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VALUE MAPPING FRAMEWORK INVOLVING STAKEHOLDERS FOR SUPPLY CHAIN IMPROVEMENT WHEN IMPLEMENTING INFORMATION TECHNOLOGY PROJECTS

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Industrial Engineering and Management Systems in the College of Engineering and Computer Science at the University of Central Florida Orlando, Florida

Spring Term
2008

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Ronald Eaglin
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ABSTRACT

Successful Supply Chain Management (SCM) depends on how well an organization performs internal and external communications with trading partners, executes the logistics component, and understands/monitors related costs of conducting its business. The use of information technology (IT) is considered a prerequisite for the effective control of today’s complex supply chains. Increased communication technology has redefined how businesses work together, raised customer expectations, and placed new demands on supply chain performance. IT components with proven and rapid return-on-investment are favored to support critical supply chain processes such as leaner manufacturing processes, consumer-driven supply chains, and customer responsiveness. The use of IT in the digital era has become critical and it is treated as a major competitive tool for success. Complex and comprehensive IT infrastructures support the firm’s communications network, databases, and operating systems. Information technology facilitates the creation of value. However, the creation of value is defined by the different groups of stakeholders. Therefore, stakeholders must be integrated into this process of change management that uses IT as the enabler.

Supply chains are due to change when higher levels of performance and/or adaptation are required as mandated by changes in the business structure and/or benchmarking and/or regulations. One of the major problems for any supply chain executive is to understand and manage these changes. These changes usually require the implementation of an IT project. Therefore, the successful design, execution, and completion of these IT projects are important for the supply chain. SCM is now a strategic function addressed at the highest levels of the organization in concert with multiple stakeholders on both the supplier and customer side of the table.

The aim of this dissertation is to develop a value mapping framework involving stakeholders to improve supply chain performance when implementing IT projects. The framework has components that help define the supply chain, measure the size of the issues, identify necessary changes in the metrics to improve performance, measure the organizational consequences of these changes, and develop and follow a plan to implement IT projects to achieve the new goals of performance. Through this new framework, these IT projects will be able to bring the supply chain from a current state “As is” to a future state “To be”;

iii
capturing the existing and desired states of the proposed changes which are aligned with the objectives and goals of the organization. Therefore, the IT project can be designed, executed, and completed. One unique component of this framework is the inclusion of the stakeholders at different stages. This framework identifies the group of stakeholders to be taken into consideration in order to define the future “To be” state. In addition, the framework identifies the value creation of the “To be” system as seen by the stakeholders.
ACKNOWLEDGMENTS

I want to first thank The Lord for blessing me with this accomplishment and for the opportunity to meet extraordinary people during this endeavor. I would like to also thank my parents for all of their support and assistance throughout my life and education; this accomplishment would have not been possible without them. I especially thank my husband Joseph for his support and for giving me the strength and motivation to endure and complete this work.

I would like to thank my advisor and co-advisor, Dr. Luis Rabelo and Dr. Ronald Eaglin, for their support, guidance, and invaluable comments that made this work possible. I would like to thank my dissertation committee Dr. Christopher D. Geiger, Dr. José Sepúlveda, and Dr. Yan Wang, for their helpful reviews and comments during the creation of this work. I want to also thank the IEMS Department, especially Dr. Linda Malone, and the ENT Department at UCF.

Finally, I would like to thank the UCF SAGE team, the Seminole County personnel, and the IT professionals that participated in this research; without their help, this work would not have been possible.
# TABLE OF CONTENTS

LIST OF FIGURES ........................................................................................................... ix

LIST OF TABLES ............................................................................................................. xi

LIST OF ACRONYMS/ABBREVIATIONS ................................................................... xii

CHAPTER ONE: INTRODUCTION ................................................................................. 1
  Supply Chain Management and IT Functions .............................................................. 3
  Problem Statement ........................................................................................................ 8
  Objectives of this Research ........................................................................................... 9
  Why A New Framework ............................................................................................... 9
  Contributions of this Research .................................................................................... 10
  Dissertation Outline .................................................................................................... 12

CHAPTER TWO: LITERATURE REVIEW ................................................................... 13
  Supply Chain Management and its relation with the Information Technology........... 13
  Change Management .................................................................................................. 23
  Stakeholder Value ....................................................................................................... 29
  Existing Gap ................................................................................................................ 36
  Summary ..................................................................................................................... 41

CHAPTER THREE: RESEARCH METHODOLOGY ................................................... 42
  Research Methodology ............................................................................................... 42
    Research Question ...................................................................................................... 43
    Research Unit of Analysis ........................................................................................... 44
    Literature Review ...................................................................................................... 43
    Existing Gap ............................................................................................................... 43
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of the Proposed Framework</td>
<td>45</td>
</tr>
<tr>
<td>Test of the Proposed Framework</td>
<td>49</td>
</tr>
<tr>
<td>Analysis of Case Evidence</td>
<td>50</td>
</tr>
<tr>
<td>Survey Development and Analysis</td>
<td>51</td>
</tr>
<tr>
<td>Summary</td>
<td>53</td>
</tr>
<tr>
<td>CHAPTER FOUR: PROPOSED FRAMEWORK</td>
<td>54</td>
</tr>
<tr>
<td>Step-by-Step Framework</td>
<td>54</td>
</tr>
<tr>
<td>Summary</td>
<td>79</td>
</tr>
<tr>
<td>CHAPTER FIVE: CASE STUDY</td>
<td>80</td>
</tr>
<tr>
<td>SCI.Net Project Description</td>
<td>80</td>
</tr>
<tr>
<td>The Agenda Process</td>
<td>82</td>
</tr>
<tr>
<td>Case Results</td>
<td>123</td>
</tr>
<tr>
<td>Summary</td>
<td>126</td>
</tr>
<tr>
<td>CHAPTER SIX: SURVEY DEVELOPMENT</td>
<td>127</td>
</tr>
<tr>
<td>Questions and Scale Development Process</td>
<td>127</td>
</tr>
<tr>
<td>Planning and Survey Design</td>
<td>128</td>
</tr>
<tr>
<td>Data Collection Process</td>
<td>128</td>
</tr>
<tr>
<td>Data Management and Analysis Methods</td>
<td>128</td>
</tr>
<tr>
<td>Pilot Study</td>
<td>129</td>
</tr>
<tr>
<td>Survey Design</td>
<td>129</td>
</tr>
<tr>
<td>Objective of the Survey</td>
<td>130</td>
</tr>
<tr>
<td>Statement of Survey Participation</td>
<td>130</td>
</tr>
<tr>
<td>Survey Deployment</td>
<td>131</td>
</tr>
<tr>
<td>Survey Results</td>
<td>131</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Wal-Mart Supply Chain Overview</td>
<td>4</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Functional Roles of IT in SCM</td>
<td>6</td>
</tr>
<tr>
<td>Figure 3</td>
<td>SCOR Management Processes (Supply Chain Council Inc, 2006)</td>
<td>16</td>
</tr>
<tr>
<td>Figure 4</td>
<td>SCOR Hierarchical Model (Supply Chain Inc, 2006)</td>
<td>17</td>
</tr>
<tr>
<td>Figure 5</td>
<td>SCOR Cross-Functional Frameworks (Fayez, 2005)</td>
<td>18</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Matrix of Change (MIT, 2003)</td>
<td>26</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Causal Loop (Forrester, 1996)</td>
<td>35</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Literature review Steps</td>
<td>38</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Research Methodology</td>
<td>42</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Proposed Framework</td>
<td>47</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Data Collection Process</td>
<td>52</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Define the Supply Chain</td>
<td>54</td>
</tr>
<tr>
<td>Figure 13</td>
<td>End-to-End Supply Chain</td>
<td>56</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Original PLP</td>
<td>58</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Measure the Supply Chain</td>
<td>61</td>
</tr>
<tr>
<td>Figure 16</td>
<td>SC Geo Map</td>
<td>61</td>
</tr>
<tr>
<td>Figure 17</td>
<td>SC Thread Diagram</td>
<td>62</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Benchmarking/Goals of the Organization</td>
<td>63</td>
</tr>
<tr>
<td>Figure 19</td>
<td>Strategy Map</td>
<td>65</td>
</tr>
<tr>
<td>Figure 20</td>
<td>Define Critical Problem: Current “As is” Stage</td>
<td>68</td>
</tr>
<tr>
<td>Figure 21</td>
<td>Stakeholder Value Mapping</td>
<td>69</td>
</tr>
<tr>
<td>Figure 22</td>
<td>Define the Future “To be” Stage</td>
<td>70</td>
</tr>
<tr>
<td>Figure 23</td>
<td>Identify Changes</td>
<td>71</td>
</tr>
<tr>
<td>Figure 24</td>
<td>Horizontal/Vertical Matrices</td>
<td>72</td>
</tr>
<tr>
<td>Figure 25</td>
<td>The Transition Matrix</td>
<td>73</td>
</tr>
<tr>
<td>Figure 26</td>
<td>Implementation</td>
<td>74</td>
</tr>
<tr>
<td>Figure 27</td>
<td>Measure New Supply Chain Performance</td>
<td>77</td>
</tr>
<tr>
<td>Figure 28</td>
<td>Lessons Learned</td>
<td>78</td>
</tr>
<tr>
<td>Figure 29</td>
<td>Agenda Process End-to-End SC</td>
<td>83</td>
</tr>
<tr>
<td>Figure 30</td>
<td>Agenda Process SC Geo Map</td>
<td>90</td>
</tr>
<tr>
<td>Figure 31</td>
<td>SC Thread Diagram</td>
<td>91</td>
</tr>
<tr>
<td>Figure 32</td>
<td>Agenda Process Strategy Map</td>
<td>96</td>
</tr>
<tr>
<td>Figure 33</td>
<td>Agenda Process Critical Problem</td>
<td>101</td>
</tr>
<tr>
<td>Figure 34</td>
<td>Agenda Process Stakeholder Value Mapping</td>
<td>103</td>
</tr>
<tr>
<td>Figure 35</td>
<td>Agenda Process Current “As is” Stage</td>
<td>104</td>
</tr>
<tr>
<td>Figure 36</td>
<td>Agenda Process Decomposition/Drill-Down Mechanics</td>
<td>105</td>
</tr>
<tr>
<td>Figure 37</td>
<td>Agenda Process Information Flow – “As is”</td>
<td>106</td>
</tr>
<tr>
<td>Figure 38</td>
<td>Agenda Process Material Flow – “As is”</td>
<td>107</td>
</tr>
<tr>
<td>Figure 39</td>
<td>Agenda Process Future “To be” Stage</td>
<td>108</td>
</tr>
<tr>
<td>Figure 40</td>
<td>Agenda Process “To be” Stage Reviewed by Stakeholders</td>
<td>109</td>
</tr>
<tr>
<td>Figure 41</td>
<td>Agenda Process Horizontal and Vertical Matrices</td>
<td>112</td>
</tr>
<tr>
<td>Figure 42</td>
<td>Agenda Process Transition Matrix</td>
<td>113</td>
</tr>
<tr>
<td>Figure 43</td>
<td>Agenda Process Transition Matrix Reviewed by Stakeholders</td>
<td>114</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1 – Stakeholders’ Classification ................................................................. 2
Table 2 – Literature Review .................................................................................. 37
Table 3 – Literature Review Gap .......................................................................... 40
Table 4 – Research Unit of Analysis .................................................................... 45
Table 5 – Supply Chain Matrix Template ................................................................. 55
Table 6 – SC Inputs, Outputs, and Potential Stakeholders ..................................... 56
Table 7 – SC “Source,” “Make,” and “Deliver” Processes Definition .................... 57
Table 8 – Modified PLP ......................................................................................... 59
Table 9 – SC Flexibility Performance .................................................................. 63
Table 10 – Objectives Alignment ......................................................................... 64
Table 11 – Stakeholders Re-evaluation ................................................................. 69
Table 12 – Stakeholder Value Matrix ................................................................... 71
Table 13 – Future “To be” Stage Design Based on Type of Changes .................... 72
Table 14 – Future “To be” Stage Possible Solutions Based on Type of Changes .... 72
Table 15 – Process Effectiveness Assessment ...................................................... 75
Table 16 – Supply Chain New Flexibility Performance ........................................ 78
Table 17 – Agenda Process SC Definition Matrix .................................................. 83
Table 18 – Agenda Process SC Inputs, Outputs, and Potential Stakeholders ........ 84
Table 19 – SC “Source,” “Make,” and “Deliver” Processes Definition .................. 87
Table 20 – Modified PLP Applied to the Agenda Process Project .......................... 88
Table 21 – Total Driving Cost Biweekly ................................................................. 94
Table 22 – Seminole County and the Agenda Process Project Objectives Alignment 95
Table 23 – Stakeholder Classification Based on the SPK Framework ................. 97
Table 24 – Agenda Process Project Benefits and Concerns Identified by Stakeholders 98
Table 25 – Stakeholders Comments on the Agenda Process Project ................... 99
Table 26 – Agenda Process Stakeholders Re-evaluation ....................................... 102
Table 27 – Agenda Process Stakeholder Value Matrix ......................................... 110
Table 28 – Future “To be” Stage Designed Based on Type of Changes ............... 111
Table 29 – Future “To be” Stage Possible Solutions Based on Type of Changes ... 112
Table 30 – Agenda Process Effectiveness Assessment ........................................... 115
Table 31 – Number of Agenda Items Before and After SCI.Net ............................ 118
Table 32 – Number of Agenda Items Past Due for Director, CAO, and CMO ......... 119
Table 33 – Average Number of Agenda Items Requiring CAO Review ............... 120
Table 34 – Number of Agenda Items Past Due for Director, CAO, and CMO ......... 121
Table 35 – Average Number of Agenda Items Requiring Fiscal Service Review ... 120
Table 35 – Number of Agenda Items Past Due for Director, CAO, and CMO ......... 121
Table 36 – Research Unit of Analysis Applied to the Agenda Project .................. 125
Table 37 – Calculation to find the average number for stakeholder involvement ... 137
Table 38 – Calculation to find the average number for stakeholder input ........... 144
LIST OF ACRONYMS/ABBREVIATIONS

BCC: Board of county Commissioners
CLD: Causal Loop Diagram
CAO: County Attorney’ Office
CMO: County Manager Office
ERP: Enterprise Resource Planning
ETO: Engineer-To-Order
IS: Information System
IT: Information Technology
KPI: Key Performance Indicator
MIT: Massachusetts Institute of Technology
MOC: Matrix of Change
MTO: Make-To-Order
MTS: Make-to-Stock
MSF: Microsoft Solution Framework
OF: Order Fulfillment
PLP: Participation Level Point
R&D: Research and Development
SC: Supply Chain
SCC: Supply Chain Council
SCLNet: Seminole County Integrated Network
SCOR: Supply Chain Operations Reference Model
SCM: Supply Chain Management
SCPDD: Seminole County Planning and Development Department
SD: System Dynamics
SIM: Society for Information Management
SPK: Stake/Power/Knowledge Framework
UCF: University of Central Florida
UPS: United Parcel Service
VSM: Value Stream Mapping
WIP: Work in Process
CHAPTER ONE: INTRODUCTION

Supply Chain Management (SCM) is a proven business strategy that has gained wide acceptance since the mid 1990's due to increasing customer demands for quality, efficient delivery, and speed. Increased speeds of communication coupled with cost reduction and more interdependent supplier, provider, and customer relationships have accelerated the integration of supply chains on a wide spread basis.

Supply chains can exist in both manufacturing and service organizations, and they are principally concerned with the flow of products/services and information between supply chain member organizations (procurement of materials, transformation of materials into finished product/service, and distribution of that product/service to end customers).

Today, many companies are not considered independent entities, but as individual parts of multi-company and multi-echelon networks, i.e., supply chains, delivering goods and services to the final customer (Christopher, 1992; Lambert and Cooper, 2000). SCM literature proposes that integrated control of these multi-company networks can provide significant benefits (e.g., Cooper et al., 1997; Burgess, 1998; De Leeuw et al., 1999; Mason-Jones and Towill, 1999; Norek and Pohlen, 2001). The utilization of IT, in turn, is considered an imperative requirement for managing these networks, and has been associated with significant supply chain efficiency improvements (e.g., Lee and Billington, 1992; White and Pearson, 2001). The use of IT is considered a prerequisite for the effective control of today's complex supply chains.

Auramo et al. (2005) explain that, based on the empirical studies, five propositions are presented on the use and benefits of IT. First, successful companies have developed focused e-business solutions for improving customer service elements that are most important in their business. Second, improved efficiency allows company personnel to focus more on critical business activities. Third, the use of e-business solutions improves information quality. Fourth, e-business solutions support planning collaboration, and improved agility of the supply network. Finally, to gain strategic benefits, the use of IT has to be coupled with process re-design.
Companies must not assume that investment in IT is, by itself, a solution to their supply chain challenges, but how they manage the IT solution for a successful implementation and how involved the stakeholders are in this process. Successful supply chain projects have four things in common: the right leadership, the right focus, the right approach, and the effective communication of key performance indicators (KPIs) to all stakeholders engaged in the project (Favilla and Fearne, 2005).

In the last decades of the 20th century, the word "stakeholder" has become more commonly used to mean a person or an organization that has a legitimate interest in a project or entity. Stakeholders are defined as a party who affects, or can be affected by, the organization's actions. The stakeholder concept was developed and championed by R. Edward Freeman in the 1980s. It has gained wide acceptance in business practice and in theorizing relating to strategic management, corporate governance, and business purpose. Stakeholders are able to define the value in an organization by trying to maximize joint outcomes.

The stakeholders engaged in a project can be:

- People who will be affected by an endeavor and can influence it but who are not directly involved with doing the work.
- People who are (or might be) affected by any action taken by an organization or group. Any group or individual who can affect or who is affected by achievement of a group's objectives.
- An individual or group with an interest in a group's or an organization's success in delivering intended results and in maintaining the viability of the group or the organization's product and/or service.
- Any organization, governmental entity, or individual that has a stake in or may be impacted by a given approach to environmental regulation, pollution prevention, energy conservation, etc.
- A participant in a community mobilization effort, representing a particular segment of society.

Table 1 – Stakeholders’ Classification

<table>
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<th>Stakeholder 1</th>
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<th>Influences</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>X</td>
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</tbody>
</table>
The aim of this dissertation is to develop a value mapping framework to manage IT projects to improve supply chain performance with the involvement of stakeholders. Through this new framework, these IT projects will be able to bring the supply chain from a current state of “As is” to a future, more efficient, “To be” state; capturing the existing and desired states of the proposed changes that are aligned with the goals and objectives of the organization.

This chapter introduces and presents an overview of this research work. Various concepts from different fields have been reviewed and presented in order to clearly present the objectives of this research work. These different concepts are introduced and discussed in this chapter and finally the thesis outline is described.

Supply Chain Management and IT Functions

The evolution of supply chain systems has not been linear over time. Various concepts and theories have been formulated to optimize supply chain systems to higher degrees of performance. The goals of supply chain systems are multidimensional and include cost minimization, increased levels of service, improved communication among partner companies, and increased flexibility in terms of delivery and response (Lancioni et al., 2000).

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request (Chopra and Meindl, 2004). A supply chain is dynamic and involves the constant flow of information, products/services, and funds between different stages. A dynamically configured supply chain has the advantage of delivering more orders in which several objectives are simultaneously satisfied (Emerson and Piramuthu, 2004). For instance, in the case of the Wal-Mart Supply Chain, Wal-Mart provides the product, as well as pricing and availability information, to the customer. The customer transfers funds to Wal-Mart. Wal-Mart conveys point-of-sales data as well as replenishment orders to the warehouse or distributor, who transfers the replenishment order via trucks back to the store. Wal-Mart transfers funds to the distributor after the replenishment. The distributor also provides pricing information and sends delivery schedules to Wal-Mart (Figure 1). Similar information, material, and fund flows take place across the entire supply chain.
SCM is the combination of art and science that goes into improving the way a company finds the components that it needs to make a product/service, manufacture that product/service, and deliver it to customers. SCM and other terms, such as network sourcing, supply pipeline management, value chain management, and value stream management have become subjects of increasing interest in recent years, to academics, consultants, and business management (Saunders, 1998).

Supply chain deals with the control of material, services, information flows, the structural and infrastructural processes relating to the transformation of the materials/information into value added products/services, and the delivery of the finished products/services through appropriate channels to customers and markets so as to maximize customer value and satisfaction (Narasimhan, 2001). It seeks to enhance competitive performance by closely integrating the internal function within the company (i.e. marketing, product design and development, manufacturing) and effectively linking them with the external operations of suppliers, customers, and other channel members.

SCM solutions have been a topic of research since early 1950’s. The classical way of managing a supply chain was to observe and analyze the sales, demand and inventory values at the end of a certain pre-defined time, and fill the required gap in it. This methodology was based on the assumption that the supply
and demand would remain linear and no drastic fluctuation would occur. Above that, this methodology was
good for previous decades where the supplier-based market dominated the consumer-based market.

As time passed, competition started increasing, and this supply-based market got replaced by consumer-based market where there were plenty of suppliers to satisfy the consumer’s demand. These revolutionizing changes compelled corporations to improve their SCM in order to survive in this ever-changing market. Corporations began using computerized systems to manage their supply chains. Enterprise Resource Planning (ERP) solutions were widely accepted by companies in the 1990’s. In the late nineties, web-based technologies were introduced and the corporations started realizing the immense potential carried by these technologies. The extensive increase of IS in such a short span of time has changed the entire perspective behind managing a supply chain. Companies are equipped with tools to monitor the behavior of their supply chains in real time, thanks to the advancement of IT.

IT is revolutionizing the scope and scale of e-supply chain infrastructures. Online data exchange is transforming business practices, allowing managers to capture and track complex data more effectively. Orders and various products related to that order can easily be traced. It also is possible to exchange information among entities within the value chain, thus greatly improving customer-provider relationships.

It is important that systems be designed to enhance open and rapid communication and sharing of information across the supply chain and within the organization. Intelligent application of IT also can eliminate redundant data entry, provide real-time status information, and help organizations move past a myopic view of their processes to view themselves within the context of larger missions and goals.

The use of IT is considered a prerequisite for the effective control of today’s complex supply chains. Although it is commonly acknowledged that IT is an essential ingredient in managing logistics operations in networks, and will increase over time, empirical evidence of the specific benefits of IT in SCM are less clear (Auramo et al., 2005).

Elaborating on the commonly viewed functional roles of IT in SCM, the following classification can be adopted (Figure 2).
The most typical role of IT in SCM is reducing the resistance in transactions between supply chain partners through cost-effective information flow (Cross, 2000). Conversely, IT is more importantly viewed to have a role in supporting the collaboration and coordination of supply chains through information sharing (Lee and Whang, 1997). Third, IT can be used for decision support. In this instance the analytical power of computers is used to provide assistance to managerial decisions. (Simchi-Levi et al., 2003; and Swaminathan and Tayur, 2003). IT in general, and IT in SCM, are argued to enable great opportunities: ranging from direct operational benefits to the creation of strategic advantage (Auramo et al., 2005). IT is able to change industry structures and rules of competition, create competitive advantage, and create new business opportunities. In the logistics/supply chain context, Bowersox and Daugherty (1995) outlined that IT is key in supporting companies creating strategic advantage by enabling centralized strategic planning with day-to-day centralized operations.

Benefits of IT in SCM are many and vary in the context of their implementation. Moreover, as the use of IT is closely related to process changes, most of the benefits are overlapping and interlinked. Then, it is hard to specify the origin of benefit very explicitly. Notably, strategic benefits are only achievable when the introduction of IT is coupled with process re-design.

Organizations that have been able to successfully integrate technology and business strategy have created significant business return. IT has become an important enabler of business strategies in any supply chain on such areas of competitive differentiation, quality improvements, and process automation and improvement.

Piccoli and Ives (2005) present the characteristics of an IT project. The literature identifies three response-lag drivers in this category: visibility, uniqueness, and complexity:
1. Visibility represents the extent to which the IT at the core of the initiative is readily observable by competitors. The visibility dimension can be conceptualized as a continuum spanning from internal systems (i.e., Harrah's Entertainment's engine for data analysis) to public systems (i.e., Lands' End Live: Web-based chat with customer service agents).

2. Uniqueness is defined here as a continuum. On one side of the spectrum are self-contained, off-the-shelf IT that are standardized and need minimal integration or customization to a given environment (i.e., a new e-mail system). At the opposite end of the spectrum are custom developed applications that are not available for acquisition in the open market and/or require extensive integration and customization (i.e., Amazon.com's collaborative filtering engine for suggestive selling). When uniqueness is low, propagating institutions such as consultants and service firms can be engaged by any firm seeking to deploy the standard functionality. Conversely, when uniqueness is high, no standardized solution is available on the open market and a customized solution needs to be developed, a typically more costly and time consuming proposition.

3. Complexity contributes to making it difficult for organizations to assimilate and effectively use technology. As a consequence, while organizations have different endowments of resources and skills that allow them to be more or less effective with any one technology, some technologies objectively offer more obstacles than others and, therefore, have the potential to produce substantially different response lag to imitation. Simple technologies, such as a static website, can quickly be designed and developed by all competitors, while more complex ones, such as SCM, often require substantial investments and time in their design and development, thus creating much higher response lag.

The current way of managing IT in supply chains does not work for the new business realities of the Internet era, where knowledge and the intangible benefits of information and technology are the most important assets. “Our primary assets, which are our software and our software development skills, do not show on the balance sheet at all,” says Bill Gates (The Economist, 1999). The disconnections between IT expenditures and the firms’ organizational performance could be attributed to an economic transition from an era of competitive advantage based in information to another one based on information value creation (Malhotra, 2000). In this new world of business, success or failure for most enterprises depend on their
ability to continually question and adapt their people of the way things are done. Such reality checks the company’s ways of doing business which is necessary to continue with the sustained dynamic and radical changes in the business environment.

There are many complexities that must be understood in order to improve supply chains. In order to understand a supply chain and its complexities, it is necessary to capture and model its configuration. Then, it is possible to know its level of performance and generate potential solutions, through process benchmarking and gap analysis. These potential solutions usually involve IT as an important factor. The use of IT is considered a prerequisite for the effective control of today’s complex supply chains. IT could be defined as an important factor when seeking to reach higher levels of performance.

Problem Statement

The use of IT is considered a prerequisite for the effective control of today’s complex supply chains. However, IT implementation cannot simply be delegated away as technology infuses into every point of the value chain. Many IT projects have failed to implement because the business and the IT strategies are not aligned. The alignment of business and IT strategies has been utilized by organizations to create and improve efficiencies, reduce costs, create barriers to entry, improve customer and buyer/supplier relationships, and create new products and business solutions (Weiss and Anderson, 2004). Companies spent almost $2 trillion worldwide every year on IT projects, with over $600 billion spent in the U.S. alone (Pisello, 2003). Therefore, one of the major challenges of the new information economy is how to efficiently implement IT projects to identify the business value of the investment to improve supply chains. At the same time, this business value has been mistaken. We do not get to define the value potentially brought by a solution. In order to get this value, stakeholders must be brought together in a joint process to define potential solutions when seeking higher level of performance.
Objectives of this Research

The objective of this research is to develop a value mapping framework to manage IT projects in order to improve supply chains performance with the involvement of stakeholders. The successful design, execution, and completion of these IT projects are important for the effective improvement of the supply chain. This unique framework will:

- Have components that help define the supply chain, measure the size of the issues, identify necessary changes in the metrics to improve performance, measure the organizational consequences of these changes, and develop and follow a plan to implement IT projects to achieve the new goals of performance.
- Make the successful implementation of an IT project bring the supply chain from a current state “As is” to a future state “To be”; capturing the existing and desired states of the proposed changes which are aligned with the objectives and goals of the organization.
- Take into consideration a unique component “the inclusion of the stakeholders at different stages”. This framework includes the group of stakeholders that will define the future “To be” state. In addition, the framework identifies the value creation of the “To be” system as seen by the stakeholders.

Why A New Framework

Changes may take place in order to improve supply chains. These changes usually require the implementation of an IT project. Therefore, the successful design, execution, and completion of these IT projects are important for the supply chain. SCM is now a strategic function addressed at the highest levels of the organization in concert with multiple stakeholders on both the supplier and customer side of the table.

Organizations should deal with three factors when managing IT projects to improve supply chains: the strategic factor, the engineering economics factor, and the effective involvement of stakeholders. The strategic factor is focused on using IT technology to maintain a competitive advantage or just to guarantee
the survival of the firm. The engineering economics factor of an IT project is driven for the need to increase profitability and productivity. The effective involvement of stakeholders is oriented by its value created to achieve higher level of performance. However, in many cases, the implementation of an IT project is considering only one of these factors. In some cases, an IT project is approved only on the basis that it produces sufficient returns to justify its costs. In other cases, IT projects are embraced for strategic reasons without considering the stakeholders, because the managers of the firm think it is necessary to continue with technology or the moves of the competition.

IT implementations cannot simply be delegated away as technology infuses into every point of the value chain. SCM is now a strategic function addressed at the highest levels of the organization in concert with multiple stakeholders on both the supplier and customer side of the table. The inclusion of the stakeholders at different stages of the process must be required. Stakeholders must be taken into consideration in order to define the future “To be” state on any improvement. Effective stakeholder involvement in the representation, design, and management of IT projects is an essential part of decision-making. The emphasis on "effective" refers to the fact that not all stakeholder involvement results in improved decision-making.

This research proposes a framework that will enable organizations to manage change in supply chains when implementing IT projects with the involvement of stakeholders. This approach will re-engineer and improve supply chains. In addition, the framework identifies the value creation of the “To be” system as seen by the stakeholders.

**Contributions of this Research**

The main contribution of this research is the introduction of a unique value mapping framework that includes the incorporation of a new sight, the stakeholders, when analyzing changes that involve IT projects to improve supply chains.

This framework identifies the group of stakeholders to be taken into consideration in order to define the future “To be” state. In addition, the framework identifies the value creation of the “To be” system as seen by the stakeholders.
This research also provides the following contributions:

1) Development of an approach for supply chain modeling when managing change involving stakeholders in the execution of IT projects.

2) Assessment of stakeholder participation needs in a supply chain analysis. This includes:
   - Direct and indirect tools for stakeholder value assessment
   - Conversion of stakeholder statements into supply chain representation components
   - Supply chain representation as a basis for stakeholder dialogue and negotiation with the use of Causal loop Diagrams
   - Stakeholder negotiated performance metric (model output) design
   - Transparent mapping of uncertainties on linkages and components
   - Working group formation and task delegation facilitation
   - Generically applicable supply chain models that can be used for similar systems with minor modifications

3) Stakeholder value mapping with their full participation in the process. This allows supply chain specialists to design what kinds of outputs are necessary to make the decisions.

4) Another minor, but helpful, contribution of this dissertation is the Stake/Power/Knowledge (SPK) framework to assess at what level individually identified stakeholders need to be involved in the process in order to improve a decision-making process. Given the limitations on how many stakeholders can physically participate in a joint process, it is necessary to assess at what levels individual stakeholders or their representatives should be involved. The SPK framework provides a rough mental guideline for this process. Stakeholders can be assessed on their stake, power, and knowledge (expert or local) on the decision. Stakeholders with high stakes in the collaborative process, even if they lack any power or knowledge can add legitimacy and community acceptance. Stakeholders with high knowledge can add to the scientific/technical/contextual validity of the analysis, while stakeholders with power (that is mandate or resources) can increase the viability of the process. Stakeholder with lower stake, power, and knowledge can be involved through feedback systems, information websites, media releases and outreach campaigns.
Dissertation Outline

This research is presented in seven chapters. Chapter One provides the introduction to this dissertation and the motivation behind this work. Chapter Two discusses the Literature Review in the field of SCM and IT projects’ implementations, Change Management frameworks, and Stakeholders’ value; and reveals the existing gap in these fields. Chapter Three discusses the research methodology developed to fulfill the existing gap, the general overview of the proposed framework, and the propositions used in the development of the proposed framework. Chapter Four explains step-by-step the new framework and introduces the case study to be used to test the proposed framework. Chapter Five presents the Seminole County Integrated Network (SCI.Net) project case study used and its results. Chapter Six presents the survey development and analysis used to validate the proposed framework. Chapter Seven includes the conclusions and recommendations for future research work.
CHAPTER TWO: LITERATURE REVIEW

The scope of SCM lies in its capacity to encompass various business functions including but not limited to logistics, inventory management, material and information flow, planning and control, IT, and various other functions directly associated with enhancement of overall value for any business.

Successful SCM depends on how well an organization performs internal and external communications with trading partners, executes the logistics component, and understands/monitors related costs of conducting its business. The use of IT is considered a prerequisite for the effective control of today’s complex supply chains. Increased communication technology has redefined how businesses work together, raised customer expectations, and placed new demands on supply chain performance.

IT is rapidly being infused into financial, retail, manufacturing, service, entertainment, transportation, and other industries. IT components with proven and rapid return-on-investment are favored to support critical supply chain processes such as leaner manufacturing processes, consumer-driven supply chains, and customer responsiveness. IT facilitates the creation of value. However, the creation of value is defined by the different groups of stakeholders. Therefore, stakeholders must be integrated into this process of change management that uses IT as the enabler.

This literature review is divided into three sections due to the nature of our problem statement. The first section reviews the different methods for SCM and its relation with IT. The second section reviews the literature for Change Management frameworks. The third section reviews the literature for Stakeholders value. This chapter concludes with a summary of the literature review findings and the existent literature gap that are the foundation of this research work.

Supply Chain Management and its relation with the Information Technology

A supply chain is a collection of several independent enterprises that partner together to achieve specific goals by complementing each other. Each enterprise in the supply chain has several elements that constitute the enterprise (i.e. organization structure, process, information, resources, etc). Each enterprise in
the supply chain, individually, manages these elements in addition to their flow, their interdependencies, and their complex interactions (Fayez, 2005).

The goal of SCM is to view the chain as a total system and to fine-tune the decisions about operating various components (companies, functions, and activities) in ways which will produce the most desirable overall system performance in the long run.

SCM has received attention since the early 1980’s, yet conceptually the management of a supply chain is not particularly well-understood, and many authors have highlighted the necessity of clear definitional constructs and conceptual frameworks on SCM (Saunders, 1998). The specific development of a coherent SCM discipline requires that advancement be made in the development of theoretical models to inform our understanding of supply chain phenomena.

During the past several years, the concept of SCM has been maturing both in terms of theory and practice. Terms such as integrated SCM, supply chain optimization, and supply chain collaboration have become the focus and the goal of many organizations in the United States and around the world. Global SCM has also emerged as a key competitive strategy.

SCM, which is also emphasized by other terms such as value chain management, demand chain management, and network sourcing, has gained more and more attention from researchers, academic, and business consultants due to its profound influence on the overall corporate performance. Extensive research is being carried out in the areas of logistics, transportation, information sharing, and other areas which contribute to a higher level of optimization of any supply chain.

Huang et al. (2005) state that in today’s rapidly changing global economy, some companies are able to change rapidly to adapt and thrive in the increasingly uncertain world of the early 21st century. They can be recognized by their ability to anticipate and understand changes in the market, to identify new opportunities, to deliver new customer services, and to adapt their businesses rapidly to meet and exceed their customer’s requirements. Over the past decade, a new term, SCM has been coined to a management approach to deliver this required agility to change while maintaining cost efficiency.
Rabelo (2002) states that there is not yet any concrete supply chain solutions in the market. In
despite of the claim of business consultants that the dominant design for integrated supply chain solutions is
already developed, the fact is that the dominant design is still far from available.

Performance measures also play a key role in the SCM field. Gunasekaran et al. (2004) present a
framework for supply chain performance measures and metrics. The metrics were classified at strategic,
tactical, and operational levels to clarify the appropriate level of management authority and responsibility
for performance. Measures are grouped in cells at the intersection of the supply chain activity and planning
level.

SCM involves the mapping of the supply chain. Jones and Womack (2003) propose a new
methodology for facility-level mapping for a supply chain. In their work, they apply this model to observe
the information and material flows as they occur, summarizing them visually, and then envisioning a future
state with a higher level of performance.

A well-documented method used to define and improve supply chains is the Supply Chain
Operation Reference (SCOR) Model. SCOR was introduced by the Supply Chain Council (SCC), a non-
profit and global organization in 1997. The SCC was organized in 1996 and initially included 69
practitioner companies meeting in an informal consortium. Today, the SCC has over 700 members around
the world.

The SCOR model has been developed to describe the business activities associated with all phases
of satisfying a customer’s demand. The model itself contains several sections and is organized around the
five primary management processes of Plan, Source, Make, Deliver, and Return (Figure 2.1). By describing
supply chains using these process building blocks, the model can be used to describe supply chains that are
very simple or very complex using a common set of definitions. The model has been able to successfully
describe and provide a basis for supply chain improvement for global projects as well as site-specific
projects.

The SCOR model spans over all customer interactions (order entry through paid invoice), all
physical material transactions (supplier’s supplier to customer’s customer, including equipment, supplies,
spare parts, bulk product, software, etc.), and all market interactions (from the understanding of aggregate
demand to the fulfillment of each order). It does not attempt to describe every business process or activity. Specifically, the model does not address: sales and marketing (demand generation), product development, research and development, and some elements of post-delivery customer support.

As shown in Figure 3, the model is designed and maintained to support supply chains of various complexities across multiple industries. The model is silent in the areas of human resources, training, and quality assurance among others.

The SCOR model includes three levels of process detail. In practice, level 1 defines the number of supply chains and how their performance is measured. Level 2 defines the configuration of planning and execution processes in material flow, using standard categories like stock, to-order, and engineering-to-order. Level 3 defines the business process used to transact sales orders, purchase orders, work orders, replenishment orders, return authorizations, and forecasts.

The Model is hierarchical with three levels (Figure 4). P1.1 is a notation that indicates a third level process element. In this case, it is a Plan (P – Level 1) element that is concerned with supply chain planning (1 – Level 2) and is specific to identifying, prioritizing, and aggregating supply chain requirements (.1 – Level 3).
Besides the five basic management processes (Plan, Source, Make, Deliver, and Return) that provide the organizational structure of the SCOR model, it is useful to distinguish among the three process types in the model: planning, execution, and enable (formerly infrastructure). A planning element is a process that aligns expected resources to meet expected demand requirements. Planning processes balance...
aggregated demand across a consistent planning horizon. Planning processes generally occur at regular intervals and can contribute to supply chain response time. Execution processes are triggered by planned or actual demand that changes the state of products. They include scheduling and sequencing, transforming materials and services, and moving product. Enable processes prepare, maintain, and manage information or relationships upon which planning and execution processes rely.

SCOR is a reference model that integrates three concepts in a single framework. These are business process reengineering, benchmarking, and analysis of best practices (Figure 5). This cross-functional framework makes SCOR unique and effective for a complex management process as supply chains. The business process reengineering function captures the current or the “As is” status of the supply chain processes. The benchmarking will quantify the operational performance of similar companies’ supply chain, identify the best operating one, and establish its values as a target for the supply chain under consideration. The best practices analysis will determine the best means that will drive the “As is” supply chain to the desired target performance, the “To be” supply chain. The best means can include a management practice, a software solution, a new business model, new technology, etc.

![Figure 5 – SCOR Cross-Functional Frameworks (Fayez, 2005)](image-url)
Companies using the SCOR model are reliable and predictable with respect to project-to-project duration, cost, and benefits. SCOR projects have been carried out with such base metrics as stock price improvement, purchase of technology through cash-flow improvements, cost reduction, and ERP optimization.

Deo (2005) discusses SCOR and its applicability to an IT organization. His point is to prove if it makes sense to develop a SCOR model for an IT system. This framework includes planning and organizing, acquisition and implementation, delivery and support, and monitoring. This approach spans over common business units from an IT perspective: customers, management, engineering, operations, purchasing, and planning and logistics. There are still some SCOR objectives that have not been fulfilled yet, such as inventory risk, communication among partners, and inter-company supply chain.

Kordysh (2005) uses SCOR to develop business cases for supply chain in IT initiatives. His research is focused on using the SCOR model to improve the reliability of a business case for IT-enable supply chain initiatives.

The literature review reveals that the SCOR methodology does not have any established framework to manage IT project implementations. The use of IT is considered a prerequisite for the effective control of today’s complex supply chains. Increased communication technology has redefined how businesses work together, raised customer expectations, and placed new demands on supply chain performance.

IT components with proven and rapid return-on-investment are favored to support critical supply chain processes. IT facilitates the creation of value. But, how is SCM associated with IT? how well could they work together? The literature reveals that organizations executing IT projects lack a model to manage its implementation to improve supply chains. The following literature review will corroborate the mention above.

Supply chains with IT systems are distinguished from traditional supply chains by their near total reliance on a set of information technologies to organize and manage. Laudon and Laudon (2004) explain that SCM systems are part of the four major systems that help define IT in a supply chain. These SCM
systems seek to automate the relationship between suppliers and the firm to optimize the planning, sourcing, manufacturing, and delivering of product and services.

In an IT project, any piece of information is required to support key business decisions available at anytime and anywhere in the organization. Supply chains with a well integrated IT system sense and respond to their environments far more rapidly than traditional supply chain; giving them more flexibility to survive in turbulent times (Laudon and Laudon, 2004).

IT project investments are a significant fraction of the budget of corporations. IT accounts for about 50% of the total business expenditures on capital equipment in the United States (Laudon and Laudon, 2004). IT budget can be a significant fraction of sales revenues from 3.3% of sales for a manufacturing company to 8.4% for a telecommunication company (Raffoul, 2003). Companies like American Express, Merrill Lynch, and Procter and Gambler spend billions of dollars on hundreds of IT projects running simultaneously.

Intensive use of IT in business firms since the mid-1990’s, coupled with equally significant organizational redesign, has created the conditions for a new phenomenon in industrial society, the fully IT system (Laudon and Laudon, 2004). A supply chain with a fully integrated IT system is one where nearly all the organization’s significant business relationships with customer, suppliers, and employees are digitally enabled and mediated. One of the main characteristics of an IT project is that the core business processes are accomplished through digital networks spanning the entire organization or linking multiple organizations. These business processes refer to the unique manner in which work is organized, coordinated, and focused to produce a valuable product or service. Also, key corporate assets are managed through digital means. These key corporate assets include intellectual property, core competencies, and financial and human assets.

Piccoli and Ives (2005) present the characteristics of an IT project. In carrying out this study, they examined the interdisciplinary literature on strategic IS. Using a structured methodology, they reviewed the titles and abstracts of 648 articles drawn from IS, strategic management, and marketing literature. They then examined and individually coded a relevant subset of 117 articles. IT differs with respect to their intrinsic characteristics and, “ceteris paribus”, their potential to produce response lag. Roche (1992) and
others state that this is due to the rapid changes and advancements which are being made in the IT arena and that long term IT plans cannot adjust quickly enough to take advantage of these advancements (Feldman, 1991; Jarvenpaa and Ives, 1992).

Curry and Ferguson (2000) explore that the strategy IT planning typically refers to the identification and implementation of the technology required supporting the business mission, goals, and strategies. With the role of IT elevated to a strategic tool for obtaining competitive advantage and achieving improved performance, the need for formal strategic IT planning becomes a critical issue (Palvia and Palvia, 1996). This means that the existing management methods and practices must be enhanced to incorporate the strategic technical planning process (Gottschalk 1999; Roche, 1992; and Yip, 1992). This necessitates that technical and business managers acknowledge technology as a critical resource and actively plan and manage IT on an on-going basis.

Venable (2005) states in his article “Developing a Global Footprint” that the Michelin corporation was using the Global Supply Chain Breakthrough Initiative to improve IT efficiencies. The first goal of this initiative was to clarify the responsibilities between entities. This led to the creation of the supply chain group service. This new supply chain group is a worldwide service to clarify the different ingredients from the upstream supply chain and the role of logistics and decision-making.

Dommelly and Lightfoot (1996) explore the relationship between an organization’s strategic management process and its use of information and communication technologies. The purpose of this study was to identify the characteristics of IT which are used during various phases of the strategic management process and to determine the sufficiency of IT in meeting the needs of strategic management activities.

Hitt and Brynjolfsson (1996) present three different measures of IT value. They separated the issue of IT value into three dimensions: the effect of IT on productivity, the effect of IT on business profitability, and the effect of IT on consumer surplus. Also, they stated that by identifying best practices either in terms of specific characteristics or as overall strategies of specific firm managers can be provided with the information they need to fully exploit the value of IT.

Carr and Smeltzer (2002) study the relationship between IT use and buyer-supplier relationship. This is an exploratory analysis of buying firm’s perspective. This research indicates the importance of
mapping the IT use and buyer-supplier relationship, and how IT can successfully help this relationship. For IT in general, Bakos and Brynjolfsson (1993) propose that IT deployment in supply chains leads to closer buyer-supplier relationships.

The efficiency and effectiveness of individual workers as well as groups can be improved through the enhanced connectivity that technology offers. Microsoft launched in 2002 a methodology to manage IT projects named “Microsoft Solution Framework” (MSF). The applications of IT in the service of business seem nearly limitless; so with this new solution, productivity can be improved through streamlining of processes made possible by technology. Growth opportunities are multiplied by access to new markets, new partners, and new business models that technology makes possible.

Chae et al. (2005) conclude that the effect of IT is not predetermined by its technology capabilities. Rather, its effect on inter-organizational collaboration is the emergent properties of the interplay between IT and existing relationship between partners. Organizations and managers form the mistaken belief that IT investment will automatically bring supply chain integration, better collaboration with partners, and ultimately higher organizational performance. There have been an increasing number of studies of IT effect on supply chain and inter-organizational relationships (Bakos and Brynjolfsson, 1993; Carr and Smeltzer, 2002; Grover et al. 2002; and Vijayasarathy and Robey, 1997). While these studies might have focused on different types of IT, most of them reported the positive effects of IT on supply chain/inter-organizational collaboration.

Supply chains, with successful IT projects’ implementation, have the capabilities to go far beyond traditional strategic systems for taking advantage of digital links with other organizations. A powerful business-level strategy available to IT involves linking the value chains of vendors and suppliers to the firm’s value chain (Laudon and Laudon, 2004).

Organizations that have been able to successfully integrate technology and business strategy have created significant business returns. IT has become an important enabler of business strategies in different areas. Weiss and Anderson (2004) present a field study performed in 15 companies to characterize them as operational, strategic resource, or strategic weapon profiles based on level of business/IT strategy
alignment. Their results indicate that strategic alignment occurs most frequently across industries and organizations at functional and team levels, followed by the business unit, and enterprise level.

IT is believed to be capable of transforming the nature of organizations and has also been identified as the driving force for organizational change and learning, new business models and the disruption of established incumbents (Hilgers et al., 2004). As a result, despite the hype and over-optimism, many organizations rush enthusiastically and aggressively into new technologies, sometimes without a prior understanding of the risk and benefits, or even the usefulness of the technology to the organization.

Aligning IT and business strategies creates new roles for IT and business leaders and staff. Four critical roles in this arena include: Political and cultural negotiators, business problem-solvers, project sellers, and interpersonal and cross-functional communication (Weiss and Anderson, 2004). The strategic alignment of business and IT strategies is not only critical to organizational effectiveness and efficient resource utilization, but alignment must be present before IT can be chosen and diffused to achieve maximum IT effectiveness and to support business strategies (Huff, 1993).

This body of knowledge reveals how organizations have been able to apply SCM practices to improve their supply chains, overcoming issues, minimizing costs, and increasing flexibility. This body of knowledge also presents the importance of IT as an enabler. The use of IT is considered a prerequisite for the effective control of today’s complex supply chains. Increased communication technology has redefined how businesses work together, raised customer expectations, and placed new demands on supply chain performance.

Change Management

Change Management is the process, tools, and techniques to manage the people-side of change processes, to achieve the required outcomes, and to realize the change effectively within the individual change agent, the inner team, and the wider system (Nauheimer, 2005). There are a multitude of concepts on Change Management and it is very difficult to distil a common denominator from all the sources that are applying the phrase to their mental maps of organizational development. But obviously there is a tight connection with the concept of learning organizations. Only if organizations and individuals within
organizations learn, they will be able to master a positive change. In other words, change is the result from an organizational learning process that centers around the questions “In order to sustain and grow as an organization and as individuals within; what are the procedures, what is the know-how we need to maintain and where do we need to change?” “how can we manage a change that is in harmony with the values we hold as individuals and as organizations?” (Nauheimer, 2005)

There are different aspects to consider when managing change. These aspects are: Human, technical, social, imperative, and environmental (Nauheimer, 2005; Grover and Kettinger, 2002; Malhotra, 1998; Datapro and Rosser, 2002). The following literature review presents different approaches to manage change considering these aspects.

Grover and Kettinger (2002) introduce a seven-step framework for organizational change. The focus of the seven phases is on the technical side of Change Management. This framework includes strategy linkage, change planning, process pathology, social re-design, technical re-design, process re-generation, and continuous improvement.

Malhotra (1998) introduces a framework for organizational change. The focus of this framework is on the social aspects of Change Management. This framework includes organizational impetus for business process re-design, process change, selection of change enablers, managing change implementation, and directions of organizational change.

Other authors address behavioral aspects of Change Management such as imperative aspects (positives elements and negatives elements); leaders who instigate and sustain the change; levers which are the tools for changed processes, people, technology, and environment; affected agents such as customers, suppliers, partners, etc.; and buoy which are the stabilizers for affected agents (Datapro and Rosser, 2002).

Earl et al. (2002), in their Lean Enterprise Value, mention the four generic strategy paradigms in Change Management. These are Engineering (reduced cycle time, order fulfillment (OF), operational problem with business process re-design as one part, cross-functional process aimed at operational optimization), Systems (costs/cycle reduction, underwriting/claims, business process re-design aimed at communication ties, cross-functional processes aimed at improving information flows), Bureaucratic (new product development, development/launch, process capability/strategy/value chain, Strategic Business
Unit), and Ecological (change mindset/mission, cultural orientation, establish new managerial mindset/strategic focus, entire organization).

This body of knowledge reveals a lack of supply chain models that include a Change Management approach. However, there is a methodology that can be used to prioritize changes, the Matrix of Change (MOC). MOC helps to characterize change management features as the feasibility of proposed changes, the preferred speed of execution, and the best sequence of changes. It works by identifying complementary and interfering work practices.

Brynjolfsson et al. (1997) present MOC as a way to capture connections between practices. It graphically displays both reinforcing and interfering organizational processes. Armed with this knowledge, a change agent can use intuitive principles to seek points of leverage and design a smoother transition. Once the broad outlines of the new system and the transition path have been charted, authority can more effectively be decentralized for local implementation and optimization.

MOC can help managers identify critical interactions among processes. In particular, this tool helps managers deal with issues such as how quickly change should proceed, the order in which changes should take place, whether to start at a new site, and whether the proposed systems are stable and coherent.

MOC is a tool which encourages a systematic approach to change management. This step by step system ensures that the salient points are addressed (MIT, 2003). MOC can help crystallize the change strategy in various different types of business situations. MOC is a visualization tool for capturing the existing and desired states of the proposed change, the complementary and opposing practices, and how best to proceed in the implementation of the change.

The MOC system consists of three matrices: (1) The horizontal matrix, representing the current organizational system; (2) The vertical matrix, representing the target (or proposed) organizational system; (3) The transition matrix, which bridges the other two.

MOC also provides a five-scale importance evaluation, giving stakeholders the opportunity to state the importance of the practices and processes (assets/activities) to their jobs under both existing and proposed systems. Figure 2.4 outlines the major parts of the MOC.
Brynjolfsson et al. (1997) present how MOC can be effective for change management, by helping management identify complementary and interfering practices and processes in the current business model, in the desired new model, and how they cooperate with a successful transition.

The benefits of MOC analysis is that it helps to identify how the existing and proposed business systems interact with each other, represented in the transition matrix (Brynjolfsson et al., 1997).

MOC presents a way to capture connections between practices. It graphically displays both reinforcing and interfering organizational processes. Armed with this knowledge, a change agent can use intuitive principles to seek points of leverage and design a smoother transition. Once the broad outlines of the new system and the transition path have been charted, authority can more effectively be decentralized for local implementation and optimization (Brynjolfsson et al., 1997).

MOC highlights interactions and complementary practices. An example of a collection of critical complements includes the use of flexible machinery, short production runs, and low inventories (Dudley and Lassarre, 1989; Milgrom and Roberts, 1988). Emphasizing one such practice increases returns to its complementary practices. Likewise, doing less of a given complement reduces returns to its operating dependents. In this example, more flexible machinery draws value from and adds value to shorter production runs. Trouble starts when change agents fail to identify feedback systems that push business units back toward old ways of doing business or when they miss synergy that would strengthen the new and better ways they wish to establish.
MOC functions as a four-step process. It provides a systematic means to judge those business practices that matter most. It uses process interactions to provide guidelines on the pace, sequence, feasibility, and location of change (Brynjolfsson et al., 1997).

In the early 1970’s, MacroMed, a producer of medical products, had enjoyed close to a 100% market share for "Betaplex," sterile adhesive compound mass-produced in its New Jersey facility. Between 1989 and 1991, however, the market share for Betaplex fell nine percentage points to about 48%, the fastest rate of decline in the previous 16 years. Competition in the form of private label and new Japanese products were proving more cost effective and responsive to consumer demand. Senior management at MacroMed became increasingly alarmed. MacroMed faced critical problems in their need for greater flexibility and modern manufacturing methods. They produced five varieties of Betaplex but had not invested in new equipment for years. Setup times for changeovers averaged almost 90 minutes and certain designated equipment could not switch product types at all. When certain products experienced low demand and others moved briskly, facilities utilization became very poor. MacroMed's union contract also enforced rigid and narrowly defined job categories, contributing to a lack of flexibility.

In an effort to coax more efficiency out of the equipment, MacroMed's managers put significant effort into formal modeling of operational details including equipment changeover times, capacity requirements and optimal queuing strategies. These complex interactions became apparent with the benefit of hindsight, but most were not explicitly considered in advance. Furthermore, it was unclear how to correct the problems given the significant investments that had already been made and the loss of forward momentum these difficulties were causing. MIT developed the MacroMed MOC to help organize and sort through these issues. The MOC process has evolved since its inception as a research project originating in the Leaders for Manufacturing Program and Center for Coordination Science at the MIT Sloan School of Management. Its development has therefore involved academic researchers, senior managers, and operators from the shop floor.

Another case study introduced by MIT is the United Parcel Service (UPS) MOC. They devote more specific attention to the transformational efforts successfully navigated at UPS in its competitive responses to Federal Express and the dramatic changes in Internet-enabled, package and document delivery
services worldwide. Their focus was leading them to ask how companies can capture both the new opportunities made available by the Internet, and the leveraging of existing assets to grow new markets at rates applicable to the economic needs of the large firm. While small firms can often most quickly respond to the opportunities for growth in emerging markets, it is the large firm that can grow these markets by leveraging their assets to bring scale-based economies to the market. But this is much easier said than done of course. Within large firms, it is often the resource allocation processes, both formal and informal, which make it difficult to focus adequate expertise and resources on small markets.

Investigation of the UPS MOC analysis suggests a preponderance of positive (complementary) interactions between the company's existing business system, and the staged rollout of services planned in its e-Logistics venture.

MOC has not been included as a part of supply chain improvement to manage change when implementing IT projects. Traditional technological change models are not particularly useful for helping the implementation of technologies such as groupware whose unprecedented, open-ended, and context-specific nature make it difficult to predefine the exact changes to be realized and to predict their likely organizational impact (Orlikowski and Hofman, 1997). There is a need to provide an alternative model of managing technological change, one that reflects the dynamic and variable nature of contemporary organizations and technologies, and which accommodates iterative experimentation, use, and learning over time.

Orlikowski and Hofman (1997) explain that traditional ways of thinking about technological change have their roots in Lewin’s (1952) three-stage change model of “unfreezing,” “change,” and “refreezing” (Kwon and Zumud, 1997). According to this model, the organization prepares for change, implements the change, and then strives to regain stability as soon as possible. Such a model, which treats change as an event to be managed during a specified period (Pettigrew, 1997), may have been appropriate for organizations that were relatively stable, bounded, and whose functionality was sufficiently fixed to allow for detailed specification. Today however, given more turbulent, flexible, and uncertain organizational and environmental conditions, such a model is becoming less appropriate; hence, the discrepancy. MOC will, therefore, help managers deal with issues such as how quickly change should
proceed, the order in which changes should take place, whether to start at a new site, and whether the proposed systems are stable and coherent.

There are factors that make an organization unique. Some of these factors are the culture of the organization (structures goals, constituencies, leadership styles, and tasks), its surrounded environment (the social and physical), its customers, its market, and its demand behaviors. This organization’s unique factors should be taken into consideration when managing changes.

**Stakeholder Value**

IT facilitates the creation of value within a supply chain. However, the creation of value is defined by the different groups of stakeholders within the supply chain. Therefore, stakeholders must be integrated into this process of change management that uses IT as the enabler.

As a result of the performance measurement revolution many organizations have numerous measures of performance. However, there are often significant weaknesses in the way that these measures are identified, integrated, communicated, and acted upon. First generation performance measurement frameworks have partly contributed to this as none of the approaches addresses the full range of criteria important for performance measurement success. Users of these frameworks often have become bound to their model, and they have lost sight of the measures that are most important for the organization and the associated stakeholders (Jack, 2006).

Business organizations should consistently meet the needs of its stakeholders (Green and Jack, 2004). Any sub-optimal position suggests that enhancement of business performance is possible in at least two areas: the effectiveness of the routes to achieving those stakeholder needs, and the efficiency of those routes. The support activities constitute an environment created by the integration and co-ordination of people, processes and places. The challenge is to create the support environment that consistently meets the needs of the business, and then to manage it through the optimum use of resources. An organization that has created, sustained and managed a business-aligned support environment is likely to have a competitive advantage over those that have not done so.
The race to identify opportunities for profitable new product development in large, multi-division organizations is often slowed by the hurdles of intra-team communication, opportunity assessment, customer needs understanding, technology and strategy alignment, and platform technology development. The lynchpin holding all of these elements together is a proper understanding and effective communication of stakeholder-based needs that drive each element (Product Genesis, 2004). Current research in product development techniques firmly embraces the notion of focusing the process on the customer, from business strategy development to prototype testing and needs analysis. The customer provides a point of balance in the development of new products, simultaneously validating market and design decisions, while empowering the satisfaction of unique customer needs, thus differentiating new products from their competitors.

Stakeholder analysis is a tool used to identify and enlist support from stakeholders. It provides a visual mean of identifying stakeholder support in order to develop an action plan for a specific project. Stakeholders, while encompassing customers in the traditional sense, also include people who will ultimately share in the product’s use and implementations, through the entire value chain for delivery of the product.

Stakeholders provide necessary feedback in effective phase-gate product development processes, allowing strategic business units to make key product line decisions on a go/no-go basis, thus optimizing investment in projects with higher probabilities of success. Maximizing the value out of the product development cycle requires judicious pruning of projects with a low-probability of success early in order to funnel capital and resources into projects that have the potential to return higher multiples on the initial investment.

Stakeholder analysis is the identification of a project's key players, an assessment of their interests, and the ways in which these interests affect project risks and viability. It is linked to both institutional appraisal and social analysis: drawing on the information deriving from these approaches, but also contributing to the combining of such data in a single framework. Stakeholder analysis contributes to project design through the logical framework, and by helping to identify appropriate forms of stakeholders’ participation (Social Development Department, 1995).
Different stakeholders must be identified. Stakeholders are people, groups, or institutions with interests in a project. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively (for example, those involuntarily resettled). Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholders includes both winners and losers, and those involved or excluded from decision-making processes (Pyzdek, 2003).

The Social Development Department (1995) explains more specifically the benefits of doing a stakeholder analysis. Organization will be able to:

1. Draw out the interests of stakeholders in relation to the problems which the project is seeking to address (at the identification stage) or the purpose of the project (once it has started).
2. Identify conflicts of interests between stakeholders.
3. Help to identify relations between stakeholders who can be built upon, and may enable "coalitions" of project sponsorship, ownership and cooperation.
4. Help to assess the appropriate type of participation by different stakeholders, at successive stages of the project cycle.

As organizations become more successful, the actions they take and the projects they run will affect more and more people. The more people they affect, the more likely it is that their actions will impact people who have power and influence over their projects. These people could be strong supporters of the organizations’ work or they could block it.

MindTools (2006) explains the benefits of using a stakeholder-based approach and those are:

1. Organizations can use the opinions of the most powerful stakeholders to shape their projects at an early stage. Not only does this make it more likely that they will support them, but their input can also improve the quality of their project.
2. Gaining support from powerful stakeholders can help organizations to win more resources. This makes it more likely that their projects will be successful.
3. By communicating with stakeholders early and frequently, they can ensure that they fully understand what organizations are doing and understand the benefits of their project. This means they can support the organizations actively when necessary.
4. Organizations can anticipate what people's reaction to their project may be, and build into their plan the actions that will win people's support.

Integration of value chain can be carried further by linking the customer’s value chain to the firm’s value chain in an efficient customer response system (Laudon and Laudon, 2004). Firms using systems to link with customers and suppliers can reduce their inventory costs while responding rapidly to customer demands.

Stakeholders can be categorized based on their influence/power, stake, and knowledge (Susskind and Larmer, 1999). The SPK framework provides a rough mental guideline for the stakeholder classification process. Stakeholders can be assessed on their stake, power, and knowledge (expert or local) on the decision. Stakeholders with high stakes in the collaborative process, even if they lack any power or knowledge can add legitimacy and community acceptance. Stakeholders with high knowledge can add to the scientific/technical/contextual validity of the analysis, while stakeholders with power (that is mandate or resources) can increase the viability of the process. Stakeholders with lower stake, power and knowledge can be involved through feedback.

- Decision-makers (High Stake, High Power, and Differing levels of knowledge) such as representatives that have a mandate to manage some part of the supply chain or a new project, as well as other organizations with mandates over other supply chain interconnected with target system, whose help is required in effectively managing the supply chain.
- Stakeholders with economic/political influence (High Stake, Medium to High Power, and Differing Levels of Knowledge) such as affected industries, private corporations, landowners, labor unions, and other groups with strong political influence.
- Knowledge-producers (Low Stake, Low Power, High Knowledge) such as scientists, engineers, and consultants working in academia, technical consulting firms, local, state and federal science agencies, and scientific and technical offices of government agencies that have a stake in the process, but have no specific mandate.
- Other affected Stakeholders (High Stake, Low Power, and Differing Levels of Knowledge) such as smaller groups of stakeholders directly or indirectly affected by SCM strategies or the proposed
project. These can include less organized neighborhood groups, local environmental groups, small business owners etc., depending on the type of supply chain or project that is initiated. These stakeholders are the one that will benefit from the output of the supply chain or final product.

Yang et al. (2006) explain that many companies excessively emphasize the IT, but they ignore the most important factor for implementing IS success should be people-centered.

Another important supply chain aspect that must be considered is decision-making under uncertainty. Stakeholders’ involvement research focuses heavily on the fact that the communication of uncertainties and risk are essential in the decision-making process, particularly to that manner the risks.

One of the main goals of complexity in a supply chain is uncertainty in its initial state, its short and long-term behavior, and its outputs over time. Uncertainty refers to a lack of realistic knowledge or understanding of the subject matter, and in this case to the inability to fully characterize the structure and behavior of a system now or in the future. In analyzing supply chains, uncertainty can apply to the current state of a supply chain and its components, as well as uncertainties on its future state and outcomes of changes to the supply chain. Essentially there are two categories of uncertainty: Reducible, and Irreducible.

Reducible uncertainty can be eliminated over time with extended observation, better tools, better measurement, etc., until it reaches a level when it can no longer be reduced. Irreducible uncertainties are inherent uncertainties due to the natural complexity of the subject matter. Different types of uncertainty can be distinguished as following (Walker, 2003):

- **Causal Uncertainty**: When experts draw causal links between different parts of the supply chain, or between a specific input and an output, there is an uncertainty in the causal link. This occurs because other, sometimes unknown, factors can influence the causal link. There is also the important difference between correlation and causation, in that an existing correlation does not necessarily indicate causation. Another source of causal uncertainty is the existence of feedback loops in a system.

- **Measurement Uncertainty**: When measuring physical or social phenomena there are two types of measurable uncertainty that can arise. The first is the reliability of the measurement, and the second is its validity. Reliability refers to the repeatability of the process of measurement, or its "precision", whereas validity refers to the consistency of the measurement with other sources of data obtained in
different ways, or its "accuracy". The acceptable imprecision and inaccuracy for different subject matters can be very different.

- Sampling Uncertainty: It is practically impossible to measure all parts of a given supply chain. Measurements are usually made for a limited sample, and generalized over the entire chain. Such generalization beyond the sample gives rise to sampling uncertainty. Making an inference from sample data to a conclusion about the entire supply chain creates the possibility that error will be introduced because the sample does not adequately represent that system.

- Future uncertainty: The future can unfold in unpredictable ways, and future developments can impact the external environment of a supply chain, or its internal structure in ways that cannot be anticipated. This type of uncertainty is probably one of the most challenging types of uncertainty, given that there is little control over the future. However, it is possible to anticipate a wide range of future developments and simulate the effect of particular decisions or developments in a supply chain across these potential futures.

We live in a world of systems driven by cause and effect. This relationship must be considered when understanding the value added by stakeholders. A supply chain is a dynamic system. Stakeholders can model dynamic systems as nodes representing system variables and connecting lines representing causal effects. The changing value of one variable can cause another to increase or decrease. Understanding how a system really works is the first step towards using, improving, automating or explaining it to others.

Causal Loop Diagrams (CLDs) are used to model dynamic systems. The CLD presents an easily understood conceptual model of how the system works (Guide et al., 2005). Facts about the system are used to parameterize the model. Each node becomes a variable that identifies a quantifiable property of the system that changes over time. Each line can have equations or rules that formalize how one variable affects another. A parameterized model has all the information needed to simulate the dynamic response of the system over a series of time increments.

A CLD is a diagram that aids in visualizing how interrelated variables affect one another. The diagram consists of a set of nodes representing the variables connected together. The relationships between
these variables, represented by arrows, can be labeled as positive or negative (Forrester, 1958, 1961, 1996; Roberts, 1978).

Forrester (1996) concludes that we live in a complex of nested feedback loops. Every action, every change in nature, is set within a network of feedback loops. Feedback loops are the structures within which all changes occur (Figure 7).

![Figure 7 – Causal Loop (Forrester, 1996)](image)

From simple systems we learn that cause and effect are closely related in time and space. Experiences that are understandable almost always drive home the lesson that the cause of a symptom is to be found nearby and immediately before the observed consequence. But in complex systems the cause of a symptom is usually far back in time and arises from an entirely different part of the system. To make matters even more misleading, complex systems usually present what appear to be causes that are close in time and space to the immediate problem, but those apparent causes are only coincidental symptoms.

From this body of knowledge, we can conclude that stakeholders can define and add value when seeking higher level of performance. Currently, stakeholders are not being taken into consideration when defining the value to achieve supply chain improvement. However, supply chain specialists must understand that not all stakeholders add value, therefore a stakeholder value mapping tool must be developed.
Existing Gap

Different areas were reviewed in this literature review. These areas are:

• Supply Chain Management. This review includes current methodologies for SCM, performance measures, and best practices. Also it explores current tools for decision-making approaches that are relevant for supply chain execution, planning, and management. The following questions were asked when reviewing this area:
  - What is the SCM evolution and what is its future?
  - What are the current practices used in SCM?
  - What are the current supply chain standards?
  - What are the supply chain methods?
  - What are the supply chain design tools?
  - What are the SC performance measures?

• Information Technology projects and its implementation. This review includes IT infrastructure, IT projects, IT and SCM, and IT projects implementation. The following questions were asked when reviewing this area:
  - IT infrastructure?
  - IT projects and its implementation?
  - What is the performance of SCM and its relation with IT project implementation?
  - What are the steps to effectively manage an IT project?

• Change Management. This review includes current methodologies for change management, and relationship between SCM and Change Management. The following questions were asked when reviewing this area:
  - What are the different methodologies to for Change Management?
  - What are the steps to manage changes?
  - What are the steps to effectively manage a SC?
  - What are the methods to manage changes in a SC?
  - What are the methods to implement Change Management in SC?
• Stakeholder. This review includes approach to identify, evaluate, and measure stakeholders. It also presents the potential value added to decision-making process. The following questions were asked when reviewing this area:
  - Who are the stakeholders?
  - How do you classify stakeholders?
  - What are the methods for adding value?
  - Value added by stakeholder and decision making?
  - How can stakeholder model a supply chain?

Table 2 summarized the reviewed research literature. The table shows the research questions and the equivalent research areas that are anticipated to answer these questions. The table allows seeing some of the current research gaps existing in the strategy and competition issues in managing supply chains.

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>SCM and IT</th>
<th>Change Management</th>
<th>Stakeholder Value</th>
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<tr>
<td>What is the SCM evolution and what is its future?</td>
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<td>What are the steps to effectively manage a SC?</td>
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<td>What are the current practices used in SCM?</td>
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<td>What are the current SC standards?</td>
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<td>How is the performance of SCM and its relation with IT projects’ implementation?</td>
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<td>What are the steps to effectively manage an IT project?</td>
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<td>What are the SC methods?</td>
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<td>What are the methods for adding value?</td>
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<td>What are the SC design tools?</td>
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<td>What are the steps to manage changes?</td>
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<td>What are the methods to manage changes in a SC?</td>
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<td>What are the methods to implement change management in a SC?</td>
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<td>What are the SC performance measures?</td>
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Finally, the different approaches were extracted to develop different supply chain alternatives for supply chain improvement (Figure 8).
1. Review SCM and analyze its contents
2. Review IT project implementation
3. Review Change Management and analyze its contents
4. Review Stakeholder Value

Extract different alternatives for supply chain improvement
Identify Existing Gap

Figure 8 – Literature review Steps
In this chapter several statements of recognized academic in the areas of SCM, Change Management, IT projects implementation, and Stakeholders were presented. These statements recognize a weakness in the current literature of SCM and Change Management. Therefore, if there is a weakness in these areas as whole, moreover there is weakness in the specific area of managing changes in the successful IT project implementation with the involvement of stakeholders. These statements are:

- There is minimum empirical work on the relationship between SCM and Change Management areas, methods, and their outcomes (Brynjolfsson et al., 1997; Earl et al., 2002)

- There is minimum empirical work on the relationship between SCM and IT project implementation, methods, and their outcomes (Deo, 2005; SCOR, 2006; Palvia and Palvia, 1996; Huang et al., 2005)

- There is minimum empirical work on the value added by stakeholders and the decision-making process when seeking to improve supply chain performance (Green and Jack, 2004; Jack, 2006; Nauheirmer, 2005)

There is an added value by stakeholders. However, this value has been ignored in the decision-making process when seeking to improve supply chains performance. Decision-makers are basing decision strategies on other factors such as cost and profit. There is a lack of strategic value when managing change while implementing IT projects to improve supply chains with the effective involvement of stakeholders. Decision-makers do not completely understand the potential benefit of the value added by stakeholders. Stakeholders not only affect the survival and development of enterprises, but determine the activities and effectiveness of enterprise’s technology innovation. Research results indicated that shareholder, senior manager, staff, user, competitor, government, and other stakeholders actually affect development and effectiveness of enterprise technology innovation, and the mode and degree of effects are different among them (Sheng and Tao, 2006). At different stages of the technology innovation process, the effect of stakeholder involvement also has different characteristics. Stakeholders have different benefit requests and different realization approaches to the technology innovation process. This dissertation work intends to understand how the value added by stakeholders affects the decision making process and which kind of roles stakeholders play in the innovation process.
Table 3 summarized the literature review gap. The table shows the researchers and the equivalent research areas that are anticipated to answer the questions of this research.

<table>
<thead>
<tr>
<th>Researchers</th>
<th>SCM and IT</th>
<th>Change management</th>
<th>Stakeholders Value</th>
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<tr>
<td>Brynjolfsson et al. (1997)</td>
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<td>Datapro and Rosser (2002)</td>
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<td>Deo (2005)</td>
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<td>Gunasekaran et al. (2004)</td>
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<td>Huang et al. (2005)</td>
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<td>Huff (1993)</td>
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<td>Jones and Womack (2003)</td>
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<td>Kwon and Zumud (1987)</td>
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<td>Kordysh (2005)</td>
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<td>Orlikowski and Hofman (1997)</td>
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<td>Palvia and Palvia (1996)</td>
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<td>Raffoul (2003)</td>
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<td>Piccoli and Ives (2005)</td>
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<td>Saunders (1998)</td>
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<td>Alvarado Moore (2008)</td>
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Summary

This literature review focuses on the classical as well as the latest research ideas in the field of SCM. The literature review includes models that have been created to help supply chains improving their way to success. However, this literature reveals a lack of SCM methodology when implementing successful IT projects as a solution for improvement. The literature review in the field of Change Management reveals that there is not a relationship with current frameworks and supply chain frameworks. The literature review in the field of stakeholder indicates the importance of incorporating stakeholders in any process to add value.

Most companies’ SCM practices are in the beginning stages of maturity despite the focus on improvements in recent years. However, many have plans to progress from functionally focused to internal integration in the near future. The results of this assessment reinforce the fact that supply chain innovation is not a fad. Companies are innovating and perfecting their SCM processes and enabling systems to become more efficient and reduce costs.
CHAPTER THREE: RESEARCH METHODOLOGY

This chapter presents the methodology used in this research work. The aim of this dissertation is to develop a value mapping framework involving stakeholders to improve supply chains performance when implementing IT projects. This framework will capture the existing and desired states of the proposed change, including the complementary and opposing practices, and how best to proceed in the implementation of the change with the effective involvement of stakeholders.

Research Methodology

The primary goal of this research methodology is to create validity in the research process, and therefore, in the research findings. The research methodology (Figure 9) presented in this chapter includes the research question, research unit of analysis, literature review and existing gap (presented in Chapter 2), development and test of the proposed framework, analysis of the case evidence, and the development and analysis of the survey; all of these to ensure the achievement of the research objectives.

![Figure 9 – Research Methodology](image)
Literature Review

The objective of this step is to determine the extent to which the existing body of knowledge can answer the research question. Specifically, this step focuses on understanding what is known and what is unknown. First, the research needed to identify the basic concepts that must be understood to do research in this area by identifying the important existing bodies of knowledge, the relevant authors and experts, as well as the relevant literature in the research area. The literature review was performed in different areas. These areas were: Supply Chain Management, Change Management, IT Projects and IT Projects’ Implementation, and Stakeholders (Refer to Chapter 2).

Existing Gap

Previously in this dissertation (Chapter 2) were presented several statements of recognized academics in the areas of SCM, Change Management, IT projects’ implementation, and Stakeholders. These statements recognize a weakness in the current literature of SCM and Change Management. Therefore, if there is a weakness in these areas as whole, moreover there is weakness in the specific area of managing changes in the successful IT project implementation with the involvement of stakeholders.

Research Question

This research will answer the following question: “Can supply chains improve their performance while implementing IT solutions with the effective involvement of stakeholders?” There is a growing realization that stakeholder involvement in decision-making for any supply chain is necessary and crucial. However, stakeholders have traditionally only been involved after decision-makers and experts have completed the decision-making process with little or no input from stakeholders. This has resulted in conflict and delays for supply chain improvement. One of the fears of experts is that the involvement of stakeholders will result in technical solutions that are of poor quality.
The proposition of this research is that an effective involvement of stakeholders in the decision-making process for IT project implementation can help supply chains to improve their performance in a superior manner than those that do not successfully involve stakeholders. Stakeholders are related to each other and interact with each other (Pouloudi and Whitley, 1997). Interactions between them can add value when exchanging information, products, instructions, or providing supporting tasks. Information about the stakeholders and the nature of their relationships and interactions also add value. The relationship between stakeholders, the relationship of each stakeholder to the supply chain, and the priority to be given to each stakeholder’s view in addition adds value. This information is needed to manage, interpret, balance, and process stakeholder input.

This dissertation proposes a Change Management framework for effectively involving stakeholders when implementing IT solutions to improve supply chains’ performance. This framework is designed based on insights from existing supply chain and Change Management methodologies, and alternative dispute resolution literature.

The proposition of this research is that the proposed framework can result in a better IT project implementation that is superior to other implementations with limited stakeholder involvement. Superior is defined in terms of (Table 4):

- Inclusion of compound views: Level of different stakeholders, decision-makers, and expert views included in the IT projects’ implementation.
- Value of modeling for suggesting strategic alternatives for improved long-term management of the supply chain: Level of deeper perspectives that can be gained from creating and analyzing the supply chain, and change in understanding of the supply chain and its most important aspects.
- Capturing effects that expert-only modeling could not capture.
- Fullness of implementation: Inclusion of different aspects such as technical, social, political and economical, and capturing supply chain components and links that were not captured in the model created by experts alone.
### Table 4 – Research Unit of Analysis

<table>
<thead>
<tr>
<th>Components</th>
<th>Measurable Indicator</th>
<th>How to Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusiveness of compound views</td>
<td>Level of different stakeholders, decision-makers, and experts’ views included in the IT projects’ implementation</td>
<td>Trace supply chain elements to individual stakeholders, decision-maker, and expert inputs to assess to what degree the final implementation includes views of diverse participants as compared to an implementation that is done by one group of experts alone</td>
</tr>
<tr>
<td>Value of modeling suggesting strategic options and as a helpful tool for stakeholders</td>
<td>Level of deeper perspectives that can be gained from creating and analyzing the supply chain</td>
<td>Comparison of the number and quality of strategic options between stakeholder involvement and without stakeholders’ involvement</td>
</tr>
<tr>
<td></td>
<td>Understanding change of the supply chain and its most important aspects</td>
<td>Request feedback from stakeholders on their improved understanding of the implementation when compared to modeling without stakeholders’ involvement of the same supply chain</td>
</tr>
<tr>
<td>Fullness of implementation</td>
<td>Inclusion of different aspects such as technical, social, political and economical, and capturing supply chain components and links that were not captured in the model created by experts alone</td>
<td>Comparison of the inclusion of overall technical, social, and economic aspects of the supply chain that were not included in those implementations without stakeholders’ involvement</td>
</tr>
</tbody>
</table>

### Proposed Framework

This dissertation proposes a value mapping framework for effectively involving stakeholders in IT projects’ implementation to improve supply chain performance. This new framework is designed based on insights from existing Supply Chain and Change Management methodologies, and an alternative dispute resolution literature. The proposed framework includes:

- The Matrix of Change (MOC) as a conceptual framework for studying the current and future supply chain changes categories as well as the critical implementation among changes. The four steps of the MOC model are parallel with the fifth, sixth, seventh, and ninth steps of the proposed framework. In the MOC model, inclusion of stakeholders occurs in the last step of the process. Within the proposed framework, stakeholders’ involvements are part of the first step and go along the process.
• The SCOR model as a management tool to capture and map the supply chain. The SCOR model is used to describe the business activities associated with all phases of satisfying a customer's demand. SCOR is the groundwork that is used to identify, define, and measure the supply chain in study. The five managerial processes of the SCOR model are parallel with the first, second, four, and fifth steps of the proposed framework.

• Stakeholders Value Mapping as a decision-making approach. Most of the steps of the proposed framework correspond directly to those of the Stakeholder Value Mapping process (Stakeholders’ assessment, Stakeholders’ re-evaluation, Joint-Fact Finding, and Negotiation). The Stakeholder Value Mapping serves as the stakeholder-process element of the proposed framework. The goal of the Stakeholder Value Mapping process is not to have agreements on every single issue, but to agree as a group on a package of strategies/alternatives that are acceptable as a whole and successfully identify the value added by them.

• Model-Assisted Joint-Fact Finding as an approach to develop shared knowledge and agreement about the supply chain and its boundaries and important issues that must be considered in the technical analysis. It is a step by which stakeholders initiate the process of gathering information, analyzing facts, and collectively making informed decisions (Ehrman and Stinson, 1999). Joint-Fact Finding rests on the following main principles:
  • The process of generating and using knowledge is a collaborative effort among decision-makers, independent experts, and other stakeholders from all sides of the conflict.
  • Information, expertise, and resources will be shared among all participants.
  • Participants are committed to finding a set of solutions to their conflict.

In a Joint-Fact Finding process, a chosen group of analysts and experts work closely with the stakeholders in analyzing the issues they deem important for decision-making.

Figure 10 displays the proposed framework. This framework will be able to manage change when implementing IT projects to improve supply chain performance with the effective involvement of stakeholders. The proposed framework uses deeper perspectives and existing models to provide an
integrated supply chain decision-making process that enables stakeholders and decision-makers to make joint decisions based on the value added by stakeholders when implementing changes.

The proposed framework is a nine-step sequential process that uses stakeholders’ value as the basis of discussion and negotiations among stakeholders.

The small rectangle on the right top side represents the contribution of the existing model in the Change Management field (the MOC model). The small rectangle on the left top side represents the contribution of the exiting model to define and measure the supply chain (the SCOR model). The big rectangle on the bottom represents the Stakeholder Value Mapping which holds the pieces together from the different contributions, including stakeholders’ representation, stakeholders’ re-evaluation along the process, negotiation, and the Joint-Fact Finding model.

The big arrow represents the proposed framework, which includes nine steps:

1. Define the supply chain. A business opportunity is identified and set. The supply chain is identified and defined. With the initial decision question defined, decision-makers assess the need for stakeholder
participation and form a core group for the process. If collaboration is needed, the core group will choose an impartial player who can prepare the basis for the actual process.

2. Measure the supply chain. In this step, the project elements and resources are being identified and organized to fulfill all the supply chain project requirements and the current supply chain is measured.

3. Benchmarking/Goals of the Organization. This step encompasses the identification and decomposition of the supply chain areas of improvement, obtaining and synthesizing of information and evaluation, publishing, or archiving of research findings. This includes the identification of sources of supply, sourcing, and validation of materials/products against requirements. The deliverables of this step are: Identification and alignment of the project and corporate objectives, Stakeholders’ classification, Stakeholders’ assessment, Selection of the process participants and the facilitator, and Best practices review.

4. Define Critical Problem: Current “As is” stage. This step includes the identification of the problems, identification of the critical problem, stakeholders’ re-evaluation and the stakeholder value network; and the review and modeling of current “As is” supply chain stage. It also determines the Stakeholder Value Mapping. This value mapping represents all the dependencies between the stakeholders. These dependencies can be identified as technology, knowledge, services, human resources, money, regulations, information, etc.

5. Define future “To be” stage. This is the most important step in the proposed framework. Here, the future supply chain “To be” stage is modeled. Experts alone proposes the initial “To be” stage for the stakeholder review. Stakeholders review the future stage and develop the Stakeholder Value Matrix. This value matrix will help decision-makers to evaluate possible “To be” systems from the stakeholders’ value added perspective. Casual Loop Diagrams are used to model the supply chain.
6. Identify Changes. This step includes the quantification and evaluation of the supply chain modeling. It also evaluates the interaction modeling by stakeholders, generates and evaluates the alternatives, and reviews the prioritization of the changes from the stakeholders’ perspective.

7. Implementation. This step includes the evaluation and negotiation of solutions, the process effectiveness assessment and peer review. It also encompasses the process validity, and the implementation strategy design.

8. Measure new supply chain. This step includes the operation and support information documentation, stakeholders’ survey, and new performance indicators. These indicators will corroborate the improvement in the supply chain performance.

9. Lessons learned. All parties involved gather together and revise the lesson learned along the project. This list should reflect lessons learned in the areas of stakeholders’ value added, communication, implementation, and supply chain performance.

Test of the Proposed Framework

This research work includes the design of a case study to test the proposed framework. This case study is completed by using an existing project between a local government and the Engineering Technology Department at the University of Central Florida (UCF).

Seminole County Integrated Networking (SCI.Net) Project

Seminole County is located just north of Orange County and the City of Orlando in Central Florida. The Census 2000 population for the county was 365,196, split approximately evenly between the seven cities and the unincorporated area. The jurisdictional land area of the county is 344 square miles of which 298 is comprised of land and small lakes, yielding a population density of 1,225 persons/square mile. The county is projected to grow to almost 500,000 residents by the year 2020. Historically, Seminole
County has served as a bedroom community to Orange County and the tourist industry to the south, but is rapidly urbanizing with an associated increase in non-residential development (http://seminolecountyfl.gov/, 2006).

Rapid growth has brought a number of customer service-related issues to light. The Seminole County Planning and Development Department (SCPDD) has the goal to exceed customers’ expectations. The SCPDD currently uses several different databases to perform routine operations. In 1998, Seminole County purchased a package software solution in hopes that Y2K issues would be resolved along with improving efficiency. The software is based on antiquated technology, is difficult to use, and is proprietary, resulting in a deterioration of accessibility to and ease of providing information.

The Seminole County Vision is to be the premier County government in Florida recognized for service exceeding customers’ expectations. The Seminole County Mission is to serve the County to improve the quality of life (http://seminolecountyfl.gov/, 2006).

The SCI.Net project, a partnership between Seminole County and UCF, has the goal to integrate Seminole County processes in order to exceed customers’ satisfaction. This project has become one of the most innovative large-scale engineering projects in recent government history. The case is a good example of a complex large-scale integrated open-system, with a technological system interacting with a social system under large amounts of uncertainty. As such, it serves as an illustrative actual case study for this dissertation.

Analysis of Case Evidence

Through this analysis it is determined if the study objectives are achieved. For that, we trace supply chain elements to individual stakeholder, decision-maker, and expert inputs to assess to what degree the final implementation includes views of diverse participants as compared to an implementation that is done by one group of experts alone. We also compare the number of quality strategic options between stakeholders’ involvement and without stakeholders’ involvement. We request feedback from stakeholders on their improved understanding of the implementation when compared to modeling without stakeholders’ involvement of the same supply chain.
Survey Development and Analysis

A survey is included to validate the framework. The decision is based on the following facts:

- A survey enables the researcher to validate the research question.
- A survey enables the researcher to collect data from different populations. The analysis of data obtained from different population enables to understand the behavior of the variables in different settings.

Steps used to develop and analyze the survey are as following:

Survey's Population

The survey’s population and target respondents are IT managers from different industry sectors. For the purpose of this research, the target respondents are limited to the Society for Information Management (SIM), with membership mixture of different industry sectors. SIM has as a Vision “to be recognized as the community that is most preferred by IT leaders for delivering vital knowledge that creates business value and enables personal development” (http://www.simnet.org/, 2007). SIM is an association of senior IT executives, prominent academicians, selected consultants, and other IT thought leaders built on the foundation of local chapters who come together to share and enhance their rich intellectual capital for the benefit of its members and their organizations.

Data Collection Process

An online survey is used to extract data from IT managers of different industry sectors. This is a low-cost survey method, with faster transmission time, rapid response, and an effective method to collect information regarding their expertise and opinions about the effective involvement of stakeholders and the value added by them when improving supply chains’ performance. The findings from the survey questionnaires can then be generalized to the larger population the sample is supposed to represent (Gall, Borg, and Gall, 1996). The questionnaire is designed and constructed to minimize the measurement error and to reduce non-response rate.
To gain a better understanding of the extent of the respondents’ expertise, and of the industry they are associated with, the survey have demographic questions about the respondents, their positions, their employers, their industry classifications, and their level of involvement in the decision-making process.

Figure 11 – Data Collection Process

Data Management and Analysis Methods

Experts are consulted to achieve content validity. Peer revisions are also executed as well as a pilot test of the survey.

Data collected must be evaluated to ensure validity and reliability. Validity refers to the extent to which a test measures what it is intended to measure. A valid measure should satisfy the following four criteria (Merriam, 1988):

1. Face Validity: This is an assessment of whether a measure, on the face of it, appears to measure the intended concept.
2. Content Validity: The content validity of an instrument is the extent to which it provides adequate coverage of all facets of a concept.
3. Construct Validity: Refers to the judgment about the appropriateness of inferences that are drawn from a survey scores regarding individual standings on certain kinds of variables or constructs (Yin, 1994).
4. Criterion-Related Validity: Reflects the success of measures used for prediction or estimation.
Summary

Organizations must deal with two factors when managing IT projects to improve supply chains: the strategic factor and the engineering economics factor. The strategic factor is focused on using IT technology to maintain a competitive advantage or just to guarantee the survival of the firm. The engineering economics factor of an IT project is driven for the need to increase profitability and productivity. However, in many cases, when implementing an IT project, we only consider one of these two factors. In some cases, an IT project is approved only on the basis that it produces sufficient returns to justify its costs. Also, IT projects are embraced for strategic reasons without considering the stakeholders, because managers of the firm think it is necessary to continue with technology or the moves of the competition.

SCM is now a strategic function addressed at the highest levels of the organization in concert with multiple stakeholders. The inclusion of the stakeholders at different stages of the process must be required. Stakeholders must be taken into consideration in order to define the future “To be” stage on any improvement. Effective stakeholder involvement in the representation, design, and management of IT projects is an essential part of decision-making. The emphasis on “effective” refers to the fact that not all stakeholder involvement results in improved decision-making.

This chapter summarizes the research methodology used to develop a new framework. This new value mapping framework will be used to improve supply chains performance when implementing IT projects with the effective involvement of stakeholders. This framework is the result of an existing gap in this field. Various research opportunities can be targeted within the SCM area. The proposed framework uses deeper perspectives to provide an integrated supply chain decision-making process that enables stakeholders and decision-makers to make joint decisions when implementing change. The proposed framework is a nine-step sequential process that uses the value added from the stakeholders’ perspective as the basis of discussion and negotiations to make decisions.
CHAPTER FOUR: PROPOSED FRAMEWORK

This chapter presents the architecture of the proposed framework. The new framework has components that help to define the supply chain, measure the size of the issues, identify necessary changes in the metrics to improve performance, measure the organizational consequences of these changes, and develop and follow a plan to implement IT projects to achieve the new goals of performance.

Step-by-Step Framework

The first step of the proposed framework is “Define the supply chain”. The deliverables of this step are: Business opportunity identification, Supply chain identification, Supply chain scope, Stakeholder participation level, Core group and the impartial player selection, and Project timeline and Communication plan.

In this step, the supply chain is identified and defined. With the initial decision question defined, decision-makers assess the need for stakeholder participation and form a core group for the process. If collaboration is warranted, the core group chooses an impartial player who can prepare the basis for the actual process.

Figure 12 – Define the Supply Chain

1. Define SC

1.1 Business Opportunity Identification. The business opportunity must be identified, defined, and must be reachable. The first step of the Joint-Fact Finding process is to determine the scope of the problem to be studied. The business opportunity identification answers the most important
question affected personnel want to know: Why must we do this? The answer to this question can lay the foundation for motivation, and thus must be answered convincingly. Answering “why” is essential not just for its motivating potential, but also because it creates a sense of urgency. Change will not happen without urgency. People will not struggle with the pain and effort of serious change without a sense that “they have to do that, like it or not”.

1.2 Supply Chain Identification. The supply chain identification provides the End-to-End overview of the supply chain players, including all suppliers, components, products or services, and customers (Table 5 and Figure 13). It is important to determine the inputs and outputs in the supply chain. These inputs will indicate all the information and material needed for the process. This helps to define the stakeholders. The stakeholders are those that (1) are important to the supply chain, because they have an outcome or output which addresses the supply chain needs; and (2) the supply chain is important to them, because the supply chain has an outcome or output which addresses their needs (Table 6).

The deliverables of this sub-step are: Supply chain identification; Supply chain definition; and Supply chain inputs, outputs, and potential stakeholders’ identification.

<table>
<thead>
<tr>
<th>Supply Chain Definition Matrix</th>
<th>Geography – Customer or Market Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 – Supply Chain Matrix Template
1.3 Supply Chain Scope. The scope determines where the supply chain boundaries are and what issues/areas need to be addressed. It is important to note that the scope will be heavily affected by who is present at the table in the joint process. While decision-makers are required to define a minimal scope for the problem, scientists have to make sure that the scope is sufficient or possible to evaluate, while other stakeholders will try to address their own concerns in the scope. Usually, different stakeholders highlight the parts of the supply chain that are directly of interest to them, or
those which if analyzed would favor their positions. This is essentially a value-based judgment, and can result in conflict. The challenge for the facilitator is then to redefine the issues in terms of interests, which are usually negotiable, rather than positions, values, or needs, which usually are not.

The deliverables of this sub-step are: Supply chain “source” scope, Supply chain “make” scope, and Supply chain “deliver” scope (Table 7).

<table>
<thead>
<tr>
<th>Definition</th>
<th>Scope</th>
<th>Players</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deliver</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.4 Stakeholder Participation Level Assessment. The stakeholder assessment stage is one of the most important stages in the proposed framework. The success or failure of the process may depend on which stakeholders are engaged and at what level. Decision-makers need to identify what level of stakeholder participation is necessary for a particular situation. As a heuristic tool, this framework uses a modified version of the Participation Level Points (PLP), which is used here to link supply chain and stakeholders’ characteristics with the participation ladder categories proposed by Arnstein (1969) and Mostashari (2005). The premise of the PLP heuristic is that some systems’ characteristics increase the desired level of stakeholders’ participation. The PLP heuristic provides a direction, not an answer. As such, it is wiser to err on the side of higher stakeholders’ participation than to settle for lower stakeholders’ participation levels. A group of IT experts was used to review the questions and their weights. Figure 14 displays the original PLP Heuristic tool.
Figure 14 – Original PLP

<table>
<thead>
<tr>
<th>Step 1: Examine System Characteristics</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the system in question spread over multiple jurisdictions?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Does the problem affect a multitude of heterogeneous stakeholder groups?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Has the issue already stirred visible controversy?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Are cost distribution issues important?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Is all the funding necessary for building/managing the system available to the decision-makers/project developers?</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Is uncertainty in scientific information a source of controversy?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Are environmental justice issues relevant?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Is there distrust of the decision-makers' ability to adequately represent stakeholder interests?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>If marginalized in the decision-making process, do stakeholders have the ability to adversely impact the implementation or management of the project/system in a significant way?</td>
<td>1-2</td>
<td>0</td>
</tr>
<tr>
<td>Do some stakeholders have access to useful information/data or financial/human resources they would be likely to share if they were involved?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Is adaptive management of the system over time imperative?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Is significant process obstruction by stakeholders likely if they are involved?</td>
<td>-1 or-2</td>
<td>0</td>
</tr>
</tbody>
</table>

**Participation Level Points (PLP)**

<table>
<thead>
<tr>
<th>Participation Level Points (PLP)</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Participation in Final Decision</td>
<td>9 or above</td>
</tr>
<tr>
<td>Public Participation in Assessing Risks and Recommending Solutions</td>
<td>6-8</td>
</tr>
<tr>
<td>Public Participation in Defining Interests, Actors and Determining Agenda</td>
<td>4-5</td>
</tr>
<tr>
<td>Restricted Participation (Feedback in Public Hearings, Commenting opportunities)</td>
<td>3</td>
</tr>
<tr>
<td>Public Right to Object</td>
<td>2</td>
</tr>
<tr>
<td>Informing the Public</td>
<td>1</td>
</tr>
<tr>
<td>Public Right to Know</td>
<td>0</td>
</tr>
</tbody>
</table>

Four experts were taken from different sectors: Education, Government, Manufacturing, and Service to validate the modified PLP tool. If the PLP of a system is 4 or higher, stakeholders' participation in the supply chain representation is advised. In contradiction, there may be a need for a basic, more limited stakeholders' consultation to determine whether stakeholders' involvement is necessary, and if so at what level. It is important to note that in any decision-making process there are different levels of participation for different stakeholders, depending on their stake, power, and knowledge. The PLP only points to the highest level of participation.
desirable in the project. If the PLP of a system is lower than 4, there is little use for this new methodology in the decision-making process. The new framework is suitable for supply chains where the degree of conflict, uncertainty, distrust, information heterogeneity has evolved to an extent that makes more aggressive stakeholders’ participation a necessity.

Table 8 shows the different questions must be asked in order to calculate the modified PLP value.

Table 8 – Modified PLP

<table>
<thead>
<tr>
<th>Step 1: Examine Supply Chain Characteristics</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Is the supply chain business opportunity spread over multiple influences?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2) Does the problem affect a multitude of heterogeneous stakeholder groups?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3) Are stakeholders easy to identify?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4) Has the issue already stirred visible controversy?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5) Is all the funding necessary for building/managing the supply chain available to the decision makers/project developers?</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6) Is uncertainty in scientific information a source of controversy?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7) Are design justice issues relevant?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8) Is there distrust of the decision-makers’ ability to adequately represent stakeholders’ interest?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9) If marginalized in the decision-making process, do stakeholders have the ability to adversely impact the implementation or management of the project/supply chain in a significant way?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10) Do some stakeholders have access to useful information/data or financial/human resources they would be likely to share if they were involved?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>11) Is adaptive management of the supply chain over time imperative?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>12) Is significant process obstruction by stakeholders likely if they are involved?</td>
<td>-1 or -2</td>
<td>0</td>
</tr>
<tr>
<td>13) Are there critical stakeholders?</td>
<td>-1 or -2</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation Level Points (PLP)</th>
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<tr>
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<td>2</td>
</tr>
<tr>
<td>Informing the Public</td>
<td>1</td>
</tr>
<tr>
<td>Public Right to Know</td>
<td>0</td>
</tr>
</tbody>
</table>

1.5 Choice of a Core Group. If the PLP heuristic indicates the need for a joint process (PLP>4), the decision-makers need to identify an appropriate core group. The core group is the entity that
manages the joint process, by formally inviting stakeholders and bringing them together, providing facilities for the duration of the stakeholder process, providing funding for major parts of the process, and chooses the impartial player. For these reasons, the core group should have credibility, authority, and honesty in the eyes of the potential stakeholders. It should also possess sufficient funds and resources to ensure that the process can be carried out to the end. The core group is composed by decision-makers, stakeholder knowledge producers, and other affected stakeholders.

1.6 Choice of an Impartial Player. The impartial player is the main person in charge of stakeholders’ identification and selection, stakeholders’ conflict, and value assessment. The core group chooses the impartial player to perform a conflict assessment for the project. The impartial player and the core group start the stakeholders’ identification process based on the identification of the business opportunity and the supply chain. The impartial player is one of the stakeholder knowledge producers.

1.7 Development of the Project Timeline. The project timeline helps to identify the dependencies between tasks, assign resources for each task, look at overall dates, and identify the start and end dates for the tasks. The Project Manager can use the schedule to plan, and implement project tasks, and monitor the progress of the project. Changes made to the project timeline, along the project, must be communicated to all involved stakeholders. A risk analysis methodology is also used to ensure mitigation actions in case of changes on stakeholders.

1.8 Development of the Communication Plan. The communication plan helps to identify the communication needs among stakeholders, and methods of communication. Communication planning helps to ensure that everyone who needs to be informed about project activities and results gets the needed information.
The second step in this proposed methodology is “Measure the supply chain”. The deliverables of this step are: Supply chain geo map and thread diagram, Supply chain key performance indicators, and the Supply Chain performance.

In this step, the project elements and resources are being identified and organized to fulfill all the supply chain project requirements and the current supply chain is measured (Figure 15).

![Value Mapping Framework Involving Stakeholders for Supply Chain Improvement when Implementing IT Projects](image)

2. Measure SC

Supply Chain Geo Map. The supply chain geo map must be created by the core group and experts alone (Figure 16). Brainstorming sessions serve as a foundation for all negotiation.

![Figure 16 – SC Geo Map](image)
This brainstorming session considers the following steps:

- Enter basic geographic context (Country, Continent, Region, World)
- Add the supply chain suppliers together logically (same region, same supply-type)
- Add the supply chain components (warehouse, manufacturing, distribution, WIP locations) considering logical grouping (performing similar processes, serving similar customers)
- Indicate material flow
- Add the supply chain customers using logical grouping (similar markets, similar material)
- Identify level-2 processes. Identify material types to identify Make type, Delivery type, Source type, and Return type.

Supply Chain Thread Diagram. The thread diagram is used as a basis for evaluating and understanding the supply chain. This thread diagram must be created by the core group and experts alone (This diagram shows the advantages and disadvantages of the supply chain in study (Figure 17).

![Supply Chain Thread Diagram](image)

Figure 17 – SC Thread Diagram

Supply Chain Key Performance Indicators (KPIs). The KPIs help analysts to measure supply chains’ progress toward organizational goals. The performance attributes are first identified. Once they are agreed
upon, the metrics are defined for each performance attribute. These metrics must be defined and measurable (See Table 9 as an example).

Table 9 – SC Flexibility Performance

<table>
<thead>
<tr>
<th>Metric</th>
<th>Definition</th>
<th>Formula</th>
<th>Level 2 Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain Flexibility</td>
<td>The number of days required to deploy a new application</td>
<td>The smaller number of days required to achieve sustainable decrease for Source, Make, and Delivery</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>ii. Make Flexibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>iii. Deliver Flexibility</td>
</tr>
</tbody>
</table>

Supply Chain Performance. The supply chain performance helps the stakeholders to evaluate current and future targets toward organizational goals.

The third step in this proposed methodology is “Benchmarking/Goals of the Organization”. The deliverables of this step are: Identification and alignment of the project and corporate objectives, Stakeholders classification, Stakeholders’ assessment, Selection of the process participants and the facilitator, and Best practices review (Figure 18).

3.1 Corporate Objectives and Strategy Identification. In this step, decision-makers and the core group make sure the corporate objectives and strategies are identified. Objectives could be associated with profit, global power, brand recognition, reputation and image, share price, ethical issues, efficiency, personal satisfaction, environment, long term survival, market share, social issues,
turnover, customer satisfaction, brand loyalty, and market power. Strategy is a long term plan of action designed to achieve a particular objective.

3.2 Project and Organization Objectives Alignment. One of the reasons of IT investment failures is that the IT and the organization objectives are not aligned. In this sub-step, decision-makers and the core group must make sure they share and follow the same objectives (Table 10).

Table 10 – Objectives Alignment

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Supply Chain Objective</th>
<th>Objective 1</th>
<th>Objective 2</th>
<th>Objective 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective A</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Objective B</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Objective C</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A strategy map (Figure 19) is also used to identify the vision and mission of the project and to define the relationship between the supply chain strategies and relevant areas such as financial, innovation and learning, processes, and supply chain, in order to produce the outcomes.

3.3 Stakeholders’ Classification. Effective stakeholder identification is crucial to determine who is directly or indirectly affected, positively or negatively, by a project or a supply chain management plan, and who can contribute to or delay its success. It is important for the impartial player to be comprehensive in identifying and prioritizing all relevant stakeholders, including those that are not usually present at the table. Stakeholders can be categorized based on their influence/power, stake, and knowledge. The SPK framework will be used in this sub-step. This step must be created by the core group and experts alone.
Figure 19 – Strategy Map
3.4 Stakeholder Value Assessment. Once a basic stakeholder list is prepared, it is imperative to establish the stakeholders’ interests/values regarding the supply chain project, eliciting how they view the project. The following approaches for extracting stakeholders’ inputs are available to the impartial player: Surveys, Interviews, and Feedback Websites.

- **Survey**: Once a basic stakeholder group is prepared, it is imperative to understand how they view the supply chain project, and what they would like to consider their issues in any strategy process.

- **Interviews**: Another approach to gather stakeholders’ inputs is to carry out interviews. The interview questions must be prepared prior to the interview date. Data collected through interviews must be documented to later analyze it.

- **Feedback Websites**: In many cases it is difficult to reach all the key stakeholders for commenting. There are some indirect ways for considering the views of stakeholders on the system. One of the ways to expand the range of stakeholders’ inputs is to study the feedback provided by them through a website.

3.5 Selection of Process Participants. The answers to the questions in the previous step, along with the initial categorization of stakeholders should provide a basis for the selection of participants for the joint process. Stakeholders not included in the initial interviews, but mentioned by a considerable number of other stakeholders should be contacted and interviewed. Stakeholders in each category should be ranked according to their importance to the process and chosen based on the criteria of authority and power, intensity of interest, potential for knowledge contribution, and potential for resource provision. This is essentially a case-by-case decision, but given the structure of the joint process, the process would be most effective if the number of participants did not go beyond a certain limit. After the selection occurs, selected stakeholders are invited to participate in the joint process. Selected stakeholders should be invited to attend the workshop session, where the decision whether or not to proceed with a joint process is made. Many selected stakeholders may agree to attend such a session. Before the workshop session, the impartial player provides the selected stakeholders with a list of all the participants and provides them with a synthesis of the interviews, where individual
participants can understand the interests, concerns and positions of other participants, categorized under each set of questions. Pre-workshop session information package containing explanations on the vision and mission of the project, the meaning and terms of stakeholders’ involvement, and technical background information on the remediation problem and available technologies must be sent out to all interested parties prior to the meeting.

In the first face-to-face stakeholders meeting, selected stakeholders who have accepted to participate come together for a workshop session intended to build initial trust and getting to know other stakeholders and their interests and points of view. The core group presents some background material on the basics of the process, and explains what the group can expect as an outcome of such a process. The group of stakeholders jointly decides whether or not to proceed with the process. Individual stakeholders may choose to be out of the process. If the remaining participants choose to proceed with the willing group of participants, the group can then proceed to choose a neutral facilitator (who can be the impartial player chosen previously by the core group or any other person agreed on by the group).

3.6 Selection of the Facilitator. The facilitator is the person responsible for facilitating dialogue among stakeholders in all subsequent stages of the joint process. The ideal facilitator for such processes is a person who is competent in negotiations and conflict resolution theory and practice, and has a basic understanding of the project in question, and is known by stakeholders as objective and neutral to the outcome. Once chosen, the facilitator initiates the next stage of the joint process, which is the Joint-Fact Finding stage.

3.7 Best Practice Review. This step encompasses the identification and decomposition of research topics, obtaining and synthesizing of information and evaluation and publishing or archiving of research findings. This includes the identification of sources of supply, sourcing, and validation of materials/products against requirements. Best practices must be reviewed by the core group and experts alone.
The fourth step of the proposed framework is “Define the Critical Problem: Current “As is” stage” (Figure 20). The deliverables of this step are: List of problems, Identification of the critical problem, Stakeholders re-evaluation and value mapping; and Review and modeling of current “As is” supply chain stage.

4.1 List of Problems: Once the supply chain has been measured, all problems can be listed. Core group needs to identify those to finally determine which one is the critical problem.

4.2 Identify Critical Problem: In this sub-step, the critical problem is identified. Critical criteria are based on the organization goals.

4.3 Stakeholders Re-evaluation and Value Mapping: The stakeholders’ group must be re-evaluated and its value network must be determined. More stakeholders might be part of the process, and some stakeholders might not be considered as key players in the process anymore. Following the steps to proceed with:

4.3.1 Identify relationships between stakeholders.

4.3.2 Identify possible conflicts of interest between stakeholders.

4.3.3 Assess the capacities of different stakeholders and stakeholder groups to participate.
Table 11 – Stakeholders Re-evaluation

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Definition</th>
<th>Relationship</th>
<th>Conflict</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Relationship: Strong (S), Average (A), Weak (W)
Conflict: Strong (S), Average (A), Weak (W)
Priority: “1” for the highest and increasing number for the lowest

Next, there is a need to determine the Stakeholder Value Mapping (Figure 21). This value mapping represents all the dependencies between them, and must be created by the core group and experts alone. These dependencies can be identified as technology, knowledge, services, human resources, money, regulations, information, etc.

4.4 Stakeholders Current “As is” State Review. Identifying the most important processes can be quite difficult, but certain guidelines can help. A key to success is “starting with the end in mind,” that is, identifying the purpose or business objective of change, whether it is organizational learning, market
share, flexibility, customer satisfaction, or something else. The core group begins by enumerating specific aspects of their existing hierarchical production techniques, as well as aligning their vision of a new organization based on the perceived benefits of a flatter more flexible production line. Then, from general statements of practice, they define subtasks or constituent practices. The steps of any process can be broken down further, if needed. The core team explains the current “As is” system (input, process, output, best practices, and performance metrics). Stakeholders are grouped by small teams and with the use of visual representations they model the current supply chain and its interactions. CLDs are used in the sub-step.

The fifth step of the proposed framework is “Define the Future (To be) Stage” (Figure 22). The deliverables of this step are: Review and modeling of the future “To be” stage and the Stakeholder value matrix.

![Value Mapping Framework Involving Stakeholders for Supply Chain Improvement when Implementing IT Projects](image)

Figure 22 – Define the Future “To be” Stage

5.1 Future “To be” State Modeling. The core group and experts identify the targets, and then perform the gap analysis. In IT, gap analysis is the study of the differences between two different information systems or applications, often for the purpose of determining how to get from one state to a new state.

5.2 Stakeholders’ Future “To be” State Review. Another session is performed with the stakeholders. The core team explains the targets for the future “To be” system. Stakeholders are grouped by small teams and with the use of visual representations they model the future supply chain state and its interactions. CLDs are used in this sub-step.
5.3 Stakeholder Value Matrix. Once the stakeholder value activities have been identified, it is necessary to relate them with the stakeholders’ involvement, their key measure, impact, and implementation level of assurance.

Table 12 – Stakeholder Value Matrix

<table>
<thead>
<tr>
<th>Value perceived by stakeholders</th>
<th>Stakeholder involvement</th>
<th>Key Measure</th>
<th>Impact</th>
<th>Easy /Hard to implement</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

The sixth step of the proposed framework is “Identify Changes” (Figure 23). The deliverables of this step are: Quantification and evaluation of the supply chain modeling; Evaluation of the interaction modeling by stakeholders; Alternatives generation and evaluation; and Stakeholders’ transition matrix review and modeling.

Figure 23 – Identify Changes

6.1 Future “To be” State and Proposed Changes. The future “To be” stage is designed based on the types of changes. The deliverables of this sub-step are: Future “To be” state design based on type of changes (Table 13), and Future “To be” possible solutions (Table 14). These deliverables must be created by the core group and experts alone.
Table 13 – Future “To be” Stage Design Based on Type of Changes

<table>
<thead>
<tr>
<th>Proposed Change</th>
<th>Structural</th>
<th>Cost</th>
<th>Process</th>
<th>Rule</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14 – Future “To be” Stage Possible Solutions Based on Type of Changes

<table>
<thead>
<tr>
<th>Solution</th>
<th>Structural</th>
<th>Cost</th>
<th>Process</th>
<th>Rule</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solution 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solution 3</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

6.2 Quantification/Evaluation. After agreeing upon future supply chain states, the core group and experts create the horizontal and vertical triangular matrix to identify complementary and competing solutions. Complementary solutions reinforce one another whereas competing solutions work at cross-purposes. Doing more of one complement increases returns to the other. A grid connects each solution in an interference matrix, and at the junction of each grid plus signs (+) designate complementary and minus signs (-) competing processes. The presence of a plus sign does not indicate that an interaction is “good,” only that it is reinforcing. In the absence of evidence to support either reinforcement or interference, the space at the junction is left blank.
6.3 Interaction Modeling Evaluation by Stakeholders. Another session is performed with stakeholders. Stakeholders are grouped in small teams to agree upon interactions. Changes must be performed with stakeholders.

6.4 Solutions Generation and Evaluation. The core group and experts construct the transition matrix. The transition matrix is a square matrix combining the horizontal and vertical matrices which helps to determine the degree of difficulty in shifting from existing to target solutions. The advantage of the transition matrix is that it shows the interactions involved in moving from existing practices to a clean state. Certain solutions complement one another.

![Figure 25 – The Transition Matrix](image)

6.5 Stakeholders’ Transition Matrix Review. Another session is performed with the stakeholders. The core group explains the option for achieving the future “To be” system. Stakeholders are grouped in small teams and with the use of visual representations they model the current and future state interactions.

6.6 Transition Matrix Modeling. The core group and the different group of stakeholders define the transition matrix model after agreeing upon the supply chain future “To be” state and its interaction.
The seventh step of the proposed framework is “Implementation” (Figure 26). The deliverables of this step are: Evaluation and negotiation of solutions; Process effectiveness assessment; Process peer review; Process validity; and the Implementation Strategy Design.

![Value Mapping Framework Involving Stakeholders for Supply Chain Improvement when Implementing IT Projects](image)

Figure 26 – Implementation

7.1 Facilitated Stakeholders Negotiation on Solutions. The core group needs to determine where various stakeholders stand with respect to retaining current practices and implementing target practices. Another session is performed with stakeholders. The idea is not only to eliminate the negative quality, but also maximize positive quality which in turn creates a “Valued” solution that will increase stakeholders’ satisfaction.

7.2 Process Effectiveness Assessment. Using the Joint-Fact Finding tool, the core group and different group of stakeholders then proceed to look at the most promising solutions identified in previous steps under the range of uncertainties, and examine its costs and benefits from the different stakeholders’ perspectives also exploring any barriers to implementation (Table 15). There are two ways to proceed in this stage. One is to plan experiments that may provide more certainty and more knowledge on the issue. The other one is to proceed with the given uncertainty range and negotiate contingent agreements, which specify precise actions that would be taken to improve the potential consequences of the problem to risk-levels acceptable to the group as a whole. Stakeholders can brainstorm on implementation procedures for changes in agreement, focusing on how costs and benefits would be distributed and how responsibilities would be distributed.
Table 15 – Process Effectiveness Assessment

<table>
<thead>
<tr>
<th>Solution</th>
<th>Type of Uncertainty</th>
<th>Costs</th>
<th>Benefit</th>
<th>Barriers to implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solution 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solution 3</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

7.3 Peer Review. Surveys can be used to identify whether a particular stakeholder-supported process has been effective in the minds of decision-makers, experts, and other stakeholders. Each survey can be skilled to its particular audience within the participant group.

The stakeholders’ survey should include the following questions to serve as the basis for the supply chain representation, evaluation, and implementation of the proposed framework:

- What is the stakeholder’s view of the supply chain boundary/the scope of the project?
- What part of the supply chain/project are they interested in?
- What is their organizational interests/mandate regarding the supply chain and how does it impact their position on the supply chain/project management strategies?
- How does the supply chain affect them at the present and how do they think it will impact them in the future? (Stakeholders with Influence, Other Stakeholders)
- What are the most important issues they see with the supply chain/project? What do they think could be done to address these issues?
- What information do they possess on the supply chain/project? What information do they believe is necessary, but missing? What capacity do they have for further information gathering? What are the resources they have at their disposal to contribute to the management of the supply chain/evaluation of the project?
- What is the approximate timeline in which the decision has to be made? Is the timeline flexible or fixed? Can the decision be staged? (Decision-makers)
- How would they want to participate in the decision-making process? Would they like to be present at all stages, or be kept informed of all the stages, or would they like to provide feedback once the recommendations are opened up for comments?
What do they think of a Joint-Fact Finding process as an alternative for the decision making process?

How is the internal decision-making mechanism for the organization? Who is the person with the authority to negotiate in a potential Joint-Fact Finding process?

Who are the other stakeholders that should participate in the decision-making process?

Also, who, if not involved, could undermine the quality, legitimacy or outcome of the Joint Fact-Finding process?

7.4 Process Validity. It is useful to have non-participant experts and decision-makers at large review the process and its recommendations before being officially published as the final agreements. For that to happen, accessible documentation on the process should be available. There are two types of validity we are concerned with:

Process:

- Was the process valid within the context of any regulation?
- Was the process sufficiently inclusive?
- Were the decision rules acceptable and adequate?
- Were the points of disagreement and the opinions of the dissenting participants adequately included in the final report?
- Were the expert working groups formed effectively?
- Was the process sufficiently transparent?
- Were the stakeholders given sufficient means of contributing to the process while it was in progress?

Validity of Expert Analysis and Recommendations:

- Was the supply chain representation used for the process accurate and valid?
- Were the methodologies used to evaluate the supply chain modeling valid?
- Were the assumptions made for the expert analysis valid?
- Were the different uncertainties adequately addressed?
Once the feedback is received the group reconvenes to decide whether there are grounds to rework parts of the process, or if the objections could be addressed without major changes. The final opinion of a diverse set of stakeholders, experts, and decision-makers outside the participating group can then be integrated into the final implementation.

7.5 Implementation Strategy Design. This sub-step must be created by the core group and experts alone. When considering how to implement a solution, it is necessary to identify those elements that are not functionally vital to the overall solution and to decide upon an effective strategy for implementing them. It is important to realize that the strategy chosen depended on the specific solution and customer requirements. For virtually any solution, some components must be implemented before users can utilize the solution. For many projects, however, the cost to implement all core components first is excessive and unnecessary.

The eighth step of the proposed framework is “Measure the New Supply Chain” (Figure 27). The deliverables of this step are: Operation and support information documentation; Stakeholder survey; and the New performance indicators.

8.1 Operations and Support Information System Documentation. All the operations and support information system are developed and documented. This information includes procedures and processes, and knowledge based reports and logbooks.
8.2 Stakeholders’ communication and survey. All parties involved need to communicate continually to reinforce the messages and make sure everyone is ready to work with the improvement. The stakeholders’ survey should include the following to serve as the basis for measurement of the proposed framework:

- Were all the implementation steps well defined?
- Were all the strategies for design well identified?
- Has all the documentation been completed?
- Are all the players in place?
- Was the training plan created? Have all the materials been prepared?

8.3 Supply Chain New Key Performance Indicators (KPIs). The new KPIs help the supply chain to determine the new performance of the supply chain. (See Table 16 as an example).

<table>
<thead>
<tr>
<th>Metric</th>
<th>Definition</th>
<th>Formula</th>
<th>Level 2 Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>The number of days required to deploy a new application</td>
<td>The smaller number of days required to achieve sustainable decrease for Source, Make, and Delivery</td>
<td>i. Source Flexibility</td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
<td>i. Source Flexibility</td>
<td>ii. Make Flexibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>i. Source Flexibility</td>
<td>iii. Deliver Flexibility</td>
</tr>
</tbody>
</table>

The last step of the proposed framework is “Lessons Learned” (Figure 28). The deliverables of this step are: List of lessons learned, and feedback mechanism.
9.1 List of Lessons Learned. All parties involved will gather together and revise the lessons learned along the project. This list should reflect lessons learned in the areas of stakeholders’ value added, communication, implementation, and supply chain performance.

9.2 Feedback Mechanism. This feedback mechanism facilitates the return of a portion of the output of this process to the input, especially when used to maintain performance or to control the process. The return of information about the result of the process or activity will help the supply chain to a continuous process improvement.

Summary

Chapter Four explains step-by-step the proposed framework. This new framework is a nine-step sequential process that uses modeling as the basis of discussion and negotiations among stakeholders. The proposed framework includes all the specific tasks to be performed in each step, the different stakeholders involved, and the deliverables to be expected from each step.
CHAPTER FIVE: CASE STUDY

This case study explains how the proposed value mapping framework can improve supply chain performance with the effective involvement of stakeholders when implementing IT solutions. In particular, this study discusses the results of using the value added by stakeholders in the design of the “To be” system and the decision-making process for the Seminole County Integrated Network (SCI.Net) e-government project to replace the existing H.T.E. legacy information system. Most local governments’ agencies base their decisions on costs and time spent to achieve a new solution without taking into consideration the value added by stakeholders when seeking higher level of performance. However, Seminole County has taken advantage of this value, and they now base their decisions on the results of this stakeholder value mapping to design and implement new IT systems.

This case study demonstrates that the proposed framework helps managers of the local government to successfully implement an IT solution to improve supply chain performance. This case study is organized as follows. First, a description of the Seminole County SCI.Net project is presented. Second, the proposed framework is applied to a SCI.Net IT project. Finally, the conclusions of the case study are summarized.

SCINet Project Description

Seminole County, located north of Central Florida, is one of the fastest growing counties in the United States. Its current population of 379,000 is expected to double over the next twenty years. The expected growth brings customer service challenges to Seminole County.

In order to improve the government services to this increasing population, the Seminole County Planning and Development Department decided to replace its current H.T.E. information system in 2003. The H.T.E. legacy system was purchased by Seminole County in 1998, and it is used to issue some county transactions. During the years of operations, the H.T.E. legacy system has cost Seminole County taxpayers more than $11 million dollars.
The Seminole County SCI.Net project objectives are to streamline service-delivery and integrate government services with the implementation of .NET based web services providing access to information anytime and from anywhere. Through the portal, Seminole County citizens can conduct business with the county from individual home computers, companies’ Internet networks, and community kiosk centers.

For the SCI.Net project, Seminole County managers considered three different project alternatives. One option was to upgrade the system to a new H.T.E version and based on proprietary software technology. A second project alternative was to develop the new system in-house using the Java programming language and using the internal resources of the IT Department at Seminole County. The third option was to implement the project in partnership with the Engineering Technology Department at the University of Central Florida, using a joint development approach and Microsoft .NET tools.

In Summer 2003, the Seminole County managers selected the partnership with the University of Central Florida to develop the new SCI.Net system to replace the H.T.E. legacy system. As a result of the joint development work with UCF, a series of new projects are being implemented including the Agenda Process to increase efficiency and service-delivery. However, there is a need to successfully implement these IT projects using a systematic approach to identify value, benefits, and risks given by stakeholders.

The proposed value mapping framework for supply chains improvement is applied in this case study to identify the value added by stakeholders to successfully implement an IT solution when seeking higher level of performance. The new framework uses a set of steps to identify both the stakeholder value and the strategic implementation of a SCI.Net project. In the next section of this case study, the application of the framework to the Agenda Process is illustrated.
The Agenda Process

The nine steps of the proposed framework applied to a SCI.Net project are summarized as follow:

1. Define the Supply Chain

   Business Opportunity Identification

   A number of major concerns have arisen around the management of the system used to support the efforts of the Agenda Process at Seminole County. The existing manual paper based system utilized by the employees has no level of usability and allows, through the existing business processes, incorrect and duplicate data. In addition, multiple databases have arisen increasing the concerns of where the most correct and accurate data can be obtained.

   The Agenda Process personnel do not have sufficient time to address these issues as they are currently busy in the maintenance of the existing manual system and their normal workloads. All departments and divisions within the county have a high reliance on the information managed in these databases.

   Supply Chain Identification

   An End-to-End overview of the supply chain and its players is provided for the Agenda Process. This overview includes all suppliers, components, services, and customers (Figure 29 and Table 17). By defining the output of each part of the supply chain, the initial stakeholders are identified. These stakeholders are those that: (1) are important to the supply chain, because they have an output which addresses the supply chain needs; and/or (2) the supply chain is important to them, because the supply chain has an output which addresses their needs (Table 18).
SUPPLIERS
Seminole County Citizen
and business owners

All Seminole County
Departments, Division,
and Sections

Property Appraiser

County Attorney Office

BCC

COMPONENTS
Seminole County Citizen
Applications, support
documentation, and
other information such
as demographic,
address, parcel ID, etc

Procedures, Methods,
Approaches, Timeline,
Workflow from all the
Departments/Divisions/
Sections at Seminole
County

PRODUCTS/
SERVICES
Agenda Package and
BCC Approval

Seminole County
Citizen data

Start new processes

CUSTOMERS
Seminole County Citizen

Internal Seminole
County Personnel

BCC

Seminole County
Businesses

Figure 29 – Agenda Process End-to-End SC

Table 17 – Agenda Process SC Definition Matrix

<table>
<thead>
<tr>
<th>Supply Chain Definition Matrix</th>
<th>Geography – Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agenda Package</td>
<td>Seminole County Citizen</td>
</tr>
<tr>
<td>BCC Approval</td>
<td>X</td>
</tr>
<tr>
<td>Seminole County Citizen and Business Owners Data</td>
<td>X</td>
</tr>
<tr>
<td>Start new processes</td>
<td>X</td>
</tr>
</tbody>
</table>

83
Table 18 – Agenda Process SC Inputs, Outputs, and Potential Stakeholders

<table>
<thead>
<tr>
<th>Supplier:</th>
<th>Input</th>
<th>Output</th>
<th>Potential Stakeholder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminole County Citizen and Business Owners</td>
<td>Application request</td>
<td>Demographic, Applications, Signed petitions and letters, and support documentation.</td>
<td>Seminole County Citizens and Business Owners</td>
</tr>
<tr>
<td></td>
<td>Knowledge, experience, information, templates</td>
<td>Methods, Approaches, procedures, Timeline, Workflow</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td></td>
<td>Permit issued, Lot split, Property information change</td>
<td>Property information, owner information, and current structure information</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>BCC</td>
<td>County knowledge, Seminole County Citizen and Business Owner relationship</td>
<td>Legislative officers and fiscal representatives of the County</td>
<td>Technology Director and staff</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component:</th>
<th>Input</th>
<th>Output</th>
<th>Potential Stakeholder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminole County Citizen Applications</td>
<td>Data</td>
<td>Information</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>Support Documentation</td>
<td>Seminole County Citizen service request</td>
<td>Information</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>Demographic</td>
<td>Seminole County Citizen service request</td>
<td>Information</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>Property Information</td>
<td>Property record</td>
<td>Information</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>Procedures, Methods. Approaches</td>
<td>Knowledge, experience</td>
<td>Step-by-step Instructions</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>Timeline</td>
<td>Agenda dates</td>
<td>Agenda Calendar</td>
<td>County Manager staff</td>
</tr>
<tr>
<td>Workflow</td>
<td>Internal users information</td>
<td>Approval process</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County, County Attorney’s Office</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product:</th>
<th>Input</th>
<th>Output</th>
<th>Potential Stakeholder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agenda Package</td>
<td>Agenda Items</td>
<td>Agenda Package</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County</td>
</tr>
<tr>
<td>BCC Approval</td>
<td>Agenda Package</td>
<td>BCC decision, Unofficial minutes</td>
<td>Agenda staff for departments, divisions, and sections at Seminole County, Commissioners, SC citizens</td>
</tr>
<tr>
<td>SC Citizen Data</td>
<td>Agenda items, BCC decision</td>
<td>New Process</td>
<td>Agenda staff and Seminole County personnel for departments, divisions, and sections</td>
</tr>
<tr>
<td>New Processes</td>
<td>Agenda Items, BCC decision</td>
<td>New service</td>
<td>Seminole County personnel for departments, divisions, and sections, SC Citizens, SC Business Owners</td>
</tr>
<tr>
<td>Customer:</td>
<td>Information</td>
<td>Requested Service, data</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Seminole County Citizens and</td>
<td>Decision</td>
<td>Agenda results</td>
<td></td>
</tr>
<tr>
<td>Business Owners</td>
<td>Procedure, knowledge, methods</td>
<td>Agenda decision, new process</td>
<td></td>
</tr>
<tr>
<td>BCC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Seminole County</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Agenda staff for departments, divisions, and sections at Seminole County, Commissioners, SC citizens |
| Commissioners, County Manager, and County Manager staff |
| Agenda staff for departments, divisions, and sections at Seminole County |
Supply Chain Scope

The Agenda Process is the procedure by which items are entered onto the agenda to be reviewed by the Seminole County Board of County Commissioners (BCC). There are five types of items that are presented on the agenda to the BCC:

1) Briefing Item. Briefing Items are defined as status updates. These items are discussed during the morning session and must be noted on an agenda. Someone bringing a briefing item before the BCC is either looking for direction or inquiring about a project or technique they wish to pursue. These items do not normally receive any action from the board.

2) Consent Item. Consent Items are routine authorizations to take action requiring no discussion by the board. These are issues and projects the board commonly handles and should not present any problems. Consent items receive a vote.

3) Public Hearing Item. Public Hearing Items deal with specific items that have to be heard in a public forum. Public Hearings are advertised and the citizens have a right to speak. Usually the items are related to land use changes, rezones, and land purchases.

4) Regular Item. Regular Items are those that require discussion and require some official action by the BCC.

5) Work Session Item. Work Session Items are public discussions between staff and the BCC to discuss tough, time consuming, or controversial topics. Due to the time that needs to be committed to these topics, they are not done in a Public Hearing. All are advertised and the public may be present at these meetings, however they are not invited to speak.

The process by which items are created and put on the agenda is divided into three phases:

- Phase I includes the process by which external customers (Seminole County citizens and business owners) make requests and provide input so staff can prepare and submit applications to have an item included on the BCC agenda.

- Phase II is the review process that the items must undergo.

- Phase III is the process that occurs after the BCC meeting.
This case study covers Phase I and Phase II of the Agenda Process. Table 19 displays the boundaries for the Source, Make, and Deliver processes.

### Table 19 – SC “Source,” “Make,” and “Deliver” Processes Definition

<table>
<thead>
<tr>
<th>Definition</th>
<th>Scope</th>
<th>Players</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td>Human and computer systems that provide data</td>
<td>Analysis of the human components: Seminole County citizens and business owners, Property Appraiser’ Office, BCC, Internal SC Agenda staff, County Attorney’s Office, and the computer systems to improve performance</td>
</tr>
<tr>
<td><strong>Make</strong></td>
<td>Human and computer systems that process data</td>
<td>Analysis of the Agenda staff and the Agenda manual systems to process information</td>
</tr>
<tr>
<td><strong>Deliver</strong></td>
<td>Human and computer system that deliver service</td>
<td>Analysis of the Service, Customer data, Agenda package, Unofficial minutes</td>
</tr>
</tbody>
</table>

**Stakeholder Participation Level Assessment**

The PLP of the Agenda Process project was assessed by decision-makers and experts. The value obtained was higher than four (See Table 20). Therefore, stakeholder participation in this Agenda Process project was advised. It is important to note that in any decision-making process there are different levels of participation for different stakeholders, depending on their stake, power, and knowledge. The PLP only points to the highest level of participation desirable in this project.
Table 20 – Modified PLP Applied to the Agenda Process Project

<table>
<thead>
<tr>
<th>Step 1: Examine Supply Chain Characteristics</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Is the supply chain business opportunity spread over multiple influences?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2) Does the problem affect a multitude of heterogeneous stakeholder groups?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3) Are stakeholders easy to identify?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4) Has the issue already stirred visible controversy?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5) Is all the funding necessary for building/managing the supply chain available to the decision makers/project developers?</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6) Is uncertainty in scientific information a source of controversy?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7) Are design justice issues relevant?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8) Is there distrust of the decision-makers’ ability to adequately represent stakeholders’ interest?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9) If marginalized in the decision-making process, do stakeholders have the ability to adversely impact the implementation or management of the project/supply chain in a significant way?</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>10) Do some stakeholders have access to useful information/data or financial/human resources they would be likely to share if they were involved?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>11) Is adaptive management of the supply chain over time imperative?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>12) Is significant process obstruction by stakeholders likely if they are involved?</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>13) Are there critical stakeholders?</td>
<td>-1</td>
<td>0</td>
</tr>
</tbody>
</table>

| Participation Level Points (PLP) | 9  |

<table>
<thead>
<tr>
<th>Step 2: Determine Level of Participation (Based on a modified Arnstein’s Ladder, 1969)</th>
<th>PLP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Participation in Final Decision</td>
<td>9 or above</td>
</tr>
<tr>
<td>Public Participation in Assessing Risk and Recommending Solutions</td>
<td>6-8</td>
</tr>
<tr>
<td>Public Participation in Defining Interest, Actors and Determining Agenda</td>
<td>4-5</td>
</tr>
<tr>
<td>Restricted Participation (Feedback in meetings, Commenting opportunities)</td>
<td>3</td>
</tr>
<tr>
<td>Public Right to Object</td>
<td>2</td>
</tr>
<tr>
<td>Informing the Public</td>
<td>1</td>
</tr>
<tr>
<td>Public Right to Know</td>
<td>0</td>
</tr>
</tbody>
</table>

Choice of a Core Group

The PLP heuristic indicated the need for a joint process (PLP>4), the decision-makers identified an appropriate core group. A Core Group of four members was put together to facilitate the stakeholder process. These four members are part of the Agenda staff and SCI.Net project staff.

Choice of an Impartial Player.

An impartial player was selected. This is the main person in charge of stakeholder identification and selection, stakeholder conflict, and value assessment. The impartial player is the SCI.Net Program Manager.
Development of the Project Timeline.

A project timeline was created and it was revised along the project (Appendix A). Change made to the project timeline, along the project, were communicated to all involved stakeholders at all time. A risk analysis approach was also created and revised along the project; this with the purposed of having mitigation action in case of changes on stakeholders (Appendix B).

Development of the Communication Plan.

A communication plan was created by the core group and experts to identify the communication channels among stakeholders (Appendix C).

2. Measure Supply Chain

Supply Chain Geo Map

The supply chain geo map was created by the core group and the Agenda Process staff (Figure 30). This geo map illustrates the production site and the consumers’ site. The production site is composed by the Seminole County main building in Sanford, where the source, make, delivery, and return processes are performed. The consumers’ sites include Sanford, Lake Mary, Longwood, Altamonte Springs, Winter Springs, and Casselberry cities. The terminology used is part of the SCOR terminology. The term “S2” represents the “Source Make-to-Order”, “M2” represents the “Make-to-Order”, “D2” represents the “Deliver Make-to-Order”, and “R1” represents the “Return Defective Product”.

89
Supply Chain Thread Diagram

The thread diagram was created by the core group and experts as a basis for evaluating and understanding the Agenda Process SC. This diagram exhibits the advantages and disadvantages of the supply chain in study (Figure 31). From the figure, there are several sources to obtain the information from the different suppliers. These systems are not connected to each other causing a low reliability and inaccurate service. This situation causes a higher “return” volume, which is corroborated in the next step.
Supply Chain Key Performance Indicators (KPIs)

The evaluation criteria are supported by the SCOR Model and are based on five principals of performance: Reliability, Responsiveness, Flexibility, Cost, and Profitability. These principals are weighed according to the relevance that each principal criteria has through the behavior of the system. The total weight of the system is 100%.

In addition, each principal criterion has its own standard explained through questions which are weighed and scored between 0-100 percent, according to the evaluator. The principal criteria are evaluated according to the definitions below:

- **Reliability**: Describes the performance of the Agenda process in delivering the items to the correct place, within the required time frame, in the condition required, with the necessary documentation, to the assigned department/division/reviewer.
Responsiveness: Describes how quickly the Agenda process provides the items to the correct customers.

Flexibility: Describes the ability of the Agenda process to respond to customer changes.

Cost: Describes the cost associated with operating the Agenda process in terms of man-hours.

Profitability: Describes the effectiveness of the Agenda process in managing assets to support demand satisfaction.

Supply Chain Performance
During our initial process analysis within the Planning and Development Department, 87% of the time the manual paper-based agenda process was reliable; 85% of the time was responsive; 88% of the time was flexible; 95% of the time it was costly because of rework, lack of communication, lack of tracking, etc; and 90% of the time the manual agenda process was effective and beneficial for both internal and external customers. There is a big opportunity for improvement notably in cost.

In addition to the metrics, additional information was collected from other departments, divisions, and sections within Seminole county. Interviews were performed in order to examine Seminole County from a process perspective. The SCI.Net core team interviewed employees who have experienced the power of process improvement and understand the key roles in process management. In addition to staff interviews, the SCI.Net core team reviewed any existing documentation of the process. The SCI.Net core team developed flowcharts to document information from interviews including time-for-steps and information flow. Simultaneously, the SCI.Net core team reviewed documentation with interviewees and obtained feedback.

The meetings provided the following information:

*Approval process problems?*

- Economic Development: Due date or late to County Manager’s Office (CMO) 50% of the time
Fiscal Services: Received information late

Environmental Services: Transport to and from County Attorney’s Office (CAO). Changes required re-approvals.

What was slow?

- Purchasing: Back-up documents lacking or wrong. Deadlines not met
- Community Information: Hand delivery
- Environmental Services: Property Appraiser’s Office (PAO). Managers changing causing process to start over. CAO will not use e-mail to send corrections.
- Public Safety: Travel to County Services Building (CSB)

Tracking Problems?

- Purchasing: Big problem with Support Documents
- Environmental Services: Send to CAO ask to forward to CMO if OK, didn’t know if it was sent.

Ways to go to the County Attorney’s Office (CAO)?

- Hand delivery
- Reviews Before Purchasing
- Email
- Drive car
- Inter-office mail

Ways to go to the County Manager Office (CMO)?

- Hand delivery
- E-mail - carry support documents
- Drive car - sometimes 3 times
Voice of the Stakeholders?

- Electronic signature, opportunity for customer input, auto routing (digital instead of paper).
- Need Routing. Need true project management, milestones, need to track status. Sometimes contracts expire before work is done and nobody knows.
- Trust based tracking of changes to document, so reviewers don't have to reread the entire document.
- Shorter routing period for non-controversial items (i.e. budget change request).
- System will allow anyone to review items.
- Need Trust, card authentication, signatures, timing, researchable text.
- Less driving to the CSB (See Table 21).

<table>
<thead>
<tr>
<th>From to CSB</th>
<th>Total Est. Time one way</th>
<th>Total Est. Distance one way</th>
<th>Total spent round trip twice/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clerk of the Court</td>
<td>3 minutes</td>
<td>0.88</td>
<td>$1.60</td>
</tr>
<tr>
<td>Supervisor of Elections</td>
<td>10 minutes</td>
<td>3.97</td>
<td>$7.8</td>
</tr>
<tr>
<td>Reflections Plaza Complex</td>
<td>12 minutes</td>
<td>5.97</td>
<td>$11.60</td>
</tr>
<tr>
<td>Public Safety Building</td>
<td>13 minutes</td>
<td>5.96</td>
<td>$11.60</td>
</tr>
<tr>
<td>Animal Service</td>
<td>14 minutes</td>
<td>6.44</td>
<td>$12.50</td>
</tr>
<tr>
<td>Central Transfer Station</td>
<td>16 minutes</td>
<td>7.64</td>
<td>$14.90</td>
</tr>
<tr>
<td><strong>Total Saving in a year ($60X100meetings)</strong></td>
<td><strong>Total spent round trip twice/month</strong></td>
<td><strong>Total spent round trip twice/month</strong></td>
<td><strong>$600</strong></td>
</tr>
</tbody>
</table>

3. Benchmarking/Goal of the Organization

Corporate Objectives and Strategy Identification

The overall goals of Seminole County are:

1. Providing customer service that exceeds expectations.
2. Accessibility 24 hours a day, 7 days a week.
3. Ensure that tax dollars are spent intelligently, responsibly and with your future in mind.
4. Ensure details that help improve the enjoyment of life to create a desirable community that attracts visitors.
5. Ensure safety, health, and social education of the community.
The strategy to pursue was to form partnership with the latest institutions of technology to make these goals possible. Seminole County partnered with the University of Central Florida (UCF) to create a technology business accelerator in the county. The purpose of the accelerator was to offer high-growth businesses the opportunity of a stable environment, staffed with experts, to collaborate on research and development for their products or services. Statistics show that 85% of the graduating companies will be located within five miles of the accelerator and will have a tremendous impact on their economy.

Project and Organization Objectives Alignment

In this sub-step, decision-makers and the core group made sure they shared and followed the same objectives (Table 22).

The Agenda Process objectives were:

1. Streamline the process.
2. Make sure all possible service requests should be available on-line. All submissions of documents need to be digital. Once the data is received, the new system should route the information to the correct staff according to the new flowcharts.
3. Control of the Agenda Process Database. The new system must prevent bad data from being entered.
4. Replace the current manual process with a new system that can identify changes in the database in real time.
5. Integrate with other systems.

<table>
<thead>
<tr>
<th>Table 22 – Seminole County and the Agenda Process Project Objectives Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agenda SCI.Net SC Objectives</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Objective 1</td>
</tr>
<tr>
<td>Objective 2</td>
</tr>
<tr>
<td>Objective 3</td>
</tr>
<tr>
<td>Objective 4</td>
</tr>
<tr>
<td>Objective 5</td>
</tr>
</tbody>
</table>
A strategy map (Figure 32) was also used to identify the vision and mission of the Agenda Process project and to define the relationship between the Agenda Process supply chain strategies and relevant areas such as financial, innovation and learning, processes, and supply chain, in order to produce the outcomes.

![Strategy Map For The Agenda Process Project](image)

**Figure 32 – Agenda Process Strategy Map**

Stakeholders Classification

Stakeholders were categorized based on their influence/power, stake, and knowledge (SPK Framework) (Table 23). This Effective stakeholder identification was crucial to determine who was directly or indirectly affected, positively or negatively, by the Agenda Process project management plan, and who could contribute to or delay its success.
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Stake/Power/Knowledge</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agenda Staff</td>
<td>Human resources processing customers’ requests and providing the service. Expertise in the Agenda Process</td>
<td>Knowledge-producers</td>
</tr>
<tr>
<td>Seminole County Citizens and Business Owners</td>
<td>Suppliers of information and users of the service provided. The initiator of the Agenda Process</td>
<td>Other affected stakeholders, and Stakeholders with economic/political influence</td>
</tr>
<tr>
<td>Departments, Divisions, Sections at Seminole County</td>
<td>Staff, Procedures, Data to initiate and process the Agenda Process. Expertise in the Agenda Process</td>
<td>Stakeholders with economic/political influence</td>
</tr>
<tr>
<td>Property Appraiser Office</td>
<td>Current source of properties and property owners’ information. Expertise in property information</td>
<td>Stakeholders with economic/political influence</td>
</tr>
<tr>
<td>County Attorney’s Office</td>
<td>Agenda Item reviewers. Expertise in County law, rules, and policy review</td>
<td>Stakeholders with economic/political influence</td>
</tr>
<tr>
<td>Board of County Commissioners</td>
<td>Legislative branch of county government and individual Commissioners serve as both legislative officers and fiscal representatives of the County</td>
<td>Stakeholders with economic/political influence</td>
</tr>
<tr>
<td>IT Department Staff</td>
<td>IT knowledge, access, maintenance</td>
<td>Decision-makers, and Other affected stakeholders</td>
</tr>
</tbody>
</table>

### Stakeholder Value Assessment

Surveys and interviews were used as approaches for extracting stakeholders’ inputs.

- **Survey:** This survey helped to understand how stakeholders viewed the project, and what they would like to consider their issues in any strategy process (Appendix D).

In the first question of the survey, stakeholders were asked to state their general perception of the Agenda Process development. The results were as follows: 55% of respondents stated having a very positive view of the Agenda Process development, with an additional 25% expressing a positive view; 10% of respondents expressed a conditionally positive view, while 10% of respondents expressed skepticism.

Those with "very positive" or "positive" perceptions of the project in general, emphasized the importance of the development of a new way to do business. The current project was identified as a critical element of this transition towards a government technology revolution.
Some undecided respondents emphasized the importance of the choice of the approach, and the lack of proper regulations for government software development.

Those "skeptical" of the project stated concerns of the effect of the project on the Agenda Process customers, and aesthetics as reasons for their opposition to the project. Other concerns include the choice of the technology, the appropriate use of stakeholders, cost/benefit analysis, and the lack of appropriate protocols for assessing and mitigating negative impacts.

Respondents were asked to state the position of their area on the Agenda Process project proposal. The purpose of this question was for ensuring that the sample is representative of the different perspectives on the issue, and does not represent the composition of views of all stakeholders in the project. The choices given were opponent, proponent, undecided, neutral and no comment. In the respondent sample, 70% identified themselves as proponents, 10% as opponents, 5% as undecided, 5% as neutral, and 10% did not comment on their position.

Stakeholders were asked to identify up to three benefits and concerns of the Agenda Process project regardless of the site. Table 24 lists the benefits and concerns identified by the stakeholders.

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Benefit</th>
<th>Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agenda staff</td>
<td>Data control</td>
<td>Timeline</td>
</tr>
<tr>
<td></td>
<td>Data accessibility</td>
<td>Interfacing with other systems</td>
</tr>
<tr>
<td></td>
<td>Improve customer service</td>
<td>Community acceptance</td>
</tr>
<tr>
<td>Seminole County Citizens and Business Owners</td>
<td>Improve customer service</td>
<td>Agenda Process availability</td>
</tr>
<tr>
<td></td>
<td>Increase local economic benefit</td>
<td>Community acceptance</td>
</tr>
<tr>
<td></td>
<td>Faster response</td>
<td>Collaborative process</td>
</tr>
<tr>
<td>Departments, Divisions, and Sections at Seminole</td>
<td>Data control</td>
<td>User-friendly</td>
</tr>
<tr>
<td>County</td>
<td>Data accessibility</td>
<td>Interfacing with other systems</td>
</tr>
<tr>
<td>Property Appraiser Office</td>
<td>Improve customer service</td>
<td>Community acceptance</td>
</tr>
<tr>
<td>County Attorney’s Office</td>
<td>Create collaborative process</td>
<td>User-friendly</td>
</tr>
<tr>
<td></td>
<td>Data control</td>
<td>Security</td>
</tr>
<tr>
<td></td>
<td>Data accessibility</td>
<td>Time consuming</td>
</tr>
<tr>
<td>Board of County Commissioners</td>
<td>Improve collaborative process</td>
<td>User-friendly</td>
</tr>
<tr>
<td></td>
<td>Improve customer service</td>
<td>Time consuming</td>
</tr>
<tr>
<td></td>
<td>Create safe place to storage data</td>
<td>Community acceptance</td>
</tr>
<tr>
<td>IT Department Staff</td>
<td>Improve collaborative process</td>
<td>Data security</td>
</tr>
<tr>
<td></td>
<td>Increase accuracy in the data</td>
<td>Data control</td>
</tr>
<tr>
<td></td>
<td>More reliable system</td>
<td>User training</td>
</tr>
</tbody>
</table>
• Interviews: Interviews were used as another way to reach stakeholders. The gathered information includes processes descriptions, flow chart development, stakeholders’ expectations, etc. This information was used to define the current “As is” state.

Table 25 displays the components and linkages identified by stakeholders as important.

Table 25 – Stakeholders Comments on the Agenda Process Project

<table>
<thead>
<tr>
<th>Category of Comment</th>
<th>Issue/Linkage/Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Goal and Justification</td>
<td>Customer service assessment</td>
</tr>
<tr>
<td></td>
<td>Timeline</td>
</tr>
<tr>
<td>Analysis of Alternatives</td>
<td>Technical feasibility</td>
</tr>
<tr>
<td></td>
<td>Economic feasibility</td>
</tr>
<tr>
<td></td>
<td>Comparison with other sources</td>
</tr>
<tr>
<td></td>
<td>Collaborative assessment</td>
</tr>
<tr>
<td></td>
<td>Clarity of assumptions in analysis</td>
</tr>
<tr>
<td>Agenda Process</td>
<td>Transparency of process</td>
</tr>
<tr>
<td></td>
<td>Need to streamline the Agenda process</td>
</tr>
<tr>
<td></td>
<td>Inclusion of all Departments, Divisions, and Sections within the County</td>
</tr>
<tr>
<td>Customers Issues</td>
<td>Customers acceptance</td>
</tr>
<tr>
<td></td>
<td>User-friendly</td>
</tr>
<tr>
<td></td>
<td>Customer impact</td>
</tr>
<tr>
<td>Economic Analysis</td>
<td>Total cost assessment</td>
</tr>
<tr>
<td></td>
<td>Value of saving</td>
</tr>
<tr>
<td></td>
<td>Cost relative other sources</td>
</tr>
<tr>
<td>Technology Analysis</td>
<td>Impact of the emerging technology on feasibility of alternatives</td>
</tr>
<tr>
<td>Potential Benefits</td>
<td>One system accessible at all time from anywhere</td>
</tr>
<tr>
<td></td>
<td>Timeless</td>
</tr>
<tr>
<td></td>
<td>Customers satisfaction</td>
</tr>
</tbody>
</table>

Selection of Process Participants

The stakeholders’ list was revised to agree upon the list of participants in the design process.

Following the list of stakeholders that were considered for this Agenda project:

1. Agenda staff
2. Seminole County citizens and business owners
3. Departments, Divisions, and Sections at Seminole County (Directors, Agenda Staff)
4. County Attorney’s Office
5. Board of County Commissioners
6. IT Department Staff
7. PAO Technology Director
8. PAO Staff
Selection of the Facilitator

A Customer Resource Center staff was selected as the facilitator. This person was responsible for facilitating dialogue among stakeholders in all subsequent stages of the joint process.

Best Practices Review

The initial step of the best practices review included defining the area of interest and selecting appropriate categories/components of the review. For the purpose of our study, the topic was identified as “electronic/digital government in the local/municipal level.” The following components were also included in the research: Concept of the electronic/digital government, implementation process of the electronic/digital government, analysis of existing situation with electronic/digital government. Each category of the literature review comprised subcategories that defined and specified the area of interest for the literature review. Third step included local and state government agencies that provide the Agenda Process (Appendix E).

4. Define Critical Problem

List of Problems

The following is a list of problems faced by the Agenda Process staff at Seminole County:

1. Paper-based system.
2. Lack of a system to process, control, keep, and track applications, customer data, etc.
3. Multiple databases entries.
4. Lack of Web services to serve customers.
5. Lack of data elements identification and accessibility by the Agenda users.
6. Lack of integration to support the Agenda process.
7. Current AS400 system no able to identify changes in real time.
8. Lack of a single entry for Agenda items.
Identify Critical Problem

The Agenda Process was facing problems of on time processing and delivery of the Agenda package. The existing paper-based system utilized by the Agenda staff has no level of usability and allows, through the existing business processes, incorrect and duplicate data to be entered into multiple locations (Access, Spreadsheet, and Individual PC). In addition, multiple databases and locations have arisen increasing the concerns of where the most correct and accurate data can be obtained. Connectivity and reliability are the critical problems faced by the Agenda Process. These are identified in the thread diagram (Figure 33).
Stakeholders Re-evaluation and Value Mapping

Not all the stakeholders were needed in every phase of the process. Table 26 displays the stakeholders’ re-evaluation.

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Definition</th>
<th>Relationship</th>
<th>Conflict</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agenda Staff</td>
<td>Process customers’ requests and provide service. Expertise in the Agenda Process</td>
<td>S</td>
<td>W</td>
<td>1</td>
</tr>
<tr>
<td>Seminole County Citizens and Business Owners</td>
<td>Suppliers of information and users of the service provided</td>
<td>S</td>
<td>W</td>
<td>1</td>
</tr>
<tr>
<td>Seminole County Departments, Divisions, and Sections</td>
<td>In charged of processing the Agenda Process</td>
<td>S</td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>PAO System</td>
<td>In charged of the current source of properties and property owners’ information. Process new and existing property and owner information</td>
<td>S</td>
<td>W</td>
<td>3</td>
</tr>
<tr>
<td>County Manager staff</td>
<td>Responsible for the Agenda Process calendar and Unofficial minutes</td>
<td>A</td>
<td>W</td>
<td>3</td>
</tr>
<tr>
<td>County Attorney’s Office</td>
<td>Key player in the Agenda item review</td>
<td>S</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>BCC</td>
<td>Decision-makers</td>
<td>A</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>IT Managers</td>
<td>Current SCI.Net support</td>
<td>S</td>
<td>W</td>
<td>1</td>
</tr>
<tr>
<td>IT Department</td>
<td>Current source and maintenance support of data and information</td>
<td>S</td>
<td>S</td>
<td>2</td>
</tr>
</tbody>
</table>

*Relationship and Conflict: Strong (S), Average (A), Weak (W), Priority: “1” for the highest*

The stakeholders’ list was revised and the relationship, conflict, and priority were set. The PAO Technology Director and the PAO Staff were combined into one stakeholder group, which is the Property Appraiser (PAO) system. A new Stakeholder type was added; this is the County Manager staff. They are in charge of maintaining the Agenda Process calendar and creating the Unofficial Minutes after each BCC meeting. Another key stakeholder was also identified; this is the IT Management level. They supported the SCI.Net project from beginning to end.
Next, the Stakeholder Value Mapping was determined (Figure 34). This value mapping represented all the dependencies between stakeholders. These dependencies were identified as technology, knowledge, services, human resources, regulations, and information.

The Agenda staff was one of the effective stakeholders in the project. They provide services to the Seminole County citizen and business owners, and the agenda item to the County Manager staff and the BCC for final decision. Also, they receive information from the Seminole County citizen and business owners; support from the IT Department, policies and regulation from the County Attorney’s Office; and they well understand the Agenda process.
Stakeholders’ Current “As is” Stage Review

To identify the current “As is” stage, the core group identified all player involved using the SCOR model, specifically the SCOR level 1 supply chain (Figure 35). This gave the first level of decomposition using the five management processes: Plan, Source, Make, Deliver, and Return.

Once the Agenda Process SCOR level 1 of detail, which is related to strategic level (process types), was identified, the Decomposition/ Drill-Down mechanics were developed in order to determine the current state of the supply chain (process categories), which is the SCOR level 2 of detail, and the “As is” stage (decompose processes) to design the desired state (process elements), which is level 3 of detail (See Figure 36).
Figure 36 – Agenda Process Decomposition/Drill-Down Mechanics

The Agenda Process SCOR level 2 of detail was associated with “Plan for Making” (M1). One to nine months were used to process an Agenda item. This long period of time was based on the current paper-based system they used to process it.

The Agenda Process SCOR level 3 involved the process elements. This level explained with more details the longest period taken by the Make element (M2) in the SCOR level 2. This long period of time was mainly caused by the following reasons:

1) Current paper-based system.
2) Lack of a standard process.
3) No database integration.
4) No tracking system available.
5) No searching capabilities.
The physical material flow was also reviewed. The total cycle time of the Agenda process material flow was approximately equal to 1 month. An Agenda Item process had to follow a continuous review process through external and internal partners (See Figure 37).

Practices were aligned and looked at procedures and systems involving work and information flow. The primary deliverables is the “As is” work and information flow (Figure 38). The total cycle time of the Agenda process work and information flow was approximately equal to one month.
5. Define Future “To Be” Stage

Future Supply Chain State Modeling

The future “To be” stage was analyzed by the core group and experts. The desire stage for level 3 was reduced from 1-6 months to 2 weeks (Figure 39). Technology, human resources, and budget were the key factors considered to make the decision. New technology such as the development of an Agenda Process system that would interface with other stakeholders systems, process improvement, and training were the key to success.
Stakeholders Future Supply Chain State Review

Another session was performed with the stakeholders. The core team explained the targets for the future “To be” system. Stakeholders were grouped by small teams and with the use of Causal Loops Diagrams they modeled the future supply chain state and its interactions (Figure 40).
Findings:

- Major Uncertainties (H: High, M: Medium, L: Low): Property Appraiser partnership (H), Tracking system (M), Cost in man/hr (H), IT Department support (L).
- Source of Disagreement: Property Appraiser data sharing (strong)

Stakeholder Value Matrix

Once the stakeholder value activities were identified, it was necessary to relate them with the stakeholders’ involvement, their key measure, impact, and implementation level of assurance. Table 27 displays the value perceived by stakeholders, their involvement, key measures, impact, and their view on how hard the implementation was going to be based on the type of change.
Table 27 – Agenda Process Stakeholder Value Matrix

<table>
<thead>
<tr>
<th>Value perceived by stakeholders</th>
<th>Stakeholder involvement</th>
<th>Key Measure</th>
<th>Impact</th>
<th>Easy /Hard to implement</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized system</td>
<td>Determine best system</td>
<td>Observation, Interviews</td>
<td>High</td>
<td>Medium</td>
<td>1</td>
</tr>
<tr>
<td>Access anywhere at anytime</td>
<td>Review Seminole County users login rules</td>
<td>Documentation</td>
<td>High</td>
<td>Medium</td>
<td>1</td>
</tr>
<tr>
<td>Easy to navigate</td>
<td>Set requirements</td>
<td>Testing</td>
<td>High</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>Tracking system built in</td>
<td>Set requirements</td>
<td>Testing</td>
<td>High</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>One database</td>
<td>Identify data sources</td>
<td>Testing</td>
<td>Medium</td>
<td>Medium</td>
<td>2</td>
</tr>
<tr>
<td>User acceptance</td>
<td>Testing use cases</td>
<td>Testing</td>
<td>High</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>Security</td>
<td>Set requirements and review Seminole County rules</td>
<td>Testing</td>
<td>High</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>Property Appraiser up to date data</td>
<td>Set requirements</td>
<td>Testing</td>
<td>High</td>
<td>Hard</td>
<td>2</td>
</tr>
<tr>
<td>Online application</td>
<td>Set requirements</td>
<td>Testing</td>
<td>High</td>
<td>Hard</td>
<td>1</td>
</tr>
<tr>
<td>Digital support documents</td>
<td>Set requirements</td>
<td>City, Seminole County citizens and business owners involvement</td>
<td>High</td>
<td>Hard</td>
<td>2</td>
</tr>
</tbody>
</table>

6. Identify Changes

Future Supply Chain State

In this step, core group and experts along worked together to identify the different type of changes to implement based on the design of the “To be” system (Table 28), and the Future “To be” possible solutions (Table 29).
Table 28 – Future “To be” Stage Designed Based on Type of Changes

<table>
<thead>
<tr>
<th>Proposed Change</th>
<th>Structural</th>
<th>Cost</th>
<th>Process</th>
<th>Rule</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. One database</td>
<td></td>
<td>3. Easy to navigate</td>
<td></td>
<td>2. Online Application</td>
</tr>
<tr>
<td></td>
<td>3. Property Appraiser up to date data</td>
<td></td>
<td></td>
<td></td>
<td>3. Digital support documents</td>
</tr>
<tr>
<td></td>
<td>4. Online Application</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Digital support documents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actions</td>
<td>1. User requirements and IT design and development</td>
<td>1. Review County user login policy and rules. IT implementation</td>
<td>1. Develop standard flow diagrams of the step-by-step Agenda process</td>
<td>1. Review County user login policy and rules. IT implementation</td>
<td>1. Involvement of users in the design. Training.</td>
</tr>
<tr>
<td></td>
<td>2. Data source, IT design and development</td>
<td></td>
<td>2. Users’ requirement and developers design. User training</td>
<td></td>
<td>2. Seminole County citizens and business training</td>
</tr>
<tr>
<td></td>
<td>3. Negotiation with the Property Appraiser Office to propose option and provide benefits</td>
<td></td>
<td></td>
<td></td>
<td>3. Identify different option to facility the transition path. Seminole County citizens and business training</td>
</tr>
<tr>
<td></td>
<td>4. Apply survey to the Seminole County citizens and business owners to anticipate results</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Apply survey to the Seminole County citizens and business owners to anticipate results</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 29 – Future “To be” Stage Possible Solutions Based on Type of Changes

<table>
<thead>
<tr>
<th></th>
<th>Structural</th>
<th>Cost</th>
<th>Process</th>
<th>Rule</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution 1</strong></td>
<td>Buy an existing software</td>
<td>Research to find out best one at best price</td>
<td>Adapt to new software</td>
<td>Adapt software to County rules and policies if possible</td>
<td>Train users on new software</td>
</tr>
<tr>
<td><strong>Solution 2</strong></td>
<td>Develop our own software</td>
<td>Estimate man/hr</td>
<td>Determine standard process</td>
<td>Review all county rules and policies</td>
<td>Meet with different stakeholders to determine requirements</td>
</tr>
<tr>
<td><strong>Solution 3</strong></td>
<td>Use a third party company to build a customized software</td>
<td>Review timeline</td>
<td>Determine standard process</td>
<td>Review all county rules and policies</td>
<td>Meet with different stakeholders to determine requirements</td>
</tr>
</tbody>
</table>

Quantification/Evaluation

After agreeing upon future supply chain states, the core group created the horizontal and vertical triangular matrix to identify complementary and competing solutions.

Figure 41 – Agenda Process Horizontal and Vertical Matrices
Interaction Modeling Evaluation by Stakeholders

Another session was performed with stakeholders. They were grouped in small teams to agree upon interactions. No changes were made.

Solutions Generation and Evaluation

The core group constructed the transition matrix. It helped to determine the degree of difficulty in shifting from existing to target solutions.

\[
\begin{array}{|c|c|c|c|c|c|c|c|c|c|}
\hline
\text{Existing Practice} & \text{Sop.} & \text{Change log} & \text{Goals} & \text{Status} & \text{Com.} & \text{Tech.} & \text{Run.} & \text{Sop.} & \text{Other} \\
\hline
\text{No standardization system} & 1 & - & - & - & - & - & - & - & - \\
\text{Manual System} & 2 & + & - & + & - & + & - & - & + \\
\text{Manual standardization system} & 3 & + & + & + & + & + & + & + & + \\
\text{Database} & 4 & - & + & + & + & + & + & + & + \\
\text{Paperwork system} & 5 & - & - & + & + & + & + & + & + \\
\hline
\end{array}
\]

Figure 42 – Agenda Process Transition Matrix

Stakeholders Transition Matrix Review

Another session was performed with the stakeholders. The core group explained the options for achieving the future “To be” system. Stakeholders were grouped in small teams and with the use of visual representations they modeled the current and future state interactions.
Transition Matrix Modeling

The core group and the stakeholders defined the transition matrix model after agreeing upon the supply chain future “To be” state and its interaction.

7. Implementation

Facilitated Stakeholders Negotiation on Solutions

The core group determined where various stakeholders stand with respect to retaining current practices and implementing target practices. Another session was performed with stakeholders. The idea was not only to eliminate the negative quality, but also maximize positive quality which in turn creates a “Valued” solution that was going to increase stakeholders’ satisfaction.
Process Effectiveness Assessment

Using the Joint-Fact Finding tool, the core group and stakeholders proceeded to look at the most promising solutions identified in previous steps under the range of uncertainties, and examined its costs and benefits from the different stakeholders’ perspectives also exploring any barriers to implementation (Table 30). To proceed with this stage, the core group gave uncertainty range to the stakeholders and negotiated contingent agreements, which specified precise actions that would be taken to improve the potential consequences of the problem to risk-levels acceptable to the group as a whole.

Table 30 – Agenda Process Effectiveness Assessment

<table>
<thead>
<tr>
<th>Solution</th>
<th>Type of Uncertainty</th>
<th>Costs</th>
<th>Benefit</th>
<th>Barriers to implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy an existing software</td>
<td>Causal, Measurement, Future</td>
<td>$100,000 – $3,000,000</td>
<td>Short term achievement</td>
<td>User acceptance</td>
</tr>
<tr>
<td>Develop our own software</td>
<td>Causal, Future</td>
<td>$100,000 – $1,500,000</td>
<td>Long term goal, Easy maintenance, IT staff training</td>
<td>IT staff manpower</td>
</tr>
<tr>
<td>Use a third party company to build a customized software</td>
<td>Causal, Future</td>
<td>$100,000 - $500,000</td>
<td>Long term goal, IT staff training, Seminole County staff education, In house maintenance</td>
<td>User cooperation</td>
</tr>
</tbody>
</table>

Peer Review

Direct interviews were used to identify whether a particular stakeholder-supported process was effective in the minds of decision-makers, experts, and other stakeholders. The stakeholders’ interviews included different questions to serve as the basis for the supply chain representation, evaluation, and implementation of the proposed framework.

The stakeholders’ view of the supply chain was well-understood. They knew the scope of the project and their part of contribution. They understood that their input was essential to the organization to achieve a common goal, “to exceed customer satisfaction”. It was found that 95% of the time, stakeholders ranked issues the same way, but only 25% of the time they agreed on the same solution. They provided key information needed in order to make the right
decision. They were informed of any change made. Their common feeling was “Ownership”. They found the Joint-Fact Finding process was the best alternative for the decision making process. They provided information about other stakeholders that should have been part of the solution.

Process Validity

Non-participant experts and decision-makers’ process review was performed. Accessible documentation on the process was given to them. There were two types of validity:

- Process, in where they found the process was valid within the context of any county regulation, the process was sufficiently inclusive, decision rules were acceptable and adequate, the points of disagreement were included in the final report, the expert working groups were effectively formed, the process was sufficiently transparent, and the stakeholders were given sufficient means of contributing to the process while it was in progress.

- Validity of Expert Analysis and Recommendations, in where they found the supply chain representation was accurate and valid, the methodologies used to evaluate the supply chain modeling were valid, the assumptions for the expert analysis were valid, and the different uncertainties were adequately addresses.

Implementation Strategy Design

User groups were identified to proceed with all the actions to take in order to accomplish the final solution. Requirements were collected, design was completed, and the deployment was in place. For the deployment phase, training material was prepared and training sessions were performed. Deployment phase was decided to be dual. Paper-based process and new system were used for the first Agenda Process BCC Hearing.
8. Measure New Supply Chain Performance

Operations and Support Information System Documentation

An assessment was performed in the beginning of the project to understand the current process and its performance. Also, best practices were reviewed to find out what was out there. Requirements were collected from users. Graphical User Interfaces (GUIs) were designed with the users. Database was designed and documented. Training was provided.

The different documents provided to stakeholders were: Agenda Process Assessment, Agenda Process best practices, Agenda Process v.1 requirements, GUIs design, Database schema and data dictionary, and Training manual.

Stakeholders’ Communication and Survey

All parties involved were communicating continually. Stakeholders did let us know that all the implementation steps and the strategies for design were well-identified and they were already using the documentation completed.

User groups were also formed to gather feedback from stakeholders about the communication channels used in the Agenda Process project.

Supply Chain New Key Performance Indicators (KPIs)

The new system performance was measured and compared with the prior system. New performance measures indicates that 99% of the time, the new system is reliable (this is a 12% improvement); 100% of the time is responsive (15% improvement); 98% of the time is flexible (10% improvement); 40% of the time is less costly (55% improvement); and 95% of the time is more effective and beneficial for both internal and external customers (5% improvement).

Average numbers of Agenda items were identified with the purpose of understanding what the new system had done for the users in eight months of implementation.
<table>
<thead>
<tr>
<th>Department</th>
<th>Divisions</th>
<th>Avg. # of Items before SCI.Net</th>
<th>Avg. # of Items after SCI.Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning &amp; Development</td>
<td>Planning &amp; Zoning</td>
<td>7 per meeting</td>
<td>4 per meeting</td>
</tr>
<tr>
<td></td>
<td>Building</td>
<td>1 per meeting</td>
<td>1 per meeting</td>
</tr>
<tr>
<td></td>
<td>Development Review</td>
<td>8 per meeting</td>
<td>4 per meeting</td>
</tr>
<tr>
<td></td>
<td>Community Resources</td>
<td>9 per meeting</td>
<td>1 per meeting (CD moved)</td>
</tr>
<tr>
<td></td>
<td>Admin</td>
<td>3 per meeting</td>
<td>1 per meeting</td>
</tr>
<tr>
<td>Tourism</td>
<td>None</td>
<td>18 per year</td>
<td>None so far</td>
</tr>
<tr>
<td>Economic Development</td>
<td>None</td>
<td>18 per year = 1/3 each</td>
<td>24 per year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>agreement renewals, yearly</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>projects, CRA's (redevelopment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>areas)</td>
<td></td>
</tr>
<tr>
<td>County Attorneys Office</td>
<td>None</td>
<td>120 per year</td>
<td>24 per year</td>
</tr>
<tr>
<td>Fiscal Services</td>
<td>Purchasing &amp; Contracts; Budget</td>
<td>15 per month</td>
<td>8 per month</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Purchasing moved out)</td>
<td></td>
</tr>
<tr>
<td>Community Information</td>
<td>SGTV &amp; Graphics</td>
<td>1-2 per year</td>
<td>None so far</td>
</tr>
<tr>
<td>Human Resources</td>
<td>None</td>
<td>2 per year</td>
<td>24 in 9 months</td>
</tr>
<tr>
<td>Sheriff's Office</td>
<td>None</td>
<td>30-40 per year</td>
<td>36 in 9 months</td>
</tr>
<tr>
<td>Public Works</td>
<td>Engineering, Road</td>
<td>5-6 per month</td>
<td>4 per month</td>
</tr>
<tr>
<td></td>
<td>Operations/Stormwater, Traffic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering, Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library and Leisure Services</td>
<td>Library Services, Parks &amp;</td>
<td>15-20 per year</td>
<td>38 in 9 months</td>
</tr>
<tr>
<td></td>
<td>Recreation, Extension Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Services</td>
<td>Prosecution Alternatives for</td>
<td>No Data Available</td>
<td>30 in 8 months</td>
</tr>
<tr>
<td></td>
<td>Youth (PAY), Probation,</td>
<td></td>
<td>(Community Development was</td>
</tr>
<tr>
<td></td>
<td>Veterans Services, Community</td>
<td></td>
<td>moved here)</td>
</tr>
<tr>
<td></td>
<td>Assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Services</td>
<td>Water &amp; Sewer; Solid Waste</td>
<td>3 + purchasing</td>
<td>35 in 8 months</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BITS</td>
<td>Telecommunications; Information</td>
<td>Not Available</td>
<td>55 in 9 months</td>
</tr>
<tr>
<td></td>
<td>Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative Services</td>
<td>Facilities Maintenance, Support</td>
<td>Per Yr: Admin: 5-30</td>
<td>32 in 8 months</td>
</tr>
<tr>
<td></td>
<td>Services, Fleet Services, Risk</td>
<td>Fleet: 1-6 Risk: 2 Support:25-30</td>
<td>(Purchasing moved here)</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Safety</td>
<td>Administration, Animal Services,</td>
<td>&gt; 1 per month</td>
<td>12 in 8 months</td>
</tr>
<tr>
<td></td>
<td>Emergency Communications/E-911,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EMS/Fire/Rescue</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The new Agenda system allows users to see how many items were created for a BCC meeting, how many items are being withdrawn, how many completed, how many on hold, etc. The new system allows managers to revise any process; for example, if a specific division is withdrawing items, an analysis should be conducted to determine the number of hours invested, the reason for withdrawal, etc.

Table 32 – Number of Agenda Items Created that Went to the BCC

<table>
<thead>
<tr>
<th>Department</th>
<th># of items Withdrawn</th>
<th># of items Continued</th>
<th># of items Continued without a date</th>
<th># of items Completed</th>
<th># of items on hold</th>
<th># of items rejected</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Managers’ Office</td>
<td>22</td>
<td>17</td>
<td>7</td>
<td>49</td>
<td>None</td>
<td>5</td>
</tr>
<tr>
<td>Planning &amp; Development</td>
<td>108</td>
<td>108</td>
<td>None</td>
<td>868</td>
<td>11</td>
<td>277</td>
</tr>
<tr>
<td>Economic Development</td>
<td>4</td>
<td>None</td>
<td>None</td>
<td>37</td>
<td>None</td>
<td>10</td>
</tr>
<tr>
<td>Fiscal Services</td>
<td>152</td>
<td>27</td>
<td>None</td>
<td>546</td>
<td>4</td>
<td>171</td>
</tr>
<tr>
<td>Human Resources</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>24</td>
<td>None</td>
<td>4</td>
</tr>
<tr>
<td>Public Works</td>
<td>25</td>
<td>None</td>
<td>None</td>
<td>210</td>
<td>None</td>
<td>66</td>
</tr>
<tr>
<td>Library and Leisure Services</td>
<td>47</td>
<td>None</td>
<td>None</td>
<td>107</td>
<td>None</td>
<td>37</td>
</tr>
<tr>
<td>Community Services</td>
<td>20</td>
<td>None</td>
<td>44</td>
<td>235</td>
<td>6</td>
<td>80</td>
</tr>
<tr>
<td>County Attorney’s Office</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>170</td>
<td>None</td>
<td>8</td>
</tr>
<tr>
<td>Environmental Services</td>
<td>56</td>
<td>57</td>
<td>None</td>
<td>117</td>
<td>None</td>
<td>59</td>
</tr>
<tr>
<td>Business Innovation and Technology Services</td>
<td>1</td>
<td>None</td>
<td>72</td>
<td>55</td>
<td>None</td>
<td>15</td>
</tr>
<tr>
<td>Administrative Services</td>
<td>2</td>
<td>None</td>
<td>None</td>
<td>212</td>
<td>10</td>
<td>126</td>
</tr>
<tr>
<td>Public Safety</td>
<td>24</td>
<td>20</td>
<td>None</td>
<td>104</td>
<td>None</td>
<td>29</td>
</tr>
</tbody>
</table>

Prior to SCI.Net an agenda item spent an average of 40 business days in the review process. With the new SCI.Net Agenda system, an agenda item spent an average of 15 business days in the review process. The total saving is 25 review days per item.
Past due items include all statuses such as withdrawn, completed, on hold, and continued. These numbers reveal internal user accountability, and helps correlate other results such as items withdrawn due to being late for the director.

Table 33 – Number of Agenda Items Past Due for Director, CAO, and CMO

<table>
<thead>
<tr>
<th>Department</th>
<th>Past Due for Director</th>
<th>Past Due for CAO</th>
<th>Past Due for CMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Managers' Office</td>
<td>124</td>
<td>78</td>
<td>0</td>
</tr>
<tr>
<td>Planning &amp; Development</td>
<td>1955</td>
<td>2156</td>
<td>1554</td>
</tr>
<tr>
<td>Tourism</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Economic Development</td>
<td>136</td>
<td>79</td>
<td>90</td>
</tr>
<tr>
<td>Fiscal Services</td>
<td>1724</td>
<td>488</td>
<td>809</td>
</tr>
<tr>
<td>Human Resources</td>
<td>204</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Sheriff's Office</td>
<td>225</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Public Works</td>
<td>568</td>
<td>857</td>
<td>442</td>
</tr>
<tr>
<td>Library and Leisure Services</td>
<td>113</td>
<td>107</td>
<td>69</td>
</tr>
<tr>
<td>Community Services</td>
<td>651</td>
<td>608</td>
<td>488</td>
</tr>
<tr>
<td>County Attorney’s Office</td>
<td>143</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Clerk’ Office</td>
<td>23</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Environmental Services</td>
<td>195</td>
<td>476</td>
<td>316</td>
</tr>
<tr>
<td>Business Innovation and Technology Services</td>
<td>0</td>
<td>109</td>
<td>0</td>
</tr>
<tr>
<td>Administrative Services</td>
<td>1712</td>
<td>1329</td>
<td>760</td>
</tr>
<tr>
<td>Public Safety</td>
<td>190</td>
<td>111</td>
<td>102</td>
</tr>
</tbody>
</table>

There is a noticeable increase in review time for items that require CAO review. Through the new system, the review time has decreased making the Agenda process more efficient.

Table 34 – Average Number of Agenda Items Requiring CAO Review

<table>
<thead>
<tr>
<th>Department</th>
<th>Number of items that went to CAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Managers' Office</td>
<td>22 in 9 months</td>
</tr>
<tr>
<td>Planning &amp; Development</td>
<td>296 in 9 months (Planning)</td>
</tr>
<tr>
<td></td>
<td>4 in 9 months (Building)</td>
</tr>
<tr>
<td></td>
<td>181 in 9 months (DR)</td>
</tr>
<tr>
<td></td>
<td>21 in 9 months (Admin)</td>
</tr>
<tr>
<td>Fiscal Services</td>
<td>130 in 9 months</td>
</tr>
<tr>
<td>Public Works</td>
<td>145 in 9 months</td>
</tr>
<tr>
<td>Environmental Services</td>
<td>112 in 9 months</td>
</tr>
<tr>
<td>Business Innovation and Technology Services</td>
<td>34 in 9 months</td>
</tr>
<tr>
<td>Administrative Services</td>
<td>278 in 9 month</td>
</tr>
<tr>
<td>Public Safety</td>
<td>26 in 9 months</td>
</tr>
</tbody>
</table>
The number of items that require the Fiscal Services review is presented below in a period of nine months. These results help the users to see where the most Fiscal Service items are originated.

Table 35 – Number of Agenda Items Requiring Fiscal Service Review

<table>
<thead>
<tr>
<th>Department</th>
<th>Grant</th>
<th>Revenue</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning &amp; Development</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Economic Development</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Fiscal Services</td>
<td>272</td>
<td>215</td>
<td>216</td>
</tr>
<tr>
<td>Human Resources</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Public Works</td>
<td>41</td>
<td>24</td>
<td>53</td>
</tr>
<tr>
<td>Library and Leisure Services</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Community Services</td>
<td>17</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>County Attorney’s Office</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Environmental Services</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Administrative Services</td>
<td>7</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Public Safety</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

9. Lesson Learned

List of Lesson Learned

The Agenda project is a great initiator of a revolutionary new way of doing business for local governments. The stakeholders’ involvement made a clear vision of what the final output needed to be. Their cooperation was crucial to design the current system that has proved to improve their supply chain performance. To work with an organization culture, there are different areas that must be included. One of these areas is to identify how the different stakeholders feel ownership in what they do, and to make sure they know their benefit the organization to achieve its goal. Involving stakeholders in the process was the best way to train them in the new system. Training time was minimal in this project.

Tensions in the Sessions: During the questions asked by one of the proponents, who went into one of the details of the Agenda project, opponents started to argue on the validity of the question. We intervened, by emphasizing that the Agenda project was not the emphasis of the session. The intervention however may have made stakeholders feel that they did not get a chance to speak their mind. Tensions remained in the audience until the break, after which the
collaborative supply chain modeling was to start. After the introductions were over,
stakeholders were offered refreshments and a chance for informal conversations for 15
minutes. There was extensive mingling, and by the end of the break much of the tension
seemed to have reduced in intensity

Feedback Mechanism
A feedback mechanism was developed mainly for testing purposes. Along the project we also
noticed the level of input received from stakeholders at all time. We decided to use the
feedback system in the production environment and it has been a great tool to users to provide
feedback to the developers in term of functionality, design, ad new ideas.

The Feedback system (Figure 44) is used to provide a convenient way for users and
developers to interact and solve problems functionality, design, and general issues regarding
the Agenda system. The current design allows the user to submit feedback (a feedback item)
pertaining to individual pages. Developers and business process analysts have easy access to
search, rank, and leave responses to these user issues in a way that is similar to a typical
discussion board.

The Feedback Review Screens gives the system users as well as the developer/feedback
reviewer easy access to all Feedback Item left by system users. Feedback reviewers can view
feedback items, search/sort feedback items, and leave appropriate feedback to the user
regarding the feedback item. Users who submitted the comment can also view their comment
and any remarks made by the reviewer such as the status of the feedback item. The Feedback
reviewer has the added ability to select an action state the item should be in to specify if the
necessary action that has/needs to be taken. Feedback reviewers can easily create an email
response to the user if they want to notify them immediately or choose not to further discuss
the issue in the “Open Forum”.

122
Chapter Five summarizes the case study used to test the proposed framework. The SCI.Net team estimated higher level of supply chain performance with the new system designed with the involvement of effective stakeholders. These new levels were measured and compared, verifying the assumption. The new Agenda system is able to interact with any County department/division/section. The system was able to improve the process flexibility for all users, increase the availability of the system to all users, and the reliability and completeness offered by an enterprise solution.

The proposed framework was valid within the context of any county regulation, the process was sufficiently inclusive, decision rules were acceptable and adequate, the expert working groups were effectively formed, the process was sufficiently transparent, and the stakeholders were given sufficient means of contributing to the process while it was in progress.

The supply chain modeling was the result of inputs of different stakeholders and was therefore by definition inclusive of a plurality of views. We asked stakeholders whether the supply chain modeling adequately addressed the key concerns and interests for the Agenda project. The

Figure 44 – Feedback Mechanism
results were as follows: 75% of respondents said they thought the supply chain representation adequately reflected stakeholder concerns, 10% believed it did not, and 15% believed it would with further refinement.

Here is a summary of comments from stakeholders who thought the supply chain modeling was either totally inadequate or needed further refinement.

- “Better refine studies and actions needed to address uncertainties.”
- “Not yet, but getting there.”
- “Too light on supportive technical benefits and benefits to organized labor.”
- “I'd like to see more consideration of how this process would change if driven by government, not educational sector.”

Stakeholders were also asked whether they felt that their understanding of the Agenda system had improved working with the supply chain modeling. The results were as follows: 87% said it had improved their understanding, 11% said that it had helped a little, and another 2% believed it had not helped at all. Comments made by those whose understanding of the Agenda system had only slightly improved or not at all, said that they had not had a chance to look at the entire supply chain modeling in much detail.

Stakeholders were asked whether they thought the supply chain modeling would allow for more decision-options to be considered than the current process allows. The results are as follows: 83% believed it would, 15% believed it may depend on how it is used, and 2% believed that it would not. Stakeholders were also asked whether the modeling would form a better basis for scoping the Agenda project than the current process. Results show that 83% said that it was a better basis for scoping, 15% said that it may depend on how it is used, and 2% said that it was not. Comments by those who were unsure or thought the modeling would not support better scoping and/or options are as follows:

- “I think it is good to understand relationships of various considerations, but this leaves out personal preferences/values that drive decisions.”
- “Still needs development.”
Stakeholders were asked whether the visual tools were sufficiently comprehensive in capturing economic, political, and technical considerations. Results show that 85% believed it was sufficiently comprehensive, 13% thought it was not, and 2% said they did not know. Those who did not think it was comprehensive enough. The following are their comments:

- “Needs more refinement, abbreviated language in boxes leads to ambiguity in depicting total impact. The folks who put this together did not know the terms of references well enough to create correct short hands and draw all the boxes and arrows.”
- “It's better now, but it still needs work.”
- “Focus should not be on comprehensiveness but should be how to decouple values/opinions from analysis.”

<table>
<thead>
<tr>
<th>Components</th>
<th>Measurable Indicator</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusiveness of compound views</td>
<td>Level of different stakeholders, decision-makers, and experts' views were included in the Agenda Process projects’ implementation</td>
<td>Supply Chain elements were trace to individual stakeholders, decision-maker, and expert inputs. This gave us a way to assess to what degree the final implementation included views of diverse participants as compared to an implementation that is done by one group of experts alone</td>
</tr>
<tr>
<td>Value of modeling suggesting strategic options and as a helpful tool for stakeholders</td>
<td>Level of deeper perspectives gained from creating and analyzing the Agenda Process supply chain through SCOR, CLD, and MOC</td>
<td>We compared the number and the quality of different options between stakeholder’s involvement and without stakeholders' involvement, using tools given by SCOR, CLD, and MOC</td>
</tr>
<tr>
<td></td>
<td>Understanding the potential change of the Agenda Process and its most important aspects</td>
<td>Feedback was obtained from stakeholders on their improved understanding of the implementation of the Agenda new system. New perspectives were given by them when comparing it to the modeling without of experts along</td>
</tr>
<tr>
<td>Fullness of implementation</td>
<td>Inclusion of different aspects such as technical, social, political and economical, and capturing supply chain components and links</td>
<td>We compared the inclusion of overall technical, social, and economic aspects of the Agenda Process that were not included in the design created by experts alone</td>
</tr>
</tbody>
</table>
Stakeholders were asked whether they thought working group selection by stakeholders in a Joint Fact-Finding context helped reduce conflict and increase the credibility of the analysis. Results show that 95% thought it did, and 5% were unsure.

Stakeholders were asked whether they thought the proposed process, based on a commonly agreed supply chain modeling was an improvement over the current process: 100% thought it was.

We asked stakeholders whether they thought the value mapping framework was more transparent than what they do to implement IT solutions. Results show that 98% said they thought it was more transparent, while 2% said they were either unsure, that it may have the potential or that it would depend on particular processes.

Summary

In this chapter we applied the value mapping framework involving stakeholders to improve supply chain when implementing IT solutions to the Agenda project. Specifically, we engaged stakeholders in the supply chain modeling, uncertainty identification, and working group formation within a joint fact-finding context. We then compared the resulting supply chain modeling, solutions, and the effective involvement of stakeholders to the scope of the project and found that the proposed framework was more comprehensive, provided more decision-making options, captured effects that the scope could not capture, and included a plurality of views. Stakeholder survey results during a work group session also confirmed these observations. In the next chapter, we look at the survey development, its application, and analysis used to validate the proposed framework.
CHAPTER SIX: SURVEY DEVELOPMENT

This chapter presents the survey developed in order to validate the proposed framework, including measures, data collection, and the analysis process of the survey questionnaire.

There are three important parts of a survey: The sample, the survey development, and the survey application (Girden, 2001; Fowler, 1993). Two critical parts of a survey development process are included here. First is the questions’ development and second the responses’ development or scale development process (Ahire, 2001). The last one is used for closed-ended questions.

Questions’ development refers to the process of obtaining a final set of questions that are reliable and valid. Fowler (1993) defines two types of questions. Reliable questions are those that provide consistent measure in comparable situations. Valid questions are those that their answers correspond to what they are intended to measure. The context of a survey influences both what to ask in a question and how to ask it. Fink (1995) states that the selection and wording of questions are strongly influenced by the survey’s context (its purposes, who asks the questions, how they are asked, who answers them, and the characteristics of respondents and responses).

Questions and Scale Development Process

In an ever changing world that is impacted by daily technological advances, managers understand that their organization’s future will be shaped by today’s decision, and those decisions must be based on extensions of today’s knowledge (Porter et al, 1991). It is essential that we explore the available techniques and tools to determine the best course of action. This survey is divided into three of the four steps proposed by SPSS technical report (“The hows and why's of survey research: Getting the most value through an effective survey research process,” SPSS technical report HMVSWP-1203):

- Planning and survey design
- Data collection
- Data management and analysis methods
- Modeling and deployment
Planning and Survey Design

The objective of this step is to plan and design the survey that is used to validate the proposed framework. Our main objective is to build and conduct a survey among professionals involved in the IT decision-making process to determine the relative importance of effectively involving stakeholders in the design of the new system.

Survey’s Population

The survey’s population and target respondents are the IT professionals from different industry sectors. For the purpose of this research, part of the target respondents is the Society for Information Management (SIM) in the Central Florida region, with membership mixture of different industry sectors.

Data Collection Process

An online survey is used to collect data from IT professionals of different industry sectors. This is a low cost survey method, with faster transmission time, rapid response, and an effective method to collect information regarding their expertise and opinions about the effective involvement of stakeholders and the value added by them when improving supply chains’ performance. The questionnaire is designed and constructed with straightforward, easy-to-understand instructions to minimize the measurement error and to reduce non-response rate.

To gain a better understanding of the extent of the respondents’ expertise, and of the industry they are associated with, the survey has demographic questions about the respondents, their positions, their employers, their industry classifications, and their level of involvement in the decision making process.

Data Management and Analysis Methods

Experts are consulted to achieve content validity. Peer revisions are also executed as well as a Pilot test of the survey.
Data collected is evaluated to ensure validity and reliability. Four criteria are used:

1. **Face Validity**: Use to determine that the survey measures the intended concept.
2. **Content Validity**: Use to determine that the survey provides adequate coverage of all facets of a concept.
3. **Construct Validity**: Use to determine that the survey scores regarding individual standings on certain kinds of variables or constructs are valid.
4. **Criterion-Related Validity**: Use to determine that the measure used for prediction or estimation is valid.

**Pilot Study**

A Pilot study is used in this survey development process. The pilot survey is reviewed by three experts in survey development. The pilot study is completed with the objective to meet the following criteria:

- Develop and test the adequacy of the survey
- Assess the feasibility of the survey
- Establish whether the sampling frame and technique are effective
- Identify logistical problems which might occur using the proposed survey
- Estimate variability in outcomes to help determine sample size
- Assess the proposed data analysis techniques to uncover potential problems

**Survey Design**

After completing the Pilot study, the university requires going through a review process before asking participants to complete any survey. This review is done through the UCF Institutional Review Board (IRB). An online process is in place to request a Board review. Permission to contact respondent was granted by the IRB.

The survey design includes the objective of the survey, the statement for participation, and the list of questions.
Objective of the Survey

The objective of this survey is to collect data from different industry sectors and among different IT decision-makers to validate the proposed value mapping framework involving stakeholders to improve supply chain performance when implementing IT solutions.

Statement of Survey Participation

The following is the statement used to explain the participation of the survey to the different respondents:

“The participation in this survey is voluntary and you do not have to answer any question you do not wish to answer. However, your cooperation is important to ensure that the information collected is as accurate and as comprehensive as possible. Also please note that:

- The survey is solely used for educational purposes;
- No information will be shared with any other entity to protect the participant’s privacy;
- There is no immediate benefit to be expected as a result of participation in the survey;
- There is no compensation to be awarded as a result of participation in the survey;
- You are free to discontinue participation in the survey at any time without consequence;
- Amount of time expected for participation: 10 minutes;
- The data reported on this questionnaire will be treated in strict confidence, used for statistical purposes and published in aggregated form only.

And of course, we will share the results, implications, and conclusions of this study with all respondents. Please click the survey link to begin the survey. Time is of the essence. It is important that we receive your response as soon as possible, and not later than March 7th, 2008.”

Information About the Survey

Implementations of Information Technology solutions have identified several factors to take into consideration in the decision making process. We ask you to answers these questions to determine the relative importance of effectively involving stakeholders in the design of the new system.
The survey is being administered by Karla Alvarado Moore, a PhD candidate in the Industrial Engineering and Management Systems Department at the University of Central Florida.

Survey Deployment

The online survey was disseminated to IT professionals in different industry sectors including the SIM members in the Central Florida region via email through their Chair and Secretary. The following is the introductory email used to distribute the survey:

“Karla Alvarado Moore, who is a PhD student here at UCF, is completing her research in Change Management in IT Supply Chains this semester. As part of the research, she has a nice simple and short survey to gauge IT professionals’ attitudes towards stakeholders’ involvement. I would like to ask for you or your staff to take a few minutes to take the survey and help out her research. The survey is at http://www.creativecrew.org/survey/sage.htm

Her email is kalvarad@mail.ucf.edu, please let her know if you would like to request a copy of the complete research on completion (a digital copy of the dissertation). This will be a pretty ground-breaking framework to improve supply chain performance and should be able to have a positive impact on anyone who manages IT projects.”

Survey Results

A total of 31 surveys were completed by the respondents. The following are the results, by question, from the survey analysis:

1) What is your company’s primary business application focus?

From the total of surveys completed, 48.4% represent the Government sector, 19.4% represent the IT or Computer sector, 9.7% represent the Education sector, 3.2% represent the Service sector, and 19.4% represent other categories such as Aerospace & Defense and Insurance organizations.
2) How many employees does your company employ?

From the total of surveys completed, 58.06% represent large-size companies, 22.58% medium size, and 19.35% small size. For the purpose of this study, small-size companies are defined as those with less than 100 employees, medium-size companies are defined as those with 100-1000 employees, and large-size companies are defined as those with more than 1000 employees.

From the surveys completed by the Government sector, 73% consider themselves large, 20% medium, and 7% small companies.

From the surveys completed by the IT or Computer sector, 17% consider themselves large, 17% medium, and 66% small companies.

From the surveys completed by the Education sector, 67% consider themselves large, and 33% small companies.

The survey completed by the Service sector is represented by a medium-sized company.

From the surveys completed by other sectors, 67% consider themselves large, and 33% medium companies.
3) Which of the following describes your position at your company at best:

From the total of surveys completed, 22.58% represent top corporate management, 38.71% middle management, and 38.71% other, such as Business Process Analyst, GIS Analyst, Computer Coordinator, Project Coordinator, Developer, Lead Developer, Senior Programmer, Programmer, and Account Manager.

The Government sector was represented by 27% top corporate management, 20% middle management, and 53% other.

The IT or Computer sector was represented by 33% top corporate management, 50% middle management, and 17% other.

The Education sector was represented by 33% middle management, and 67% other. The Service sector was represented by middle management.

Other sectors were represented by 17% top corporate management, 66% middle management, and 17% other.
4) What was your company’s prior year revenues?

From the total of surveys completed, 51.61% represent large-company revenues, 19.35% medium-company revenues, and 29.03% small-company revenues. For the purpose of this study a small-company revenues is represented by less than $1 million, medium-company revenues is represented by $2-$50 million, and large-company revenues is represented by $50 million and above.

For the Government sector, 53% were large, 20% medium, and 27% small revenues.

For the IT or Computer sector, 17% were large, 33% medium, and 50% small revenues.

For the Education sector, 33% were large and 67% small revenues.

The Service sector was represented by medium-company revenues. Other sectors were represented by large-company revenues.
5) Does your company build your own IT solutions?

From the different sectors represented in the sample, 9.68% always design and develop their own IT solutions, 74.19% sometime, and 16.13% rarely.
6) Please rank 1 through 8 the importance of the stakeholder involvement in each phase of an IT project:

In order to analyze this question an equation was used to calculate the average number of their ranks in each phase of an IT project.

The average number is the sum of the total number of possible points (which would be the highest rating number) times the number of respondents.

For example, in the Inception phase of the Government sector, the value “8” was selected 10 times by the respondents, “7” was selected four times, and “4” was selected once. The total amount for that phase is equal to \((8*10)+(7*4)+(4*1) = 112\). The total of each phase is the sum of each all sectors.

The Government sector considers the User Acceptance phase as the priority for stakeholders’ involvement followed by the Inception, Training, Collection of Expectations, Collection of Specifications, Testing, Deployment, and Design phases.

The IT or Computer sector considers the Training phase as the priority for stakeholders’ involvement followed by Collection of Expectations, User Acceptance, Collection of Specifications, Inception, Testing, Deployment, and Design phases.

The Education sector considers the User Acceptance and Training phases as the priority for stakeholders’ involvement followed by the Inception, Collections of Expectations, Collections of Specifications, Design, Testing, and Deployment phases.

The Service sector considers the Inception, Collection of Expectations, and User Acceptance phases as the priority for stakeholders’ involvement followed by the Collection of Specifications, Training, Design and Testing, and Deployment phases.

Other sectors consider the Inception, Collection of Expectations, and User Acceptance as the primary phases for stakeholders’ involvement; followed by the Training, Deployment, Collection of Specifications, Design, and Testing phases.

In general, the User Acceptance phase is considered to be the priority for stakeholders’ involvement followed by the Inception, Collection of Expectations, Training, Collection of Specifications, Testing, Deployment, and Design phases.
Table 37 – Calculation to find the average number for stakeholder involvement

<table>
<thead>
<tr>
<th>Sector</th>
<th>Inception</th>
<th>Collection of Expectations</th>
<th>Collection of Specifications</th>
<th>Design</th>
<th>Testing</th>
<th>User Acceptance</th>
<th>Deployment</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>8(10)+7(4)+4(1) =112</td>
<td>8(11)+7(1)+4(1)+3(2) =105</td>
<td>8(7)+7(3)+6(1)+5(1)+4(1)+3(1)+1(1) =96</td>
<td>8(1)+7(1)+6(4)+5(5)+4(1)+3(1)+2(2) =75</td>
<td>8(3)+7(7)+6(2)+5(1)+3(2) =96</td>
<td>8(12)+7(3) =117</td>
<td>8(3)+7(3)+6(3)+5(3)+3(1)+2(2) =85</td>
<td>8(9)+7(4)+4(1)+2(1) =106</td>
</tr>
<tr>
<td>IT or Computer</td>
<td>8(2)+6(3)+5(1) =39</td>
<td>8(4)+7(1)+5(1) =44</td>
<td>8(3)+7(1)+6(1)+5(1) =42</td>
<td>8(1)+6(2)+5(1)+3(1)+2(1) =30</td>
<td>8(1)+7(3)+6(1)+2(1) =37</td>
<td>8(4)+7(1)+5(1) =44</td>
<td>8(2)+7(1)+5(1)+4(1)+1(1) =33</td>
<td>8(4)+7(1)+6(1) =45</td>
</tr>
<tr>
<td>Education</td>
<td>8(2)+7(1) =23</td>
<td>8(2)+7(1) =23</td>
<td>8(2)+7(1) =23</td>
<td>8(1)+7(1)+6(1) =21</td>
<td>7(2)+5(1) =19</td>
<td>8(3) =24</td>
<td>7(1)+6(1)+3(1) =16</td>
<td>8(3) =24</td>
</tr>
<tr>
<td>Service</td>
<td>8(1) =8</td>
<td>8(1) =8</td>
<td>7(1) =7</td>
<td>4(1) =4</td>
<td>4(1) =4</td>
<td>8(1) =8</td>
<td>1(1) =1</td>
<td>5(1) =5</td>
</tr>
<tr>
<td>Other</td>
<td>8(4)+7(2) =46</td>
<td>8(4)+7(2) =46</td>
<td>8(2)+6(2)+5(1)+4(1) =37</td>
<td>8(1)+6(1)+5(1)+4(2)+3(1) =30</td>
<td>8(1)+5(2)+4(2)+3(1) =29</td>
<td>8(3)+7(1)+5(3) =46</td>
<td>8(1)+7(2)+6(2)+4(1) =38</td>
<td>8(3)+7(1)+6(2) =43</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>226</td>
<td>205</td>
<td>160</td>
<td>185</td>
<td>239</td>
<td>173</td>
<td>223</td>
</tr>
</tbody>
</table>
Importance of Stakeholders Involvement in the Inception Phase

Importance of Stakeholders Involvement in the Collection of Expectations Phase

Importance of Stakeholders Involvement in the Collection of Specifications Phase

Importance of Stakeholders Involvement in the Design Phase

Figure 50 – Importance of Stakeholder Involvement in the first four IT phases
Importance of Stakeholders Involvement in the Testing of the System Phase

Importance of Stakeholders Involvement in the System Acceptance Phase

Importance of Stakeholders Involvement in the System Deployment Phase

Importance of Stakeholders Involvement in the System Training Phase

Figure 51 - Importance of Stakeholder Involvement in the last four IT phases
7) If you are managing an IT project and you must select the correct phase for stakeholder input, would you prefer to have stakeholders’ input in: The early phases (Inception-Design), The later phases (Testing – Deployment), No phases.

From the total of surveys completed, all sectors agreed on the value of having the stakeholder input in early phases of the IT project life cycle.

Using a 1 to 5 scale where 1 is the lowest and 5 is the highest, answer the following questions:

8) What level of importance do you feel identifying all stakeholders in a project is to the success of the project?

From the total of surveys completed, 64.52% agreed on the positive effect of identifying all stakeholders in a project, 32.26% somewhat agreed, and 3.23% did not agree at all.
In the Government sector, 53% of the total sample agreed on the positive effect of identifying all stakeholders in a project, 40% somewhat agreed, and 7% disagreed.

In the IT or Computer sector, 50% of the total sample agreed on the positive effect of identifying all stakeholders, 33% somewhat agreed, and 17% disagreed.

In the Education and Service sectors, 100% of the total sample agreed on the positive effect of identifying all stakeholders.

In other sectors, 83% of the total sample agreed on the positive effect of identifying all stakeholders, and 17% somewhat agreed.

9) If you are involved in project management for IT projects what level of effort do you put into the identification and documentation of the stakeholder input?

From the total of surveys completed, 58.06% agreed that organization must put a high level of effort into the identification and documentation of the stakeholders’ input in a project, and 41.85% somewhat agreed.
In the Government sector, 53% agreed that organization must put a high level of effort into the identification and documentation of the stakeholders input in a project, 40% somewhat agreed, and 10% disagreed.

In the IT or Computer sector, 66% agreed that organization must put a high level of effort, 17% somewhat agreed, and 17% disagreed.

In the Education sector, 67% agreed that organization must put a high level of effort, and 33% somewhat agreed.

In the Service sector, 100% agreed that organization must put a high level of effort.

In other sectors, 50% agreed that organization must put a high level of effort, and 50% somewhat agreed.

10) Rank the importance of stakeholder input on these phases of a project

In order to analyze this question an equation was used to calculate the average number of their ranks for each phase of an IT project.

The average number is the sum of the total number of possible points (which would be the highest rating number) times the number of respondents.
For example, in the Inception phase of the Government sector, the value “5” was selected 12 times by the respondents, “4” was selected two times, and “3” was selected once. The total amount for that phase is equal to \((5 \times 12) + (4 \times 2) + (3 \times 1) = 71\). The total of each phase is the sum of each all sectors.

The Government sector considers the Inception phase as the priority for stakeholders’ input followed by the User Acceptance, Collection of Expectations, Training, Collection of Specifications, Testing, Deployment, and Design phases.

The IT or Computer sector considers the Training phase as the priority for stakeholders’ input followed by the User Acceptance, Inception, Collection of Expectations and Testing, Deployment, Collection of Specifications, and Design phases.

The Education sector considers the Collection of Expectations, Collection of Specifications, and Training phases as the priority for stakeholders’ input followed by the Inception and User Acceptance, Design, Testing, and Deployment phases.

The Service sector considers the Inception, Collection of Expectations, and User Acceptance phases as the priority for stakeholders’ input followed by the Collection of Specifications and Testing, Design and Training, and Deployment phases.

Other sectors consider the Inception and Collection of Expectations phases as the priority for stakeholders’ input followed by the User Acceptance, Training, Deployment, Collection of Specifications, Design, and Testing phases.

In general, the Inception phase is considered to be the priority for stakeholder’ input followed by the User Acceptance, Collection of Expectations, Training, Collection of Specifications, Testing, Deployment, and Design phases.
Table 38 – Calculation to find the average number for stakeholder input

<table>
<thead>
<tr>
<th>Sector</th>
<th>Inception</th>
<th>Collection of Expectations</th>
<th>Collection of Specifications</th>
<th>Design</th>
<th>Testing</th>
<th>User Acceptance</th>
<th>Deployment</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>5(12),+4(2)+,3(1) =71</td>
<td>5(12)+4(1)+3(1)+2(1) =69</td>
<td>5(6)+4(6)+3(2)+2(1) =62</td>
<td>5(2)+4(2)+3(11) =51</td>
<td>5(5)+4(6)+3(3)+2(1) =60</td>
<td>5(11)+4(3)+3(1) =70</td>
<td>5(4)+4(4)+3(5)+2(2) =55</td>
<td>5(11)+4(2)+3(1)+2(1) =68</td>
</tr>
<tr>
<td>IT or Computer</td>
<td>5(4)+4(2) =28</td>
<td>5(3)+4(2)+3(1) =26</td>
<td>5(2)+3(3)+2(1) =21</td>
<td>5(1)+4(1)+3(3)+2(1) =20</td>
<td>5(3)+4(2)+3(1) =26</td>
<td>5(5)+4(1) =29</td>
<td>5(2)+4(2)+3(2) =24</td>
<td>5(6) =30</td>
</tr>
<tr>
<td>Education</td>
<td>5(2)+4(1) =14</td>
<td>5(3) =15</td>
<td>5(3) =15</td>
<td>5(1)+4(1)+3(1) =12</td>
<td>4(2)+3(1) =11</td>
<td>5(2)+4(1) =14</td>
<td>4(1)+3(1)+2(1) =9</td>
<td>5(3) =15</td>
</tr>
<tr>
<td>Service</td>
<td>5(1) =5</td>
<td>5(1) =5</td>
<td>4(1) =4</td>
<td>3(1) =3</td>
<td>4(1) =4</td>
<td>5(1) =5</td>
<td>1(1) =1</td>
<td>3(1) =3</td>
</tr>
<tr>
<td>Other</td>
<td>5(6) =30</td>
<td>5(6) =30</td>
<td>5(2)+4(2)+3(2) =24</td>
<td>5(1)+4(2)+3(2)+2(1) =21</td>
<td>5(1)+4(1)+3(2)+2(1)+1(1) =18</td>
<td>5(4)+4(2) =28</td>
<td>5(1)+4(5) =25</td>
<td>5(4)+4(1)+3(1) =27</td>
</tr>
<tr>
<td>Total</td>
<td>148</td>
<td>145</td>
<td>126</td>
<td>107</td>
<td>119</td>
<td>146</td>
<td>114</td>
<td>143</td>
</tr>
</tbody>
</table>
Figure 55 – Importance of Stakeholder Involvement in the first four IT phases
Figure 56 - Importance of Stakeholder Involvement in the last four IT phases
11) What level of importance do you feel providing an ownership of the new system to all stakeholders is to the success of the project?

From the total of surveys completed, 80.65% agreed on the importance of providing new system ownership to all stakeholders in order to have a successful IT project implementation, and 19.35% somewhat agreed.

In the Government sector, 80% agreed on the importance of providing new system ownership, and 20% somewhat agreed.

In the IT or Computer sector, 67% agreed on the importance of providing new system ownership, and 23% somewhat agreed.

In the Education, Service, and other sectors, 100% agreed on the importance of providing new system ownership.

![Stakeholder Ownership & Project Success](image)

Figure 57 – Stakeholder Ownership & Project Success

12) In your opinion does involving stakeholders decrease the level of resistance to the adoption of a new system?

From the total of surveys completed, 77.42% agreed that the involvement of stakeholders decreases the users’ resistance level, 16.13% somewhat agreed, and 6.46% totally disagreed.
In the Government sector, 80% agreed and 20% somehow agreed.

In the IT or Computer sector, 33% agreed, 33% somehow agreed, and 33% disagreed.

In the Education, Service and other sectors, 100% agreed.

Summary

Chapter Six presented the survey design, development, analysis, and results. The online survey was disseminated to the SIM members in the Central Florida region and other IT professionals via email. A total of 31 surveys were completed. The survey was validated by subject matter experts. The response rate, the diversity, and the experiences of the respondents were high-quality.

Data collected was evaluated to ensure validity and reliability. Four criteria were used:

1. Face Validity determined that the survey measured the intended concept.
2. Content Validity determined that the survey provided adequate coverage of all facets of the concept.
3. Construct validity determined that the survey scored regarding individual standings on certain kinds of variables was valid.
4. Criterion-Related Validity determined that the measure used for estimation was valid.
The analysis of the demographic data showed that the respondents are highly influential professionals in the IT field, with the majority occupying either a top corporate level or a middle management position. More than half of the respondents work for very large companies in different sectors.

Survey results indicated that these companies are familiar with all phases of the IT life cycle and currently are or have done any type of IT project implementation. The results also showed that companies rarely involve stakeholders in the design of the new system. From the survey results, Companies believe that the phases that have potential stakeholder values are the Inception and the User Acceptance; having the Design phases as the phase with less stakeholder value.
CHAPTER SEVEN: CONCLUSIONS

This chapter provides an overview of this research, a summary of the final outcomes, conclusions, contributions, and recommendations for future research.

Overview

This research provides a value mapping framework to be used by organizations when seeking higher level of supply chain performance to effectively implement IT solutions.

This research and unlike any previous research, focuses on a value mapping framework that uses the effective involvement of stakeholders in the successful implementation of IT projects to improve supply chain performance.

Research Summary and Conclusions

Chapter 1 set the context and motivation for this dissertation work. It provided basic arguments for the effective involvement of stakeholders.

Chapter 2 presented the literature review. The literature review identified factors such as cost and time that IT professionals are using to base their decision when implementing IT solutions. It showed different approaches, methodologies, and processes that are used for supply chain, change management, IT project implementation, and decision-making. The gap analysis is also presented, showing that most companies’ SCM practices are in the beginning stages of maturity despite the focus on improvements in recent years. However, many have plans to progress from functionally focused to internal integration in the near future.

Chapter 3 presented the methodology used in this dissertation to develop, test, and validate the proposed framework to improve supply chains performance when implementing IT projects with the effective involvement of stakeholders. This research methodology is to create validity in the research process, and therefore, in the research findings. The research methodology presented in this chapter included the research question, research unit of analysis, literature review and existing gap
(presented in Chapter 2), development and test of the proposed framework, analysis of the case evidence, and the development and analysis of the survey; all of these to ensure the achievement of the research objectives.

Chapter 4 presented the proposed value mapping framework. The proposed framework uses deeper perspectives to provide an integrated supply chain decision-making process that enables stakeholders and decision-makers to make joint decisions when implementing change. The proposed framework is a nine-step sequential process that uses the value added from the stakeholders’ perspective as the basis of discussion and negotiations to make decisions. It uses the contributions of an existing model in the Change Management field (the MOC model). It also uses the contributions of an exiting model to define and measure the supply chain (the SCOR model). It includes the Stakeholder Value Mapping which holds the pieces together from the different contributions, including stakeholders’ representation, stakeholders’ re-evaluation along the process, negotiation, and the Joint-Fact Finding model. This framework uses the modified Participation Level Point (PLP) heuristic as a way to assess what level of participation needed. Also, it uses of the Stake, Power, Knowledge (SPK) framework to identify which stakeholders to include at different levels of participation.

Chapter 5 presented the case study used to test the proposed framework. This case study showed how engaged the stakeholders were in the supply chain modeling, how they identified uncertainties, and how the working group formation was achieved within a joint fact-finding context. Results showed that the proposed framework was more comprehensive, provided more decision-making options, captured effects that the scope could not capture by experts alone, and included a plurality of views.

Chapter 6 presented the survey used to validate the framework. Email invitations were sent to the corporate professional members of the Society for Information Managements and other IT professionals, asking for their participation in a short web-based survey that targeted specifically IT professionals. Returned survey responses totaled 31 (50%). The analysis of the demographic data showed that the respondents are highly influential professionals in the IT field, with the majority occupying either a top corporate level or a middle management position. More than half of the respondents work for very large companies in different sectors. Survey results also indicated that these
companies are familiar with all phases of the IT life cycle and currently are or have done any type of IT project implementation. The results also showed that companies rarely involve stakeholders in the design of the new system.

Advantages of the Proposed Framework

The value mapping framework proposed in this dissertation has five important advantages over the current models present in the research literature and used by IT managers to manage IT project from beginning to end resulting in a successful implementation.

First, the proposed framework guarantees the strategic alignment of the decision with the overall business mission and vision of the firm. This framework provides a more disciplined methodology to the IT project implementation overcoming the empirical and subjective approach that IT managers use to understand the business value of project. Instead of ad-hoc categories, this framework uses the well defined supply chain perspectives of the SCOR model and includes the change management of the well defined Matrix of Change model.

Second, the framework approach identifies the impact of uncertainty in the project implementation, using a more axiomatic approach to include the value added by stakeholders.

Third, the framework minimizes the political bias in the decision process by using a more objective methodology to compare project alternatives, using a more axiomatic approach to compare stakeholders’ views and assigning the priority weights that IT managers assign to the different business factors under consideration.

Fourth, the framework uses the value added by effective stakeholders. Stakeholders’ involvement is first assessed, and then it is re-evaluated along the project phases with the objectives of including only those stakeholders that will benefit the IT project design, development, and deployment.

Fifth, the framework approach decreases the level of training at the time of the IT project deployment, because the new system’s users are involved in all phases of the IT project and they already know how they system works. This also increases users’ new system ownership and decreases the new system resistance levels.
The main contribution of this research is the introduction of a unique value mapping framework that includes the incorporation of a new sight, the stakeholders, when analyzing changes that involve IT projects to improve supply chains.

This framework identifies the group of stakeholders to be taken into consideration in order to define the future “To be” state. In addition, the framework identifies the value creation of the “To be” system as seen by the stakeholders.

This research also provides the following contributions:

1. Development of an approach for supply chain modeling when managing change involving stakeholders in the execution of IT projects.

2. Assessment of stakeholder participation needs in a supply chain analysis. This includes:
   - Direct and indirect tools for stakeholder value assessment
   - Conversion of stakeholder statements into supply chain representation components
   - Supply chain representation as a basis for stakeholder dialogue and negotiation with the use of Causal loop Diagrams
   - Stakeholder negotiated performance metric (model output) design
   - Transparent mapping of uncertainties on linkages and components
   - Working group formation and task delegation facilitation
   - Generically applicable supply chain models that can be used for similar systems with minor modifications

3. Stakeholder value mapping with their full participation in the project. This allows supply chain specialists to design what kinds of outputs are necessary to make the decisions.

4. A modified PLP heuristic tool to assess the stakeholders’ participation in the project. This tool provides a numerical value to understand at what level stakeholders should be involved in the project.

5. Another minor, but helpful, contribution of this dissertation is the Stake/Power/Knowledge (SPK) framework to assess at what level individually identified stakeholders need to be involved in the process in order to improve a decision-making process. The SPK framework provides a rough
mental guideline for this process. Stakeholders can be assessed on their stake, power, and knowledge (expert or local) on the decision. Stakeholders with high stakes in the collaborative process, even if they lack any power or knowledge can add legitimacy and community acceptance. Stakeholders with high knowledge can add to the scientific/technical/contextual validity of the analysis, while stakeholders with power (that is mandate or resources) can increase the viability of the process. Stakeholders with lower stake, power, and knowledge can be involved through feedback systems, information websites, media releases and outreach campaigns.

Major Findings

The proposed framework was applied to a local government entity, the SCI.Net project, to improve the supply chain performance of the Agenda Process with the implementation of a new online system with the effective involvement of stakeholders. Supply chain performances were measured before and after, verifying that higher level of performances were achieved and a total of 357 man/hours every other week are saved.

The survey determined the importance of incorporating stakeholders from beginning to end. Also, the importance of documenting stakeholders’ input as value added, but it was clear that decision-makers are not currently including them in the design, which is a clear failure at the time of deployment.

Study Limitations

One of the limitations of the proposed framework is the dependency on the expertise of the decision makers (the IT executives and managers). The initial supply chain representation depends on the expertise of the particular manager making the decision.

The proposed framework uses the SCOR and Matrix of Change models to guide the supply chain mapping and to prioritize changes. The final decision should be made by the managers based on the specific trade-offs that are required for the current business conditions. Therefore, applying the framework or any other decision analysis framework will provide good results as long as the IT
managers and stakeholders provide good information about the business goals that they want to achieve. If the business vision and goal for the project are not clear, then any random outcome will be possible.

**Recommendations for Future Research**

Recommendations for future research include:

1. The distribution of the survey nationally to collect more data from IT professionals and their view of effectively involving stakeholders. This will help overcome some of the limitations faced in this research.

2. The extension of the capabilities of the proposed framework to identify potential technology shortfalls, and provide suggestions and recommendations on how they could be overcome.

3. The development of a software application to support the nine phases of proposed framework. A model that could allow stakeholders to use different layers of information for different sites and consider them in their decision-making.

4. The inclusion of a better way to deal with obstructionism. The proposed framework address some of the issues related to process obstructionism by stakeholders, through careful selection of stakeholders, creating an initial system representation to channel stakeholder dialogue right from the beginning and emphasis on decision rules and effective facilitation. However, it is still far from addressing obstructionism as one of the most important obstacles facing joint processes. It is necessary to investigate better ways of dealing with obstructionism and to incorporate it into a model, while not undermining the collaborative spirit of the process.

5. Verify and validate framework for project scalability. Scalability is defined as the ability of a system or component to accommodate greater demand while maintaining an acceptable response time for users. Scalability is an important factor for organizations that anticipate future growth. The proposed framework has the stakeholders’ value component that will facilitate this process. However, a verification and validation tool must be in place to corroborate it.
APPENDIX A: AGENDA PROCESS PROJECT TIMELINE

- SCLNET: 630 days
- SCUET: 639 days

Phase 1: Document Business Process
- Agenda Review Process: 36 days
- Define expectations, needs and details: 3 days
- Gathering Information & Assign responsibilities: 1 day
- Schedule the (Food) Service Needs: 1 day
- Collect Relevant Materials for the Literature Review: 10 days
- Classify by Categories Relevant material: 12 days
- Decrease size of the UCF team: 2 days
- Discussion and scheduling for the agenda memorando process: 1 day
- Elaboration of the New Flow Diagram for agenda process: 15 days
- Analysis and identification of course-effect diagram for the agenda: 5 days
- Gathering information and show town: 8 days
- Presentation topic: "Agenda Process Review": 1 day
- Interview "Community Resources Agenda" (Jame Peight): 1 day
- Interview "Planner request process" (Cathleen Couty): 1 day
- Interview "Development review planer" (Denny Dill): 1 day
- Analysis and collecting information about planner request process: 1 day
- UCF team working meeting: 6 days
- Interview legal services manager: 1 day
- Brainstorm meeting with UCF team: 1 day
- UCF team walkthrough Landscape Agenda Process: 1 day
- UCF team working meeting: 1 day
- Analysis of the features for the SCLNET website: 10 days
- Get feedback for the agenda process: 1 day
- Document Management System: 6 days
- User Web Interface methodology: 2 days
- Contract update: 4 days
- Final Documentation process for the agenda: 2 days
- Report and Final documentation for the agenda process at Sentinel: 1 day
- Feedback for the Web Interface with UCF: 1 day
- Feedback, needs and expectation for web Interface: 7 days
- UCF team group meeting, building draft for interfaces: 14 days

Phase 2: Technical Evaluation
- Initial Evaluation of the Computer System: 480 days
- GIS/Geo: 120 days
- RTE Evaluation
  - HITEXS SQL User Interface Module: 15 days
  - HITEXS SQL User Interface Module: 25 days
  - HITEXS SQL User Interface Module: 30 days
  - HITEXS SQL User Interface Module: 30 days
- Street Directory: 60 days
- Access Database: 60 days
- Legal Department: 100 days
- Commitment Database: 80 days
- On-Race Imaging Database: 80 days
- Initial creation: 1 day
- Evaluation Testing: 20 days
- Definitive evaluations and specifications Defense: 80 days
- Expectations Business Requirements and subsystem breakdown: 68 days
- Agenda Review Process: 80 days
- Technical Implementation and Recommendations: 200 days
- HITEXS Editor Evaluation and documentation: 100 days
- Lotus Notes Editor evaluation and documentation: 100 days
<table>
<thead>
<tr>
<th>Integration of Data Sources Evaluation and documentation Oracle</th>
<th>136 days</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase IV: Specifications/Bid Plan</strong></td>
<td>99 days</td>
</tr>
<tr>
<td>Prepare formal bid plan</td>
<td>63 days</td>
</tr>
<tr>
<td>Determine the order in which the sub-systems will be developed</td>
<td>4 days</td>
</tr>
<tr>
<td>Define System Quality standards</td>
<td>36 days</td>
</tr>
<tr>
<td>Define Test plan for each software subsystem</td>
<td>25 days</td>
</tr>
<tr>
<td>Open Specification of each sub-module</td>
<td>26 days</td>
</tr>
<tr>
<td>Design database schema</td>
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<tr>
<td>Define Location and Connectivity</td>
<td>36 days</td>
</tr>
<tr>
<td>Define Data Dictionary and class diagram current TEC</td>
<td>46 days</td>
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<tr>
<td>Define Software Specification for each Module</td>
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<tr>
<td>Build SRS_Application</td>
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<tr>
<td>Build SRS_Hardware</td>
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<td>Build SRS_Source</td>
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<td>Build SRS_Security</td>
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<td>Build SRS_GUI</td>
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<td><strong>Agenda</strong></td>
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<td>Focus Group Agenda</td>
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<td>Define Interfaces Design</td>
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<tr>
<td>Build Data Dictionary and class diagram</td>
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<td><strong>Define Technical Architecture</strong></td>
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<td><strong>Development Environment</strong></td>
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<td>Identify dependencies</td>
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</tr>
<tr>
<td>Software dependencies</td>
<td>16 days</td>
</tr>
<tr>
<td>Hardware dependencies</td>
<td>16 days</td>
</tr>
<tr>
<td>Identify Hardware/Software Costs</td>
<td>16 days</td>
</tr>
<tr>
<td>Identify Performed Resources</td>
<td>16 days</td>
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<tr>
<td>Development Environment Hardware and Software Specification</td>
<td>10 days</td>
</tr>
<tr>
<td>Saratoga County Review</td>
<td>10 days</td>
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<tr>
<td>Reuse Dev Env Hardware/Software Spec Doc</td>
<td>10 days</td>
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<td><strong>Production Environment</strong></td>
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<tr>
<td>Identify dependencies</td>
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<td>Software dependencies</td>
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<tr>
<td>Hardware dependencies</td>
<td>16 days</td>
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<tr>
<td>Identify Hardware/Software Costs</td>
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<tr>
<td>Identify Performed Resources</td>
<td>16 days</td>
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<tr>
<td>Production Environment Hardware and Software Specification</td>
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</tr>
<tr>
<td>Saratoga County Review</td>
<td>10 days</td>
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<td>Reuse Prod Env Hardware/Software Spec Doc</td>
<td>10 days</td>
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<td><strong>Phase V: Systems Development</strong></td>
<td>246 days</td>
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<td>Batch/Load Scripts</td>
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<td><strong>Build &amp; Test each of the system module</strong></td>
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<td>Build Application Module</td>
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<td>Build Move_Flow_Module</td>
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<td>Build Report Module</td>
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<td>Build Search Module</td>
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<td>Build Security_Module</td>
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<td>Build GUI Module</td>
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<td><strong>Build each of the Process module</strong></td>
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<td><strong>Agenda Phase II</strong></td>
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<td><strong>Phase V: Testing</strong></td>
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<td>Create Test Environment at Saratoga County</td>
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<td>Conduct Integration and Interface System Testing</td>
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<td><strong>Agenda Phase II</strong></td>
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<td>Validate Data conversion</td>
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<td>User Acceptance</td>
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<tr>
<td><strong>Literature Review and Best Practices</strong></td>
<td>374 days</td>
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<td><strong>Documentation Process</strong></td>
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<td>Outlining Documentation</td>
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<td>Analyze Documentation</td>
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<td>Major Summary</td>
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<td><strong>Development</strong></td>
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<td>Determine Focus Group</td>
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<td>Intensive</td>
<td>38 days</td>
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<td>Sustaining the feedback</td>
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<td>Identifying themes for Survey</td>
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<tr>
<td><strong>Customer survey</strong></td>
<td>150 days</td>
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<tr>
<td>Identify end papers to survey subjects</td>
<td>45 days</td>
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<td>Data collection</td>
<td>15 days</td>
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<td>Enter Customer Survey</td>
<td>14 days</td>
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<tr>
<td>Draft summary Report</td>
<td>14 days</td>
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<tr>
<td>Report</td>
<td>20 days</td>
</tr>
<tr>
<td>Troubleshooting Sections/External Customer</td>
<td>1 day</td>
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## APPENDIX B: AGENDA PROCESS RISK ANALYSIS

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Condition</th>
<th>Consequence</th>
<th>Probability</th>
<th>Impact</th>
<th>Exposure</th>
<th>Mitigation</th>
<th>Contingency</th>
<th>Triggers</th>
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<tbody>
<tr>
<td><strong>People</strong></td>
<td>Unable to identify all stakeholders</td>
<td>Unable to identify all value</td>
<td>0.10</td>
<td>0.68</td>
<td>0.07</td>
<td>Several meetings, time, and types of interview</td>
<td>External benchmarks</td>
<td>Communication Plan, timetable</td>
</tr>
<tr>
<td></td>
<td>Unable to interview stakeholders</td>
<td>Unable to identify needs</td>
<td>0.23</td>
<td>0.68</td>
<td>0.15</td>
<td>Several meetings, time, and types of interview</td>
<td>External benchmarks</td>
<td>Communication Plan, timetable</td>
</tr>
<tr>
<td></td>
<td>Unable to identify different needs</td>
<td>Unable to meet customers' satisfaction</td>
<td>0.17</td>
<td>0.67</td>
<td>0.11</td>
<td>Multiple sources and methods to obtain information</td>
<td>Benchmark against historical data &amp; externally</td>
<td>Timetable</td>
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<tr>
<td></td>
<td>Reliance on a single entity</td>
<td>Inaccurate assessment</td>
<td>0.43</td>
<td>0.55</td>
<td>0.24</td>
<td>Multiple sources and methods to obtain information</td>
<td>Benchmark against historical data &amp; externally</td>
<td>Timetable</td>
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<tr>
<td></td>
<td>Willingness to participate</td>
<td>Incomplete assessment</td>
<td>0.33</td>
<td>0.37</td>
<td>0.12</td>
<td>Several meetings, time, types of interview, motivation</td>
<td>Campaign</td>
<td>Timetable</td>
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<td></td>
<td>Critical stakeholder availability</td>
<td>Project delay</td>
<td>0.20</td>
<td>0.80</td>
<td>0.16</td>
<td>Several meetings, time, and types of interview</td>
<td>Benchmark against historical data &amp; externally</td>
<td>Timetable</td>
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<tr>
<td></td>
<td>Proper response from the stakeholders</td>
<td>Subjective information</td>
<td>0.41</td>
<td>0.25</td>
<td>0.10</td>
<td>Multiple sources and methods to obtain information</td>
<td>Benchmark against historical data &amp; externally</td>
<td>Timetable</td>
</tr>
<tr>
<td></td>
<td>Unable to collect surveys from respondents</td>
<td>Unable to survey results</td>
<td>0.40</td>
<td>0.60</td>
<td>0.24</td>
<td>Multiple sources and methods to obtain information</td>
<td>Benchmark externally</td>
<td>IRB recommendations</td>
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<tr>
<td><strong>Process</strong></td>
<td>Identify critical aspects of the Agenda process</td>
<td>Unable to provide recommendations for improvement</td>
<td>0.20</td>
<td>0.88</td>
<td>0.18</td>
<td>Multiple sources of information</td>
<td>External and historical benchmarks</td>
<td>Timetable</td>
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<tr>
<td></td>
<td>Extent of information available</td>
<td>Improper analysis</td>
<td>0.35</td>
<td>0.35</td>
<td>0.12</td>
<td>Reduce number of sources of information</td>
<td>Remove unnecessary data</td>
<td>Timetable</td>
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<tr>
<td>Category</td>
<td>Issue Description</td>
<td>Probability</td>
<td>Impact</td>
<td>Risk</td>
<td>Countermeasure</td>
<td>Benchmark</td>
<td>Timeline</td>
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<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>--------</td>
<td>------</td>
<td>---------------------------------------</td>
<td>--------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Lack of specific information</td>
<td>Lack of specific information</td>
<td>0.30</td>
<td>0.63</td>
<td>0.19</td>
<td>Multiple sources and methods to obtain information</td>
<td>Benchmark externally</td>
<td>TBD</td>
<td></td>
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<tr>
<td>Technology</td>
<td>System availability Unable to retrieve information</td>
<td>0.26</td>
<td>0.70</td>
<td>0.18</td>
<td>System backup</td>
<td>Benchmark externally</td>
<td>TBD</td>
<td></td>
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<td></td>
<td>System incompatibility Inefficient use of time</td>
<td>0.38</td>
<td>0.57</td>
<td>0.22</td>
<td>Identify compatible systems</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>Environment</td>
<td>Political barrier Unable to complete the project phases</td>
<td>0.23</td>
<td>0.77</td>
<td>0.18</td>
<td>Multiple sources of information</td>
<td>Benchmarks</td>
<td>Timetable</td>
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<tr>
<td></td>
<td>County Regulations Unable to interact with stakeholders</td>
<td>0.28</td>
<td>0.35</td>
<td>0.10</td>
<td>Multiple sources of information</td>
<td>Benchmarks</td>
<td>Timetable</td>
<td></td>
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</table>
Communications Plan

Prepared by:

Karla Alvarado

September, 2003

v1.0

Prepared by Karla Alvarado

Project Manager

kalvarad@mail.ucf.edu
<table>
<thead>
<tr>
<th>Submitted by:</th>
<th>Version</th>
<th>Date</th>
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<tr>
<td>Karla Alvarado, Project Manager, University of Central Florida</td>
<td>0.1</td>
<td>09/12/03</td>
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</table>
Meeting Considerations

When meetings are scheduled, the parties should agree upon the date, agenda, time commitments, and the attendees. Additionally, each participant should receive this information prior to the meeting.

- All project meeting participants should make their best effort to be on time or early for meetings, and meeting leaders should manage meetings so they end on time.
- Meeting Agendas and Meeting Minutes will be emailed to the parties involved.

Project Status Reporting

Description of process

A project status report will be produced every week. The purpose of the status report is to keep the management team informed of significant project activity, progress against the Project Plan, and project risks.

The process is as follows:
Product Status Reporting

Description of process

The purpose of the status report is to keep the project managers informed of significant project activity, progress against the Project Plan, and project risks.

The process is as follows:
Project Status Reporting Process

Weekly SCINET Meetings

- UCF Business team meeting is held on Tuesdays and Thursday at 2pm. The purpose is to collect data, document information, improve process, develop the database specification requirements, quickly review the exceptions from the previous week’s planned activities, highlight the current week’s planned activities, and briefly review any open items.

- UCF Development team meeting is held on Tuesdays and Thursday at 2pm. The purpose is to design and build the new Agenda system, quickly review the exceptions from the previous weeks planned activities, highlight the current week’s planned activities, briefly review any open items, and review the change management log of what has been approved. If required, at the adjournment of this meeting, the Project and Development managers may meet afterwards to consider new/existing project change requests. These requests are described later in this document under change management.

- UCF testing team meeting is held on Tuesdays and Thursday at 2pm. The purpose to prepare, document, and develop the testing plan for testing the new Agenda system. Also, they review the exceptions from the previous weeks planned activities, highlight the current week’s planned activities, and briefly review any open items including the change management log of what is approved.

- The Management team meeting is held on Wednesdays. The purpose is to quickly review the status of the project, risk analysis, briefly review any open items, and review the change management log of what has been approved.

- Expectations working groups (EWG) meeting will be set up by Seminole County. The purpose is to have small groups from different Divisions, Sections, and other Seminole County Departments involved in the Agenda process to elaborate the expectation for the new system.

- Brainstorming and Focus Group sessions will be set up as convenient. The purpose is to gather the information necessary to build a new Agenda system based on customers’ needs and to confirm that the gathered information was collected correctly.

- UCF Internal team meeting is held on Fridays from 11:00 am to 12:00 pm. The purpose is to present and review the product to the project managers. Also, we review the previous weeks planned activities and briefly review any open items, and review the change management log of what has been approved.

Track Team Members and Team Leaders Reporting

Product and Development managers will submit a weekly status report by Thursday Noon EST to the PM via email.

Weekly Issues and Scope Meeting

*Held on a weekly basis as needed (Management team).* The purpose is to review all issues and scope items based on reviewing the current issue log and any project change requests.
Detailed Descriptions of Key Meetings

Weekly Project Directions Meeting
On a weekly basis, the team leads will meet with the Management Team at the beginning of the week to quickly review the exceptions from the previous week’s planned activities, to highlight the current week’s planned activities, and briefly review any open items. This meeting is held every week if necessary.

The agenda will include:

• Project status.
• Planned activities for the current week.
• Report on the consolidated project financial summary.
• Open items.

The documents required are:

• Previous weeks consolidated status report.
• Issues Log.
• Change Request Log.
• Risk Management.

Attendees are:

• Project Managers from UCF and Seminole County.
• UCF Product Manager.
• UCF Development Manager.
• Colleen Rotella.
• Jackson Heinzelman.

Weekly Issues and Scope Meeting
The management team will review the current week’s issues and scope items. This meeting will be held on a weekly basis when necessary. When possible all issues and scope changes will be broken down into a series of steps, with owners and due dates.

The agenda will include:

• Issues (P1 and P2 priorities only).
• Scope Changes/Requests (All).
• Review of next steps.
The documents required are:
• Report of all New and Open P1/P2 Issues.
• New and Open Scope Items.

Attendees are:
• Project Managers from UCF and Seminole County.
• UCF Product Manager.
• UCF Development Manager.

Weekly Project Status Reporting Meeting (UCF Internal Meeting)
On a weekly basis, the management team will review the current project status. This meeting will be held each Friday at 11:00 to 12:00 PM.

The agenda will include reporting on the:
• Team work status.
• Progress toward milestones/deliverables (e.g. red/yellow status).
• Status of resource commitments.
• Review of project sponsor’s assessment of the conditions of satisfaction.

Attendees are:
• UCF project manager.
• UCF team.
• Seminole County project manager.

Team Member Status Reporting

Description of process
On a weekly basis, product and development managers will provide status and schedule information on their work for the current week to their team leads, on a Thursday-to-Thursday reporting cycle. All project team members and team leaders are required to fill out the weekly consultant status report. A template is emailed by the product manager.

Team Member Status Reports are due by noon each and every Thursday. Status reports will be submitted by the product manager via email.

The time frame for the reporting period is as follows: Pages 1 and 2 of the Member Status Report are from Thursday to Thursday, the Time and Expense Tracking worksheet is from the current week Monday to Friday, and each team member will estimate their time and expense for Friday since the report is due on Thursdays.

Consolidated Project Status Reporting

Description of process
On a weekly basis, the product manager, in coordination with the development manager, reports the overall project status information.

Input is directly by the product manager after reviewing the weekly minutes.

Additionally, the Development Manager will also update the overall project schedule.
Scheduled Communications

Document Repository
All project documentation will be stored on the project’s SharePoint SCINET Site.
The team site can be accessed at the following URL.

http://druid.engr.ucf.edu/seminolescinet/index.html

SharePoint SCINET Site Rule:

- Every document needs to be approved by one of the member of the management team to be loaded.
- Visual Source Safe (VSS) should NOT be used in any capacity for document storage. The SharePoint SCINET Site does this automatically for you.

Milestone Completion and Deliverable Sign-off

Description of process
All project deliverables are stored, managed, and versioned in the Project SharePoint SCINET Site.

Non-Recurring Communications

Issue Management
During the course of any development effort, issues arise in the development, testing, stabilizing and deployment phases that need to be proactively managed.

Definition of an Issue
For purposes of issue management, an issue is defined as defects, bugs, problems, complaints, etc., in the solution which occurs during the testing and stabilization phases.

Description of the Issue Management Process
Once an issue has been identified, the issue management process (described in the diagram below) will be used to track and resolve all issues throughout the project lifecycle.

The process is as follows:
The Project Team discovers an ISSUE

SCINET Server

Analysis of Issue for completeness by the Development Manager

Is the Issue High, Medium, or Low?

High or Medium

Action Owner Assigned

Issue status presented Issue Scope Meeting

Medium

Resolved at the Project Team Level

SCINET Server

Low or High

Resolved within Dev. Team

SCINET Server

Issue Process Flow

Escalated to Release Manager

Assign single accountable person for immediate action

Issue status presented Issue Scope Meeting

Share Issue with UCF Project Manager

Ongoing re-evaluation of issue

Resolution > 10 Days

Escalated to a project Risk

SCINET Server

**IF THE SLA IS NOT MET, AND THE ISSUE IS IN THE CRITICAL PATH, THE ISSUE WILL BE RE-EVALUATED FOR ESCALATION.**

HIGH

Critical path items that are jeopardising dates and/or deliverables
Status SLA: 2 Days

MEDIUM

Items that require assistance or resolution outside of the immediate project team
Status SLA: 5 Days

LOW

Non-critical path items that can be resolved within your own project team
Status SLA: 10 Days

If the SLA is not met, and the issue is in the critical path, the issue will be re-evaluated for escalation.
Change Management

During the course of any development effort, changes to the project scope may be necessary. However, to ensure that all parties understand the impact on the required features, schedules, and resources, a formal change management process is required.

Definition of project scope change

For purposes of change management, a project scope change is defined as any change to one of the variables of the project triangle (e.g. features, schedules, and/or resources).

Project Change Request Form

A Project Change Request form should be initiated whenever changes are required for the existing project scope (e.g. Statement of Work, schedule, costs, predetermined deliverables, functional requirements, technical requirements, functional specifications, technical specification, and/or technical designs).

Description of the Change Management Process

Once a change is identified as being critical to the successful completion of the solution, either party may initiate a project change request, using the change management process as described in the following diagram.
The process is as follows:

**Initiate a Project Change Request**

- Team member fills out a Change Request Form
- Development Manager Completeness Review

**Project Manager reads the request for review**

- Store in Change DB
- Escalated to next wly mtg
- Escalation Review
- Rejected the change request (e.g. resolved, closed, more info)
- Development Manager Updates change request status in the Change DB

**Issues and Scope Meeting**

- Escalated to Management Team for further consideration
- Revisions & Clarification
- Disposition: resolved, closed, returned more info, or declined

**Management Team Meeting**

- CMB Consideration Review
- IA Approved
- Change Request Declined

**Impact Analysis Process**

- Change Request Declined
- Approved for execution

**Change Management Process**

**Change Requests Request are**
- Resolved and closed
- Raised for escalation to change board
- Returned to Development Manager for more information

**Change Requests Request are**
- Escalated to Management Team for further consideration

**Change Requests Request are**
- Approved Impact Assessment
- Declined for Impact Assessment
- Returned to Development Manager for more information

**Change Requests Request are**
- Declined
- Approved for execution

**Change Requests Request are**
- Resolved and closed

**All Change Request are submitted to the SCINET SharePoint**
1. **Initiating a Change Request:** The party requesting the change in project scope will submit a Project Change Request form to the product manager via email.

2. **UCF Project Manager Completeness Review:** The Project Manager will review the project change requests for completeness and will follow up with the initiator if the request is incomplete. If the project change request is complete the request will be escalated to the management team for review in the next weekly meeting.

---

**Risk Management**

A Risk Management document will be initiated and managed throughout the project in order to monitor and manage the risks associated with the project. It will be organized into four sections, covering each of the major risk areas.

- **The People** section includes items related to the human resources involved in the project. These could be risks that are internal to the Agenda process or risks that are people-related that could affect the Agenda process.
- **The Process** section includes items related to Land File processes. These could be risks that are internal to the Agenda process or risks that are process-related that could affect the Agenda process.
- **The Technology** section covers specific technology-based risks for this effort, resulting from our current understanding of the functional requirements.
- **The Environment** section of the document describes items for consideration that relate to the implementation of this particular project.

Where appropriate, an estimate of the project exposure and recommendations for mitigation and contingency planning will be incorporated into each specific risk area. Risk management reports will be posted on the SharePoint SCINET Site and optionally reviewed at weekly project status conferences.
APPENDIX D: STAKEHOLDER VALUE ASSESSMENT SURVEY

Stakeholder Value Assessment Survey

Partnering with University of Central Florida

Seminole County Integrated Network (SCI.Net)

**Purpose:** The purpose of this survey is to help Seminole County, in partnership with the University of Central Florida, understand our stakeholders’ experience with them. We encourage you to participate so that we can learn how we currently are doing in our relationship with **YOU**, our stakeholder. Please help us to improve our services. Thank you very much.

1. **What is your general perception of the Agenda process development?**
   - [ ] Very positive view
   - [ ] Positive view
   - [ ] Conditional positive view
   - [ ] Skepticism
   - [ ] Undecided

2. **What is your position on the Agenda project proposal?**
   - [ ] Opponent
   - [ ] Proponent
   - [ ] Undecided
   - [ ] Neutral
   - [ ] No Comment

3. **Can you identify up to three benefits and concerns about the Agenda project?**

Thank you for completing this survey.
Results of this survey will be available on our website at [www.seminolesci.net](http://www.seminolesci.net)

SEMINOLE COUNTY PLANNING AND DEVELOPMENT
ATTENTION: CUSTOMER RESOURCE CENTER
1101 EAST FIRST STREET
SANFORD, FLORIDA 32771
APPENDIX E: BEST PRACTICES REVIEW

Currently there are no academic studies about the agenda process for government entities. The review of the many best practices collections about e-government reveals only one citation of the agenda process—a survey conducted by the Public Sphere Information Group (PSIG) in 2003. The report of PSIG indicates that 3 municipalities in the USA (Irving, TX, St. Paul, MN, and Phoenix, AZ) have implemented an advanced system of “minutes meeting dissemination.” These systems provide citizens and other users with advanced search engines for the council meeting agendas; however, no information about interaction among the government employees in the process of agenda creation is provided.

More information exists for processes similar to the agenda process, such as legislation tracking systems, document and record management products, and e-filing software. The analysis of existing software products results in the following characteristics important for the successful implementation of a document management system:

**Best Practices**

**Accessibility**
The document management system needs to make documents and records easily accessible and searchable for external (citizens and business) and internal (employees) customers (NECCC, 2002). To ensure document accessibility, leading government software developers include multilevel indexing, multiple search engines and automated track reporting to make creation, tracking and maintenance of the necessary government documents easy and fast.

**Software products:** Leading software products providing high accessibility are:
- Legislative tracking solution by NIC, Inc.
- Record Management and Archiving Solutions by CBOSS
- Government Record Management by ACS, Inc.

**Best practice examples:** A high accessibility of government documents was recognized in such best practices cases as:
- Texas legislative tracking system (best e-government award of NASCIO in 1998)
- San Diego Department of Child Support Services (winner of NACO achievement award in document management, 2003)
- Grand Forks County, ND (TexasOnline best practice nomination)

**Flexibility**
The document management system needs to follow the life of each type of government document. Because each government document has unique conditions for creation, maintenance, storage and deletion (users, content, access, alteration permission, etc.), the documentation management system needs to be flexible and diversified to provide each document with appropriate management levels (Center for Technology in Government, 1997; NECCb, 2002). In government software solutions, such flexibility can be reached by including workflow modules, diversified users account systems, tracking reporting and notification of the document progress.

**Software products:**
- Enterprise Document Management by HR Doctors
- Smeadlink Express Recordkeeping by Smead Express
- PaperGate by CCPartners

**Best practice examples:** Examples of successful flexibility feature implementation can be found in such projects as:
- American Hospital Association government relations (empowered by Vocus)
• Electronic Information Sharing Law and Justice Group Strategic Plan (NACO achievement award, 2003) San Bernardino County, CA
• Alaska legislature (Council of State Government award)
• City of Virginia Beach Public Document Archive

**Integrity/Unity**
The document management system needs to support a united database for all types of documents, and also have standard data input/output requirements, compatible document forms and the integrity of a single government document (NECCC, 2001; CIO, Miami-Dade Working Group report, 2000). To guarantee integrity, government software developers are offering diversified users access (approval, routing, notification, reporting, tracking), support data sharing between several databases maintaining and storing different types of government documentation, and user-created forms for government documents.

**Software products:**
• Minus Workflow by Minus
• Record Management and Archiving Solutions by CBOSS

**Best practice examples:** Examples of successful projects supporting government documents unity/integrity include:
• Electronic Information Sharing Law and Justice Group Strategic Plan (NACO achievement award, 2003), San Bernardino County, CA
• Minnesota Legislature (winner of Council of State Governments best legislature web site award)
• Indiana BillWatch service (empowered by NIC)

**Conclusion**
To summarize, best practices suggest that successful document management systems should have the following characteristics:
• Provide fast and easy access and searching for all maintained records.
• Follow the unique life of each government document.
• Support standard requirements for all managed agendas and minutes.
• Ensure its compatibility with other documents.
• Share data of maintained and stored records between the different departments and government entities.

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