... 35
Table 3.7  Binney's KM Spectrum Categories ....................................................................... 36
Table 3.8  KM Spectrum Enabling Technologies ................................................................. 38
Table 3.9  KM Spectrum Applications .................................................................................. 39
Table 3.10 Value Discipline Analysis for KM ...................................................................... 40
Table 3.11 Factors Influencing KM Strategy Selection .......................................................... 41
Table 3.12 KM Selection Activities ..................................................................................... 41
Table 4.1  KCS Focus Shift .................................................................................................... 46
Table 4.2  Solve Loop Processes .......................................................................................... 48
Table 4.3  Evolve Loop Processes ......................................................................................... 49
Table 4.4  KCS Roles .............................................................................................................. 50
Table 4.5  KCS Framework ................................................................................................... 51
Table 4.6  KCS Phase 0 Exit Criteria ..................................................................................... 54
Table 4.7  Self-Service Measurements ................................................................................. 55
Table 4.8  Evolving Knowledge Management as a Core Competency .................................... 57
Table 4.9  KMS Critical Success Factors .............................................................................. 59
Table 5.1  Deep Dive KMS Comparison .............................................................................. 67
Table 5.2  Project Athena - Cost Estimates .......................................................................... 70
Table 5.3  Project Athena - Financial Benefit Estimates ....................................................... 71
Table 5.4  Project Athena - Non-Quantifiable Financial Benefit Estimates ........................... 73
Table A.1 CSA KMS Requirements ..................................................................................... 93
Glossary

3G
“International Mobile Telecommunications-2000 (IMT—2000), better known as 3G or 3rd Generation, is a generation of standards for mobile phones and mobile telecommunications services fulfilling specifications by the International Telecommunication Union. Application services include wide-area wireless voice telephone, mobile Internet access, video calls and mobile TV, all in a mobile environment. Compared to the older 2G and 2.5G standards, a 3G system must allow simultaneous use of speech and data services, and provide peak data rates of at least 200 kbit/s according to the IMT-2000 specification (Wikipedia, 3G).”

4G
“4G refers to the fourth generation of cellular wireless standards. It is a successor to 3G and 2G families of standards. A 4G system is expected to provide a comprehensive and secure all-IP based solution where facilities such as IP telephony, ultra-broadband Internet access, gaming services, and streamed multimedia may be provided to users. [4G] cellular system must have target peak data rates of up to approximately 100 Mbit/s for high mobility such as mobile access and up to approximately 1 Gbit/s for low mobility such as nomadic/local wireless access, according to the ITU requirements. Scalable bandwidths up to at least 40 MHz should be provided (Wikipedia, 4G).”

ADSL2+
“ADSL2+ extends the capability of basic ADSL by doubling the number of downstream bits. The data rates can be as high as 24 Mbit/s downstream and up to 1.4 Mbit/s upstream depending on the distance from the DSLAM to the customer's premises (Wikipedia, ITU G.992.5).”

ARPU
“Average revenue per user (sometimes average revenue per unit) usually abbreviated to ARPU is a measure used primarily by consumer communications and networking companies, defined as the total revenue divided by the number of subscribers. This term is used by companies that offer subscription services to clients for example, telephone carriers, Internet service providers, and hosts. It is a measure of the revenue generated by one customer phone, pager, etc., per unit time, typically per year or month. In mobile telephony, ARPU includes not only the revenues billed to the customer each month for usage, but also the revenue generated from incoming calls, payable within the regulatory interconnection regime (Wikipedia, Average revenue per user).”

Broadband
“The term broadband refers to a telecommunications signal of greater bandwidth, in some sense, than another standard or usual signal (and the broader the band, the greater the capacity for traffic). Broadband in data can refer to broadband networks or broadband Internet and may have the same
meaning as above, so that data transmission over a fiber optic cable would be referred to as broadband as compared to a telephone modem operating at 56,000 bits per second (Wikipedia, Broadband).”

**Broadband Internet**

“Broadband is often called "high-speed" access to the Internet, because it usually has a high rate of data transmission. In general, any connection to the customer of 256 kbit/s (0.25 Mbit/s) or greater is more concisely considered broadband Internet access (Wikipedia, Broadband Internet access).”

**CAPEX**

Capital Expenditure

**CSA**

TELUS Client Solutions Assurance is an external facing business unit which includes teams such as TELUS Service Desk that partners with TELUS customers to provide cost effective and efficient “life-cycle incident management” by acting as their single point of contact (SPOC) service desk.

**CSI**

Consortium for Service Innovation

**CSR**

Customer Service Representative. This includes Tier1 and Tier2 support.

**GSM**

“GSM (Global System for Mobile Communications: originally from Groupe Spécial Mobile) is the most popular standard for mobile telephony systems in the world. The GSM Association, its promoting industry trade organization of mobile phone carriers and manufacturers, estimates that 80% of the global mobile market uses the standard. GSM is used by over 1.5 billion people across more than 212 countries and territories. Its ubiquity enables international roaming arrangements between mobile network operators, providing subscribers the use of their phones in many parts of the world. GSM differs from its predecessor technologies in that both signalling and speech channels are digital, and thus GSM is considered a second generation (2G) mobile phone system. This also facilitates the wide-spread implementation of data communication applications into the system (Wikipedia, GSM).”

**HSPA**

“High Speed Packet Access (HSPA) is an amalgamation of two mobile telephony protocols, High Speed Downlink Packet Access (HSDPA) and High Speed Uplink Packet Access (HSUPA), that extends and improves the performance of existing WCDMA protocols. HSPA supports increased peak data rates of up to 14 Mbit/s in the downlink and 5.8 Mbit/s in the uplink. It also reduces latency and provides up to five times more system capacity in the downlink and up to twice as much system capacity in the uplink, reducing the production cost per bit compared to original WCDMA protocols (Wikipedia, HSPA).”

**IT**

Information Technology

**ILEC**

“All ILEC, short for incumbent local exchange carrier, is a local telephone company in the United States that was in existence at the time of the break up
of AT&T into the Regional Bell Operating Companies (RBOCs), also known as the "Baby Bells." In Canada, the term ILEC refers to the original telephone companies such as Telus (BC Tel and AGT), SaskTel, Manitoba Telephone Systems (MTS Allstream), Bell Canada Enterprises and Aliant (Wikipedia, ILEC).”

**JIT**  Just in Time

**KB**  Knowledge Base

**KM**  Knowledge Management

**KMS**  Knowledge Management System

**OPEX**  Operational Expenditure

**Roaming**

“In wireless telecommunications, roaming is a general term referring to the extension of connectivity service in a location that is different from the home location where the service was registered. Roaming ensures that the wireless device is kept connected to the network, without losing the connection. The term "roaming" originates from the GSM (Global System for Mobile Communications) sphere; the term "roaming" can also be applied to the CDMA technology. Traditional GSM Roaming is defined … as the ability for a cellular customer to automatically make and receive voice calls, send and receive data, or access other services, including home data services, when travelling outside the geographical coverage area of the home network, by means of using a visited network. This can be done by using a communication terminal or else just by using the subscriber identity in the visited network. Roaming is technically supported by mobility management, authentication, authorization and billing procedures (Wikipedia, Roaming).”

**Tier1 Support (TELUS CSA)**

Within TELUS CSA, Tier1 support agents act primarily as a reporting and routing contact centre service that can also resolve simple issues such as password resets.

**Tier2 Support (TELUS CSA)**

Within TELUS CSA, Tier2 support agents perform remote (not onsite for clients) problem resolution for more technical issues than handled by Tier1.

**W-CDMA**

“W-CDMA (Wideband Code Division Multiple Access)… is an air interface standard found in 3G mobile telecommunications networks. It utilizes the DS-CDMA channel access method and the FDD duplexing method to achieve higher speeds and support more users compared to most time division multiple access (TDMA) schemes used today (Wikipedia, W-CDMA).”

**VoIP**

“Voice over Internet Protocol (Voice over IP, VoIP) is a general term for a family of methodologies, communication protocols, and transmission technologies for delivery of voice communications and multimedia sessions..."
over Internet Protocol (IP) networks, such as the Internet (Wikipedia, Voice over Internet Protocol).”
1: Introduction

TELUS is facing an increasingly competitive environment where it is essential to prioritize operational efficiency, in order to facilitate investment in strategic assets. In this regard, TELUS has focused on system technology and infrastructure, which they expected to support customer service and thereby improve market competitiveness. Specifically, the customer facing CSA team is seeking to implement a new knowledge management system, in order to enable best-in-class service, realize reduced costs and support future growth.

In order to ensure this project is successful, it is vital that the true nature of knowledge management is understood, that common strategies and frameworks for development are investigated, and that applied best practices are reviewed. Work done by leading researchers and application developers provides the necessary insight to assess TELUS project work to date, and help identify key success factors.

This strategic analysis first presents the market factors that are driving TELUS to implement such a system, and then investigates knowledge management theory and best practices required to analyze the work done on project Athena to date. Finally, this analysis is used to present key recommendations and conclusions regarding critical success factors for the project as well as demonstrate the huge potential upside to TELUS for creating a best-in-class knowledge management system.
2: The Need for Knowledge Management

TELUS currently faces many business challenges that have led them to focus on operational efficiency in order to support the necessary investment in technology needed to support an improved customer experience and competitive position. Within TELUS, the Customer Service Assurance group has determined that a new knowledge management system is key to achieving the strategic goals for its Service Desk operations, which provide help desk support to business customers. In this regard, CSA has struck project Athena. This situation is outlined in the following chapter.

2.1 TELUS

TELUS is Canada’s second largest telecommunications company with $9.6 billion in annual revenue, 12 million customer connections (6.5 million wireless, 4 million wireline, 1.2 million internet and 170 thousand TELUS TV) and is currently valued at $19.8 billion CDN before debt. Providing a full line of telecom products and services, TELUS is comprised of three main business segments:

- National wireless service where TELUS holds approximately 30% Canadian market share
- Regional incumbent local exchange carrier (ILEC), acting as a full service wireline telecommunications company in Western Canada (Alberta and B.C.) and Eastern Quebec
- Central Canadian wireline data services provider in Ontario and Quebec

(Campbell & Chen, 2010)

Operating in the increasingly competitive Canadian telecommunications market, TELUS is facing significant downward pressure on both market share and revenues. These effects are occurring across the growth wireless and internet markets as well as the mature wireline markets, and emerging data and satellite/IPTV markets (TELUS, 2010 Aug 6). This is a result of traditional telecommunication and cable companies evolving to provide service across all market
segments including telephony (wireline), mobile (wireless), internet and television, as well as from new competitors entering individual segments.

Major competitors for TELUS include Bell Canada Enterprise (BCE), Rogers Communications, and Shaw Communications (see Table 2.1 – Key Players: Canada Telecoms Sector). As well, the recent Canadian wireless spectrum auction in July 2008 introduced new mobile operators including Egypt’s Orascom Telecom who partnered with Globalive Wireless to purchase spectrum across every region in Canada with the exception of Quebec. Launching their Wind brand of service in November 2009, Globalive is the first new player in the Canadian mobile market in the past decade.

Table 2.1 Key Players: Canada Telecoms Sector

<table>
<thead>
<tr>
<th>Company</th>
<th>Ownership</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bell Canada</td>
<td>BCE (Bell Canada Enterprises) (100%)</td>
<td>Fixed-line telephone (local, domestic long distance, international), mobile, data, internet, satellite TV, digital TV, VoIP</td>
</tr>
<tr>
<td>TELUS</td>
<td>Public (100%)</td>
<td>Fixed-line telephone (local, domestic long distance, international), mobile, data, internet, IPTV</td>
</tr>
<tr>
<td>Bell Aliant Regional Communications Income Fund</td>
<td>BCE (44.2%)</td>
<td>Fixed-line telephone (local, domestic long distance, international), data, internet</td>
</tr>
<tr>
<td>Manitoba Telecom Services (MTS)</td>
<td>Publicly traded</td>
<td>Fixed-line telephone (local, domestic long distance, international), mobile, data, internet, IPTV</td>
</tr>
<tr>
<td>Saskatchewan Telecommunications (SaskTel)</td>
<td>Crown Investments Corp (100%)</td>
<td>Fixed-line telephone (local, domestic long distance, international), mobile, data, internet</td>
</tr>
<tr>
<td>Rogers Wireless</td>
<td>Rogers Communications (100%)</td>
<td>Mobile</td>
</tr>
<tr>
<td>Rogers Cable</td>
<td>Rogers Communications (100%)</td>
<td>Cable TV, data, internet, telephony</td>
</tr>
<tr>
<td>Shaw Communications</td>
<td>JR Shaw Group (79.4%)</td>
<td>Cable TV, data, internet, telephony, satellite TV, VOD, DTH</td>
</tr>
<tr>
<td>Videotron</td>
<td>Quebecor Media Inc (100%)</td>
<td>Cable TV, data, internet, telephony, VOD</td>
</tr>
</tbody>
</table>
Table 2.2 TELUS SWOT provides a high-level assessment of TELUS in terms of strengths, weaknesses, opportunities and threats.
Table 2.2 TELUS SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Strong wireless growth</td>
<td>- Foreign ownership restrictions affecting investment and partnerships</td>
</tr>
<tr>
<td>- Full market coverage including wireline, broadband, wireless and TV offerings</td>
<td>- CDMA based wireless network technology which must compete with the more prevalent global GSM standard</td>
</tr>
<tr>
<td>- Significant infrastructure investments for both broadband and wireless networks</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Low Canadian wireless penetration allowing for continued market growth</td>
<td>- Increasing competition as the CRTC licenses new operators, including four wireless providers in 2008</td>
</tr>
<tr>
<td>- Quadruple play bundling of services (wireline, wireless, internet, TV) which facilitates strong marketing offers and enhances customer loyalty, thereby reducing customer churn</td>
<td>- Technological advances continuing to blur the boundaries between broadcasting, Internet and telecommunications resulting in increased competition</td>
</tr>
<tr>
<td></td>
<td>- High cost of national coverage in a geographically large country</td>
</tr>
<tr>
<td></td>
<td>- New technologies such as VoIP taking market share from traditionally strong TELUS business services such as national long distance</td>
</tr>
</tbody>
</table>

Source: Adapted from Business Monitor International, 2010, pp.74-75

TELUS has focused on the following three areas in order to address the increasingly competitive environment, maintain and grow market share and average revenue per unit, and ensure that shareholder’s demands for improved profitability are met:

- Technology & Infrastructure Investment
- Operational Efficiency
- Customer Experience

Table 2.3 TELUS Corporate Focus details some of the specific actions TELUS has taken in relation to these core areas of focus.
Table 2.3 TELUS Corporate Focus

<table>
<thead>
<tr>
<th>Technology &amp; Infrastructure Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nov. 2009 TELUS and Bell Wireless launched their joint HSPA wireless network with download speeds up to 21 Mbps and coverage for 93% of the Canadian population. This was built as a W-CDMA overlay of the existing CDMA network and supports moving towards 4G in the future (BMI, 2010)</td>
</tr>
<tr>
<td>• In 2010 TELUS plans to make additional substantial investment in their wireline ADSL2+ network, covering up to 90% of the top 48 communities in Alberta and B.C. (TELUS, 2010, Aug.6th)</td>
</tr>
<tr>
<td>• TELUS is continuing to invest in their national fibre optic network and next generation IP based network</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In the second quarter of 2010, TELUS realized $37 million in cumulative operational savings and expects to realize $135 million for the full year</td>
</tr>
<tr>
<td>• The number of full time equivalent (FTE) employees was reduced by over 1,000 in the first half of 2010 as a result of restructuring, attrition and a hiring freeze</td>
</tr>
<tr>
<td>• Additional efficiency initiatives that are ongoing include:</td>
</tr>
<tr>
<td>• Process simplification and automation</td>
</tr>
<tr>
<td>• Organizational structure redesign</td>
</tr>
<tr>
<td>• Leveraging outsourcing and off-shoring opportunities</td>
</tr>
<tr>
<td>(TELUS, 2010, Aug. 6th)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>• TELUS consolidated their customer facing business units in May 2010, creating TELUS Customer Solutions, in order to facilitate approaching customers as one team and enhancing the customer experience, as well as to gain operational efficiencies</td>
</tr>
<tr>
<td>• TELUS explicitly stated in the Management Discussion and Analysis, Q2 2010 that, “Driving the best customer experience and earning the patronage of clients is a Company-wide commitment” (TELUS, 2010, Aug. 6th, p.42) was a key part of the risk mitigation plan</td>
</tr>
</tbody>
</table>

**Source:** Developed by the author based upon information supplied by TELUS.

TELUS has also clearly demonstrated commitment to these three areas of focus in the detailed description of their corporate priorities for 2010:

1. Capitalize on the full potential of TELUS’ leading wireless and wireline broadband networks
   - “Monetize on the HSPA build through increased loading, client loyalty…”
   - “… demonstrate strong operational execution and improve, fulfil, and assure processes for TELUS TV and High Speed Internet Access to drive client satisfaction and greater cost efficiency…”
• “Continue to implement a phased approach to the broadband build that optimizes long-term return on investment…”

2. Enhance TELUS’ position in the Small and Medium Business market

• “Drive increased penetration… through… improved customer service”

3. Deliver on our future friendly brand promise to clients

• “Deliver on our brand promise – the future is friendly – and company-wide commitment to driving the best client experience in the industry”

4. Continue to improve TELUS’ operational efficiency to effectively compete in the market and fund future growth

• “… facilitate the team to draw upon best practices and ensure a competitive cost structure”

5. Invigorate TELUS Team engagement…

• “Drive an increased customer focus orientation across the entire organization by embedding it into our culture, leadership model and priorities”

(TELUS, 2010, Our Corporate Priorities for 2010)

Figure 2.1 TELUS National Fibre Network

The continuing evolution of the Canadian Telecommunications market and its underlying technology has forced TELUS to evolve its business strategy in order to remain competitive now and into the future. At the corporate level, this has led TELUS to focus on three broad areas: Technology & Infrastructure, Operational Efficiency and Customer Experience.

2.2 Client Solutions Assurance – TELUS Service Desk

TELUS Service Desk is the customer facing business group within Client Solutions Assurance (CSA) that partners with TELUS internal and external business customers to provide cost effective and efficient “life-cycle incident management” by acting as their Single Point of Contact service desk. TELUS customizes this service based upon individual client requirements and can staff both Tier1 and Tier2 operators. Tier1 operators act primarily as a reporting and routing contact centre that can also resolve simple issues such as password resets, and Tier2 operators perform remote (not onsite for clients) problem resolution for more technical issues. Overall, the services provided by TELUS Service Desk encompass:
- “Incident detection and recording”
- “Incident classification and initial support”
- “Investigation and diagnosis”
- “Resolution and recovery”
- “Incident closure”

(TELUS, 2009, June, Service Desk)

TELUS Service Desk handles over 60,000 individual transactions (calls, emails and problem tickets) per month and supports over 100,000 end users across Canada and the United States. Within this area, there exist 25 separate teams and over 600 Customer Service Representatives (CSR’s) who must rely on multiple different ticketing, information management and knowledge management systems in order to efficiently and effectively provide the contracted services. This combination of high-ticket volume and heterogeneous systems being used by the multiple support teams makes fulfilment of TELUS Service Desk’s mandate to be an industry leader much more challenging. Agents cannot efficiently cross-reference issues between the many clients, ensure that solutions to known issues are not being reinvented and implement standards that allow for continuous improvement. As stated on the TELUS Service Desk website, the team’s mandate is to:

- “Answer all calls, take ownership of problems, and pursue resolution – courteously, quickly and efficiently”
- “Be proactive in the elimination of repeat problems, and follow up with the end user to ensure the highest level of customer satisfaction”

(TELUS, 2009, June, Service Desk)

Along with the operational challenges, the evolution of TELUS Service Desk towards a heterogeneous set of systems limits TELUS’ ability to ensure the provision of consistent customer service. This is a result of knowledge and information duplication that leads to inconsistency and maintenance issues, CSR’s not being able to access a ‘single source of truth’ for a particular issue or customer, and multiple standards and templates making knowledge capture and retrieval more difficult. It not only hinders meeting operational efficiency targets including staffing levels, training time and service quality but also makes continuous improvement much more difficult as well. As such, Senior Client Solutions Assurance
management is interested in rolling out a single foundational knowledge management process and information management architecture for this group.

2.3 Project Athena

In May 2010, TELUS Client Solutions Assurance struck project Athena with the goal of investing in the “software, hardware and services necessary to execute and support a world-class knowledge management program (TELUS CSA, Sept. 2010, p.5)”. The expectation was that this project would address both efficiency and quality aspects of Service Desk. The Athena team expanded upon this vision in the initial Business Case presented to the Steering Committee in September 2010 as follows:

- “Enhanced user experience across Tier1 & Tier2 and web self-help”
- “Implementation of a knowledge architecture and taxonomy to support multiple lines of business”
- “Ensuring there is a strategy for content management to create and mature information quality”
- “Designing measures and metrics to support continuous improvement”
- “Providing governance across lines of business”

(TELUS CSA, Sept.24 2010, p.5)

The project team also identified multiple project drivers and areas for improvement, based upon the current makeup of CSA where 25 teams maintain over 50 separate repositories to store direct customer support information, and at least an additional 50 sites to store references to product and service information. The main drivers and areas for improvement include:

- There are common support processes being documented and maintained by multiple teams, leading to issues around consistency and efficiency
- There is difficulty in getting a consistent view of the support provided for individual customers
- The needs of CSR’s are not being met by some of the systems
- There is difficulty in providing self-help material for customers which then reduces the opportunity for call deflection from Tier1
There is segregation of internal knowledge from customer facing knowledge, preventing quality of service benefits.

There is difficulty measuring crucial aspects of service delivery including content utilization, gap reporting and search effectiveness.

(TELUS CSA, Sept. 10 2010)

CSA staffed project Athena with members of their Knowledge Management (KM) team, which they created in May 2010. The vision statement for this team was to become, “a unified team providing an organized, proactive and responsive approach to Knowledge Management within CSA (TELUS CSA, Sept. 10 2010, p.6).” Included in the Knowledge Management team’s deliverables were the creation of a knowledge management strategy for CSA, assessing technical solutions, building the knowledge management processes to govern Service Desk and proposing a knowledge management organizational structure within CSA.

However, it became evident early on that stakeholders did not generally agree on what knowledge management really entailed and further, since knowledge management was not well defined, the scope of project Athena was also not well defined. To illustrate this lack of clarity, project members often used the concept of document management to represent knowledge management during planning discussions, and many Service Desk teams considered software solutions as being adequate to fulfil the entire scope of the project. Thus, in order to provide a solid foundation upon which to plan and execute project Athena, it was determined that understanding what knowledge management really entails was the first step. Table 1.3 shows the high-level knowledge management strategy that served as a starting point for additional work in project Athena.
Figure 2.3  CSA KM Strategy – Core Principles

<table>
<thead>
<tr>
<th>Core Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance</td>
</tr>
<tr>
<td>- Provide leadership to evolve a knowledge-driven culture</td>
</tr>
<tr>
<td>User Experience</td>
</tr>
<tr>
<td>- Drive RELEVANCE</td>
</tr>
<tr>
<td>Knowledge Architecture</td>
</tr>
<tr>
<td>- Develop CONTEXT</td>
</tr>
<tr>
<td>Content Management</td>
</tr>
<tr>
<td>- Make content CONSUMABLE</td>
</tr>
<tr>
<td>Metrics and Measures</td>
</tr>
<tr>
<td>- Track and guide business value</td>
</tr>
</tbody>
</table>

Source: Developed by the author based upon information supplied by TELUS (TELUS CSA, Sept. 10, 2010)

2.4 The Need for Knowledge Management Conclusions

As demonstrated in the analysis of TELUS’ current business environment, there is a pressing need to improve both operational efficiency and the quality of the customer’s experience. Specifically related to CSA, this corresponds to technology investments directed towards implementing a common knowledge management system. Such a system provides many crucial benefits including:

- Enabling a single-source of truth, along with the associated cost benefits related to system upkeep and maintenance, ease of use for CSR’s and the ability to implement company wide standards, processes and metrics
- The ability for CSR’s to support multiple new customers with minimal training
- The ability to assess and optimize customer service for known issues
- The ability to quickly source issues and assign groups for resolution
- Providing the foundation for customer self-service options which has both cost and user experience implications

However, project Athena, which was created to address this need, first requires a sound understanding of KM theory and best practices in order to be successful. The following section provides an overview of knowledge management theory in this regard.
3: Knowledge Management Theory

When considering knowledge management and organizational systems built to support it, it is important to begin with a sound understanding of what knowledge really is. While this may seem like a somewhat trivial question, it has proven to have important and subtle aspects that can substantially affect knowledge management solution design. This section will investigate both knowledge and knowledge management from a theoretical perspective, along with strategies and frameworks for implementation.

3.1 What is Knowledge?

According to Drucker, knowledge is the principle raw material driving the wealth of people, organizations and nations (Drucker, 1999). Following in this line of thought, knowledge then represents both a strategic asset as well as an indispensable resource, the “creation and dissemination” of which “is vital for sustaining competitive advantage, especially in knowledge-intensive industries (Brydon & Vining, 2006, p.964).”

In order to begin to define knowledge management in a manner that allows it to become the foundation for business strategy, which is the focus of the investigation for TELUS; we must first consider what knowledge itself really is. While this may seem trivial on the surface, trying to build the higher-level knowledge management strategy without first gaining a common understanding of this concept proves very difficult. A starting point is to consider the definition provided by Claire McInerney who writes, “Knowledge is the awareness of what one knows through study, reasoning, experience or association, or through various types of learning (McInerney, 2002, p.1009).” Further, as knowledge originates and is based in people, as well as being affected by their interactions, it is dynamic and will change based upon the experience and learning of individuals and organizations (ibid, p.1010).

The implications of knowledge being dynamic are very critical when designing a knowledge management strategy. “‘Knowledge’ is not merely an object that can be ‘placed’, nor should it be confused with representations of knowledge in documents, databases, etc. (McInerney, 2002, p.1010).” McInerney cites Broadbent in providing a deeper understanding when she writes, “knowledge is enriched information with insights into its context (McInerney,
These perspectives lead to the important conclusion that “knowledge requires knowers” (McInerney, 2002, p.1010), and that knowledge is not merely a static entity that can be transcribed and stored for future use without taking into account this key aspect. While the capture and representation of knowledge is important to allow convenient sharing, the knowledge artefacts themselves must not be confused with the knowledge they serve to represent. That is, knowledge is more than information recorded in an artefact; it also includes the information needed to interpret it for use in a specific situation.

Taking a small step back to traditional information theory, knowledge can be described (albeit somewhat simplistically) as part of a spectrum (see Figure 3.1). Data, consisting of unorganized facts, is at the lowest level and through organization is transformed into information. Making the following jump to knowledge however is more difficult as it includes factors outside the collected information. First, the historically oriented perspective used in defining data and information must shift to a future orientation. Second, the information can no longer be represented as artefacts without interpretation. Instead, knowledge is created when information is interpreted with respect to some particular application. This interpretation is contingent on the intended use of the information, where users may also consider such things as insights that have been transferred to them from previous users. Thus, knowledge is situation and application specific. Finally, the highest order on the spectrum, wisdom, might be seen as the ability to transfer and apply knowledge from unrelated contexts (Hawryszkiewycz, 2010).

Regardless of whether this spectrum is an oversimplification of the true nature of knowledge, it does serve to illuminate some critical points as outlined above:

- Knowledge and information are not synonymous
- Knowledge is dynamic
- Knowledge has social aspects based upon people’s experience and perceptions
- Knowledge should not be confused with the artefacts used to represent it
- Knowledge is context specific and its value comes from interpretation to a particular situation
When defining knowledge management it is also important to differentiate between the two common types of knowledge that both business strategists and academics usually consider for investigation, these being tacit and explicit. These represent two opposing states of knowledge where the difference is that tacit (or implicit) knowledge is hidden and even potentially unknown to the individual or organization in which it resides, whereas explicit knowledge is codified, having been recorded or documented in some way, such that it is more easily transferred and is fully known to those who understand it. Tacit knowledge therefore includes expertise and assumptions embodied in individuals, which again points back to the experience, and judgement attributes that separate knowledge from information in the first place.

As initially discussed, there is a lot of potential value in capturing knowledge and disseminating it through the organization at large, in order to help others complete their work. Thus, because tacit knowledge is personal and somewhat subjective, creating organizational knowledge through processes that transform tacit knowledge to explicit knowledge is a core component of knowledge management.
3.2 What is Knowledge Management?

According to Stankosky, “Knowledge management is about leveraging an organization’s relevant knowledge assets to improve efficiency, effectiveness, and innovation (2010, p.v)”, and as such, knowledge management has become both an academic discipline and foundation for business strategy. Another definition of knowledge management describes it as being “about creating, identifying, capturing and sharing knowledge” and “getting the right knowledge, in the place, at the right time” (Campbell & Schryer-Roy, 2008, p.2). Obviously, universal agreement on a concise definition does not exist, as the perspective taken on knowledge management seems to be closely associated with the intended application (Haggie & Kingston, 2003). However, a working definition that is simple enough to serve as the foundation for business strategy and that can also be expanded to suit each particular interest is, “knowledge management (KM) is an effort to increase useful knowledge with the organization (McInerney, 2002, p.1014).” To give some additional scope to this definition, it is helpful to consider the perspective of Igor Hawryszkiewycz who, when expounding on the ultimate goal of process design in relation to knowledge management states, “… [the intent of such process is] to use knowledge management to improve the quality of outputs and decision making in business decisions (2010, p.23).”

Regardless of the definition used, it is important to remember that knowledge management is about managing the artefacts used to represent knowledge, not knowledge itself. While this may seem like a contradictory observation, consider that managing knowledge involves such concepts as learning, experience, sharing of experience and personal growth whereas knowledge management seeks to leverage the results. Perhaps another useful way to define knowledge management that follows from this point is to state what it is not. Knowledge management is not document management or information management, which is not to say it may not encompass both of these disciplines. Further, knowledge management is also not the technology used to enable any of these activities, including knowledge management itself.

It is easy to mistake document management for knowledge management when the true definition of knowledge, interpretation of information within a specific context, is not considered. Further, as knowledge management requires content management, the distinction between the two can again be lost. Now, content management and more specifically Enterprise Content Management (ECM), can be defined as, “… the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes”. “ECM tools and strategies allow the management of an organization’s unstructured information, wherever that information exists. (AAIM, 2010, para.1).” Thus, ECM is not concerned with what
the managed content represents, be it knowledge artefacts or not. Finally, it may be tempting to consider knowledge management to simply be the software and processes marketed by vendors in support of this aspiration. However, “the idea that data storage, telecommunication, retrieval, and accessibility equal viable knowledge management is a false assumption (McInerney, 2002, p.1013)”. This will be explored when considering what a complete knowledge strategy entails.

3.3 Knowledge Management Strategy

The core components of a complete knowledge management strategy according to Campbell & Schryer-Roy are people (organizational culture, behaviour and skills), process (structure) and technology (2008). Calabrese (2010, p.xix) presented a similar structure when defining the pillars of a complete knowledge management system but also included leadership as one of the core components. As the concept presented by Calabrese has been continually developed, challenged and verified through academic research at George Washington University, both before and after they chartered the Institute of Knowledge Management in 2001, this amalgamated four-component approach serves as a solid foundation for investigating knowledge management strategy.

*Source: Adapted from Campbell & Schryer-Roy, 2008, p.4 and Calabrese, 2010*
3.3.1 Leadership

When introducing leadership Anantatmula quotes Benis & Namus (1985) with the cogent statement that, “Management is doing things right, Leadership is doing the right thing” (2010, p.1). He further expands on this by noting such leadership characteristics and truisms as:

- “[Having] the ability to influence the behaviour of others to align their goals with that of the leader (Liu & Fang, 2006)”
- “leaders must not only be confident, but also inspire confidence in the people they interact with (Prabhakar, 2005)” and
- “the ability of the project leader to project the vision of the project with all the stakeholders in developing, communicating, and delivering the message in a way that ensures continued support is a contributing leadership factor that plays a large role in project success or failure (Christensen & Walker, 2004)”

(ibid, p.7)

The fact that leadership should play such a fundamental role in knowledge management strategy is not surprising as this is the case with business strategy in general, and while a deeper discussion of leadership is beyond the scope of this analysis it is worthwhile to consider the paradigm under which knowledge management leaders must operate.

First, many such leaders find themselves working with predominantly Industrial Age management systems, technology and workforces that are just beginning to evolve into the more dynamic Information Age equivalents, and where it is increasingly difficult to make reliable long term predictions. In response to such conditions, an enterprise might try to minimize change, become capable of quick adaptation or become agile and quickly leverage new opportunities. As it is unlikely that most businesses can achieve long-term success without responding to change and continuous adaptation is very problematic from both a management and technological perspective, businesses may need to look to becoming agile, and this requires strong utilization of all intellectual assets the company has, including knowledge.

(Vandergriff, L., 2010, pp.19-20)

Specific observations compiled by Vandergriff regarding the emerging Intelligence Age context that business leaders must incorporate into their strategies include:

- The shift from long lead-times with “controllable, predictable, stable, incremental, and linear changes” to a world of “rapid discontinuous change”
The emergence of intellectual capital as a dominant factor in revenue generation

The increasing reliance on “Intelligence, Wisdom, Knowledge, Information, Data and Measurement based products and services” as sources of wealth

The emergence of innovation as a competitive factor closely associated with the creation of new knowledge and evolution of existing knowledge

The shift of the workforce to be more reliant on highly qualified knowledge workers who “implement decisions under non-routine, unstructured, and uncertain environments” and

The evolution of the global economy to one that is “knowledge-based and technology-enabled”

(2010, pp.21-22)

Specific key contributors to organizational agility compiled by Vandergriff include:

“Success depends upon integrated decision-making and implementation facilitated by ubiquitous KM”

The emergent competencies of the organization are based upon those of the individual knowledge workers

“Knowledge workers provide the value directly to the customer”

“An empowered workforce receives authority to represent the enterprise, takes initiative to ensure timely informed decisions, and ensures effective implementation”

“Flexible, but known, processes free the knowledge worker to spend more time on the harder effort of thinking” and “they adapt for competitive advantage”

(2010, p.23)

As is evidenced by both the emerging business context and the foundational attributes of an agile organization, a sound knowledge management system is a key factor in enabling such an evolution. Further, if the anticipated ROI of implementing a knowledge management system is to be realized, strong leadership with a complete knowledge of the emerging environment must be present to ensure both corporate commitment and that strategic planning takes into account the needs and timelines involved.
3.3.2 People & Culture

“Culture is comprised of the assumptions, values, beliefs, norms, behaviour patterns, thoughts and actions of its members (Hawryszkiewycz, 2010, p.102)”, and it occurs at many different levels including the individual, societal, and professional both within company groups and for the company as a whole. While an in-depth investigation of culture is also outside the scope of this analysis, it is important to understand its effects on knowledge management.

According to King, corporate culture has been addressed as the biggest impediment to knowledge activities as well as the most significant input to effective knowledge management (King, 2007). He goes on to describe the relationship between culture and successful knowledge management through the following attributes.

Culture:

- “Shapes assumptions about which knowledge is important”
- “Mediates the relationship between organizational and individual knowledge”
- “Creates a context for social interaction”
- “Shapes processes for the creation and adoption of new knowledge”
- “Encourages knowledge creation by influencing employees to be involved in organizational learning activities”
- “Encourages knowledge sharing by making it the norm of acceptable behaviour”

(Ribiere & Sasa Sitar, 2010, p.39)

As quoted by Ribiere and Sasa Sitar, a positive culture in support of knowledge management is one that “enables and motivates people to create, share, and utilize knowledge (Oliver & Kandadi, 2006)” (2010, p.36). Further, this culture must also support “knowledge creation, codification, transfer, and use (p.49)”.

Culture within a group presents itself at three levels, the first and most visible being observable artefacts (symbols, ceremonies, etc.), the second being espoused values (norms, attitudes, etc.) and the third and most hidden being the underlying assumptions and values that may unconsciously affect perceptions, feelings and behaviour. Hofstede defined five dimensions of culture that can be used to compare, contrast and explain differences between cultures, all of which have potential impacts upon effective knowledge management strategy as well. These dimensions are:
• Power distance – the acceptance of unequal power distribution by the less powerful members

• Uncertainty avoidance – the level of comfort people have with ambiguity and uncertainty

• Masculinity/femininity – expected roles by gender

• Individualism/collectivism – the effect on individual behaviour of the group, and

• Long-term vs. short-term orientation – the manner in which time affects individuals

(Hofstede, 1984)

Together, these levels and dimensions can help structure a cultural assessment when designing an effective knowledge management strategy and help to ensure positive cultural attributes are present.

Brydon and Vining (2006) present an interesting and useful perspective regarding cultural effects on knowledge management where they investigate cultures as being internal knowledge markets, and then present potential situations that can cause market failures. They begin by determining that such markets rarely resemble efficient markets for private goods because knowledge often demonstrates public good qualities where it lacks both rivalry and excludability. That is, knowledge is seldom rivalrous, where use by one individual affects or prevents use by another, and exclusion of use is often difficult or costly within the organizational setting. They build upon this perspective by breaking down the different forms in which knowledge can exist as a public good along with the associated cultural risks, and then present possible management strategies to address these risks.

Prior to getting into this deeper analysis, Brydon and Vining first bring up potential negative externalities (negative impacts outside the central transaction between the knowledge holder and user) that may arise, and which management must consider. First, a negative externality faced by the company in terms of excessive cost of dispersion arises when knowledge transfer is only possible through direct social interactions, apprenticeships or mentoring, none of which scale well. This type of externality is a strong incentive for the implementation of knowledge management systems in the first place, as they help drive the marginal transfer cost towards zero. However, such systems still do not address another negative externality, “first-copy cost”, which represents the cost borne by the tacit knowledge holder to create the first explicit
copy. This cost may be significant in terms of the time and effort involved to create knowledge artefacts, and there may be costs related to loss of power and prestige when specialized knowledge is commoditized as well. This culturally sensitive aspect must be addressed because if the knowledge holders cannot recoup these costs, they will not be motivated to create knowledge artefacts.

Within the framework presented by Brydon and Vining, knowledge can be viewed as a public good in four different forms: a pure public good, an open access good, a priced good or a hoarded good. The analysis of each type follows, with the caveat that the discussion for these types of goods is only in relation to knowledge and knowledge markets.

3.3.2.1 Knowledge as a Pure Public Good

Public goods lack rivalry (especially applicable when knowledge is stored in electronic form) and excludability, but knowledge rarely exists in the form of a pure public good. This is due in part to the presence of variable excludability, where knowledge holders have the option not to share tacit knowledge. Knowledge holders may be motivated to keep knowledge hidden if the opportunity to sell it on the open market exists, such as when an employee leaves the company, or when the rewards they receive do not outweigh the potential costs they incur. The result is an undersupply of knowledge to the company.

3.3.2.2 Knowledge as an Open Access Good

When management takes a pure public good, where exclusion is not feasible, and underwrites the associated costs of production and consumption, the result is an open access good. A potential negative externality related to open access goods however, is congestion. Congestion occurs when the system does not have the capacity to handle the creation and use of knowledge artefacts and the suppliers and consumers, no longer paying the associated costs, have no incentive to limit production or use. Under such conditions, performance may significantly degrade and this has associated costs for the organization overall.

3.3.2.3 Knowledge as a Priced Good

Priced goods exist when suppliers can restrict consumption to only those willing to pay and, as with pure public goods, externalities do not exist. However, under such circumstances of excludability, knowledge holders themselves may try to drive up the price and the result is under-consumption of knowledge by the company as a whole. While excludability may seem counter
productive due to the resulting under-consumption, the alternative is a pure public good with the associated risks of undersupply. Further, excludability allows the market to price knowledge, and knowledge suppliers are thus more willing to share. Such a willingness to share may also be possible without excludability when knowledge providers can expect reciprocal benefits for their work. This represents a cultural response to the issue and is preferable to attempting to implementing excludability, as it is less costly to enforce and generally more feasible.

3.3.2.4 Knowledge as a Hoarded Good

Knowledge hoarding may occur when knowledge sharing results in costs to the creator including commoditization of their knowledge and high “first-copy costs”. Unfortunately, commoditization is an underlying goal of an effective knowledge management system, even if it threatens individual expertise. Individual knowledge creators do not often consider the cost to the organization as a whole when assessing the value of creating new knowledge artefacts.

The following figure, adapted from Brydon and Vining (p.966) shows these knowledge types along with potential risks.

![Figure 3.3 Typology of Knowledge Goods](image)

<table>
<thead>
<tr>
<th></th>
<th>No Externalities</th>
<th>Externalities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-excludable</strong></td>
<td><strong>Pure Public Goods</strong></td>
<td><strong>Open Access Goods</strong></td>
</tr>
<tr>
<td></td>
<td>potential for under-supply</td>
<td>potential for congestion</td>
</tr>
<tr>
<td><strong>Excludable</strong></td>
<td><strong>Priced Goods</strong></td>
<td><strong>Hoarded Goods</strong></td>
</tr>
<tr>
<td></td>
<td>potential for monopoly pricing</td>
<td>potential for under-supply</td>
</tr>
</tbody>
</table>

*Source: Adapted from Brydon & Vining, 2006, p.966*

Beyond the four types of knowledge goods that can exist, Brydon and Vining also identified potential “barriers to effective management of internal knowledge markets” (ibid, p.968). These include uncertainty related to the expected returns of knowledge management systems and uncertainty over the value of knowledge created by employees. The former may be mitigated through a carefully planned implementation that takes into account the potential need for cultural change and its inherent challenges, and the latter may be addressed through “demand pull” of knowledge rather than “supply push”, where knowledge creation is pulled by the business needs instead of created prior to them being identified.
Along with uncertainty, there is also the issue of information asymmetry where knowledge suppliers have an advantage in that they have a better understanding of the value of the knowledge they create than either the business or the potential users. The issue presented by this asymmetry is exacerbated by the nature of knowledge goods, which can exist in one of three forms:

- ‘Search Goods’ where consumers can assess value before use
- ‘Experience Goods’ where consumers can only assess value upon acquisition and use, and
- ‘Post Experience Goods’ where assessment of value is difficult even after use

As knowledge generally exists as a post experience good, incorrectly incentivised employees may create high volumes of low quality knowledge as they realize the company cannot easily value it. Further, the knowledge base users will rely on this low quality knowledge, as they cannot determine its true value, even after use. Such opportunism, enabled by knowledge management systems, can be reduced through ongoing quality assurance programs and incentives to recognize high quality knowledge suppliers.

Finally, Brydon and Vining present possible responses to the failure of internal knowledge markets. One such response is to impose subsidies and taxes in order to address the under and oversupply of knowledge, by affecting employee incentives. However, this requires sound knowledge of the marginal costs and benefits of knowledge in order to be effective and there is the risk that subsidies may result in goal displacement. As well, due to the potential information asymmetry, knowledge pollution may be the unintended result of such a strategy and this represents another negative externality.

An additional management response is to establish rules and routines around knowledge management in order to help “regulate the price, quantity, and quality of knowledge shared (ibid, p.969)”\(^1\). The potential problem here is that simple rules are easy to manipulate and difficult to effectively enforce. Management can look to make investments including such areas as system infrastructure, knowledge editors, search facilities and quality assurance as this can serve to reduce congestion, search costs and knowledge pollution. However, modifying the culture to gain desired behaviour is again considered the best option, as alignment of worker and company goals is the key to a successful knowledge management system.

\(^1\) Ibid, p.969.
3.3.2.5 Knowledge Goods Conclusion

The conclusion to be drawn from this discussion is that knowledge markets that fail to account for the motivations of individual employees, work groups and businesses are likely to fail and that management must strive to balance “individual incentives with organizational welfare (ibid, p.973)”. While changing culture can be a difficult and slow process, it is critical for success. Changed culture also needs to be maintained through such actions as socialization of new members, a reward and performance management system, leadership development and mentoring, and ongoing sharing of expertise (Ribiere & Sasa Sitar, p.45). Further, “knowledge management approaches need to be tailored to leverage organizational culture (ibid, p.49)” and recognize that “the concepts of knowledge culture and leadership are intertwined, particularly in periods of cultural change (ibid, p.49)”.

3.3.3 Process

Knowledge management systems require processes to perform knowledge capture and maintenance, communication, and overall system and program management as the basic steps for a successful and ongoing implementation. Schwandt (1996) developed an insightful perspective for this area when he investigated organizational learning. He began by viewing the organization as a dynamic social system continually recreating itself through learning, and then proceeded to describe the underlying sub-systems that are required. The descriptions of these subsystems, including their inter-dependencies where the output created from one subsystem becomes the inputs for another, provide a good understanding of the overall processes needed for knowledge management.

Table 3.1 Knowledge Management Subsystems

<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Interface</td>
<td>Functioning as the interface for the entry of information, this subsystem encompasses organizational learning through activities that respond to internal and external signals. The processes range from those designed to actively gather information based upon specific internal criteria, to those, which passively accept information from external sources.</td>
</tr>
<tr>
<td>Action-reflection</td>
<td>The intent of this subsystem is to create valued knowledge from the new information that has been acquired. This is done through reflection on the other actions in terms of: the processes they use, their results, or the purpose.</td>
</tr>
<tr>
<td>Subsystem</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Dissemination & Diffusion | This subsystem integrates learning through the transfer of knowledge and information throughout the organization. “Dissemination processes are those that are more purposefully directed and governed by formal procedures and policies. Diffusion techniques represent more informal processes such as rumours and informal communications (O’Sullivan et al., p.79)”.
| Meaning & Memory        | Providing the foundation for guidance and control of other subsystems, this subsystem, “maintains the mechanisms that create the criteria for the judgement, selection, focus, and control of the organizational learning system (p.79)”.
|                         | These acts are intended to create and sustain the “cultural beliefs, values, assumptions and artefacts of the organization (p.79)”.
| Acquisition of Resources | This subsystem is responsible for assessing and implementing the organizational resources necessary to support the system as processes are carried out in support of intended goals.
| Production/Service      | The most complex of the subsystems, this subsystem is intended to represent all the specific process directly involved in meeting the intended goals of the overall system to produce the final product.
| Management & Control    | This subsystem is concerned with total integration of all parts of the system including “management control of processes, job design, training, organizational development, and operational and strategic planning (p.80)”.
| Reinforcement           | Reinforcement of performance through maintenance and management of standards, norms and values upon which the entire system operates is the intention of this final subsystem.

*Source: Adapted from O’Sullivan et al., 2010, pp.79-80*

Beyond the high-level processes detailed above, it is worth noting the specific processes around managing knowledge itself. According to Hawryszkiewycz (2010, p.82), these include:

- Definition of the specific type of knowledge to be captured (e.g. customer specific, technology centric or product related)
- Knowledge collection
- Knowledge filtration to ensure it meets the necessary standards and requirements
- Codification in order to allow categorization in support of effective use
- Classification, storage and distribution according to the specific work it is intended to support
With respect to this flow and utilization of knowledge throughout the organization, there exist two main approaches as noted by O’Sullivan. These are described as ‘codification’ and ‘personalization’ and they reflect the core concept that “organizations are comprised of knowledge-producing and knowledge-consuming subsystems (Schulz, 2001, p.78)”. Codification relates to the formal capture of tacit knowledge within a knowledge base for use across the company or business unit and is based upon “a people-to-document approach (ibid, p.80)”. Alternatively, personalization relates to the sharing of tacit knowledge between individuals when it cannot be codified. In most knowledge management systems, there is likely to be the need for both types of implementations.

3.3.4 Technology

The importance of information technology as a foundation for effective knowledge management cannot be understated. However, it must not be overstated as well, and before investigating IT’s role in knowledge management strategy a few points need to be considered. First, many organizations have failed to achieve their desired results when they mistakenly perceive knowledge management as merely being composed of IT solutions and implement according to this approach. Second, investment in IT is very difficult to correlate to improved business performance in general, and thus it cannot be used as the single important driver behind a strong business case or effective strategy (Anantatmula, 2010, p.5).

Correctly viewed, technology is as an enabler of knowledge management where, at a high level, it must support social relationships, provide support for the underlying business processes and enable the capture and sharing of knowledge (Hawryszkiewycz, 2010, p.24). The social structure of the company, which supports the underlying development of social capital and effective knowledge management processes, is also enhanced by the use of technology. Specifically, technology can increase the degree of connectivity and frequency of interactions between employees as well as the amount of information and knowledge sharing (p.42). However, the correct technology must be matched to the organizational structure and culture to obtain these advantages.

According to O’Sullivan (2010, p.75), there are four critical actions necessary to support investment in knowledge management technologies:

- Knowledge management technology must be linked to the corporate strategy
Knowledge management technology must be championed and supported by leaders within the company.

There must exist within the organization, people who are responsible for coaching others in effective use of the technology, and

Effective organizational incentives must exist for using the technology

Knowledge management technology can be viewed in many different ways including paradigms where broad categories are created to reflect the overall processes they support. An example of one such view defined five categories: synthesis, dissemination, communication, gathering and storage. Another option more closely related to the technology itself, as opposed to the underlying processes, uses eight categories defined as Internet, Intranet, Extranet, Data Warehousing, Document Management/Content Management, Decision Support Systems, Knowledge Agents and Groupware (O’Sullivan, 2010, p.77). Such categorization has also been extended into technology frameworks as demonstrated by Ribiere’s L.A. R.O.S.A. model (2008) which views the knowledge management process as encompassing Locate, Acquire, Organize, Share and Apply as the main processes (Ribiere & Arntzen, 2010, p.226). Specifics of such knowledge management frameworks will be investigated more deeply in a following section.

3.3.5 Knowledge Management Strategy Conclusions

As discussed in the preceding sections, leadership, culture, process and technology are all foundational aspects of an effective knowledge management system. Strong leadership is fundamental but faces significant challenges including the emergence of dynamic Information Age markets where business must become agile in order to compete and survive. Further, management must also work to inspire employees whose roles and motivations have evolved along with how they provide value to the company.

Culture represents another huge factor for success as management attempts to align company and individual goals while avoiding negative externalities. Such externalities in the form of over or under-supply, knowledge pollution, and hiding or hoarding of knowledge can all have adverse effects at the company level. With respect to the individual employees, loss of expert status and commoditization of skills may also result in goal displacement issues that the organization must addressed. While management tools including taxes and subsidies or the implementation of processes and rules can be attempted as potential resolutions, cultural change is seen as the most effective and efficient strategy.
Finally, processes and technology are required to manage the overall knowledge management strategy as well as the knowledge lifecycle within the organization. These must cover both codified knowledge as well as the knowledge that resides within individuals. While these processes are usually heavily reliant on technological solutions, it must be remembered that technology does not actually manage knowledge. Instead, technology manages knowledge artefacts that trigger knowledge when interpreted and put into action by the end user.

3.4 Knowledge Management Frameworks

There exist a number of different frameworks or models for knowledge management systems with the main difference between them being their primary area of focus. Some focus on the knowledge itself, while others are directed towards business processes or the desired results. Haggie and Kingston (2003) present a good overview of representative models for these alternatives, including Binney’s KM Spectrum. Binney’s work is based up the classification of other knowledge management frameworks into a spectrum that can be used to help assess individual implementations and provide direction on selecting the appropriate framework for a particular situation.

3.4.1 Knowledge Focused Frameworks

Two knowledge-focused frameworks described by Haggie and Kingston are Nonaka & Takeuchi’s “Knowledge Spiral” (1995) and Boisot’s “Information Space” (“I-Space”) (1998). These models are based on a combination of “knowledge accessibility (i.e. where is the knowledge stored or located and in what form?), and knowledge transformation (i.e. the flow of knowledge from one place to another and from one form to another) (2003, sec.2.1)”. The following descriptions provide insight into their structure and usefulness for organizational knowledge management development.

The “Knowledge Spiral” is perhaps the best known and most cited model for classifying knowledge in terms of knowledge management. It is based upon a two-dimensional “knowledge matrix” which categorizes knowledge as either tacit or explicit and then as either individual or collective. This matrix is associated with a corresponding knowledge conversion process that describes the ongoing creation of organizational knowledge in a continuous spiral through four modes: socialization, externalization, combination and internalization. As knowledge spirals through these modes, it moves to higher levels of the organization, from the individual, to the
The following figure shows the flow of knowledge through the corresponding knowledge conversion modes, as defined for the “Knowledge Spiral” model.
Boisot’s “I-Space” model is similar to the “Knowledge Spiral” with the addition of abstraction as another dimension, which is used to represent the generalization of knowledge to different situations. In this model, Boisot uses a three-dimensional knowledge classification system with axes defined as uncodified to codified, concrete to abstract, and undiffused to diffused. Upon this foundation, Boisot then builds his “Social Learning Cycle” to “model the dynamic flow of knowledge through a series of six phases (sec.2.2)”. The six phases of the cycle are described in Table 3.3.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Scanning</td>
<td>“insights are gained from generally available (diffused) data”</td>
</tr>
<tr>
<td>2 Problem-Solving</td>
<td>“problems are solved giving structure and coherence to these insights (knowledge becomes ‘codified’)”</td>
</tr>
<tr>
<td>3 Abstraction</td>
<td>“the newly codified insights are generalized to a wide range of situations (knowledge becomes more ‘abstract’)”</td>
</tr>
<tr>
<td>4 Diffusion</td>
<td>“the new insights are shared with a target population in a”</td>
</tr>
</tbody>
</table>

Source: Adapted from Hawryszkiewycz, 2010, p.78, figure 4.5
In the “I-Space” model, organizations attempt to maintain knowledge in a state that is as abstract, highly codified and undiffused as possible, as it is in this form that they gain the greatest competitive advantage. However, the natural tendency is for knowledge to move towards becoming diffused as the organization pursues value-added applications. Further, innovation and new knowledge development naturally result in less abstraction and codification as well. The following figure shows the continuous flow implied by this model.

Both the “Knowledge Spiral” and “I-Space” models demonstrate the continuous process change that organizations must implement in order to maintain learning, as knowledge flows through the learning cycle.
3.4.2 Business Process Focused Frameworks

Karl Wiig (1997) and the “American Productivity and Quality Centre” identified six emerging strategies that represent business process focused frameworks (Haggie & Kingston, sec.2.3), as shown in Table 2.4.

Table 3.4 Emerging Business Process Focused Frameworks

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Strategy as Business Strategy</td>
<td>“A comprehensive, enterprise-wide approach to KM, where frequently knowledge is seen as the product.”</td>
</tr>
<tr>
<td>Intellectual Asset Management Strategy</td>
<td>“Focuses on assets already within the company that can be exploited more fully or enhanced.”</td>
</tr>
<tr>
<td>Personal Knowledge Asset Responsibility Strategy</td>
<td>“Encourage and support individual employees to develop their skills and knowledge as well as to share their knowledge with each other.”</td>
</tr>
<tr>
<td>Knowledge Creation Strategy</td>
<td>“Emphasises the innovation and creation of new knowledge through R&amp;D. Adopted by market leaders who shape the future direction of their sector.”</td>
</tr>
<tr>
<td>Knowledge Transfer Strategy</td>
<td>“Transfer of knowledge and best practices in order to improve operational quality and efficiency.”</td>
</tr>
<tr>
<td>Customer-Focused Knowledge Strategy</td>
<td>“Aims to understand customers and their needs and so provide them with exactly what they want.”</td>
</tr>
</tbody>
</table>

Source: Adapted from Haggie & Kingston, 2003, section 2.3

McKinsey & Company (1998) identified five additional business process focused frameworks currently being employed by large companies (sec.2.4) as shown in Table 2.5.

Table 3.5 In-Use Business Process Focused Frameworks

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing and Transferring Best Practices</td>
<td>The focus of this strategy is the identification and dispersion of best practices across the organization. It is similar to Wiig’s “Knowledge Transfer Strategy”</td>
</tr>
<tr>
<td>Creating a new industry from embedded knowledge</td>
<td>This strategy is focused on leveraging existing company knowledge to create new products and opportunities.</td>
</tr>
<tr>
<td>Shaping Corporate Strategy around knowledge</td>
<td>Here, the corporate strategy itself is built upon the knowledge assets already existing in the company.</td>
</tr>
</tbody>
</table>
Fostering and Commercializing Innovation

This strategy is intended to build competitive advantage through leveraging knowledge to increase technological innovation and reduce time to market.

Creating a standard by releasing proprietary knowledge

Through releasing proprietary knowledge to the market, this strategy is intended to create a market standard on which the company can capitalize.

Source: Adapted from Haggie & Kingston, 2003, section 2.4

3.4.3 Results Focused Frameworks

The following two models attempt to “provide a business framework for choosing a KM strategy (sec.2.5)” and thus are very result oriented approaches. The first is Treacy and Wiersema’s “value disciplines”, which relates organizational activities to the three basic elements of a business (those being the business itself, its products and its customers). These disciplines and their focus are:

- Customer Intimacy (customers)
- Product Leadership (products)
- Operational Excellence (organization)

The value disciplines embody the natural trade-offs that must be made between convenience, quality and price, and the inherent tension between them usually results in organizations focusing primarily on a single one. Organizations may choose to focus on customer’s needs and preferences to increase satisfaction and build relationships, their own products in terms of generating new ideas and getting to market faster, or internal operations with the goal of achieving efficiency and reducing costs (Haggie & Kingston, sec.2.5).

The second results focused framework is Zack’s “Knowledge Strategy” (1999) which is designed to help make an explicit connection between a corporation’s competitive situation and the appropriate knowledge management strategy that will enable them to create or maintain competitive advantage. First, the organization must classify its competitive knowledge “on a scale of innovation relative to the rest of the particular industry (sec.2.6)”. The classification system used for knowledge is:
Table 3.6  Zack's Knowledge Strategy Types

<table>
<thead>
<tr>
<th>Knowledge Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>Basic knowledge required to participate in the industry but that will not provide competitive advantage</td>
</tr>
<tr>
<td>Advanced</td>
<td>Knowledge that provides competitive advantage either through being unique or being applied in a unique way</td>
</tr>
<tr>
<td>Innovative</td>
<td>Market leading knowledge that allows an organization to change the way their sector competes and creates value</td>
</tr>
</tbody>
</table>

*Source: Adapted from Haggie & Kingston, 2003, Section 2.6*

The next step in Zack’s “Knowledge Strategy” is to perform a SWOT analysis (strengths, weaknesses, opportunities, threats) to identify “strategic gaps in [the] organization’s knowledge (sec.2.6)”. This is intended to identify areas where the organization has knowledge it can exploit and where it is lacking. Zack makes this determination in relation to two dimensions of knowledge management strategy as follows:

- Exploration vs. Exploitation
  - Degree to which knowledge is lacking and needs to be created, compared to opportunity where existing knowledge is not being fully leveraged for competitive advantage

- Internal vs. External
  - Degree to which the organization relies on external sources for knowledge versus internal generation

These dimensions provide insight as to whether the organization is conservative with respect to knowledge management strategy or aggressive. Conservative companies are more exploitative of internal knowledge sources while aggressive companies are explorative.

3.4.4 Binney’s KM Spectrum

As noted at the start of this discussion, Binney’s KM Spectrum is a classification system that uses other frameworks as a foundation, and that can be used to help an organization understand the diversity of potential options available to them, as well as to assess where they currently stand in terms of knowledge management. Further, it also provides an alternative
method to identify knowledge management activities already being performed, even if they are not perceived as KM.

This spectrum focuses on six knowledge management activities. These activities reflect parts of both the knowledge and business process centred approaches, and correspond to the categories and strategies they define. The six categories of the “KM Spectrum” are:

Table 3.7  Binney’s KM Spectrum Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transactional KM</td>
<td>“Knowledge is embedded in technology.”</td>
</tr>
<tr>
<td>Analytical KM</td>
<td>“Knowledge is derived form external data sources, typically focusing on customer-related information.”</td>
</tr>
<tr>
<td>Asset Management KM</td>
<td>“Explicit management of knowledge assets (often created as the by-product of business) which can be reused in different ways.”</td>
</tr>
<tr>
<td>Process-based KM</td>
<td>“The codification and improvement of business practice and the sharing of these improved processes within the organization.”</td>
</tr>
<tr>
<td>Developmental KM</td>
<td>“Building up the capabilities of the organization’s knowledge workers through training and staff development.”</td>
</tr>
<tr>
<td>Innovation/Creation KM</td>
<td>“Fostering an environment which promotes the creation of new knowledge, for example through R&amp;D and through forming teams of people from different disciplines.”</td>
</tr>
</tbody>
</table>

Source: Adapted from Haggie & Kingston, 2003, Section 3

Binney also created an associated table of enabling technologies that relate to each of these categories (see Table 3.8 KM Spectrum Enabling Technologies). The KM Spectrum reveals some interesting insights into knowledge management through this table, including:

- Left-to-right transition through the categories corresponds to:
  - Progression from the management of explicit knowledge to the management of tacit knowledge
  - Increasing degree of individual choice for knowledge users
  - Increasing choice in terms of tools that can be applied

- Knowledge management is made up of a range of techniques that are applicable to different issues and needs
The usefulness of this model is dependent in part, on whether the spectrum is complete in terms of representing all knowledge management approaches. Research by Haggie and Kingston (sec.4) determines this to be the case as the categories and strategies discussed in the other frameworks can all be mapped to the “KM Spectrum”, with the exception of Asset Improvement. This additional category represents the technologist’s perspective related to the optimization of knowledge assets and the intention to increase their value, and thus it has been added to the tables showing the KM Spectrum. The question of whether knowledge management as a corporate strategy should also be added was dismissed as this is actually a result of spectrum analysis, and therefore not a component.

Finally, it should be noted that the KM Spectrum represents strategic approaches to knowledge management and not specific problem solving techniques. Application of the spectrum involves selecting a suitable knowledge management approach based upon the features described by Binney. Table 3.9 provides a list of enabling technologies that are related to each knowledge management category, and that can be used to help guide implementation. As knowledge management is part of a continuum, and company knowledge does not exist entirely in either explicit or implicit form, multiple strategies may be required at the same time as part of the overall framework.

(Haggie & Kingston, 2003)
Table 3.8  KM Spectrum Enabling Technologies

<table>
<thead>
<tr>
<th>Transactional</th>
<th>Analytical</th>
<th>Asset Improvement</th>
<th>Asset Management</th>
<th>Process</th>
<th>Developmental</th>
<th>Innovation &amp; Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Technologies</td>
<td>Web Crawlers</td>
<td>Genetic Algorithms</td>
<td>Search Engines</td>
<td>Process Modelling Tools</td>
<td>Online Training</td>
<td>eMail</td>
</tr>
<tr>
<td>Semantic Networks</td>
<td>Relational &amp; Object DBMS</td>
<td>Ant Colony Programming</td>
<td>Knowledge Maps</td>
<td></td>
<td></td>
<td>Chat Rooms</td>
</tr>
<tr>
<td>Probability Networks</td>
<td>Push Technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Search Engines</td>
</tr>
<tr>
<td>Rules Induction Decision Trees</td>
<td>Data Analysis &amp; Reporting Tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voice Mail</td>
</tr>
<tr>
<td>Geospatial Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Push Technologies</td>
</tr>
</tbody>
</table>

Source: Adapted from Haggie & Kingston, 2003, Section 3
### Table 3.9  KM Spectrum Applications

<table>
<thead>
<tr>
<th>Transactional</th>
<th>Analytical</th>
<th>Asset Improvement</th>
<th>Asset Management</th>
<th>Process</th>
<th>Developmental</th>
<th>Innovation &amp; Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Based Reasoning (CBR)</td>
<td>Data Warehousing</td>
<td>Timetabling</td>
<td>Intellectual Property</td>
<td>Total Quality Management (TQM)</td>
<td>Skills Development</td>
<td>Communities</td>
</tr>
<tr>
<td>Help Desk Applications</td>
<td>Date Mining</td>
<td>Job Scheduling</td>
<td>Document Management</td>
<td>Benchmarking</td>
<td>Staff Competencies</td>
<td>Collaboration</td>
</tr>
<tr>
<td>Customer Service Applications</td>
<td>Business Intelligence</td>
<td>Configuring Layouts</td>
<td>Knowledge Valuation</td>
<td>Best Practices</td>
<td>Learning</td>
<td>Discussion Forums</td>
</tr>
<tr>
<td>Order Entry Applications</td>
<td>Management Information Systems</td>
<td>Time &amp; Motion Studies</td>
<td>Knowledge Repositories</td>
<td>Business Process Re-engineering (BPR)</td>
<td>Training</td>
<td>Networking</td>
</tr>
<tr>
<td>Service Agent Support Applications</td>
<td>Decision Support Systems</td>
<td>Supply Chain Management</td>
<td>Content Management</td>
<td>Process Automation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer Relationship Management (CRM)</td>
<td>Allocation of Resources</td>
<td></td>
<td>Lessons Learned</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competitive Intelligence</td>
<td></td>
<td></td>
<td></td>
<td>Research &amp; Development</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CMM, Six Sigma, ISO9xxx</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Adapted from Haggie & Kingston, 2003, Section 4.2.2*
3.4.5 Selecting a KM Framework

Selection of the appropriate knowledge management framework is supported through questions derived from the KM Spectrum:

- “What do you hope to achieve through knowledge management?”
- “What applications do you think you need?”
- “Is your focus on following best practices in-house; establishing an external standard; encouraging innovation and creativity; or learning knowledge from data?”
- “What technologies do you think you need? What technologies do you currently have skills in?”
- “Do your people rely on explicit or tacit knowledge to solve problems?”
- “Do you plan to analyze existing knowledge or to create new knowledge?”
- “Would you consider that your major activities fall into one or more of the following task types: classification; diagnosis; assessment; monitoring; optimization; configuration/design; planning/scheduling; control?”

(Haggie & Kingston, sec.5.1)

Additionally, the three value disciplines can be used to evaluate the company’s needs as well:

Table 3.10 Value Discipline Analysis for KM

<table>
<thead>
<tr>
<th>Focus</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Intimacy</td>
<td>As this approach strives to evolve products to match customer’s needs, systems that collect customer based knowledge are the focus (CRM, Data Mining, Business Intelligence, etc.)</td>
</tr>
<tr>
<td>Operational Excellence</td>
<td>Minimizing overhead and waste implies systems related to optimization (TQM, BPR, Process Improvement, etc.)</td>
</tr>
<tr>
<td>Product Leadership</td>
<td>Creating cutting edge and innovative products required systems that support innovation (Collaboration, Discussion Forums, etc.)</td>
</tr>
</tbody>
</table>

Source: Adapted from Haggie & Kingston, 2003, Section 5.2
Finally, organizations must always make their choice of knowledge management framework in relation to the business environment in which they compete, the types of product they supply, and the core competencies and capabilities they hope to support. This implies consideration of stakeholders, including knowledge creators, users, and decision makers. Further, the organization’s mission, vision, goals and business strategy must also be taken into account. Haggie and Kingston (sec.5.4) provide a comprehensive set of factors influencing the knowledge management selection and a series of activities that help identify the correct framework to implement.

**Table 3.11  Factors Influencing KM Strategy Selection**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current/Planned KM Strategy</td>
<td>Goals, Desired Applications, Technological Capabilities, etc.</td>
</tr>
<tr>
<td>Business Sector Characteristics</td>
<td>Regulation, Innovation, Risk, Competition, etc.</td>
</tr>
<tr>
<td>SWOT</td>
<td>Products, Acquisition and Mergers, Industry Trends</td>
</tr>
<tr>
<td>Values</td>
<td>Operational Excellence, Product Leadership, Customer Intimacy</td>
</tr>
<tr>
<td>Organizational Structure</td>
<td>Centralized/Decentralized, Hierarchical, etc.</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>Power Distance, Uncertainty Avoidance, Masculinity/Femininity, Individualism/Collectivism, Long-term/Short-term Orientation</td>
</tr>
</tbody>
</table>

*Source: Adapted from Haggie & Kingston, 2003, Section 5.5*

**Table 3.12  KM Selection Activities**

<table>
<thead>
<tr>
<th>KM Selection Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Determine the external business drivers for the industry sector</td>
</tr>
<tr>
<td>2 Perform a SWOT analysis, focused on the product or service in question</td>
</tr>
<tr>
<td>3 Identify the value discipline that reflects the way the company wishes to compete in this sector</td>
</tr>
<tr>
<td>4 Identify the appropriate KM category to focus on</td>
</tr>
<tr>
<td>5 Identify the knowledge management related activities currently performed along with associated knowledge assets, nature of assets (explicit, implicit, tacit), and location, form and quality of the assets</td>
</tr>
</tbody>
</table>
Consider how well the current knowledge management activities are being performed and consider alignment to relevant knowledge management applications

Ensure the selected framework is feasible for the business in its current environment

Source: Adapted from Haggie & Kingston, 2003, Section 5.5

3.5 Knowledge Management Theory Reviewed for TELUS CSA

Knowledge management is a critical skill required by information-based organizations to compete in Information Age markets. To implement a successful knowledge management system, it must be understood that knowledge is more than just information. Instead, knowledge should be viewed as information interpreted with respect to a specific application. Thus, it is situation specific, dynamic, and has social aspects as well. Further, knowledge management is more than information or documentation management, and it is much greater than any technological solution used to support it.

Having defined knowledge on a continuum from data to wisdom and having identified its major attributes, TELUS CSA can proceed to consider their knowledge management strategy in a more focused way. To begin with, their knowledge management strategy can now be effectively assessed based upon its core components: people (culture), process, technology and leadership. Especially significant in this regard is the cultural climate and how it may influence the realization of potential negative externalities as identified by Brydon and Vining. Following such analysis, TELUS CSA can then assess the effectiveness of the designed solution in efficiently converting tacit knowledge to explicit knowledge, and disseminating this knowledge throughout the organization as a whole. These factors are key underpinnings of knowledge management theory in general, as well as identified needs for TELUS CSA.

With respect to the multiple knowledge management frameworks presented here, the models provide additional concepts that will help focus the design of the Athena solution, as well as ensure that key objectives are both identified and realized. Specifically, in terms of the Knowledge Spiral and I-Space models, it is important that the TELUS CSA solution create a continuous process wherein existing knowledge is used both to support the immediate business needs, as well as to support the creation and refinement of new knowledge. If this is not the case, such as when CSR’s cannot locate solutions to known issues in support of similar problems, the cycle will be broken and the process will have to restart from the beginning after each customer
interaction. Such a situation is obviously inefficient and prevents capitalization on existing knowledge assets.

The concept of a continuous process also ties into the business process focused frameworks presented by Wiig. In this regard, TELUS CSA will likely desire a combination of the presented strategies. First, knowledge management should become an integral part of the overall business strategy (Knowledge Strategy as Business Strategy), and upon this foundation, intellectual asset management can then be included to reflect the desire to create and leverage a well-designed knowledge base (Intellectual Asset Management Strategy). Finally, knowledge transfer amongst users and customers can be strategically targeted to improve quality and efficiency (Knowledge Transfer Strategy). This desire for quality and efficiency also ties into TELUS CSA’s desire for operational excellence, identified earlier as one of the three possible value disciplines, and this can also help to focus effort and prioritize investment decisions.

TELUS CSA must also ensure that their solution supports the value that the company places on knowledge management, as identified using Zack’s Knowledge Strategy Types. In this regard, it is apparent that knowledge management is, at the very least, core to the business (required to compete in the market) but would provide more value if it were advanced (provided competitive advantage). TELUS CSA has stated the desire for a best-in-class knowledge management system and this implies a system that can support their competitive position. After solution implementation, TELUS CSA may want to reassess their knowledge management system in hopes of evolving it towards an innovative strategy that is capable of supporting the creation of entirely new markets.

Beyond the theoretical underpinnings of knowledge management theory, it is equally important to understand applied principles and best practices. These are discussed in the following section.
4: Knowledge Management Application

Investigating knowledge management from an applied perspective provides additional insight and information, after having already discussed if from a broad theoretical perspective. This will be achieved through review of the work of both the Consortium for Service Innovation and KANA Software Inc. Both of these groups have done extensive work related to knowledge management directed toward customer service organizations. As such, this research is directly applicable to the knowledge management needs of TELUS Service Desk, as outlined at the beginning of this analysis.

4.1 Consortium for Service Innovation

The Consortium for Service Innovation (CSI) is a not-for-profit, vendor neutral, cross-industry alliance of support organizations that is focused on addressing challenges faced by customer service groups. Their work attempts to link the latest academic research with the “organizational challenges and experience of their members (CSI, Our Work)”, with the goal being to “develop new ways to think about and manage the business that will improve both the customer experience and business efficiency and effectiveness (CSI)”.

CSI’s board includes industry representation from such companies as Cisco, HP, Microsoft, Novell and Symantec where they have successfully implemented their methodologies, as well as doing so at 3Com, Compaq, Ericsson, Hitachi, Oracle and VeriSign among others.

CSI currently has three main areas of focus:

- Knowledge Centred Support (KCS)
  - “A set of practices that efficiently captures the collective experience of the support organization in interacting with customers and introduces a process of persistent learning and continuous improvement.”

- Adaptive Organization (AO)
  - “Transforming support from a marginalized, command and control, hierarchical organization focused on cost reduction to a highly leveraged,
knowledge enabled, unbounded network focused on customer success and cost management.”

- Leadership Framework for Service Excellence
  
  o “As service support organizations shift from a transaction based support model to a value based model new leadership principles and practices are required.”

The primary focus of this investigation will be their Knowledge Centred Support model and its application to customer service and support.

4.1.1 Knowledge Centred Support (KCS)

Started in 1992, “KCS is a set of practices that integrates the creation and maintenance of knowledge into a set of clearly defined customer interactions (CSI).” That is, KCS is a business methodology that seeks to:

- “Create JIT content as a by-product of solving problems”
- “Evolve content based on demand and usage”
- “Develop a KB of [the company’s] collective experience to date”
- “Reward learning, collaboration, sharing and improving”

(Oxton, Slide 5)

The expected benefit of adopting this methodology is the ability to solve a problem once and use the solution often. This results in greater operational efficiency, increased employee moral and higher customer satisfaction. Further, the intention of KCS is to help populate content for such delivery channels as web-based self-help, as this completely alters the economics of overall solution delivery.

In alignment with the discussion of knowledge management strategy in the previous chapter, KCS is based upon people, processes and content. Technology is a key enabling factor but not the source of value. Instead, value is driven by knowledge as the move is made from “a call-centric, transaction-oriented model to a knowledge-centric, relationship-based model (CSI, The KCS Operational Model, p.3)”. Companies must also begin to measure the creation of value and no longer focus solely on the activities of providing service. Finally, gaining knowledge during interactions with customers represent another area that must be capitalized on. Not only is
this a largely untapped source of value, but customer’s productivity and satisfaction is almost entirely influenced by their interaction with service representatives (CSI).

KCS requires a shift in organizational and team member focus as well. Team members must now work to “capture and improve the collective knowledge, not just... solve individual customer problems, but... improve organizational learning (CSI, p.5).” These shifts are shown in Table 4.1 below.

Table 4.1  KCS Focus Shift

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Team</td>
</tr>
<tr>
<td>Activity</td>
<td>Results</td>
</tr>
<tr>
<td>Completion</td>
<td>Evolution</td>
</tr>
<tr>
<td>Escalation</td>
<td>Collaboration</td>
</tr>
<tr>
<td>Content</td>
<td>Context</td>
</tr>
<tr>
<td>Knowing</td>
<td>Learning</td>
</tr>
</tbody>
</table>

Source: Adapted from CSI, The KCS Operational Model, Version 3.7, p.5

4.1.2  The KCS Process

Knowledge Centred Support is designed as a double loop process. The “Solve Loop” represents activities carried out during resolution of support problems and the “Evolve Loop” represents organizational level processes that extend over the support processes.
Together, this provides a strong focus on “solution creation, reuse and evolution (CSI, p.8)”. Support analysts create solutions as they proceed through the workflow and there exists a reusable solution in the company knowledge base when they are finished. Thus, solving customer problems creates immediate access to solutions for the organization as a whole (CSI).

The process descriptions for the Solve and Evolve loops are as follows:
Table 4.2  Solve Loop Processes

<table>
<thead>
<tr>
<th>Capture in the workflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• As the problem is being resolved, agents capture both content and context. Customers using web-based self-help provide this information in the form of their submitted search queries.</td>
</tr>
<tr>
<td>• Agents must capture information in the customer’s context as this improves future find-ability. As well, capture during resolution helps ensure that they use customer context when recording the interaction, which is key to effective knowledge design. Further, it also helps the agent to notice tacit information they have used, which they may not be able to recall or articulate outside the customer interaction.</td>
</tr>
<tr>
<td>• Reviews occur during solution reuse and are thus demand driven. That is, when new agents reuse a solution, they are required to validate and update it as necessary.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure for reuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Solution structure (content and format of the solution) is critical as it helps find-ability and readability.</td>
</tr>
<tr>
<td>• Solution statements must represent complete thoughts, although they may not be complete sentences.</td>
</tr>
<tr>
<td>• Agents record statements that relate to the problem, environment, fix or solution.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Searching is creating</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Searches on the knowledge base are also recorded in order to increase knowledge. Successful searches may result in updates and unsuccessful searches become the basis for new solutions. All searches help identify support trends to enable future enhancement to customer service and product design.</td>
</tr>
<tr>
<td>• An agent using the knowledge base for searching and completing new solutions captures the experience of the organization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Just-in-time Solution Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>• “If a solution is considered to be good enough to give to the customer (in the judgement of the analyst it meets the requirements of the situation) it should be immediately available to the peers of the analyst who delivered it (CSI, p.10).”</td>
</tr>
<tr>
<td>• Solutions are reviewed and evolve based upon demand (usage). This demand driven review is much more efficient than either complete or random screening, as empirical evidence shows as much as 80% of knowledge base content will never be reused.</td>
</tr>
</tbody>
</table>

Source: Adapted from CSI, The KCS Operational Model, Version 3.7, pp.9-11
Table 4.3  Evolve Loop Processes

<table>
<thead>
<tr>
<th>Workflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The goal of KCS is to have a process that concurrently creates and updates knowledge while the solutions are being created. Closely integrated incident management and knowledge management systems are needed to support this goal.</td>
</tr>
<tr>
<td>• The problem solving process must support separation of call administration with problem solving. Further, it should involve framing the customer problem and doing diagnostic research to see if it already exists in the knowledge base.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content and the content life cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The goal is to “create solutions (content) that are findable and usable and that are migrated to new audiences based on demand (CSI, p.13)”</td>
</tr>
<tr>
<td>• Solutions should adhere to simple rules and structure and be migrated to new audiences based on demand.</td>
</tr>
<tr>
<td>• Gap analysis and quality assurance should be layered on top of content creation to ensure quality.</td>
</tr>
<tr>
<td>• Peer reviewed solutions (driven by demand) should be made available to other audiences and even the customer via self-service support.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Management must facilitate, encourage, and reward the use of KCS when value is created. This usually requires a shift in organizational culture and a focus on desired outcomes (lagging indicators). Focusing on leading indicators (activities) may result in degradation of the knowledge base as management and agent goals become unaligned.</td>
</tr>
<tr>
<td>• Management should measure the creation of value across leading and lagging indicators as well as performance drivers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>• KCS is a transformational approach that requires strong leadership. This includes a vision for success, goals, values and an alignment between them.</td>
</tr>
<tr>
<td>• A definition of success is also critical, as is ongoing encouragement and support.</td>
</tr>
</tbody>
</table>

Source: Adapted from CSI, The KCS Operational Model, Version 3.7, pp.12-14

While the preceding process descriptions provide insight into the intent and structure of Knowledge Centred Support, some additional explanation is warranted to provide context. First, with respect to content, the “goal in creating solutions is to make them good enough to be findable and usable by a target audience (CSI, p.8)”. This helps to focus support effort on the highest value areas and not spend a disproportionate amount of time engineering ‘perfect’ solutions. Important concepts regarding solutions include:

• Solutions are more than answers

• Solutions capture the problem solving experience
• Solution creation should start as soon as possible and are part of the workflow, not a subsequent activity
• Solutions include the customer’s question and use the customer’s context
• Solutions are succinct but complete
• Solutions should have structure and status (in progress, draft, verified, published)
• Solutions are dynamic and have a lifecycle

(CSI, p.8)

Second, while all agents should be creating solutions during their work, this does not mean they all have the same level of privileges to create, modify and publish solutions. A good outline for agent qualification provided by CSI follows:

Table 4.4 KCS Roles

<table>
<thead>
<tr>
<th>Role</th>
<th>Skills &amp; Abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>KB User</td>
<td>No training; read privileges only</td>
</tr>
<tr>
<td>KCS I</td>
<td>Trained user; solutions reviewed by coach</td>
</tr>
<tr>
<td>KCS II</td>
<td>Licensed user; can create, modify, and publish for internal use</td>
</tr>
<tr>
<td>KCS III</td>
<td>Journeyman user; can publish solutions for external users</td>
</tr>
<tr>
<td>Coach</td>
<td>KCS expert; focus on development of KCS I, II, III</td>
</tr>
<tr>
<td>Knowledge Champion</td>
<td>Monitors solutions, solution patterns and identifies opportunity for improvements and value extraction from KB</td>
</tr>
</tbody>
</table>

Source: Adapted from CSI, The KCS Operational Model, Version 3.7, p.11

Figure 4.2 KCS Role Development

Source: Adapted from CSI, The KCS Operational Model, Version 3.7, p.11. Used with permission.
4.1.3 KCS Framework

The Consortium for Service Innovation has also developed an implementation framework around Knowledge Centred Support that provides additional insight into applied knowledge management best practices. This framework exists as a four-phase process complete with milestones and metrics to help assess progress and measure results. The expectation is that an evolution of people and their skills, processes, technology and customer relationships will occur as the knowledge base matures. As well, new value will be created outside the traditional area of operational efficiency.

The four phases as described by CSI are:

Table 4.5 KCS Framework

<table>
<thead>
<tr>
<th>Focus</th>
<th>Sample Organizational Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 0: Planning &amp; Design</strong></td>
<td>• Build tools required for successful adoption</td>
</tr>
<tr>
<td></td>
<td>• Gather baseline measurements</td>
</tr>
<tr>
<td></td>
<td>• Set realistic internal and external expectations</td>
</tr>
<tr>
<td></td>
<td>• Executive sponsor buy-in</td>
</tr>
<tr>
<td></td>
<td>• First draft of project deliverables</td>
</tr>
<tr>
<td><strong>Phase 1: Adoption</strong></td>
<td>• Create internal understanding and excitement through internal competency</td>
</tr>
<tr>
<td></td>
<td>• Establish internal reference-ability</td>
</tr>
<tr>
<td></td>
<td>• Ratio of known to new incidents</td>
</tr>
<tr>
<td></td>
<td>• Participation rate</td>
</tr>
<tr>
<td></td>
<td>• Solution quality index</td>
</tr>
<tr>
<td></td>
<td>• Competency profile</td>
</tr>
<tr>
<td><strong>Phase 2: Proficiency</strong></td>
<td>• Create and mature knowledge base</td>
</tr>
<tr>
<td></td>
<td>• Increase process efficiency</td>
</tr>
<tr>
<td></td>
<td>• Reduce time to proficiency</td>
</tr>
<tr>
<td></td>
<td>• Improve collaboration and analyst satisfaction</td>
</tr>
<tr>
<td></td>
<td>• Cost per incident</td>
</tr>
<tr>
<td></td>
<td>• Resolution capacity</td>
</tr>
<tr>
<td></td>
<td>• % first contact resolution</td>
</tr>
<tr>
<td></td>
<td>• Time to proficiency for new employees and new technologies</td>
</tr>
<tr>
<td></td>
<td>• Time to publish</td>
</tr>
<tr>
<td><strong>Phase 3: Leverage of Knowledge Base</strong></td>
<td>• Optimize resource utilization</td>
</tr>
<tr>
<td></td>
<td>• Reduce support cost</td>
</tr>
<tr>
<td></td>
<td>• Increase customer success</td>
</tr>
<tr>
<td></td>
<td>• Improve employee satisfaction</td>
</tr>
<tr>
<td></td>
<td>• Support costs as % of revenue</td>
</tr>
<tr>
<td></td>
<td>• Customer loyalty</td>
</tr>
<tr>
<td></td>
<td>• Customer satisfaction</td>
</tr>
<tr>
<td></td>
<td>• Employee satisfaction</td>
</tr>
</tbody>
</table>
Within this framework, phase appropriate measurements indicate when the implementation is ready to move to the next level. In Phase 1 and 2, KCS should trend towards improved efficiency (reduced resolution time and increased capacity), as measured with familiar metrics including average time to resolve, cost per incident and incidents handled. At Phase 3 however, there should be a significant shift as customers begin to rely more heavily on self-service for common problems. Escalations to agents will now represent more complex and unique incidents, along with a corresponding worsening trend in common metrics. Thus, a new set of metrics is now required to determine the real success of the project, as shown in Table 3.5. Understanding this shift is an important aspect of a maturing knowledge management process. An overview of key aspects for each phase follows.

(Kay, 2007)

### 4.1.3.1 Phase 0: KCS Planning & Design

Phase 0 is concerned with planning and design as indicated by key deliverables CSI recommends: Strategic Framework, Content Standard, Workflow Map, Communication Plan, Performance Assessment Model, Technology Plan and Adoption Roadmap. An in-depth discussion of each deliverable is beyond the scope of this investigation but some key points should be noted regarding the purpose of the Strategic Framework. This deliverable is intended to document high-level project goals and ensure alignment between the stakeholders (the customers, employees, management, the business). As well, it should capture baseline measurements for benchmarking success and determining business value. This will include measurements (quantitative and qualitative) across all phases as shown in Table 3.5. Cultural metrics are of critical importance as this is an area that generally requires significant change when adopting
KCS and progressing through the phases. Note that the Strategic Framework is not intended to be a static document and should be reviewed and revised throughout the project.

CSI also provides some interesting ideas around the investment required for knowledge management. In this regard, they expect implementation costs for people and process development will equal the investment in technology. Thus, budgeting must account for items including project design and management, training and coaching, as well as marketing and communication. Further, they do not expect that KCS will necessarily require an increase in headcount but instead, consider that skill transformation from existing staff can be sufficient. Finally, Phase 0 exit criteria as presented in Table 4.6 provide a sound overview of the planning necessary for knowledge management in general.

(Kay, 2007)

4.1.3.2 Phase 1: KCS Adoption

Phase 1 consists of a team-wide rollout for KCS including activities such as training, validation of Phase 0, and development of competency. If successful, it should introduce modest efficiency gains although explicit targets should not be set as they distract from the core objective of adoption.

4.1.3.3 Phase 2: KCS Proficiency

Phase 2 is focused on growing proficiency and maturing the knowledge base and thus should coincide with large efficiency gains. The traditional business measures should be very strong by the end of this phase in support of ROI projections necessary to maintain executive support.
Table 4.6 KCS Phase 0 Exit Criteria

<table>
<thead>
<tr>
<th>Phase 0 Activities</th>
<th>Benefits</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Sponsor Buy-in</td>
<td>● Ensures champion is identified who can launch and maintain visibility externally and provide vision and leadership internally</td>
<td>● Kickoff meeting for core team with executive budget approval executive communication about plans and goals</td>
</tr>
<tr>
<td>Strategic Framework Development</td>
<td>● Sets clear expectations; show alignment and fit into a bigger picture</td>
<td>● Separate Customer, Employee, and Business Views with related activities &amp; anticipated results</td>
</tr>
<tr>
<td>Baseline Measures</td>
<td>● Allows self-benchmarking to assess the KCS program against as it matures</td>
<td>● 1-3 baseline measures captured for each Customer, Employee and Business View cultural baseline established at group level</td>
</tr>
<tr>
<td>Workflow and Content Standard</td>
<td>● Enables consistent solution quality and rapid improvements in proficiency</td>
<td>● Workflow has been simulated &amp; documented content standard is understandable &amp; accessible</td>
</tr>
<tr>
<td>Communication Plan</td>
<td>● Captures key messages</td>
<td>● Written plan with project owner review and sign-off by executive sponsor feedback and improvement process</td>
</tr>
<tr>
<td>Performance Assessment &amp; Reports</td>
<td>● Guides individual development</td>
<td>● Draft radar chart developed with baseline competency profiles for team members</td>
</tr>
<tr>
<td>Technology Plan</td>
<td>● Help understand ability of existing technology to support new KCS</td>
<td>● Completed technology assessment technology accurately implements workflow and content standard</td>
</tr>
<tr>
<td>Adoption Roadmap &amp; Training Plan</td>
<td>● Help set expectations about time &amp; cost</td>
<td>● KCS core team &amp; first adopters identified training scheduled</td>
</tr>
</tbody>
</table>

4.1.3.4 Phase 3: Leverage of Knowledge Base

Phase 3 is an inflection point in the evolution of the support organization where the mix of issues faced by agents begins to shift from mostly known to mostly new. Customers should now begin to use web-based self-service options to deal with the majority of their common issues. This shift changes the cost model for support as well because web technology allows customers greater access to information with very low incremental cost.

As noted previously, this shift also requires new metrics to measure success. Traditional efficiency metrics will begin to deteriorate as the agents begin to deal more heavily with unknown and complex issues not supported through self-serve options. If the organization is not aware of this shift and maintains the efficiency-based metrics, they will mistakenly interpret increasing success as performance degradation. Table 4.7 provides sample measurements including some specific to self-service. It should be noted that self-service adoption and use should be measured as well, as it will likely include a large amount of queries for which customers would not have opened an incident. This use represents the supply of additional value to customers.

(Kay, 2007)

Table 4.7 Self-Service Measurements

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Deflection</td>
<td>“The value of solving customer issues on the web for which they would otherwise have opened an incident. (This represents a small subset of the total customer success on the web.)”</td>
</tr>
<tr>
<td>Time to Publish</td>
<td>“How long it takes new issues to be posted to the web.”</td>
</tr>
<tr>
<td>Self Service Use</td>
<td>“Percentage of customers who use the web before opening an incident.”</td>
</tr>
<tr>
<td>Self Service Success</td>
<td>“Percentage of time customers find what they need on the web.”</td>
</tr>
</tbody>
</table>

Source: Adapted from CSI, The KCS Operational Model, Version 3.7, p.14

4.1.4 CSI Theory & Application Principles Reviewed for TELUS CSA

In summary, the Consortium for Service Innovation’s work on Knowledge Centred Support (KCS) is very relevant for designing, implementing and maximizing the value of the TELUS CSA project Athena solution. Specifically, the KCS process presents an efficient way to
create, evaluate and modify knowledge base content, as these processes are embedded in the workflow designed to handle issues throughout the “Solve Loop”. Additionally, the “Evolve Loop” outlines specific practices and goals that support an efficient and evolutionary knowledge management system, along with key considerations for solution development. Finally, CSI has also provided a good overview on how an effect knowledge management team should be structured and how a successful knowledge management project should proceed. All three of these aspects can be used for TELUS CSA to assess their knowledge management plan.

4.2 KANA Software Inc.

KANA is an industry leader in knowledge management solutions and works closely with the Consortium for Service Innovation in order to develop and implement best practices. These best practices provide useful insight that should be considered by other organizations prior to implementing their own solutions. This analysis will present KANA’s best practices for knowledge management solutions in general, optimizing call centre solutions and knowledge base searching.

4.2.1 KMS Best Practices

KANA identified and examined four fundamental business drivers for change that are necessary to evolve knowledge management as a core competency.
### Involving Users

- Before designing a solution, feedback must be gathered on how users do their job in order to ensure the system is designed to support user’s actions and to understand where process changes may be required.
- The top support drivers for customers and agents must be determined. The results provide insight to help determine how agents access information and the customer’s context when requesting support. This is critical for developing a knowledge base taxonomy that is customer centric.

### Optimizing Content

- Authoring and ownership tasks are key areas to a successful KMS
- The business must consider reworking any existing content that is to be migrated to the new knowledge base. The recommendation is that this is a value-added task as it significantly increases the quality and usability of the knowledge, which helps drive adoption. However, it is time, labour intensive, and relies on solid documentation standards being in place.
- Creating a dedicated content authoring team is also recommended in order to ensure that key information is added quickly and that it reflects a customer perspective. As the knowledge base will become a core asset for the company, there is value in defining “content owners and knowledge experts, a dedicated team to manage and maintain content and a structured integration of knowledge to the… self-help channels (p.8)”.
- Members of the knowledge management team should be professionals in their field. Allowing non-professionals to define and implement content standards risks the value of the knowledge base, which is core to the success of the knowledge management system.
- Content is a living entity and evolves. It requires review processes and analytics to ensure its quality.
- Clear content ownership is necessary, as the knowledge base will be used across many groups and customer support channels. Information entered is no longer the sole property of those who create it and the owner must have this broader perspective to support the entire organization.

### Empowering People

- Establishing agent buy-in is critical for success. This requires strong and continuous communication and an attention to cultural development opportunities and requirements. All stakeholders must develop an attitude of ownership toward the knowledge management solution.

### Targeting Technology Use

- Developing the knowledge base as the core source of support information is the highest priority of the project. Capitalizing on it to create self-service and integrate with other applications is secondary.
- Many knowledge management solutions have a large amount of potential functionality. Focusing on core functionality is the key to success.
- The knowledge base should become the single source of information for both internal and external users. This helps ensure quality and maintainability.

Source: Adapted from KANA, 2009, pp.5-10
4.2.2 KMS Critical Success Factors

KANA identified and examined six critical success factors related to the successful implementation of a knowledge management solution.
## Determining Objectives & Metrics

- Metrics relevant to the most critical areas of customer support must be established. These should include operational as well as performance metrics and can be presented as part of a balanced scorecard. This is a critical factor as opposing goals can require different strategies. For example, increasing Tier1 first call resolution requires a broad content set with extensive search capabilities, while reduction in Tier1 call times requires less content but better processes to pass issues onto relevant support teams.
- Establishing goals and metrics includes creation of benchmarks to monitor progress and success.

## Planning the Implementation Strategy

An effective implementation strategy requires:

- “A well rounded implementation team to champion the project and ensure the development of high quality knowledge base content”
- “A realistic roll-out plan that eliminates the risks of a ‘big bang’ implementation approach”

(KANA, 2008 Feb., p.5)

- KANA has determined that “knowledge management is most effective when phased in, starting with a small, internal deployment, gradually expanding to including the complete service organization and, ultimately, encompassing customer service (p.6)”.
- Organizational roles critical to success include:
  - Executive Sponsorship: knowledge management is transformational and requires senior leadership
  - KM Business Owner: must define the overall experience expected in the call centre for both users and agents
  - Knowledge base Owner: creation of content styles and standards as well as creation and maintenance processes
  - KM Team (authors, reviewers, editors): required to have dedicated time and training to be successful in these roles

## Designing a Robust Knowledge Base

- “A robust knowledge base contains content that is appropriate to customer questions and can be easily traversed to find the best possible answer in the shortest amount of time (p.7)”
- The design must address content standards and guidelines, taxonomy and organization of content, and lifecycle management.
- Content usability is generally improved through succinctness, addressing specific questions, and being appropriate for the user's knowledge level and experience (e.g. novice vs. expert users).
- Best practices for content include:
  - Each item should contain one idea
  - Resolution steps must be concise and simple to follow
  - A consistent vocabulary and taxonomy should be used
- Content templates can help ensure quality and support productivity
Developing Useful Content

- Content optimization is centred on making the search process fast and the solution set consistent and appropriate. There is a fine balance between providing too few results and missing critical content, and providing too many results that the user must filter.
- As customers are most likely to talk in terms of symptoms and not technical terms requiring deep product knowledge, it is important that knowledge base content be structured this way as well. An extensive list of synonyms and key industry terms can help bridge this divide and enhance search-ability.
- It is critical that users can recognize relevant content when it is returned by the search functionality. Failure to do so prevents the use of valuable knowledge and leads to the creation of additional and unnecessary solutions. Content titles can be used effectively in this regard and again, should use the customer’s language.

Optimizing the User Experience

- There are multiple methods to enhance usability beyond basic search capabilities. These include Natural Language and Boolean search, structured scripts to source solutions, clarifying questions to narrow results, decision trees, misspelling correction, synonym lists and presentation methods such as topic trees.
- It is not recommended to implement all of these options as it may confuse users and reduce productivity.

Constantly Improving Knowledge

- Content optimization is an ongoing process.
- Empowering agents to author content as part of the solution process is the most effective way to build meaningful content. Agents should also be able to:
  o Flag content for rework or add additional comments
  o Rate content for relevance and provide feedback
  o Correct errors and fill in gaps
- Automatic capture of agent/customer interaction in the knowledge base can be a valuable method to develop quality content as well.
- Service analytics to identify trends and gaps can help to:
  o Determine solution use to allow high priority content to be identified
  o Understand search patterns to help improve performance
  o Monitor content creation

Source: Adapted from KANA, 2008, Feb., pp.3-20

Some additional points to consider with respect to organizing knowledge base content are:

- Taxonomies are exhaustive, hierarchical or relationship mappings that are defined for content. These need to be carefully considered as they can affect filtering of search results as well as presentation.
• Classification is an organization by category and not necessarily exhaustive in nature. Again, this should be done from the customer’s perspective in order to support searching and usefulness of results.

• Structure gives meaning to content, such as through the definition of keyword fields and titles. Solid structure is a key to the quality of knowledge base content.

• Ranking of search responses must be done carefully as it implicitly becomes a form of filtering, due to user’s tendency to review only the first few results.

(Oxton, G., Chmaj, J. & Kay, D., *Perspectives on Taxonomy*…)

4.2.3 Searching Best Practices

Searching is a fundamental component for knowledge management systems and a key driver for successful implementations. An inadequate search mechanism will increase response times, prevent efficient usage of the knowledge base and drive up service requests by inhibiting the self-serve process.

Key issues related to inadequate search include:

• Presuming that users have sophisticated knowledge regarding the topics they are investigating

• Requiring users to search in an ‘answer-centric’ form that relies on knowing terms related to the solution but not the issue

• Providing results that are relevant to key words but not the actual issue being addressed

To avoid such pitfalls, content needs to be written in ‘problem-centric’ terminology and the search functionality must support this paradigm for investigation. Users must not be required to know the solution in order to search for it. Further, writing content with key issues included will help return more appropriate results than simple key words. That said keywords could still be useful for filtering out content from the response list, and thereby narrowing the search. Finally, users must be able to easily recognize correct results when presented to them, and this can be supported through problem-centric titles.

(KANA, 2008 Aug.)
4.2.4 KANA Theory & Application Principles Reviewed for TELUS CSA

The four fundamental business drivers identified by KANA (involving users, optimizing content, empowering people and targeting technology use) directly align with the core components of a complete knowledge management solution (people, process, leadership and technology). Specifically, these business drivers provide insight into best practice aspects of a knowledge management system that are crucial to creating a core competency in this area. Further, the critical success factors listed by KANA support the creation and assessment of a knowledge management solution that focuses on the highest priority issues. Finally, KANA also presents best practices for searching, which is the key technological component of a knowledge management system. Together, these three areas of focus can be used to analyze the work done by TELUS CSA to date on project Athena and help ensure the project has done appropriate planning to support future work.

4.3 Applied Knowledge Management Conclusions

Knowledge management theory must be combined with sound application practices and principles in order to create effective solutions. The Consortium for Service Innovation and KANA Software Inc. have extensive understanding of this theory and have combined this with their experience to provide guidance in the area of knowledge management development. Thus, a review of their findings and conclusions is extremely valuable.

Areas where CIS provides significant insight include:

- Supporting the execution and management of knowledge management initiatives through the structure and understanding that their Knowledge Centred Support framework provides
- Outlining the processes required for both knowledge creation and program maintenance
- Identifying and describing the phases that a typical knowledge management implementation will go through
- Suggesting metrics that can be effectively utilized to track progress, along with how they may change during different phases

Areas where KANA provides significant insight include:
• Identifying best practices related to call centre based knowledge management implementations

• Determining critical success factors for implementing knowledge management in a call centre environment

• Identifying best practices related to the search functionality which is so vital to success

Having presented knowledge management theory and application principles and best practices, the knowledge management project being considered by TELUS CSA will now be described and analyzed.
5: Project Athena – Gate 0 Execution & Analysis

Having defined the foundational theory and application principles for knowledge management, the work prepared by the Athena project team to date can now be reviewed in order to assess progress, identify gaps and help support successful project execution. As stated previously, thus far the Athena team has created a Project Charter and Gate 0 Business Case for Steering Committee review and approval. The key content from these deliverables is presented here along with additional contextual information to provide the background for evaluation. Note that TELUS uses a gating model for project governance, and Gate 0 represents the high-level business case to be prepared and presented to the Steering Committee, prior to receiving formal approval and solution development funding.

5.1 Athena Project Charter

5.1.1 Vision Statement

“A unified team providing an organized, proactive and responsive approach to Knowledge Management within CSA (TELUS CSA, 2010, Sept. 24, slide 6).”

Figure 4.1 shows the focus for the Athena project within the high level CSA customer support process for Tier1 and Tier2 agents.
5.1.2 Business Drivers

Client Solutions Assurance (CSA) is an externally facing TELUS team comprised of 25 separate groups, which maintain over 50 customer support repositories and at least an additional 50 product information repositories. The knowledge stored in these repositories is used to provide Tier1 and Tier2 support to customers and includes both support process documentation as well as technical product notes. However, this information is largely separated between the different customer support groups as well as between external (customer facing) and internal (intra-group) support and therefore, CSA lacks a single source of truth upon which all support can be based. This situation creates additional problems related to information and process management, and replication of content across systems, as well as leading to inefficiencies and issues regarding the quality of solutions delivered. Further, it becomes very difficult to get a
centralized, consistent view of the services supported for any single customer (service agreements can be much customized) and this hinders service optimization.

The multitude of different systems also results in performance issues for agents when delivering support. Relevant to this situation are limitations related to knowledge sharing and visibility across teams, searching and filtering results between repositories, implementing common knowledge taxonomies, template utilization, documentation standardization and document lifecycle management, as well as increased agent training time. Together, these problems can also adversely affect the quality of knowledge stored in the repositories and this affects the solutions provided, as well as presenting limitations in supporting call-deflection through the creation of customer self-service options. Finally, the collection of key metrics required to enable continuous improvement initiatives is also made much more difficult and this has a detrimental effect on overall efficiency.

5.1.3 High Level Business Opportunities & Benefits

Creation of a centralized KM team with ownership of knowledge management across CSA, and a mandate to create and operationalize knowledge management best practices and processes, including the rollout of a new centralized knowledge management system is expected to:

- Provide the foundation for addressing the main business drivers identified in the Project Charter
- Centralize all CSA customer support processes within a single system
- Provide agents with a single source of truth to obtain the knowledge required to support any specific customer
- Enable the provision of customer self-service options, thereby supporting the realization of business benefits such as call deflection, improved performance and reduced costs for support
- Support better management of knowledge artefacts including such things as lifecycle control, version control, usage tracking, security access levels, classification, etc.
- Facilitate the realization of CSA goals related to improved efficiency and customer service

5.2 Athena Business Case

As the first step in creating the foundation for the business case, the Athena project team worked with representatives from all CSA groups in order to create and vet requirements (see Appendix A), document the PMO (present mode of operations) and itemize the existing systems being used for document and knowledge management. This information was combined with an investigation of existing TELUS KM systems and upcoming projects, and resulted in a first cut of twelve potential solutions. From this list of solutions, five vendors were short-listed to give demonstrations to the project team and key stakeholders, thereby enabling assessment of each product’s ability to fulfill the envisioned FMO (future mode of operations).

After completing this initial round of investigation, feedback from stakeholders was solicited and used to narrow the field of potential solutions down to the two best options, MediaWiki and KANA IQ. Representation for MediaWiki was provided by internal TELUS resources currently using a similar product, and representation for KANA IQ was provided by KANA’s professional consulting staff. Both solutions provided multiple product demonstrations along with feedback to TELUS stakeholders (see Appendix B). They also deployed sandbox applications to allow participants to use each tool and get firsthand experience. Key findings from this deep dive investigation are shown in Table 4.1.

<table>
<thead>
<tr>
<th>Feature</th>
<th>KANA IQ</th>
<th>MediaWiki</th>
</tr>
</thead>
<tbody>
<tr>
<td>On TELUS Technology Roadmap</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Document Repository Included</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Vendor Support</td>
<td>Yes</td>
<td>3rd Party</td>
</tr>
<tr>
<td>LDAP, SSO Enabled</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ticket System Integration</td>
<td>Yes</td>
<td>Custom Code</td>
</tr>
<tr>
<td>Self-Serve Support</td>
<td>Yes</td>
<td>Custom Code</td>
</tr>
<tr>
<td>Guided Agent Assist</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Session History / Click Trail</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Feedback Mechanism</td>
<td>Yes</td>
<td>Plug-in</td>
</tr>
<tr>
<td>Search Engine</td>
<td>Multiple Methods &amp; Filters</td>
<td>Full Text &amp; Namespace</td>
</tr>
<tr>
<td>Attachment Search</td>
<td>Yes</td>
<td>Plugin</td>
</tr>
<tr>
<td>Synonym Search</td>
<td>Yes</td>
<td>Unsure</td>
</tr>
</tbody>
</table>
Based upon this upfront work, the Athena project team presented the Steering Committee with a recommendation to pursue KANA IQ as the solution of choice for the technical component of the project. The Gate 0 Business Case was created using this recommendation as the foundation.

### 5.2.1 Project Scope

At a high level, Project Athena is intended to:

- Implement best-in-class knowledge management software in support of CSA Service Desk, including integration with existing systems and processes
- Centralize CSA knowledge and information artifacts into a single system across all groups, thereby creating a single source of truth
- Formalize the Knowledge Management team and define their mandate, roles, responsibilities and key deliverables
- Create and operationalize best practices for knowledge management across CSA, in order to realize the high level business benefits and opportunities as outlined in the Project Charter

### 5.2.2 Strategic Fit

Project Athena supports TELUS’ corporate objectives to improve operational efficiency and customer service, in order to effectively compete in the service desk market and also to enable future growth. This is part of CSA’s strategy to further enhance efficiency and effectiveness through optimized capital expenditures. Specifically, alignment between project Athena and TELUS’ corporate objectives is demonstrated as follows:

1. Offer integrated solutions that anticipate and meet the evolving needs of TELUS customers
This solution will exploit a highly fragmented market where there are multiple different competitors across a diverse set of products, niches and geographies.

2. Focus relentlessly on growth markets with the objective of building scale and differentiation by integrating TELUS services into compelling solutions for customers.
   - Self-service knowledge management presents a huge opportunity for CSA Service Desk and project Athena will facilitate pursuing it.

3. Go to the market as one team under one brand.
   - Consolidating CSA onto a single knowledge management system will allow a consolidated view of customer support across all teams. This will serve to increase customer confidence, loyalty and satisfaction.

4. Invest in internal capabilities and use existing TELUS resources to improve upon and create lasting synergies between groups.
   - A centralized KM team supports leveraging and improving TELUS’ capabilities related to knowledge management that can become the foundation for future success.

(TELUS CSA, 2010, Sept. 24, p.6)

### 5.2.3 Financial Investment

High-level financial projections were created for project Athena in order to estimate the costs of implementation as well as the expected financial benefits. These figures were then used as input for the TELUS’ EASE (Economic Analysis Standard Evaluation) financial modeling tool, in order to compute key project metrics including Net Present Value, Discounted Payback Period and Internal Rate of Return (see Figure 4.2).

Important notes related to these calculations are:

- The EASE modeling tool implements industry standard techniques for economic calculations and is scrutinized by the CRTC.
- The figures shown in this analysis are for demonstration purposes only; while they are representative of the results used for the Gate 0 Business Case, they are not the actual figures used.

- The EASE model calculations are based upon TELUS’ weighted average cost of capital (discount rate) which will not be released in this analysis.

- Gate 0 Business Case financial projections are required to be +/- 100% and therefore, theses initial calculations may change substantially if the project is given approval to proceed to the next gate and more refined figures are generated.

The financial cost projections were calculated are as follows (see Table 5.2):

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>• Initial estimates based upon similar recent purchases within TELUS</td>
</tr>
<tr>
<td></td>
<td>• No account was taken for efficiencies from sharing/reusing existing HW or purchase volume discounts</td>
</tr>
<tr>
<td></td>
<td>• Final system architecture was not created or approved</td>
</tr>
<tr>
<td>SW Licensing (CAPEX &amp; OPEX)</td>
<td>• Initial estimates provided by vendor</td>
</tr>
<tr>
<td>Consulting (CAPEX &amp; OPEX)</td>
<td>• Initial estimates provided by vendor</td>
</tr>
<tr>
<td>CSA Labour (CAPEX &amp; OPEX)</td>
<td>• Initial estimates based upon similar project work at TELUS</td>
</tr>
<tr>
<td>BT Labour (CAPEX &amp; OPEX)</td>
<td>• Initial estimates provided by TELUS Business Technology team</td>
</tr>
<tr>
<td>Annual SW Maintenance (OPEX)</td>
<td>• Initial estimate provided by vendor</td>
</tr>
</tbody>
</table>

Source: Developed by the author based upon information supplied by TELUS.

The expected financial benefits to be achieved are related to operational efficiencies and the associated savings that project Athena will enable (see Table 5.3). Time and motion studies, process analysis and agent interviews were conducted to calculate the initial baselines values used.
in calculations. The results from this work were then combined with CSA data (e.g. working hours, labour rates, call volumes, etc.), the expected roll-out schedule and continuous annual improvement targets in order to extend the figures beyond the first year.

Table 5.3  Project Athena - Financial Benefit Estimates

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Realization Factors</th>
</tr>
</thead>
</table>
| Tier1 CST (call service time) Improvements | • Better Search (Keyword, Natural Language, Synonyms)  
• Tailored answers vs. long, unstructured documents  
• Intelligent filtering of results and clarifying questions  
• Decision trees  
• Ranked content, favourites, alerts, etc. |
| Tier2 SWT (sweat or working time) Improvements | • Better Search (Keyword, Natural Language, Synonyms)  
• Session history capture (Tier2 can view Tier1 interactions)  
• Intelligent filtering of results  
• Ranked content, favourites, alerts, etc.  
• Single source of truth |
| Tier1 FTR (first time resolution) Improvements | • Single source of truth  
• Improved collaboration  
• Improved escalation notes and reliability of hand-off information |

*Source: Adapted from TELUS CSA, 2010, Sept.24, p.7*

Note that financial benefits are not expected to be realized until year two of the project. The first year is required to plan, rollout and integrate the new solution between the different CSA groups.
**Figure 5.2 Project Athena – Financial Investment Summary**

<table>
<thead>
<tr>
<th>Capital Expenditures (or Avoidance)</th>
<th>Asset Class Code and Name</th>
<th>Total</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>KS1 Servers &amp; Peripherals</td>
<td>85,600</td>
<td>85,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW Licensing</td>
<td>C50 Operator Services Platforms</td>
<td>485,000</td>
<td>485,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulting</td>
<td>C50 Operator Services Platforms</td>
<td>395,000</td>
<td>395,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA Labour</td>
<td>C50 Operator Services Platforms</td>
<td>65,000</td>
<td>65,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT Labour</td>
<td>C50 Operator Services Platforms</td>
<td>50,000</td>
<td>50,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Capital</strong></td>
<td></td>
<td>1,080,600</td>
<td>1,080,600</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational Expenses (or Savings)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual SW License Maintenance (20%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Tier I CST</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Tier II SWT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Tier I FTR - NSD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved Tier I FTR - CS/ES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA Labour (yr 1 data conversion, yr 2 - 5 sustainment)</td>
<td></td>
<td>176,000</td>
<td>150,000</td>
<td>6,500</td>
<td>6,500</td>
<td>6,500</td>
<td>6,500</td>
</tr>
<tr>
<td>BT Labour (sustainment)</td>
<td></td>
<td>20,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Total Opex</strong></td>
<td></td>
<td>(2,925,135)</td>
<td>236,667</td>
<td>(755,251)</td>
<td>(778,254)</td>
<td>(801,947)</td>
<td>(826,350)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revenue (or Revenue Lost)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Economic Results**

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Present Value (NPV) over 5 years</td>
<td></td>
<td>407,579</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discounted Terminal Value (included in NPV)</td>
<td></td>
<td>377,796</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPV excluding Discounted Terminal Value</td>
<td></td>
<td>88,243</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discounted Payback Period</td>
<td></td>
<td>4.9 Years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Rate of Return (IRR)</td>
<td></td>
<td>20.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Adapted from TELUS Finance, EASE Lite*
5.2.4 Non-Quantified Benefits

Beyond the quantitative benefits presented in the EASE model, the Gate 0 Business Cass also identified significant non-quantified benefits to be considered as well (see Table 5.4). Most of these benefits have the potential to be benchmarked under the current system and then re-measured after project execution. Such quantification would be a valuable source of information for project success and ROI assessment.

Table 5.4 Project Athena - Non-Quantifiable Financial Benefit Estimates

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Realization Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Agent Efficiency</td>
<td>• Fast, intuitive access to relevant knowledge during customer interactions</td>
</tr>
<tr>
<td></td>
<td>• Call deflection reducing overall direct contact volume</td>
</tr>
<tr>
<td>Improved Customer Satisfaction</td>
<td>• Self service provision</td>
</tr>
<tr>
<td></td>
<td>• Increased perception of quality and service</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td>• Improved systems, processes and tools</td>
</tr>
<tr>
<td></td>
<td>• Metric driven continuous improvement initiatives</td>
</tr>
<tr>
<td></td>
<td>• Higher quality knowledge content</td>
</tr>
<tr>
<td></td>
<td>• More efficient knowledge lifecycle management</td>
</tr>
<tr>
<td>Support for New Organizational Capabilities</td>
<td>• New customer support products including self-service, documentation search, etc.</td>
</tr>
<tr>
<td></td>
<td>• Support team flexibility due to increased knowledge visibility and reduction of knowledge silos</td>
</tr>
<tr>
<td>Strategic Organizational Alignment</td>
<td>• Organizational and departmental level efficiency initiatives and synergies</td>
</tr>
</tbody>
</table>

Source: Adapted from TELUS CSA, 2010, Sept.24, pp.8-10

The impact of denying project Athena recommendations was also assessed. With respect to the business drivers identified, it was determined that failure to act would result in decreased customer satisfaction and confidence, an inability to achieve operational savings through efficiency initiatives, and increasing costs due to limitations of the current system and processes. Specific operational issues that would continue include:

- Multiple, separate knowledge management repositories
- Duplication of work
• Agents relying on outdated content
• Agents using an inadequate customer support system
• An emphasis on ‘fire-fighting’
• Solving problems multiple times instead of eliminating them or capitalizing on known solutions
• Inconsistent and sub-optimal quality of service

(TELUS CSA, 2010, Sept. 24, p.9)

5.2.5 Risk Assessment

While a formal risk assessment related to the financial investment projections for project Athena was beyond the scope of the Gate 0 Business Case, the TELUS Risk Assessment tool was used to get an initial feeling for project acceptability. This work was not included in the EASE model calculations used for the Business Case and was not presented to the Steering Committee for review. However, if the project moves forward it will be required input to be used in order to determine the necessary Internal Rate of Return required when determining project acceptability under TELUS’ investment criteria.

The specific areas addressed in Figure 4.3 provide insight into the business and internal risks related to the project.
### BUSINESSES RISKS

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Implemented at TELUS before</td>
<td>Newer but widely accepted technology</td>
</tr>
<tr>
<td>2 - Mature and Established Technology</td>
<td>Technology is mature and established.</td>
</tr>
<tr>
<td>3 - Newer, but widely accepted technology</td>
<td>Technology is newer but widely accepted.</td>
</tr>
<tr>
<td>4 - Commercial, but Developing Technology</td>
<td>Technology is developing but could be commercial in the future.</td>
</tr>
<tr>
<td>5 - Early Stage Technology/New, Pre-Commercial Technology</td>
<td>Technology is in the early stage or pre-commercial.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - No Changes to Existing Systems or Network</td>
<td>No changes to existing systems or network.</td>
</tr>
<tr>
<td>2 - Minor Changes to Existing Systems or Network</td>
<td>Minor changes to existing systems or network.</td>
</tr>
<tr>
<td>3 - Some Changes to Existing Systems or Network</td>
<td>Some changes to existing systems or network.</td>
</tr>
<tr>
<td>4 - Significant Changes to Existing Systems or Network</td>
<td>Significant changes to existing systems or network.</td>
</tr>
<tr>
<td>5 - Extensive Changes or Requires New Systems or Network</td>
<td>Extensive changes or requires new systems or network.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - &lt; 3 Months</td>
<td>Time to implement is less than 3 months.</td>
</tr>
<tr>
<td>2 - 3 to 6 Months</td>
<td>Time to implement is between 3 and 6 months.</td>
</tr>
<tr>
<td>3 - 6 to 12 months</td>
<td>Time to implement is between 6 and 12 months.</td>
</tr>
<tr>
<td>4 - 12 to 18 months</td>
<td>Time to implement is between 12 and 18 months.</td>
</tr>
<tr>
<td>5 - &gt; 18 months</td>
<td>Time to implement is greater than 18 months.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Mature Market</td>
<td>Market maturity is high.</td>
</tr>
<tr>
<td>2 - Rapidly Growing/Widely Accepted Market</td>
<td>Market is rapidly growing and widely accepted.</td>
</tr>
<tr>
<td>3 - Rapidly Growing/Developing Market</td>
<td>Market is rapidly growing but still in development.</td>
</tr>
<tr>
<td>4 - Early Stage Market/Early Adopters</td>
<td>Market is in the early stage and early adopters are present.</td>
</tr>
<tr>
<td>5 - New, Unestablished Market/Nascent</td>
<td>Market is new and unestablished.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - No Direct Effect on either Brand or Customer</td>
<td>No effect on brand or customer.</td>
</tr>
<tr>
<td>2 - Minimal Effect on Brand or Customer</td>
<td>Minimal effect on brand or customer.</td>
</tr>
<tr>
<td>3 - Some Effect on Brand or Customer</td>
<td>Some effect on brand or customer.</td>
</tr>
<tr>
<td>4 - Significant Effect on Brand or Customer</td>
<td>Significant effect on brand or customer.</td>
</tr>
<tr>
<td>5 - Extensive Effect on Brand or Customer</td>
<td>Extensive effect on brand or customer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Highly Predictable Outcome</td>
<td>Outcome is highly predictable.</td>
</tr>
<tr>
<td>2 - Predictable Outcome; Few Unknown Factors</td>
<td>Outcome is predictable with few unknown factors.</td>
</tr>
<tr>
<td>3 - Somewhat Unpredictable Outcome</td>
<td>Outcome is somewhat unpredictable.</td>
</tr>
<tr>
<td>4 - Unpredictable Outcome; Several Unknown Factors</td>
<td>Outcome is highly unpredictable with several unknown factors.</td>
</tr>
<tr>
<td>5 - Highly Unpredictable Outcome</td>
<td>Outcome is highly unpredictable.</td>
</tr>
</tbody>
</table>

### INTERNAL RISKS

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Platinum (10+ years of PM experience)</td>
<td>Project Manager has extensive experience.</td>
</tr>
<tr>
<td>2 - Gold (5 - 10 years of PM experience)</td>
<td>Project Manager has significant experience.</td>
</tr>
<tr>
<td>3 - Silver (2 - 5 years of PM experience)</td>
<td>Project Manager has some experience.</td>
</tr>
<tr>
<td>4 - Base (1 - 2 years of PM experience)</td>
<td>Project Manager has limited experience.</td>
</tr>
<tr>
<td>5 - Developmental (new to role)</td>
<td>Project Manager is new to the role.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - No Impact</td>
<td>Operational impact is minimal.</td>
</tr>
<tr>
<td>2 - Limited - less than 20 people</td>
<td>Operational impact is limited with less than 20 people.</td>
</tr>
<tr>
<td>3 - Narrow - 20 to 50 people</td>
<td>Operational impact is narrow with 20 to 50 people.</td>
</tr>
<tr>
<td>4 - Broad - 50 to 1,000</td>
<td>Operational impact is broad with 50 to 1,000 people.</td>
</tr>
<tr>
<td>5 - Extensive - greater than 1,000</td>
<td>Operational impact is extensive with more than 1,000 people.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - All Special Skills/Resources identified and committed</td>
<td>Availability of required skill sets is fully identified and committed.</td>
</tr>
<tr>
<td>2 - All Special Skills/Resources identified; Some not committed</td>
<td>Availability of required skill sets is mostly identified but some are not.</td>
</tr>
<tr>
<td>3 - Most Special Skills/Resources identified; Some not committed</td>
<td>Availability of required skill sets is partially identified.</td>
</tr>
<tr>
<td>4 - Some Special Skills/Resources identified; Yet to be committed</td>
<td>Availability of required skill sets is not fully identified.</td>
</tr>
<tr>
<td>5 - Key Special Skills/Resources yet to be identified and committed</td>
<td>Availability of required skill sets is not identified at all.</td>
</tr>
</tbody>
</table>

Source: Adapted from TELUS Finance, Risk Return Model
5.2.6 Knowledge Management Team

As identified in the scope statement for Athena, formalization of the structure and mandate of the CSA Knowledge Management team is also part of the project. While the CSA KM team was formed earlier in the year, a new structure was proposed based in part upon best practices presented by KANA professional consultants. At this time, only a high level analysis of the mandate and roles for individual team members has been considered and no specific recommendations have been presented.

Figure 5.4 Proposed CSA KM Team Structure

Source: Adapted from TELUS CSA, 2010, Sept.10, p.10

5.3 Project Athena –Analysis of Gate 0 Execution

To begin, it must be noted that the work done to date on Athena is for the most part still very high level as the intent was to demonstrate the value of the project in order to determine if full solution design and execution is worthwhile. That said, analysis of this work still provides insight into where the project needs to focus additional effort, should the proposal be accepted by senior TELUS management. In order to frame the analysis of this work, the four components of a
solid knowledge management system will be used: people (culture), process, technology and leadership.

5.3.1 People (Cultural) Analysis

CSA has a very good understanding of their work culture, based upon their years of experience in the Service Desk industry. Further, they also know their strengths and weaknesses as related to their organizational culture, and this has been effectively integrated into preparation of the Gate 0 deliverables. Specifically, the Athena project team did a very good job of reaching out to all potential stakeholders and including them in the project. Representatives from all the individual Service Desk teams were asked to participate in the project and product reviews and feedback was elicited, validated and discussed in an open and integrative forum. This has provided a good foundation for building buy-in and commitment.

That said, it was evident that there will still be some significant cultural issues to overcome, as not all stakeholder groups sent representatives to participate in the process. Further, some Service Desk teams presented direct opposition to a new, centralized knowledge management system and others withheld approval, possibly indicating passive opposition. Also related to this issue of obtaining buy-in and commitment, while the project team did a good job of creating and proposing the revised team structure needed to support their vision for the new knowledge management system, opposition from senior management was voiced during the Steering Committee review and this will have to be addressed as well.

5.3.2 Process Analysis

CSA has done a very good job of identifying the business drivers for the Athena project as well as the high-level processes required for knowledge management across the different Service Desk teams. This information was then effectively combined with documentation created to capture the present and future modes of operation in order to provide assurance that the proposed solution would support the expected benefits (both quantifiable and non-quantifiable). That said, this evaluation is still very high level and will require a deeper analysis and a more formalized project plan in order to make accurate projections and ensure their attainability. Finally, as the project team chose the KANA IQ product as their tool of choice, they were also able to capitalize on KANA expertise in designing the high-level processes for the knowledge management solution and determine the viability of the design.
5.3.3 Technology Analysis

In general, there has been an over emphasis on the technical component of the knowledge management solution in relation to the other areas. Specifically, the project Athena investigation began with an assessment of solution vendors and proceeded through product demonstration and review before process requirements and system design were completed. As a best practice, the technical solution should be secondary to overall system design, and used to evaluate the potential for each architectural solution to satisfy the requirements.

That said, the Athena team did a very good job identifying the technical requirements for the knowledge management system and produced a thorough and prioritized list documenting this work. This result was then used to create a solid solution design that addressed all key areas. Further, the early selection of the KANA IQ product was actually beneficial in this area, as it allowed the project team to ensure that all of the most important technical requirements could be met, and that the multiple existing knowledge management systems could be effectively integrated into the new solution. Thus, this work effectively ensured that technical limitations would not become an issue in the future.

5.3.4 Leadership Analysis

Athena project leadership was effective in facilitating the production of the Gate 0 project deliverables under conditions of severe time constraint and resource limitations. Specifically, the team members were required to attend to critical aspects of their regular work throughout the initial project phase, and project leadership managed and adjusted schedules accordingly. This helped to maintain momentum and ensure that the project did not become an after-thought to the stakeholders.

Further, the Program Manager and Executive Sponsor also created a very supportive working environment by managing and prioritizing scope, not allowing early resistance to gain momentum but also ensuring it was not disregarded, and keeping the Steering Committee aware of progress. This allowed team members to envision a best-case solution and not constrain themselves to only known processes or procedures. The result was a better solution design process and not just a re-fit of the existing situation.

Perhaps the only significant area of weakness during the initial phase was the ability of the Project Manager to effectively plan, prioritize and resource specific project activities. This was likely due to a lack of detailed planning on the specific tasks that were required, not having a
deep understanding of the real requirements for each task, and the continuous need to modify the schedule. That said, there now exists a solid vision for the project along with a clearly defined set of opportunities and benefits and a strong statement for the intended scope, and these will all support more effective project management in the future.

Finally, while the Athena project team has done a good job identifying the strategic drivers for the project, it still needs to generate greater momentum across TELUS CSA as a whole. In part, this will be supported through executive sponsorship if approval to begin the next phase is obtained.

The following section presents conclusions and recommendations for project Athena based upon the knowledge management theory, application best practices, and project work completed to date.
6: Conclusions & Recommendations

TELUS CSA struck project Athena in order to address the knowledge management requirements, issues and opportunities of their customer facing Service Desk groups. Thus far, the project team has created the Gate 0 Business Case, which is currently before the Steering Committee, in the hope of getting approval to move into the formal Analysis and Design phases of solution development.

CSA’s strategy is to:

- Achieve best-in-class employee engagement, performance and quality
- Achieve superior process efficiency
- Deliver optimum First Contact Resolution
- Deliver a differentiated customer experience

Following are the key conclusions and recommendations that TELUS CSA should consider to help ensure this project is successful, again using the core components of a complete knowledge management solution as a framework.

6.1 People (Culture)

The source of both the revealed and potential opposition to the Athena project needs to be investigated if the project moves into the solution design phase. With respect to the separate Service Desk teams, it is possible that the cause of this resistance may be power based, as the individual teams might wish to maintain control of their own knowledge management systems (technology and processes), avoid disruption to their separate operations and not incur the costs associated with the project (specifically in terms of time and effort for implementation and alignment of processes). Adding to the complexity of this issue, it is also possible that the business level advantages being sought through this project may not provide the same results for the individual Service Desk teams. For example, individual teams may be very efficient with respect to serving their own client base and not be concerned with the overall business level efficiency. Such factors might result in misalignment of goals and then create resistance to the project.
With respect to individual people within the separate teams, resistance has the potential to arise due to possible negative externalities related to the project. These externalities include such things as loss (or even the perceived potential for loss) of individual expertise and status, effort related to the requirement to learn new procedures, reduced individual importance related to a new team structure and hierarchy, and the reduced value of experience that has been gained through mastering the existing systems. As TELUS CSA consists of a large number of agents with varying levels of skill, expertise and experience, it is unlikely that any transition will be resistance free in this regard.

To address such concerns in terms of Brydon and Vining’s typology (see Figure 3.3), it is very important that CSA creates a culture where hiding knowledge (under-supply of a pure public good) to maintain personal expertise is not acceptable and further, that this becomes a team norm so it does not need to be enforced entirely through management rules. At the same time, CSA should ensure their quality control and incentive programs do not reward quantity of knowledge artefacts produced over quality, thereby resulting in congestion for open access goods. This is a current area of concern for CSA as there is a relatively small team tasked to address quality for a large group of agents. The Consortium for Service Innovation’s Solve Loop addresses this concern as part of their Just-in-Time, Solution Quality approach and thus, it is recommended that this concept is considered for inclusion in the Athena project as well (see Table 4.2). Further, an incentive structure must also be created such that it compensates agents for spending the time to create valuable knowledge content to be used by others and thereby address potential under-supply of knowledge as a hoarded good. As suggested by Brydon and Vining’s, these issues are all addressed most effectively through modification of the team culture as it is less costly than rule based enforcement and also has greater support from the team. That said, it is not a trivial task and will require good planning and strong leadership in order to be successful.

Finally, there are also issues to be addressed around the knowledge management team design. While the model prepared and presented in the initial business case is aligned with KANA best practices, it does not align to the existing CSA structure and may not be achievable within the TELUS environment. This is due to operational issues related to the movement, classification and hiring of staff as well as potential political sensitivity around team structure and power across the CSA area overall. Specifically, TELUS has rules related to team composition and the associated management structure, there are pay ranges associated with specific roles which are also tied into existing budgets, and the creation of a new team requires senior management agreement on how it fits within the overall organizational structure and design. As team structure
is a key foundational component of the knowledge management system, the project must address this issue as soon as possible in the next phase. Regardless of whether they can build the best case team as presented, all the underlying roles and responsibilities must be accounted for. This requires that the specific roles and associated responsibilities be fully documented and mapped onto the new team structure, regardless of the actual implementation. Thus, if the final team structure must be changed, the associated impacts to the affected knowledge management system can be identified and addressed.

The cultural issues presented here also tie into the leadership and process aspects of the solution, and a solid changed management plan will need to be developed and then effectively executed through project implementation. Further, this plan will need to address concerns across all three levels (management, Service Desk teams, and individual employees) in order to be complete and attainable. Creation of a detailed and finalized project solution and vision for the individual teams to review and consider will be beneficial in addressing this area of concern, as it will serve to focus discussion on real issues and not individual expectations or fears. That said, this plan will still require strong leadership to ensure that the high level vision is supported by the solution throughout all stages of implementation, that it is acceptable to the individual Service Desk teams, and that it receives buy-in and support from all stakeholders.

6.2 Process

In terms of process, TELUS CSA can capitalize on the advantage of working with KANA and their KANA IQ product (presented as the optimum software solution), as it is based upon and supports proven telecommunication knowledge management needs. The challenge will be to effectively develop the tool for use at TELUS and prioritize the different functionality in support of CSA’s immediate requirements and goals for the Athena project. That said, there is still a lot of detailed work to be done in terms of creating best practices, processes and an operational structure that can effectively support the diverse CSA teams. In this regard, the processes described in the CSI Solve and Evolve models can be very helpful and should be consulted as they all serve to support knowledge management efficiency, which has been identified as the key driver for this project.

With respect to knowledge base content creation and review, there are currently known limitations within CSA related to cost and effort. Specifically, agents cannot easily locate existing content for known issues resulting in duplication of solutions and having to solve similar issues multiple times. Further, the documentation updating process is constrained in that only a small
group of individuals have the responsibility to support a large team in this regard. These issues were outlined in the business case as ongoing risks and need to be resolved in the Athena solution. Adopting the role based privileges outlined by the Consortium for Service Innovation, in conjunction with the knowledge management best practices created by KANA will be very beneficial in this regard (see Table 4.4). Specifically, agents should be creating solutions (knowledge base artefacts) during their interactions with customers as well as vetting and updating existing content. Combined with role based privileges that determine which agents can publish final edits without review and which need to have their worked verified, the result should be a reduction in the current bottleneck. Not only should this help to make the authoring and vetting processes more efficient, it can also be useful in addressing potential negative externalities related to the over and undersupply of content, as outlined previously.

One final point related to process is in relation to project execution itself. The project plan must include processes for the migration of existing content into the new knowledge base and to ensure the quality of this content. As the knowledge base is the underlying foundation of the entire system, quality in this area is critical and this issue has not yet been addressed to the level needed to ensure success. While there has been discussion of cleaning and vetting the documentation as it is being migrated to the new system as well as implementing new content standards based upon best practices presented by KANA, such work is potentially very expensive and time consuming. CSA needs to do additional investigation here and determine if tradeoffs between cost and quality are required, and then how they will affect the overall knowledge management system.

6.3 Technology

As TELUS CSA has many years experience in using knowledge management tools to support Service Desk activity, the approach used in Gate 0 (selecting the technical solution prior to formalizing all requirements and preparing the logical solution design) may not be as detrimental an approach as it would be for a company that is new to knowledge management. Further, as the selected vendor (KANA) is an industry leader in this area with a proven track record of successfully supporting companies of similar size and complexity of operations, it is very unlikely that any major technical limitations will arise. That said, there may still be issues related to the overall cost of software customizations required to support the final solution design and this will need to be investigated in the next phase of the project. Such costs are likely to
represent a significant increase in the proposed project budget and the associated work may also require substantial time and resources to complete.

A final key area of design yet to be addressed is that of the knowledge base itself. The Athena project team has begun to create new templates for knowledge management content, and these will need to be aligned with the underlying knowledge base structure. One area of concern is the need to create these templates and structure, such that they will support the many different CSA teams. This will require more detailed analysis and is an area of considerable risk that crosses both process and technology. Initial discussions with KANA indicate that there is enough flexibility in the interface that team specific modifications can be implemented to address this issue, albeit with the cost of additional development. However, it is still important to design as complete a system as possible in order to avoid excessive redevelopment costs throughout the implementation. Perhaps communicating that non-participation teams will be responsible to cover the cost of any rework related to their area and resulting from their failure to actively help on the project can be used as an incentive to gain buy-in as well.

6.4 Leadership

At this early stage of the Athena project, leadership is the most crucial aspect and touches on issues relevant to the other areas as well. First, there still remains the need for a visible project champion with a thorough and well thought out strategic plan and implementation strategy. The project champion must also be able to convey an overall vision for the project, complete with milestones and metrics that people can focus on. It is understandable that this is the case at such an early stage of solution investigation, and both the team manager and director have already provided strong leadership to the project team itself. However, in order to be successful, they must now work to gain consensus from the broader group of stakeholders. CSI’s framework for implementation provides a good outline of the tasks needed in this regard and also outlines where leadership is critical.

The following sections outline areas where project leadership must now focus and provide direction if the project advances into the next stage of development:
6.4.1 Concept Alignment

To begin with, it is critical that CSA understands the difference between document, information and knowledge management, and that all stakeholders use a common definition. If this is not the case, there cannot be common understanding and agreement on the focus and scope of any proposed solutions. In this regard, document management is specifically focused on content artefacts without respect to what type of information or knowledge they contain. Information management is focused on content but without respect to context or application-specific use of such content, and knowledge management is focused on actionable content in support of specific business needs. Project Athena requires a knowledge management solution and any such solution must have components related to document management and information management as well.

Further, knowledge management solutions are not equivalent to technical solutions or vendor software products. While technology is a core component of knowledge management, other areas must be addressed as well. These include leadership, culture and processes. It is evident that the CSA Knowledge Management team and Athena project team have an implicit understanding of these separate components but that they have not been thoroughly distinguished and addressed at the level of detail needed to ensure a successful solution; the focus has been disproportionately directed towards the technology. The cause of this situation is not oversight or lack of proper planning, but has to do with the project execution model employed at TELUS. Creation of the Gate 0 Business Case does not require the depth of analysis and design that is truly required for a full assessment. That said, if the Steering Committee accepts the recommendation, the teams must explicitly address each area and plan accordingly. It is important to remember that knowledge management is something you do, not a solution you purchase. To gain such consensus and provide the necessary foundation for the project, the Program Manager, under authority of the Executive Sponsor, should forward clear communication outlining this concept and its application to the project to all stakeholders. A follow-up meeting can then be held if any confusion remains or feedback indicates the issue is not resolved.

6.4.2 Vision & Goals

Another key area to consider is the separate but associated project goals presented in the business case. First, there is the creation of the knowledge management team itself, along with a business-unit wide knowledge management strategy, best practices and processes. Second, there
is the implementation of the knowledge management system in support of the business drivers. While this work is interconnected and is being concurrently developed over the same timeline, a natural order for execution does exist. CSA must first create the knowledge management team along with the knowledge management strategy that will be employed, and the high-level processes to be used. This is necessary in order to assure the solution (including the vendor and technology) is capable of supporting it. Further, the strategy and high-level processes must be in place to dictate the expectations for the technical project solution. It is incorrect to allow the technical solution to dictate the knowledge management strategy and processes to be adopted. That said, there must still be some overlap and iteration of all work as the knowledge management system and technology do present implications regarding detailed process design.

In terms of strategy, CSA must also decide upon their primary focus with respect to the three potential value disciplines: customer intimacy, operational excellence or product leadership. While all three are key areas of concern for TELUS, operational excellence should be the initial focus, as it can become the foundation for extension into customer intimacy and product leadership as well. That is, a robust and well-designed knowledge management system will facilitate better customer service and allow for the creation of product extensions such as self-service. Further, it is likely that returns from operational improvements will be needed to maintain executive support for a program that might have a multiple year implementation window.

6.4.3 Knowledge Management Team

The knowledge management team structure developed as part of project Athena is consistent with applied knowledge management best practices and principles presented by the Consortium for Service Innovation but it may not be acceptable for TELUS. As the current business environment is extremely cost conscious, it is very difficult to create a case for the hiring of new resources or realignment of existing resources. Even if a detailed business case were to be developed that projected a strong return on investment, it is possible that senior management would still want to pursue the project using current team members and reporting structures. Therefore, the project may be well served to develop these roles around the current organizational structure and identify any strategic risks that result from this course of action.

Additional points regarding the knowledge management team include the roles and responsibilities that members will be assigned. From an overall team culture perspective, it appears there will be significant work to do in getting buy-in from the multiple CSA groups to
accept direction from this centralized unit. The separate teams are used to having autonomy with respect to their own knowledge management needs and they likely hold individual team goals above those for CSA as a whole. This requires CSA to investigate alignment of goals in order to support the success of the project. The individual teams must be accountable to some extent for company wide efficiency and performance, and through this, results beyond the direct performance of their team. This is not a trivial undertaking, as any incentive or performance structures implemented to attain such behaviour must not jeopardize existing performance beyond the gains achieved for the overall company. It may be wise to start at the manager level of the separate teams and then have them assist in modifying the behaviour of their personnel. Such a change may take some time to create.

In addition, it is important that skilled personnel be put in place to manage and lead in all roles, especially content development. These resources must fully realize the higher-level requirements of quality documentation, understand overall knowledge management goals, and have demonstrated expertise. This is a very difficult challenge and begins with an open and honest assessment of current personnel with respect to the skills and experience required for their intended position. Such an assessment may then indicate where additional training or coaching is required and CSA does have access to personnel who can provide this to the team. Quality content is the primary driver for success and the risk of having personnel without the necessary experience or expertise leading key areas cannot be overstated.

6.4.4 Financial Risk Analysis

The following subsections outline the major areas of concern related to overall financial risk for the project, both with respect to costs and expected returns.

6.4.4.1 Solution Design

With respect to the desired knowledge management solution, the proposed future mode of operation is extremely complex in terms of a single implementation design. Combining multiple teams with disparate technology, processes and existing knowledge artefacts into a centralized system is an incredibly difficult task in terms of all four pillars (leadership, culture, processes, technology). This means that detailed planning is imperative and that critical success factors and metrics must be identified and monitored throughout the project. Attempting to focus on ‘quick-wins’ is dangerously alluring under the current operational environment at TELUS but it can be very risky if it jeopardizes foundational aspects of the project. The detailed project
design is not currently developed to the level of detail necessary to ensure successful implementation.

As well, it is likely that there will be a significant increase in vendor consulting costs needed to realize the CSA wide solution. The original estimate used in financial models was based upon the creation of a single customized workflow in the KANA IQ software and it is very unlikely that so many different groups operating at different support tiers can work from one interface. TELUS may reduce this cost if they develop in-house capabilities to customize the software and while this would be less costly than external consulting, it would still result in increased internal development costs. This issue must be addressed in the detailed business plan to ensure a more accurate estimate of software customization requirements, and development and maintenance efforts are projected.

In terms of solution deployment, the phased approach suggested by CSA does seem to be the best direction to take for rollout and while this provides the opportunity to learn as the project progresses, it too presents risks. Each phase must prove to be successful in order to maintain momentum and gain buy-in from subsequent groups. Further, the up-front work to create the foundation for all phases must also be well designed and extensible, and in place prior to conversion of any individual group. Considerable time and resources will be required to design the knowledge base structure and templates such that all teams are supported, including the on-boarding of new customers and support for yet to be defined new products.

Finally, while the KANA IQ software provides extensive and powerful features in support of knowledge management solutions, they all come with up front development costs. Advanced security, user roles, searching capabilities (black words, keywords, synonyms, decision rules, etc.) all require proper design and implementation. While this does not represent a differential cost between competing solutions, which all must address the technical and process related aspects of knowledge management, it is easy for senior management to assume the software takes care of all such details out of the box and that any customization is a minor detail. This of course is not the case.

6.4.4.2 Operational Efficiencies

While the initial EASE financial modelling showed a positive ROI and net present value (NPV), the assumptions upon which the calculations were based must be explored. Apart from being Gate 0 estimates (+/- 100%), the following factors are also relevant:
The operational savings were calculated based upon transaction volumes for three representative months (July, Augusts & September 2010) and realization is contingent on converting all 600 CSA agents to the new system.

No sensitivity analysis has been performed to determine the impact of changes in any of the individual estimates used for projected ROI, payback period or NPV.

As stated above, total development costs required to realize all projected benefits from such a complex project may be significantly underestimated.

Therefore, the accuracy of the operational savings projections remains to be seen. Further, it should be noted that providing successful self-service channels for customer support may actually reduce agent performance in the long term. As discussed earlier, self-service generally has a positive effect at the outset but may eventually result in Tier1 agents having to handle an ever increasing proportion of new and unique issues, as standard calls are resolved without contact. Such calls generally take longer to resolve as there are fewer known solutions and past knowledge that agents can rely upon. CSA must be sure to put metrics, appropriate expectations, targets and incentives in place to capture any such change in the support profile so that performance measures are not misinterpreted.

Another key area related to operational efficiency goals is the desire to push customer support down to lower support tiers. For example, enable Tier2 calls to be handled by Tier1 agents using a strong KMS, and enable Tier1 calls to be handled via self-serve options. The concept behind this desire is to capitalize on lower cost resources and thereby achieve savings. However, some CSA Tier1 agents pass calls to non-TELUS Tier2 agents. In such a case, it may not be economical to develop knowledge management expertise to allow the Tier1 agents to resolve the issues outright. This situation should be investigated to ensure resources are used efficiently and it may also present an area for new product development.

### 6.5 Final Words

Regardless of pursuing KANA IQ as the technological foundation for a new CSA knowledge management system, TELUS must take steps to improve their knowledge management process in order to remain competitive and support future growth. At the least, project Athena should be used to provide value in terms of defining proper KM strategies and processes upon which the organization can capitalize, regardless of the technology selected.
If TELUS CSA truly wants to become best-in-class for help desk support, they must have an exceptional knowledge management system. In order to achieve this, the following points must be considered:

- There is a huge potential upside to TELUS for creating a best-in-class KMS but it requires great leadership, planning and patience

- The project strategy must contain all the core components of a sound knowledge management system (people, process, technology and leadership) and address key issues in all areas as well

- It is critical that knowledge management project complexity not be underestimated and oversimplified in order to gain senior management approval, or the end solution will not meet expectations. Knowledge management represents a complex, transformational shift in business strategy and this must be accepted throughout project design and execution

- CSA should follow the correct sequence for project execution. First, a detailed vision and strategy must be created and then used to design the appropriate organizational structure and systems. Limitations on best-case design in any area must be determined and then worked into the overall plan

- Customers will not accept self-service options based upon a poor quality knowledge base

- While there are going to be significant costs for data conversion, the knowledge base is the most critical aspect of the system. If the knowledge base is compromised, no amount of leadership, management or process will help realize operational efficiencies

- In-depth risk, financial and sensitivity analysis based upon more refined estimates and a better understanding of the value presented by knowledge management must be conducted in order to ensure a successful project design is in place

- Key areas of risk include the long project timeline and complexity of the solution required to cover all areas of Service Desk, the large impact this solution has on the TELUS CSA operations, customers and brand, and the need for highly skilled individuals experienced in creating these types of solutions
Knowledge management is a core requirement of CSA’s business but should evolve to provide competitive advantage and create new market opportunities.

“Knowledge is experience, everything else is information.”

Albert Einstein

(Ribiere & Arntzen, 2010, p.222)
Appendices
Appendix A – CSA KMS Requirements

The following table provides an overview of the knowledge management system requirements developed by CSA and used to assess potential solutions. When the project moves to the Solution Design phase, these requirements will be expanded and formalized.

Table A.1  CSA KMS Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Architecture</td>
<td>System must support Thin Client / VPN</td>
</tr>
<tr>
<td>Environment</td>
<td>Backup</td>
<td>System must support daily backup of content, reporting data, and system level event logs. The system must be restorable using this backup in the event of failure.</td>
</tr>
<tr>
<td>Environment</td>
<td>Disaster Recovery</td>
<td>System must support disaster recovery planning, acceptable to TELUS standards</td>
</tr>
<tr>
<td>Environment</td>
<td>Growth</td>
<td>System must be scalable and flexible to support expected growth without degradation of performance</td>
</tr>
<tr>
<td>Environment</td>
<td>Availability</td>
<td>System must support 24x7x365 up-time with scheduled outages for maintenance and upgrades</td>
</tr>
<tr>
<td>Environment</td>
<td>Integration</td>
<td>System must be able to integration with Call Handling SW, email systems, DB and file repositories and other system software currently in place to support CSA.</td>
</tr>
<tr>
<td>Security</td>
<td>User Authentication</td>
<td>System must support security based upon user authentication</td>
</tr>
<tr>
<td>Security</td>
<td>Security Admin</td>
<td>System must support Security Admin profile to allow creation and maintenance of User profiles</td>
</tr>
<tr>
<td>Security</td>
<td>Content</td>
<td>System must be able to secure content based upon User account privileges. This security architecture must be granular enough to support required system design.</td>
</tr>
<tr>
<td>Site Administration</td>
<td>Admin</td>
<td>System must support Administration metrics to analyze usage statistics and performance measures</td>
</tr>
<tr>
<td>Site Administration</td>
<td>Admin</td>
<td>System must support Admin level privileges to manage the content, users and system</td>
</tr>
<tr>
<td>Site Administration</td>
<td>Admin</td>
<td>System must support implementation of</td>
</tr>
<tr>
<td>Role</td>
<td>Feature</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Site Administration</td>
<td>Admin</td>
<td>System must support content review process and rules</td>
</tr>
<tr>
<td>Site Administration</td>
<td>Admin</td>
<td>System must support workflow rules in support of user process development</td>
</tr>
<tr>
<td>Site Administration</td>
<td>Admin</td>
<td>System must support content templates along with associated security and access permissions</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Images</td>
<td>System must support importing and managing images (e.g. screen shots)</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Content Updates</td>
<td>System must support real time (&gt; 1min) publishing of updates for content.</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Content Updates</td>
<td>System must support easy and fast content update processes</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Admin</td>
<td>System must support both centralized and decentralized (e.g. SysAdmin, Tier1Admin, GroupAdmin) content management roles</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Copy/Paste</td>
<td>System must support copy/paste of content both within system and from external sources (e.g. MS Word Docs, Excel, PDF, etc.)</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Content Linking</td>
<td>System must support hyper-linking to external content.</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Templates</td>
<td>System must support templates for content</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Templates</td>
<td>System must support inserting tables and images into content</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Taxonomy</td>
<td>System must support creation of taxonomies to manage content</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Taxonomy</td>
<td>System must support maintenance and changes to taxonomies in an efficient manner</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Content Management</td>
<td>System must support rules and privileges regarding update and maintenance of content</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Content Management</td>
<td>System should have an easy to use WYSIWYG editor for content</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Archive</td>
<td>System must support archive and retrieval of content</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Language</td>
<td>System must support multiple language content (English, French, Spanish, etc.)</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Spell-check</td>
<td>System must have multi-language spell-check</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Access</td>
<td>System must support bookmarking and subscription to content for individual users</td>
</tr>
<tr>
<td>Content Administration</td>
<td>Roll-back</td>
<td>System must support roll-back of content to previous versions</td>
</tr>
<tr>
<td>Search</td>
<td>Search</td>
<td>System must provide basic search functionality and advanced search functionality including: black words, key words, Boolean, by category, by customer, by product, etc.</td>
</tr>
<tr>
<td>Search</td>
<td>Sorting</td>
<td>System must support search result ordering (lexicographical, date entered/updated, customer, etc.)</td>
</tr>
<tr>
<td>Search</td>
<td>Functions</td>
<td>System must support auto-complete and alternate spelling suggestions</td>
</tr>
<tr>
<td>Search</td>
<td>FAQ’s</td>
<td>System must support creation and maintenance of multiple FAQ’s</td>
</tr>
<tr>
<td>Search</td>
<td>Filtering</td>
<td>System must support filtering of search content and results, including drill-down into results</td>
</tr>
<tr>
<td>Search</td>
<td>Content</td>
<td>System must be able to search within linked documents and across linked repositories</td>
</tr>
<tr>
<td>Reporting</td>
<td>Audit</td>
<td>System must support change/update tracking</td>
</tr>
<tr>
<td>Reporting</td>
<td>Content</td>
<td>System must support ad-hoc reporting on content</td>
</tr>
</tbody>
</table>

*Source: Developed by the author based upon information supplied by TELUS.*
Appendix B – CSA KMS Vendor Feedback

The following table provides an overview of the questions used to obtain feedback from vendors regarding their knowledge management solutions.

Table B.1  CMS KMS Vendor Feedback

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy</td>
<td>• How does your product support and promote a KM strategy?</td>
</tr>
<tr>
<td></td>
<td>• What differentiates the quality of your solution from your competitors?</td>
</tr>
<tr>
<td></td>
<td>• What does a standard support model entail?</td>
</tr>
<tr>
<td></td>
<td>• Describe the ongoing customer support you provide.</td>
</tr>
<tr>
<td>Implementation Approach</td>
<td>• Recommended # customer resources to implement?</td>
</tr>
<tr>
<td></td>
<td>• System requirements and costs?</td>
</tr>
<tr>
<td></td>
<td>• Consulting requirements and costs?</td>
</tr>
<tr>
<td></td>
<td>• Bulk data conversion process and costs?</td>
</tr>
<tr>
<td>Licensing</td>
<td>• Licensing model and associated costs?</td>
</tr>
<tr>
<td></td>
<td>• User profiles supported?</td>
</tr>
<tr>
<td>Sustainment</td>
<td>• Expected maintenance and associated costs?</td>
</tr>
<tr>
<td></td>
<td>• Other?</td>
</tr>
<tr>
<td>Training Requirements &amp; Costs</td>
<td>• Standard training (Admin, Users, etc) and associated costs?</td>
</tr>
<tr>
<td></td>
<td>• Documentation provided?</td>
</tr>
<tr>
<td>Interfaces &amp; Integrations</td>
<td>• Ticket systems, email, LDAP, etc.?</td>
</tr>
<tr>
<td></td>
<td>• Associated development requirements and costs?</td>
</tr>
<tr>
<td>Technical Features</td>
<td>• Describe (e.g. source code availability, programming language, customization, data import tools, data recovery methods, monitoring and metrics gathering, interface customization, etc.)</td>
</tr>
<tr>
<td>Security Model</td>
<td>• User authentication and content security?</td>
</tr>
<tr>
<td></td>
<td>• User rights assignments?</td>
</tr>
<tr>
<td></td>
<td>• Backup and disaster recovery processes?</td>
</tr>
<tr>
<td>Searching</td>
<td>• Describe the type of search capabilities provided (e.g. basic, Boolean, Agent Assist, Keyword, Synonym, Black Words, etc.)</td>
</tr>
<tr>
<td>Editing</td>
<td>• Describe the GUI for admin and users including editor,</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>HTML support</td>
<td>HTML support, customization, features, design tools, template support, etc.</td>
</tr>
<tr>
<td>Workflow</td>
<td>• Describe how the system supports customized workflow, especially with respect to TELUS CSA requirements?</td>
</tr>
<tr>
<td>Versioning/History</td>
<td>• Describe content versioning and history support</td>
</tr>
<tr>
<td>Reporting</td>
<td>• Describe both canned and ad-hoc reporting features</td>
</tr>
<tr>
<td>Content Exporting</td>
<td>• Describe content export facilities</td>
</tr>
<tr>
<td>Performance</td>
<td>• Document system performance metrics, scalability and tuning requirements</td>
</tr>
</tbody>
</table>

*Source: Developed by the author based upon information supplied by TELUS.*
Bibliography

Works Cited


**Company Documents**


TELUS Finance (n.d.) *EASE Lite.*

TELUS Finance (n.d.) *Quantitative Risk Assessment.*

TELUS Finance (n.d.) *Risk Return Model.*


TELUS News Centre. (2009, Dec. 15). *Foreign ownership laws now unclear; unequal playing field created.*


TELUS News Centre. (2010, Mar. 4). *Throne speech opens the door to more foreign investment in telecom.*

TELUS News Centre. (2010, Mar. 29). *CRTC decision allows broadcasters to negotiate payment for signals.*

TELUS News Centre. (2010, Apr. 6). *TELUS investing $650 million in B.C. to expand advanced broadband services.*

TELUS News Centre. (2010, Apr. 19). *TELUS presents views on foreign ownership to House of Commons.*

TELUS News Centre. (2010, Apr. 20). *TELUS a top performer in telecom industry; shares 10 per cent in March.*

TELUS News Centre. (2010, Apr. 23). *TELUS completes major network migration to ISP.*


**Works Consulted**


The Globe and Mail. (2010, May. 5). *Wind Mobile to offer tiered pricing.*


**Websites Reviewed**

Consortium for Service Innovation.

http://www.serviceinnovation.org


International Development Research Center.

http://www.idrc.ca


Kana Software Inc.

http://www.kana.com


TELUS.

http://www.telus.com

http://business.telus.com
