Assessing Project Success: Comparing Integrated Change Management and Change

Management

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DOCTOR OF PHILOSOPHY

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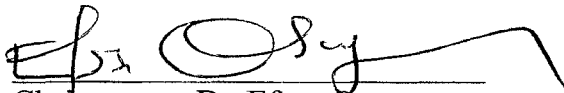PO Box 1346
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Management

By

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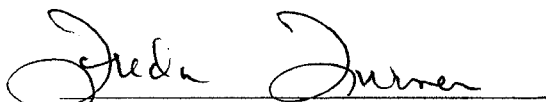
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Abstract

Assessing Project Success: Comparing Integrated Change Management and Change

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Northcentral University, April 2008

Managers achieve their long-term business goals or objectives through strategies. They

undertake projects to realize these strategies. However, in global businesses, only 2.5% of

projects fully succeed. Researchers found empirical evidence that the high failure rate of

projects is because managers are not implementing projects that align with the business

strategy. Many researchers have posited as to the possible affects of implementing

projects not aligned with the business strategy to the poor alignment between business

strategies and project management. Others emphasized the role of change as a key to the

survival of the organizations. Many others emphasized the important role of change

management as a key to project success. However, none has studied the relationship

between change management process or integrated change management process and

project success. Furthermore, no known research has been conducted to test if project

success in organizations who implement integrated change management process exceeds

project success in organizations who implement change management process. The

researcher focused on these aspects in the research.

The researcher found two reliable, linear, and positive correlations between

project success and change management process from one hand and project success and

integrated change management process from the other. The research findings also

confirmed the hypothesis that organizations who implemented integrated change

management process achieved higher project success rates as measured by adherence to project scope, project time, project cost and stakeholders' satisfaction than those who implemented a traditional change management process.

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CHAPTER 1 - INTRODUCTION

Managers achieve their long-term business goals or objectives through strategies. They undertake projects to realize these strategies. However, in global businesses, only 2.5% of projects fully succeed and over 50% fail completely (PriceWaterhouseCoopers, 2005).

Technology, customer focus, and globalization are the main forces that lead to change (Jick & Peiperl, 2002). In the marketplace, these forces increasingly effect changes in customers' needs, buying patterns, markets, and channels. Since these forces are the main parameters that shape business strategy, changes in these parameters lead to changes in strategy. According to Jick and Peiperl, organizations that do not change are destined to die.

The findings of a customer research study conducted by Business Improvement Architects (2006) included:

1.   The high failure rate of projects is because managers are not implementing projects that align with the business strategy. In fact, in only 13% of the cases, managers align projects with their strategy.

2.   Only 2.5% of global businesses achieve 100% project success (PS).

The impact of project failures on global businesses is dramatic. Researchers at Gartner and the Giga Group concluded that project failures cost businesses more than $450 billion in 2001 (Palmer, 2002).

Many researchers have posited as to the possible affects of implementing projects not aligned with the business strategy to the poor alignment between business strategies and project management (Hartman, 2000; Zhang, 2004). However, these researchers did

not consider change and its effects on strategy and projects. As such, the focus of the study was to:

1.   Assess the relationship, if any, between PS and two processes implemented by managers in organizations to deal with change: (a) a traditional change management process (CMP), and (b) an integrated change management process (ICMP). While a CMP is a stand alone process used to manage changes, ICMP is a change management process that is institutionalized in the company's organization, processes, and policies.

2.   Examine the outcome differences in project success PS between companies whose managers implement CMP and companies whose managers implement ICMP.

Statement of the Research Problem

Managers undertake projects to implement strategies. During the project life cycle, change may occur and could affect strategy, project, or both leading to misalignment and thus to project failure. Researchers at Gartner and the Giga Group suggested that project failures cost businesses more than $450 billion in 2001 (Palmer, 2002). The high failure rate of projects (PriceWaterhouseCoopers, 2005) has been posited to result from managers not implementing projects that align with the business strategy (Business Improvement Architects, 2006). When dealing with change, managers use either CMP or ICMP to align strategies and projects. However, there does not appear to be any viable evidence that confirms or rejects the hypotheses that there exists a relationship between PS and CMP or ICMP and that there is a difference in PS outcomes between the use of CMP and ICMP. This information is vital for managers in

organizations who compete in a continuously changing market because it reduces project failure costs.

Background and Significance of Research

When dealing with change, companies use either CMP or ICMP to align strategies and projects. However, there does not appear to be any viable evidence that confirms or rejects the hypothesis that there exists a relationship between PS and CMP or ICMP and that there is a difference in PS outcomes between the use of CMP and ICMP. This information is vital for managers in organizations who compete in a continuously changing market because it reduces project failure which cost businesses more than $450 billion in 2001. Each dollar recovered would add to the company's bottom line.

The researcher through the quantitative research examined the relationships between the use of ICMP or CMP and PS. The difference in PS outcomes, if any, was considered as a potential indicator that managers in companies using ICMP have higher PS than those who use CMP.

The results of this research may lead to scientific, economical, and organizational benefits. First, scientifically, the researcher confirmed that ICMP better aligns strategy and projects, as reflected by increased levels of PS, than CMP. This could lead to further investigations and studies to either concentrate the research efforts on the ICMP or to find other features to improve the performance of CMP. This approach could potentially spur scientific progress. Second, economically, reducing project failures would benefit organizations and the community because it reduces waste. Reducing waste is a key issue to remain in business today because it allows building it right the first time, every time, rather than waste time and money (Koltko, 2008). Third, organizationally, ICMP is

intended to integrate change management in organizations to improve project success regardless of the organization's structure. Managers who consider the organizational structure of their companies as a winning factor for project success may need to revise their strategies as a result of the outputs of this research.

Research Questions

The main two purposes of this quantitative correlational and comparative study were to examine two principle factors: (a) the relationships between the use of CMP or ICMP and PS, and (b) the differences in PS outcomes, if any, being used to as a possible indicator of improved alignment of strategy and projects. To achieve these purposes, the researcher needed to answer the following questions:

Q1: What is the degree of the relationship, if any, between CMP and PS?

Q2: What is the degree of the relationship, if any, between ICMP and PS?

Q3: To what extent, if any, is there a difference in PS values between the use of

CMP and ICMP?

Brief Review of Related Literature

Managers in organizations undertake projects to realize their strategies, but only 2.5% of projects fully succeed (PriceWaterhouseCoopers, 2005). In many cases, project failure is due to the misalignment between strategies and projects (Hartman, 2000; Zhang, 2004). A change in strategy without a corresponding change in project leads to a misalignment between the two. Managers, influenced by change, use either traditional stand-alone or integrated change management processes to align strategies and projects (Prosci, 2004b). For this inquiry, the research hypothesis was that managers using an integrated ICMP achieve higher levels of PS than those who use a CMP, and thus a closer

degree of alignment between business strategy and projects can be inferred. To test this hypothesis, analysis was conducted on three constructs: PS, CMP, and ICMP. The researcher reviewed the literature focusing on these three areas.

Project success. Projects are defined as failures if their results do not meet the pre-established requirements for performance, schedule, and cost (Project Management Institute, 2004). Project success is the measure of adherence of the project to the triad of project management factors: project scope, project cost, and project schedule. Much has been written about the identification and measurement of project success. Success means different things to different people (Dvir, Levy, Maltz, & Shenhar 2001).

Researchers at Business Improvement Architects (2006) related project success to time, cost, scope, customer requirements, and deliverables. Shatz (2006) identified project success as meeting stakeholder satisfaction, project team satisfaction, cost and time criteria, business added-values requirements, quality requirements, and scope requirements. Henrie and Sousa-Poza (2005) posited that project success measurements include time, cost, project team goal, people involved in the project, requirements definition, and management techniques and processes. Atkinson (1999) concluded that project success includes measurement of cost, time, quality, system benefits, organizational benefits, and stakeholder/community benefits.

Hartman (2000) confirmed Atkinson's view of project success as a measurement of stakeholders' benefits. Researchers at A.G. Edwards measured project success as a combination of factors such as time, cost, and the project's business value (Levinson, 2006). Legris and Collerette (2006) linked project success to stakeholders, social factors, and the integration of change management practices. As illustrated in Table 1, grouping

these results in a logical pattern, one can conclude that these types of measurements fall under two main streams; (a) meeting the triple constraint, and (b) satisfying stakeholders. The authors of the Project Management Book of Knowledge defined the triple constraint as meeting predefined scope, time, and cost of a project (Project Management Institute, 2004).

Table 1

Project Success Measurement

Reference	Meet the triple constraint			Satisfy stakeholder?		
	Time	Cost	Scope	Stakeholder	Project Team	System Benefits
Project Management Institute (2004)	X	X	X			
Business Improvement Architecture (2006)	X	X	X			
Shatz (2006)	X	X	X	X	X	
Henrie and Sousa-Poza (2005)	X	X	X		X	
Atkinson (1999)	X	X	X	X	X	X
Hartman (2000)				X		
Levinson (2006)	X	X	X	X		
Legris and Collerette (2006)				X		X

Change management process. Change management (CM) is the process of selecting and deciding which changes to encourage, allow, or refuse based on the evaluation of the impact of these changes on the triple constraint and the gains or losses in business. The CMP is a stand-alone process that allows incorporating changes into a project and or into a strategy. Researchers at Prosci reported varying levels of change management capability across organizations (Prosci, 2004a). The change management maturity model has five levels or stages that range from no change management to organizational competency (Prosci, 2004a). Levels *1-3* are the lower levels where CM is an ad-hoc process or at most a structured process localized to particular teams or areas in the organization. For this study, Levels 1-3 were used to represent CMP.

Integrated change management process. Integrated change management process (ICMP) is similar to CMP. However, ICMP is institutionalized in the company's organization, processes, and policies (Prosci, 2004a). ICMP allows incorporating changes into a project and or into the strategy. Gary Kissler (1991), a partner at Deloitte Consulting Change Leadership practice, posited that the three components critical to the project's success and that form an integral part of change management are people, processes, and technology. Fuchs (2004) noted that change management should not stop at managing variance in the project management triad but should address user adoption as well. Involving business users in the change management process is key to overall project success. Managers at A.G. Edwards concluded that one of the main reasons why project managers continue to fail in delivering their projects is the lack of implementing a change management process not just in IT but across the company (Levinson, 2006). In the change management maturity model, ICMP fits in Levels 4 and 5 because companies

reflecting these levels can be characterized as having integrated change management in their organizations, processes, and policies (Prosci, 2004a). The present literature is summarized in Table 2.

Table 2

ICMP Measurement

Reference	Organization-wide standards and methods broadly deployed for managing and leading change		Change management competency is evident in all levels of organization and is part of the company's intellectual property		
	People	Processes and Technology	People	Processes and Technology	Culture
Kissler (1991)	X	X			
Fuchs (2004)				X	X
Levinson (2006)			X	X	X
Prosci (2004a)	X	X	X	X	X

Level 4 of the change management maturity model includes companies where organization-wide standards and methods are broadly deployed for managing and leading change. These standards and methods are broadly deployed by employees through processes and technology. The works of Kissler and Prosci (1991, 2004a) perfectly fit into this level. Level 5 of the change management maturity model includes companies where change management competency is evident in all levels of organization and is part of the company's intellectual property. This involves people, processes and technology,

and the organizational culture. The works of Fuchs, Levinson, and Prosci (2004, 2006, 2004a) fit into this level of the maturity model.

Definition of Key Terms

Business strategy. Business strategies are the means and potential actions by which a company tries to fulfill its long-term objectives (Nadler & Nadler, 1997). Business strategies may include geographic expansion, diversification, acquisition, product development, market penetration, retrenchment, divestiture, liquidation, and joint ventures (David, 2004). In this study, the researcher refers to business strategy as strategy.

Change in business strategy. Change in business strategy adds to, deletes, or modifies strategy. Change in business strategy happens in response to external factors (Nadler & Nadler, 1997).

Change management. Change management is the application of knowledge, skills, tools, and techniques to incorporate changes into a project and or into a strategy (Prosci, 2004b). Thus change management aligns strategy and projects. Since change can be generated either in strategy or in the context of the project, aligning strategy and projects requires a bidirectional process.

Change management maturity model. According to the developer of this model, employees implement change management in five different ways: (a) little change management applied in managing projects, (b) some elements of change management are being applied in isolated projects, (c) a detailed approach for managing change is being applied in multiple projects, (d) organization-wide standards and methods are broadly deployed for managing and leading change, and (e) change management competency is

evident in all levels of the organization and is part of the organization's intellectual property and competitive edge (Prosci, 2004a).

Change management process. The change management process is a stand-alone process that allows incorporating changes into a project. In the change management maturity model, the change management process occupies the first three levels (Prosci, 2004a).

Integrated change management process. The integrated change management process is similar to the change management process except that it is institutionalized in the company's organization, processes, and policies. ICMP allows incorporating changes into a project and or into the strategy. In the change management maturity model, ICMP occupies the last two levels (Prosci, 2004a).

Project. Projects are temporary endeavors that companies undertake to achieve business targets (Project Management Institute, 2004). Projects are either internal or external. An organization develops internal projects to achieve a competitive advantage either through its offerings (i.e., products and services), diversification, product development, divestiture, organizational structure (i.e., geographic expansion, acquisition, market penetration, retrenchment, liquidation, and joint ventures), or through internal practices and policies that is, geographic expansion, acquisition, retrenchment, liquidation, and joint ventures (David, 2005). Companies undertake external projects to achieve a temporary marketing advantage.

Project management. The authors at The Project Management Institute (2004) defined project management as "The application of knowledge, skills, tools, and

techniques to meet project requirements" (p. 6). Project requirements are the triad of project management and include scope, cost, and schedule.

Project success. Project success is commonly defined as the level of adherence of to the triad of project management factors: project scope, project cost, and project schedule. However, many researchers have also related project success to stakeholder satisfaction (Business Improvement Architects, Shatz, Legris and Collerette, Atkinson, and Hartman, 2006, 2006, 2006,1999, 2000).

Project scope. Project scope is defined as the sum of products, services, and results to be provided by a project (Project Management Institute, 2004). To ascertain that a project includes all the work required, project managers use a process called project scope management. This process consists of scope planning, scope definition, work breakdown structure creation, scope verification, and scope control project management processes (Project Management Institute, 2004). A project is on scope when the outcome of the final verification process confirms that work has indeed been carried out in accordance with applicable regulations, contract, and design documents (Khan, 2006).

Project cost. Project cost is the cost incurred to realize a project (Project Management Institute, 2004). Projects are on cost if the overall project cost does not exceed the initial project budgeted cost (Project Management Institute, 2004).

Project time. Project time or duration is the total number of work periods required to complete a project. Work periods are time measures (i.e., days, weeks, and months) that do not include holidays and nonworking periods. A project is on time when the overall project duration does not exceed the initially planned project time (Project Management Institute, 2004).

Stakeholder satisfaction. The Project Management Institute (2004) defines stakeholder satisfaction as meeting the expectations of the stakeholder. Stakeholders are individuals or entities that are affected by the outcome of the project and include the project manager, project team members, customers, suppliers, management, regulators, the public/community, sponsors, and owners (Project Management Institute, 2004).

Highlights and Limitations of Methodology

Conceptually, the research included the following steps: (a) test the significance of the relationship between PS and CMP, (b) test the significance of the relationship between PS and ICMP, and (c) assess the differences in PS values.

Employees use both CMP and ICMP to manage changes in projects and strategies and thus align them. PS can thus be defined as the level of adherence of the project to the objectives or strategies for which it was launched. The conceptual model is illustrated in Figure 1.
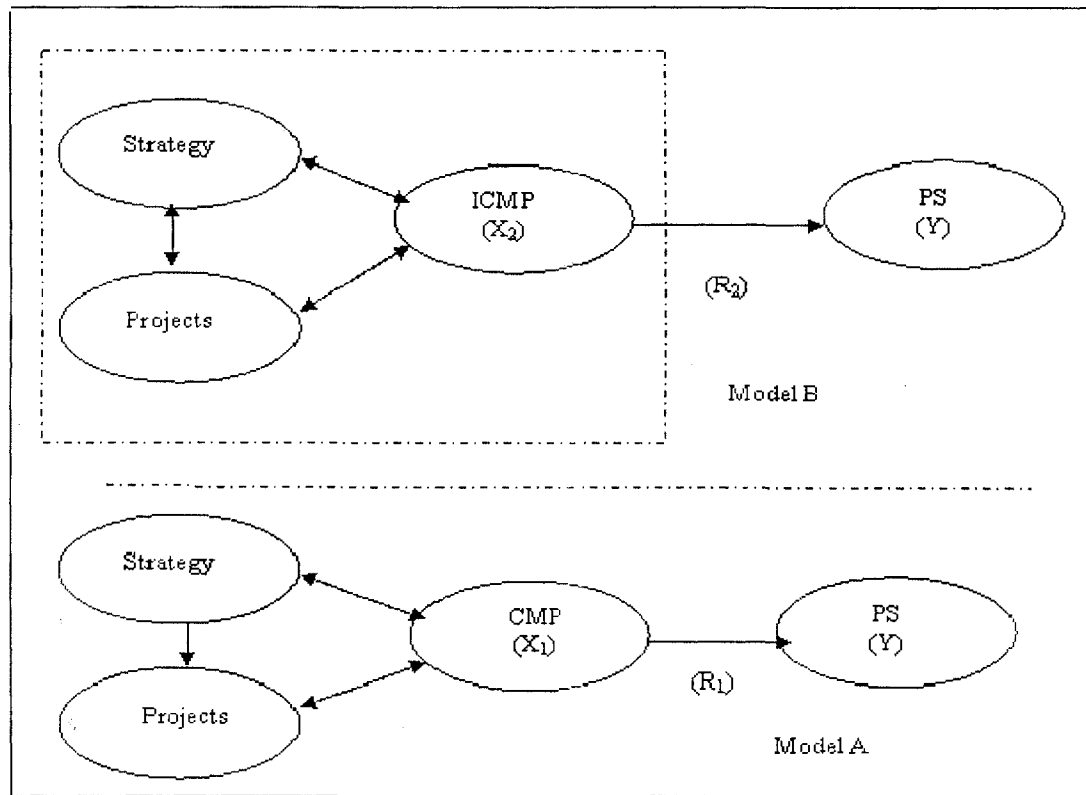
Figure 1. Conceptual construct model.

As shown in Figure 1, CMP and ICMP are different variables and have each a relationship (R1) and (R2) respectively with the variable PS. CMP and PS are two variables with a relationship (R1), and ICMP and PS are two variables with a relationship (R2). Since CMP and ICMP are mutually exclusive with respect to a single project, the above chart represents two conceptual models: a) a model that involves companies where CMP is implemented (model A) and b) a model that involves companies where ICMP is used (model B). In model A, changes in strategy may directly lead to changes in projects without passing through CMP because CMP is a stand-alone process. In this case, employees who manage the CMP have no control on the overall alignment of strategy

and project leading to PS. In model B, companies achieve bidirectional alignment of strategy and projects through ICMP leading to presumably higher PS.

The research methodology was a quantitative correlational and comparative process because the three principal research questions that are used to guide this research are – (a) to what extent, if any, is there a relationship between PS and CMP; (b) to what extent, if any, is there a relationship between PS and ICMP ; and (c) to what extent, if any, is there a difference in PS values between the use of CMP and ICMP?

To answer these questions the researcher considered R_1 and R_2 as two positive correlations and assumed that managers who implemented ICMP achieved higher PS values than those who implement CMP. The results of the research were intended to test the statistical significance of these correlations and the difference in the PS means.

CHAPTER 2 – LITERATURE REVIEW

Introduction

The objective of the researcher in this chapter is to summarize and synthesize the published information and ideas of others that the researcher used in developing the research. The subject area of the research can be delimited by identifying the constructs, their relationships, the scientific procedures and practices used to give the research its scientific validity, and the revised research designs and methodologies. The research areas under investigation include strategy, project, project success, project scope, project cost, project duration, stakeholder satisfaction, change management, change management process, integrated change management process, and the levels of implementation of change management. The researcher has grouped the literature reviewed for these areas as follows: (a) strategy and projects to include literature on strategies and projects; (b) measuring project success to include literature on project success, project scope, project cost, project duration, and stakeholder satisfaction; and (c) change management to include change management, the change management process, the integrated change management process, and levels of implementation of change management.

Strategy and Projects

David (2004) discussed strategic management concepts in today's environment and analyzed specific cases to increase the students understanding of the concepts and to allow students to think strategically. The author also discussed ways to set strategic goals, measure the strengths and weaknesses in organizations through SWOT, build strategic policies, and use control points to help managers control progress of implementing their strategies. Dharmaraj, Lewlyn, Rodrigues, and Shrinivasa (2006) claimed that one of the

most important winning factors in business strategy is the new product development project. Milosevic and Srivannaboon (2006) discussed the relationship between business strategy and the project elements (i.e., project strategy, project organization, project processes, project tools, project metrics, and project culture). The authors claimed that different strategies required different configuration of project elements.

Measuring Project Success

Palmer (2002) cited that researchers at Gartner and the Giga Group claimed that project failure, which is the inverse of project success, cost businesses more than $450 billion in 2001. Dharmaraj, Lewlyn, Rodrigues, and Shrinivasa (2006) claimed that many project managers failed because changes in scope may influence any or all of the project management triad because of the dynamic nature of the triple constraint that is, time, cost, and scope (quality). Atkinson (1999) claimed that project managers continue to fail in delivering their projects because the definition of project success included a limited set of measurement criteria; (i.e. cost, time and quality). Even when these criteria were met, it simply meant that the project manager had only realized two best guesses and a phenomenon, (i.e. cost, time, and quality).

Atkinson (1999) added three additional primary measurements for project success to include: system benefits, organizational benefits, and stakeholder/community benefits. Hartman (2000) referred to a positive relationship between the dependent variable *project success* and *happy stakeholders*. It is interesting to note that both Hartman and Atkinson attributed project success to stakeholders. The researchers at Business Improvement Architects (2006) conducted an empirical global study on 750 organizations. They related project success to time, cost, scope, customer requirements, and deliverables. In this

research, employees of targeted companies defined project success as projects on time (76%), projects on budget (67%), projects that achieved scope requirements (66%), projects that achieved customer requirements (65%), and projects that achieved all milestone deliverables (52%).

Shatz (2006) discussed the factors that determined the success for a project. Among these are stakeholder satisfaction, project team satisfaction, meeting cost and time criteria, and meeting requirements. Dvir, Levy, Maltz, and Shenhar (2001) claimed that success meant different things to different people. These authors posited that project success was a multidimensional variable. Different dimensions meant different things to different stakeholders at different times and for different projects. The researchers analyzed four distinct success dimensions: (a) project efficiency, (b) impact on the customer, (c) direct business and organizational success, and (d) preparing for the future. Henrie and Sousa-Poza (2005) argued that project managers fail because the criteria for measuring project success is partial. Time, cost, and deliverables were but a portion of other valid measurement criteria such as project team goals, people involved in the project, poor requirements definition, and misused management techniques and processes. However, considering the *poor requirements definition* from a change management perspective, one can argue that it is logically independent of the type of change management process used for the project. Even though poor requirements definition may lead to project failure, implementing one change management process instead of another does not change the project destiny. The same applies for project team goal(s) and people involved in the project.

According to Legris and Collerette (2006) the low success rate for information technology projects could be increased by closely involving stakeholders, paying attention to social factors, and integrating better change management practices. According to Levinson (2006), researchers at A.G. Edwards measured project success as a combination of factors such as time, cost, and the project's business value. Levinson argued that if a project is not completed on time but delivered the expected business value, the company still considered it a success. Internal or external customer business success was the real value that defined project success or failure. Customers had the final say on project success.

Lewis (2007) posited that for a change process to succeed there was a need for an involvement plan. He added that people accepted change that affected them positively and resisted change that was bad for them. He concluded that people would only embrace those changes that they controlled. Researchers at Prosci (2006) claimed that the most important contributor to project success was active, strong, and visible sponsorship throughout the project from top management, managers and supervisors.

Change Management

Paul Underwood (2005), a senior manager in performance, claimed that realizing benefits and ensuring project success was largely a change management issue. Dharmaraj, Lewlyn, Rodrigues, and Shrinivasa (2006) focused on change management as a tool to manage changes in project scope and analyzed the influence of the change in scope on time and cost. Edward (2000) posited that projects changed over time because business requirements changed and that to be successful in business, one needs to include these changes in strategic projects. He added that an efficient change management

process could make the difference between project success and failure. He claimed that an efficient change management process required a well-defined project baseline, a work authorization system, a trend program, and a change control process. The baseline clearly defined what was in and what was out of the project. A work authorization system helped to reduce costs and increased effectiveness in resource management and performance. The main functionality of a trend program was to provide for early alarm of potential changes. Edward concluded that during the change control process employees identified, quantified, planned, and evaluated impacts of a change on project baseline. Fielden (2001) claimed that project managers managed all types of change requests including specification and documentation changes through the change management process. He added that change management software applications produced reports that project managers needed in order to track and analyze project performance. According to the Project Management Institute (2004), change may influence a project's scope, time, and cost.

Green (2003) studied the use of a particular change management technique called configuration management to improve software processes. The researcher concluded that using configuration management techniques, management and employees increased their support to process improvement efforts and thus created a receptive environment for change. Moreover, the researcher added that communications issues were reduced and processes became less static and came under better organizational control.

According to Fuchs (2004), the functionality of change management should not be limited to managing variance in the project management triad but should include user adoption. Involving business users in the change management process was key to overall

project success. Fuchs claimed that project managers failed in delivering their projects because even when change had no impact on any of the three project constraints, it did impact business users. It was posited that business users should get involved during the startup of the project, its development, and after its implementation. He argued that any new IT project implied changes in processes, operations, policies, or business. Fuchs concluded that employees who were affected by the project needed to change to adapt to the new project technology, user-interface, or limitations. Change management could help in defining these changes, quantifying them, and planning for their execution.

Nadler and Nadler (1998) attributed changes in business to external factors. The authors claimed that companies changed because something outside the organization forced them to make a change. Nadler and Nadler discussed the change management practices. They named seven steps to drive and sustain change to include: owning, aligning, setting expectations, modeling, communicating, engaging, and rewarding. Goff (2000) claimed that change management tools and processes were not enough to make change management succeed; rather, it was people who made companies work. Gary Kissler, a partner at Deloitte Consulting Change Leadership practice, concluded that the three components critical to the project's success and that form an integral part of change management were people, processes, and technology (Goff, 2000).

Gomolski (2003) listed five actions that could help manage the behavioral implications and thus favor the implementation of a comprehensive change management program. The aforementioned actions listed by the author were to (a) identify the desperate need for change, (b) instigate and sustain change, (c) identify and implement levers, (d) identify and sustain affected agents, and (e) identify and use buoys and

stabilizers. Jick and Peiperl (2002) claimed that on average 30% of project managers who were responsible to realize change initiatives succeeded. It is interesting to compare these results to those of the study conducted by researchers at PriceWaterhouseCoopers. These researchers concluded that only 2.5% of global businesses achieved 100% project success (PriceWaterhouseCoopers, 2005). While only 2.5% of global businesses achieved 100% project success, 30% of project managers who were responsible to realize change initiatives succeeded. The evidence indicated that projects that implemented change had a better probability of success than those who did not. According to Laszlo (2004), if change was critical for a company's success, then change management became crucial for the survival of the organization. He concluded that project managers should accompany change management by motivation through reasoning and then into implementation through planning and execution. The author highlighted how change champions used change management to improve an organization's success.

Levinson (2006) claimed that researchers at A.G. Edwards found that one of the main reasons for project failure was the lack of implementing a change management process, not just in IT but across the company. The author added that applying the change management process across the company improved project success by 50 %. Researchers at Prosci (2004) conducted a benchmarking research on change management. The researchers found that there were varying levels of change management capabilities across organizations. They developed a model that they named the change management maturity model. The model had five levels or stages that ranged from no change management to organizational competency. These levels could be used as measurements of the change management maturity in organizations. Levels 1-3 were the lower levels

where change management was an ad-hoc process or at most a structured process localized to particular teams or areas in the organization. Levels 4-5 were the levels where change management was an integral part of the project management process and the organization. Eighty-five percent of the 160 companies ranked their change management processes between level one and three. It is asserted that the change management levels could be used to identify the type of change management used in an organization. Levels 1-3 included companies whose employees used a traditional change management process while levels 4-5 included companies whose employees used an integrated change management process.

Bin Sayeed and Prasad (2006) linked change orientation experienced with the qualitative differences perceived in the management practices of the company using a sample of 157 managers and supervisors. The researchers inferred that there was a critically higher level of linearity or correspondence between these two major constructs of the study that is, if individuals saw a change due to a change management program implementation or an ongoing organizational learning/maturation process within, there would be a qualitative difference in management practices (Bin Sayeed and Prasad, 2006).

Research Design and Methodology

To select the research design and methodology that best fits the research, the researcher reviewed existing research designs and methodologies; among these are descriptive correlational, true experimental, and quasi-experimental designs. The researcher selected the descriptive correlational and comparative design. Descriptive research is based on some previous understanding of the nature of the research problem

(Zikmund, 2003). Researchers use descriptive research to describe a phenomenon and to look for relationships between variables. Researchers using such designs are interested in defining possible causes for experiments to then assess in a future step. Descriptive correlational designs include case studies, naturalistic observation, and surveys (College of Lake County, 2007).

Summary

The literature is still evolving in the area of strategies, projects, change management, and project success. Factors such as global business, high competition, and new strategies require the development of new projects. These projects will continue to change as a response to the continuous changes in these factors. The faster these changes happen the more the need for companies to implement new and complex organizational tools and processes and to become more efficient. Managers implement sophisticated change management tools and processes through the use of high technology. To become more efficient, managers need to address factors related to workflow and human beings. Developing new and complex change management tools and procedures would help future managers align changes in their strategies with changes in projects. However, to become more efficient, managers should instigate and sustain a change culture in their organizations.

CHAPTER 3 – METHODOLOGY

Overview

The objective of the researcher in this chapter is to describe the research methods and procedures used to answer the research questions. The research questions were:

Q1: What is the degree of the relationship, if any, between CMP and PS?

Q2: What is the degree of the relationship, if any, between ICMP and PS?

Q3: To what extent, if any, is there a difference in PS values between the use of CMP and ICMP?

To answer these questions, the researcher conducted a quantitative correlational and comparative design. The instrumentation used to measure the dependent variable was a questionnaire. The nature of the research was driven by business strategy and projects. The researcher selected the study sample from employees working in companies in diverse business sectors, locations, industries, and dimensions.

Restatement of the Problem

Managers undertake projects to implement strategies but in a continuously changing market, change happens and leads to misalignment between strategy and projects. Project managers fail when the project deliverables are not aligned with the strategy (Lively, Mejillano, and Miller, 2007). The researchers at Gartner and the Giga Group suggested that project failures cost businesses more than $450 billion in 2001 (Palmer, 2002). When dealing with change, managers use either CMP or ICMP to align strategies and projects. However, there does not appear to be any viable evidence that confirms or rejects the hypothesis that there exists a relationship between PS and ICMP or PS and CMP, or that there is a difference in PS outcomes between the use of ICMP

and CMP. This information is vital for managers in organizations who compete in a continuously changing market because it reduces project failure costs.

The principal two research questions that the researcher addressed in this study were – (a) to what extent, if any, is there a relationship between project success PS and CMP or ICMP? and (b) to what extent, if any, is there a difference in PS values between the use of CMP and ICMP? The researcher through the quantitative research examined the relationships between the use of ICMP or CMP and PS. The difference in PS outcomes, if any, was considered as a potential indicator that managers in companies using ICMP have higher PS than those who use CMP.

Statement of Research Questions/Hypotheses

The researcher through the quantitative research examined the relationships between the use of CMP or ICMP and PS. The difference in PS outcomes, if any, was considered as a potential indicator that managers in companies using ICMP have higher PS than those who use CMP. To answer the research questions the researcher tested the following hypotheses:

$H1_0$: There is no statistically significant relationship between CMP and PS.

$H1_a$: There is a statistically significant relationship between CMP and PS.

$H2_0$: There is no statistically significant relationship between ICMP and PS.

$H2_a$: There is a statistically significant relationship between ICMP and PS.

$H3_0$: There is no statistically significant difference in PS values between the use of ICMP and CMP.

$H3_a$: There is a statistically significant difference in PS values between the use of ICMP and CMP.

Description of Research Design

The researcher built the research design in such a way to address the following points:

1.   Test the statistical significance of a probable positive relationship between the dependent variable PS and the independent variable CMP. Testing the statistical significance of such a relationship could result in rejecting the hypothesis that there was no probable positive correlation between CMP and PS ($H1_0$), and could confirm the hypothesis that there was a probable positive correlation between CMP and PS ($H1_a$).

2.   Test the statistical significance of a probable positive relationship between the dependent variable PS and the independent variable ICMP. Testing the statistical significance of such a relationship could result in rejecting the hypothesis that there was no probable positive correlation between ICMP and PS ($H2_0$), and could confirm the hypothesis that there was a probable positive correlation between ICMP and PS ($H2_a$).

3.   The researcher could confirm hypothesis $H3_0$ and reject $H3_a$ by statistically testing the difference between the means of ICMP and CMP.

To provide for the first two points, the researcher had selected to perform a quantitative correlational design. The researcher collected descriptive data and performed a descriptive correlational design. To test the difference between the means, the researcher compared two groups; a first group where subjects were from companies with CMP and a second group where subjects were from companies with ICMP. To eliminate external validity issues, the researcher used the following (a) to generalize the results of the research, the researcher selected the study sample from employees working in companies in diverse business sectors, locations, industries, and dimensions; and (b) to

eliminate selection history, selection testing, selection instrumentation threats the researcher did not repeat measurements.

The researcher used an ICMP group and a CMP group. If the mean of the PS in the first group exceeded that of the second group then the researcher could reject the hypothesis that companies that implemented ICMP had a lower PS than those who implemented CMP ($H3_0$), and confirm the hypothesis that companies that implemented ICMP had a higher PS than those who implemented CMP ($H3_a$).

Because companies were classified as either using CMP or ICMP, the two groups were independent. Two means were independent when they belonged to two independent groups. Two groups were independent when there was no relationship between the subjects in group with those in the other (Norusis, 2006). The researcher used descriptive statistics to compare the two independent means (Norusis, 2006). A formal descriptive statistical independent sample t-test was conducted.

Operational Definitions of Variables

The researcher tested the significance of the relationships PS-CMP and PS-ICMP, and compared PS outcomes in companies where ICMP was implemented and companies where CMP was implemented.

The researcher analyzed three variables: CMP, ICMP, and PS.

CMP: Independent variable (X_1). Edward, Fielden, Green, and Prosci (2000, 2001, 2003, 2004) defined CMP as a stand-alone process. CMP is a stand-alone process that is not implemented throughout the whole organization. Changes in strategy may directly lead to changes in projects without passing through CMP. In this case, employees who manage the CMP have no control on the overall alignment of strategy and project.

Operationally, employees implement a stand-alone change management process in three different ways: (a) little change management applied in managing projects, (b) some elements of change management are being applied in isolated projects, and (c) a detailed approach for managing change is being applied in multiple projects

$$CMP = [1,2,3]$$

The independent variable CMP has a value that ranges from 1 to 3. These values respect the three categories and as such a value of 1 implies that the subject works in a company where little change management is applied in managing projects. CMP in these companies is people-dependent without any formal practices or plans in place. Project teams are not aware of and do not consider change management as a formal process for managing the people side of change (Prosci, 2004a). A value of 2 implies that the subject refers to a company where some elements of change management are being applied in isolated projects. Employees working in these companies use many different tactics inconsistently to manage the change process. Some elements of change management begin to emerge in isolated parts of the organization. The effort to manage the people side of change is infrequent and is not centralized (Prosci, 2004a). A value of 3 implies that the subject works in a company where a detailed approach for managing change is being applied in multiple projects. In these companies, some groups emerge that begin using a structured change management process; however, change management is still localized to particular teams or areas in the organization (Prosci, 2004a).

ICMP: Independent variable (X$_2$). Goff, Fuchs, Levinson, and Prosci (2000, 2004, 2006, 2004) consider ICMP as an integral part in the company's organization, processes, and policy. ICMP is a change management process that is institutionalized in

the company's organization, processes, and policies. In this case, companies achieve

bidirectional alignment of strategy and projects through ICMP. Operationally, employees

implement an ICMP in two different ways: (a) organization-wide standards and methods

are broadly deployed for managing and leading change, and (b) change management

competency is evident in all levels of the organization and is part of the organization's

intellectual property and competitive edge

$$ICMP = [1,2]$$

The independent variable ICMP has a value that varies between 1 and 2. These

values respect the two categories and as such a value of 1 implies that the subject works

in a company where organization-wide standards and methods are broadly deployed for

managing and leading change. The organization has selected a common approach and

implemented standards for using change management on every new project or change

(Prosci, 2004a). A value of 2 implies that change management competency is evident in

all levels of the organization and is part of the organization's intellectual property and

competitive edge. In this case, the change management competency is part of the skill set

of the organization (Prosci, 2004a).

PS: Dependent variable (Y). Project success (PS) in most organizations is

measured by the degree to which the project's outcomes meet the triple constraints of

time, cost, and scope (Project Management Institute, 2004; Business Improvement

Architecture, 2006; Shatz, 2006; Henrie and Sousa-Poza, 2005; Atkinson, 1999;

Hartman, 2000; Levinson, 2006). Projects are successful when they are delivered on

scope, on time, and on cost. The researcher considered the project success items affected

by time, scope, and cost as the first three traits to measure project success. The researcher

addressed these traits as PS(time), PS(scope), and PS(cost) respectively. In recent years the measurement of PS has included a metric for the level of stakeholders' satisfaction (Fuchs, 2004; Levinson, 2006; Prosci, 2004a). Stakeholders are entities affected by the project. The stakeholders in a project are customers and end-users, employees and shareholders, the community, and legislators (government). The researcher considered the item of project success affected by stakeholder satisfaction as a fourth trait to measure PS. The researcher addressed this trait as PS(stake). To include a fair representation of stakeholders, the researcher included subjects from diverse business sectors, countries, industries, and company dimensions regardless of the level of change management adopted. PS was thus measured as the summated scaling of four different traits: PS(cost), PS(time), PS(scope), and PS(stake).

PS: Summated scaling of PS(cost), PS(time), PS(scope), and PS(stake)

PS(scope) = [1,...,5], This was the level of agreement of the subject that a project satisfies the scope for which it was developed. Where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

PS(time) = [1,...,5] , This was the level of agreement of the subject that a project is delivered on time. Where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

PS(cost) = [1,...,5] , This was the level of agreement of the subject that a project is delivered on cost. Where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

PS(stake) = [1,...,5], This was the level of agreement of the subject that a project satisfies its stakeholders. Where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Description of Material and Instruments

Before discussing the methods used in the research, it was important to discuss the samples sizes. From a statistical point of view, the researcher tested two correlations and compared two independent means. The researcher used the G*Power 3 software to estimate the sizes required for the two correlations and for the means and selected the sample size with the highest number of subjects.

The assumptions that the researcher considered for the two probable correlations included:

1.   High effect size of $|r|$: The researcher considered the smallest effect worth detecting to be high. Hopkins (2002) defined a high effect size of $|r|$ as 0.5.

2.   A significance level of 0.05: The researcher accepted to reject the null hypothesis when it was true provided that overall probability of committing a Type 1 error did not exceed 5%.

3.   A statistic power of 0.95: The researcher accepted to reject the null hypothesis when it was true provided that overall probability of committing a Type II error did not exceed 5%.

The assumptions that the researcher considered for the two independent means included:

1.   High effect size of $|r|$: The researcher considered the smallest effect worth detecting to be high. Hopkins (2002) defined a high effect size of $|r|$ as 1.2. However, the

inventors of G*Power 3 considered a high effect size in the case of independent means to be 0.8. Since the interest was in detecting the smallest effect, one should consider the scale that would give the highest sample size that is, the one with the smallest effect. In this case the researcher chose the 0.8 scale.

2.   A significance level of 0.05: The researcher accepted to reject the null hypothesis when it was true provided that overall probability of committing a Type I errors did not exceed 5%. Since both means were those of the dependent variables in the correlations then there should be congruency between the significance value assumed for the means and the significance value assumed for the correlations.

3.   Allocation ratio of 1: The researcher compared two independent means from two equal samples.

4.   Statistical power of 0.95: The researcher accepted to reject the null hypothesis when it was true provided that overall probability of committing a Type II error did not exceed 5%.

Using the G*Power 3 software, the researcher estimated the sample sizes for the correlations to be 34 while the sample sizes for the two independent samples means was 35. The researcher chose the biggest sample size of the two cases to ensure that both relationships (i.e., the two correlations and the comparison between the two independent means were statistically valid). In this case the same size chosen was 35.

Deciding which instrumentation to use in a research project depends on, among other things, the (a) nature of the research, (b) nature of the traits of the independent variable to be measured, (c) time and cost, and (d) the type of available medium. The

instrumentation used to measure the dependent variable was a questionnaire because of the following reasons:

1.   The researcher dealt with social aspects. The subjects were human beings and the types of measurements required were not related to physical dimensions (i.e., weight, volume, and mass) but to social dimensions (i.e., stakeholder satisfaction). Stakeholder satisfaction was a social and personal aspect and depended on the stakeholder opinion. A questionnaire that asked the stakeholder about his/her level of satisfaction was good measurement instrumentation.

2.   Project success was the dependent variable to be measured. The traits were PS(scope), PS(cost), PS(time), and PS(stake).

Time could have been measured using chronometers, accessing stored data, or asking people. However, using chronometers would require the researcher to start the count at project startup. Because the sample size was composed of 35 +35 = 70 subjects, performing such measurements for the purpose of this research would have required significant resources and time. Reading stored data would require the researcher to get permission to access diverse proprietary databases or files in diverse organizations and would be exceedingly time consuming. Questioning people about the time required to deliver projects in their organization was not an easy question to answer because projects usually required much time and because people might not remember the time spent by each project. However, questioning people if projects were delivered on time in their companies was considered by this researcher as being an easy question to answer. Respondents in this case needed only to remember if projects were delivered on time or not regardless of the duration of each project.

Cost could have been measured by counting the dollars spent, accessing stored data, or asking people. Counting the dollars spent required that the researcher started the count at project startup. Because the sample size was composed of 35 +35 = 70 subjects, performing such measurements for the purpose of this research would have required significant resources and time. Reading stored data would have required the researcher to get permission to access diverse proprietary databases or files in diverse organizations and was time consuming. Questioning people about the cost required to deliver projects in their organization was not an easy question to answer because projects usually required much money and because people may not remember how much money they spent on each project. However questioning people if projects were delivered on cost in their companies was an easy question to answer. Respondents in this case needed only to remember if projects were delivered on cost or not regardless of the cost of each project.

To measure the degree to which the projects were delivered on scope the researcher could have either audited each single project or questioned the subjects. Auditing would have been a tedious process and would have required the researcher to validate whether this requirement was met. Because of the large effort and cost that auditing 70 projects might have required, the researcher opted to question the subjects about the degree to which projects were delivered on scope.

3.   Time and cost were constraints that limited the choice of the instrumentation to be used in the research. However, these constraints should not lead the researcher to select a data collection instrument that did not give scientifically and statistically valid measurements. In selecting the best instrumentation to perform this study, the researcher considered time and cost as an integral part of the selection process.

4. In Points 1 and 2, the researcher concluded that subjects should be questioned to obtain the requested information. This effort could have been done either synchronously (i.e., through personal or interactive video/teleconferencing or asynchronous through questionnaires). The researcher decided to use a web-based questionnaire as a medium to conduct the research for the following reasons: (a) web-based questionnaires allowed the subjects spread internationally to answer the questionnaire whenever they had time without involving the researcher; (b) time zones were not an issue even if the subjects were spread internationally; (c) no interviewer bias was present because the researcher did not interact with the subjects; and (d) low cost medium if compared with personal, telephone, or web-based interviews. Please refer to Appendix A for a copy of the informed consent form and the questionnaire.

To assess the measurement reliability of the research, the researcher computed Cronbach's alpha (α) from the same sample. Trochim (2002) recommended using Cronbach's alpha to estimate internal consistency for subjective constructs. Cronbach's alpha is a coefficient based on the internal consistency of a construct. Cronbach's alpha is a function of the number of items of a construct and the average inter-correlation among these items (University of Michigan, 2008). Analyzing latent constructs such as project cost, project scope, project schedule, and stakeholder satisfaction, requires instruments to accurately measure the constructs. Cronbach's coefficient alpha estimates the reliability of this type of scale by determining the internal consistency of the test or the average correlation of items within the test (Cronbach, 1951).

Researchers face instrumentation effects only if they use both a pre-post research design and when they change the measurement methods to measure the dependent

variable (Zikmund, 2003). Since internal validity is the ability of the research to conclude that the treatment was the sole cause of changes in a dependent variable, building research conclusions on wrong data caused by instrumentation effects automatically jeopardize internal validity. The research design selected to test the research hypotheses was a correlational and comparative design. Since the researcher did not consider pretest-posttest measurements, the researcher could conclude that instrumentation effects did not jeopardize internal validity.

Selection of Participants or Subjects

The researcher selected the study sample from employees working in companies in diverse business sectors, locations, industries, and dimensions. The researcher could have either addressed these employees directly at their companies, or used indirect channels such as competency centers, on-line groups, and educational institutions. The researcher satisfied these requirements by selecting the subjects of the research samples from diverse business sectors, countries, industries, and company dimensions. Subjects either belonged to companies that implemented CMP or companies that implemented ICMP.

Respondents may tend to answer in a certain direction leading to response bias (Zikmund, 2003). Response bias may falsify the research results because wrong data leads to wrong conclusions. Response bias may result from different biases created by the interviewer, the respondent, or both. To address this issue, the researcher identified each probable bias and acted to reduce or cancel its impact on the study as follows:

1. Acquiescence bias: This bias may occur when one or more respondents tend to agree with all questions or to indicate a positive attitude to a new idea (Zikmund,

2003). To address this potential problem, the researcher asked questions related to the specific change management process implemented in the organization that the respondent worked with. For example, if the respondent worked in an organization that implemented ICMP then he/she should have answered the questions related to the ICMP only.

2.   Extremity bias: Some respondents tend to use or avoid extremes when responding to questions (Zikmund,2003). To address this potential issue, the researcher performed the following steps: (a) informed the respondent about the importance of correctly answering the questions, and (b) used a sufficiently large sample size to reduce the impact of such occurrences.

3.   Interviewer bias: This bias in response may happen due to the influence of the interviewer on subjects (Zikmund, 2003). Even though the survey was an on-line survey, the respondent might still be influenced by the interviewer through the questionnaire. To address this potential problem the researcher performed the following steps: (a) asked questions in a simple and non influential way, and (b) designed a questionnaire that was detailed enough to give sufficient information to the respondents and short enough to reduce waste in their time.

4.   Social desirability bias: This bias in responses is caused by the desire of respondents to save face or to create a favorable impression (Zikmund, 2003). To overcome this potential issue, the researcher (a) informed the respondents that their responses were not related to their performance but to the companies they work with, (b) informed the respondents that there was no link between the responses and the respondent name or profile, and (c) informed the respondents that the company's name

was not part of the research and that the researcher had no possibility or interest in identifying the name of the company.

Procedures

The researcher developed a step-by-step process to define the quantitative correlational and comparative methodology and design used for this study. The procedures developed for this purpose include:

1. Prepared a questionnaire. The questionnaire included, among other things, questions that the participants answered and whose answers determined the level of change management and the project success values in their companies. A copy of the questionnaire is attached in appendix A.

2. Developed a web-based questionnaire. This allowed subjects to access the questionnaire whenever they had time independently of the time-zone.

3. Determined a priori the sample size. This was performed by using a statistical power analysis software tool that is, G*Power 3 (Buchner, Erdfelder, Faul, & Lang, 2007). For a high effect size of 0.8, a significance level of .05, allocation ratio of 1, and power .95, G*Power 3 calculated a recommended sample size of 70 equally divided between the ICMP group and the CMP group.

4. Invited potential participants to participate in the study. Provided the subjects with a link to the web-based questionnaire.

5. Received data from the study participants.

6. Stratified the organizations approach to change management into two groups: CMP and ICMP.

7. Used statistical techniques to compare the variables and relationships project success-ICMP and project success-CMP.

8. Completed the dissertation with the study findings.

Discussion of Data Processing

The researcher performed a visual screening on the collected data to ensure that all questions were answered by the respondent. Responses with missing data were not included in the study. Non-normal data were detected using the box and whisker plot. These data were analyzed for inclusion or elimination as appropriate. The researcher transferred the data collected to three different SPSS® files. The data transfer process was performed manually using double entry to test for data entry errors. A sample example of these files is attached in Appendix B. The first file was called CMP and contained the data related to subjects that would have selected CMP as a change management process. The second was called ICMP and contained the data related to subjects that would have selected ICMP as a change management process. The third was called CMPICMP and contained the data related to all the subjects. The first two files were created because separating the data in different files allowed the researcher to better address each group independently to perform specific group analysis. The CMPICMP file was created to compare the means. Files CMP1, ICMP1 and CMPICMP1 were used for dual entry purposes. The researcher compared CMP, ICMP, and CMPICMP with the files CMP1, ICMP1, and CMPICMP1 respectively to test for data congruency and eventually to correct any error in data entry. This process was repeated until the comparison led to equal results.

The CMP file contained the following fields:

1.   CMP - This field had a value that ranged from 1 to 3. These levels included the first three levels of the change management maturity model, that is: (a) little change management applied in managing projects, (b) some elements of change management were being applied in isolated projects, and (c) a detailed approach for managing change was being applied in multiple projects

2.   PS1 - This was the project success trait affected by scope

3.   PS2 - This was the project success trait affected by cost

4.   PS3 - This was the project success trait affected by time

5.   PS4 - This was another trait of the project success based on stakeholder satisfaction.

6.   PSC - This was the project success value calculated as the summated scaling of the four PS traits for companies using CMP.

The ICMP file contained the following fields

1.   ICMP - This field had a value that ranged from 1 to 2. These levels respected the last two levels in the Change Management Maturity Model, that is: (a) organization-wide standards and methods were broadly deployed for managing and leading change, and (b) change management competency was evident in all levels of the organization and was part of the organization's intellectual property and competitive edge

2.   PS1 - This was the project success trait affected by scope

3.   PS2 - This was the project success trait affected by cost

4.   PS3 - This was the project success trait affected by time

5.   PS4 - This was another trait of project success based on stakeholder satisfaction.

6.   PSI - This was the project success value calculated as the summated scaling of the four PS traits for companies using ICMP.

The CMPICMP file contained the following fields

1.   CMPICMP - This was the organizational level for the selected subjects. CMP levels were from 1 to 3 while ICMP varied between 1 and 2.

2.   PS - This was the project success of the subjects calculated as the summated scaling of PS(scope), PS(time), PS(cost), and PS(stake).

3.   ICMPYN - this was a categorical variable and indicates whether the subject belonged to ICMP group (Y) or to CMP group (N).

The researcher plotted a box and whisker diagram of the variable PS. The variables that were plotted and analyzed were PSC and PSI. Cronbach's alpha (α) was estimated for the latent variable PS in both CMP and ICMP samples.

To assess the correlation between the dependent variable PSC and the independent variable CMP, the researcher estimated the Pearson correlation coefficient and tested the null hypothesis using the desired confidence factor. The same was applied to the dependent variable PSI and the independent variable ICMP. These correlations were further plotted on scattered diagrams. PSC and PSI values were plotted on the Y axis while CMP and ICMP values were plotted on the X axis.

The researcher used the CMPICMP file to compare the two independent means of Project Success in organizations that implemented Integrated Change Management Process and in organizations that implemented Change Management Process. The grouping variable that was used to distinguish between the two groups was ICMPYN.

Methodological Assumptions, Limitations, and Delimitations

There are limitations that should be considered when attempting to generalize the findings of this research. First, the sample size was limited to 70 respondents which limited the smallest effect worth detecting to include only high values. Future research could be conducted to detect if the research findings are also valid for larger sample sizes where the smallest effect worth detecting is low. Second, Cronbach's alpha, was interpreted in this study based on the works of Hopkins (2002). However, the literature includes other interpretations such as those of Nunnaly (1978). Nunnaly suggested that a 0.7 value for Cronbach's alpha is an acceptable reliability coefficient. It is suggested that future studies should attempt to validate the evolution of the literature in this regards. Third, while every attempt was made to develop a representative sample of international subjects, there is no certainty that the sample was totally representative. Nonetheless, it is posited that including subjects from two international Internet competency centers, an international on-line adult learner university, and other international subjects directly invited by the researcher represents a valid attempt to generalize the outcomes. Finally, the use of the Internet as a method for taking and collecting survey responses is commonly used in today's *digital age*.

Ethical Assurance

Identifying clearly the scope of the research, allows both the researcher and the subjects to act on the right problem. A decision made on the basis of a solution to the wrong problem may be harmful (Zikmund, 2003). To eliminate this issue, the researcher clearly described the scope of the research in the informed consent form. The form contained sufficient information on the nature and purpose of the study, the

confidentiality of the collected data, the type of information gathered, the right of the participants to withdraw at any time during the survey, and how the results would be used.

While random selection and assignment were not possible in this ex post facto inquiry, the researcher took many actions to include a fair representation of the population. First, the use of an on-line questionnaire gave equal opportunities for all potential subjects independently of their geographic location, time zone, type of business, culture, and other factors. Second, the researcher invited potential subjects directly through e-mail and indirectly through on-line advertisement in international competency centers and on-line university. Subjects decided autonomously to join or discard the survey. Subjects had no obligation to take the inquiry and the researcher had no power to identify who took the survey and who did not. Accordingly, the researcher has a valid reason to consider that non-response bias was at least limited. Non-response bias may lead to false conclusions because it may alter the findings of the research.

The researcher prepared a questionnaire and sent it to the subjects. Even though the respondents were highly educated individuals, they might have lacked some technical or social restrictions. Mentors at San Diego State University (2001) suggest that researchers use simple 6th to 8th grade reading level language. The researcher used simple language to describe the research and to formulate the questions.

The researcher used four traits that were identified by the literature to measure project success: stakeholders' satisfaction, scope, time, and cost. Using all the traits reduced misrepresentation of the collected data and provided for criterion validity.

The researcher used five well defined categories to define the change management level that best fit the respondents' approach to change management. These levels were clearly stated in the questionnaire so that the respondents could easily select which level best fit their organization. According to mentors at San Diego State University (2001), researchers should clearly define their constructs to ensure that respondents understand the question and to provide for content and construct validity.

If data are not reliable then all conclusions based on such data are not reliable. A decision made on the basis of wrong data is unethical (San Diego State University, 2001). To access the measurement reliability of the research the researcher computed Cronbach's alpha (α) for the latent variable PS. The Cronbach's alpha (α) estimate is considered to assess measurement reliability because for subjective constructs such as those of the study, Cronbach's alpha tends to be the most frequently used (Trochim, 2002). Cronbach's alpha is a function of the number of items of a construct and the average inter-correlation among these items (University of Michigan, 2008). Analyzing latent constructs such as project cost, project scope, project schedule, and stakeholder satisfaction, requires instruments to accurately measure the constructs. Cronbach's coefficient alpha estimates the reliability of this type of scale by determining the internal consistency of the test or the average correlation of items within the test (Cronbach, 1951).

Since the subjects of the research were human beings, subjectivity might become an issue if not scientifically managed because human beings are not always sincere in their actions and answers. They might deliberately choose to give wrong answers either to satisfy the interviewer or because they were shy to admit a fault or for other reasons.

This might lead to a bias in the collected data and might raise ethical issues about the correct representation of the population. To test the validity of data, the researcher performed a box and whisker plot on the collected data. The researcher analyzed and eventually included or discarded data that fell outside the 1.5 times of the box length. The researcher also estimated Cronbach's alpha (α) to assess the measurement reliability of the constructs.

The researcher addressed the sample subjects in different business areas, time zones, and without interaction. This allowed subjects to answer the questionnaire whenever it best suited them without limiting their access to a particular business, location, or time. While random selection and assignment were not possible in this ex post facto inquiry, the researcher took many actions to include a fair representation of the population. Limiting access to the questionnaire to a particular business, location, or time might lead to select a sample that misrepresented the population. Misrepresentation is unethical because the researcher used inferential statistics to make an inference of the study conclusions on the population (Zikmund, 2003). Since the objectives of the researcher were to infer the study findings generally, misrepresentation could lead to false conclusion. A conclusion made on the basis of a false data may be harmful. A web-based questionnaire was a perfect remedy to such potential ethical issues because it allowed potential subjects in different businesses, locations, and time zones to participate in the study.

Eliminating internal validity issues reduces the possible alternative explanations of the research results and thus reduces the misrepresentation of the research (Zikmund, 2003, p. 83). Trochim (2002) recommended five ways to minimize threats to validity: by

argumentation, by measurement or observation, by design, by analysis, and by preventive action. The researcher used an ex post facto correlational and comparative design to eliminate all single group threats to internal validity (Trochim, 2002). The researcher did not assign elements to groups; elements either belonged to CMP or ICMP. This excluded selection regression threats. To eliminate selection history, selection testing, selection instrumentation threats, the researcher used single no repeated measurements. Argumentation is a good way to minimize selection mortality and social threats. Since the elements in the groups used either CMP or ICMP, and since the study was an ex post facto then the selection mortality was not an issue because the researcher did not favor one group on the other. Social threats such as diffusion or imitation, compensatory equalization, compensatory rivalry, and resentful demoralization were not valid ethical threats to the study because the treatments did not favor one group on the other.

External validity is the ability to generalize beyond the data of the experiment to other groups in the population under study (Zikmund, 2003). To reduce the lack of external validity, the researcher collected real data from the business world. Data collected belonged to participants belonging to different locations, businesses, and cultures.

The research design was a correlational comparative design. The researcher needed to (a) test the statistical significance of a probable positive relationship between the dependent variable PS and the independent variable CMP, (b) test the statistical significance of a probable positive relationship between the dependent variable PS and the independent variable ICMP, and (c) test the difference between the means of PS in organizations that implement CMP and in organizations that implement ICMP.

Demonstrating a probable correlation between PS and CMP or ICMP was an ethical advantage because it might lead organizations to focus on change management as a vehicle to improve project success and thus reduce waste. Demonstrating that PS in organizations that implemented ICMP was higher than PS in organizations that implemented CMP might lead organizations to migrate to ICMP as a way to improve project success and thus reduce waste.

When a researcher rejects the null hypothesis when it is true, she/he will arrive to false conclusions and results. False conclusions may lead to ethical issues such as wrong actions that may harm others (Zikmund, 2003). To eliminate or reduce such a probability, the researcher tried to eliminate or reduce Type I and type II errors. Type I and type II errors could be reduced by selecting a high t statistic that is, larger population or between-samples differences, large sample sizes, and small internal sample variances. However, large is a subjective parameter and may mean different things to different people and may become an ethical issue if not addressed. Hopkins (2002) developed a standardized table to define subjective parameters (i.e., small, medium, and large) used in statistics. To eliminate such interpretations, the researcher built the research on the works of Hopkins. Researchers who cite the works of Hopkins remove the subjectivity issues from their works when they use such terms as small, medium, and large. For example, if a researcher refers to a correlation as large and cites the works of Hopkins, then the correlation coefficient is expected to be between 0.5 and 0.7.

The researcher used the G*Power 3 software to estimate the statistically valid sample sizes. Statistical validity is dependent on many parameters that define the power of the study that is, correlation effect size, significance level, statistical power, and

allocation ratio. Defining these parameters a priori and using a standardized table such as that produced by Hopkins (2002) to define subjective parameters allowed for a common understanding and reduced misinterpretations and false conclusions of the study. False conclusions may have led to ethical issues such as wrong actions that might harm others (Zikmund, 2003).

Researchers face instrumentation effects only if they use both a pre-post research design and when they change the measurement methods to measure the dependent variable (Zikmund, 2003). The research design selected to test the research hypothesizes was a correlational and comparative design. Since the researcher did not consider pretest-posttest measurements, the researcher concluded that instrumentation effects did not jeopardize internal validity.

CHAPTER 4 -- FINDINGS

Overview

The researcher collected 35 elements in each group to satisfy the estimated sample size. The study was based on the assumption that the smallest effect worth detecting was high and the power of the study was 95%. This limited the sample size to 70 subjects. The intent of the researcher in limiting the sample size was to start an initial investigation to describe a phenomenon and to look for relationships between the studied variables with limited available resources and time. The researcher stratified the responses into two groups: responses of subjects whose companies used CMP and those whose companies used ICMP. The SPSS® files were populated accordingly. The web application was designed so that respondents could either complete the questionnaire or withdraw at anytime without completing it. This allowed the researcher to receive only completed responses. Subjects decided autonomously to join or discard the survey. Subjects had no obligation to take the inquiry and the researcher had no power to identify who took the survey and who did not. Accordingly, the researcher has a valid reason to consider that non-response bias was at least limited. The researcher transferred the data collected to CMP, ICMP, and CMPICMP files. The data transfer process was performed manually using double entry to test for data entry errors. The researcher compared CMP, ICMP, and CMPICMP with the files CMP1, ICMP1, and CMPICMP1 respectively to test for data congruency and eventually to correct any error in data entry. This process gave a negative response indicating that data was perfectly identical in these files. The data included in the CMP, ICMP, and CMPICMP files is illustrated in appendix C. The

researcher then applied the research design and methodology to produce the findings and the analysis.

Findings

    Findings from the CMP sample. The first research question that the researcher addressed was: To what extent, if any, is there a relationship between project success PS and CMP? To answer this research question the researcher tested the following hypotheses:

    $H1_0$: There is no statistically significant relationship between CMP and PS.

    $H1_a$: There is a statistically significant relationship between CMP and PS.

    Cronbach's alpha (α) for PS was 0.75. The group statistics for PS in CMP sample confirmed that the sample size was 35 with no missing data. These results are shown in Table 3.

Table 3

Case Processing Summary for the CMP Sample

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
CMP-PS	35	100.0%	0	0.0%	35	100.0%

    The box and whisker diagram for PS in the CMP group is illustrated in Figure 2.

Figure 2. A box and whisker diagram for PS in CMP

In Figure 2, the box boundaries are 10 and 13 while the upper and lower whiskers

are 7 and 15. The median is not in the middle of the box which indicates that the data was

not symmetric. There was one outlier with a PS of five. The statistics for PS-CMP

correlation are shown in Table 4.

Table 4

Descriptive Statistics for PS-CMP Correlation

	Mean	Std. Deviation	N
PS	11.200	2.2069	35
CMP	1.97	0.707	35

The sample group was composed of 35 subjects, the mean for PS was 11.20 and the standard deviation was 2.21 while the mean for CMP was 1.97 and the standard deviation was 0.71.

The Pearson correlation statistics for the PS-CMP correlation are illustrated in Tables 5 and 6.

Table 5

Pearson Correlation Statistics PS-CMP

		PS	CMP
Pearson Correlation	PS	1.000	0.57
	CMP	0.57	1.000
Sig. (1-tailed)	PS	.	0.000
	CMP	0.000	.
N	PS	35	35
	CMP	35	35

Table 6

Model Summary CMP Group

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.570(a)	0.325	0.304	1.8411

a Predictors: (Constant), CMP

In a sample of 35 subjects, the absolute value of the correlation coefficient was 0.57, R square or the proportion of variation that can be explained by the model was 0.33. The t-test statistics for the slope of the correlation PS-CMP was calculated in Table 7.

Table 7

t-Test Statistics for the Slope of the Correlation PS-CMP

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.692	0.934		8.232	0.000
	CMP	1.779	0.447	0.570	3.982	0.000

a Dependent Variable: PS

The sample slope was 1.78, its standard error was 0.45, and the value for the t

statistic was 3.98. The sample slope was 3.98 standard error units above the hypothesized

value of 0. The significance level was less than 0.0005. The scattered chart in Figure 3 is

a graphical representation of the values of PS compared to those of CMP. The chart

confirms the R square value of 0.33.

Figure 3. Scatter diagram PS vs. CMP

Findings from the ICMP sample. The second research question that the researcher addressed was: To what extent, if any, is there a relationship between project success PS and ICMP? To answer this research question the researcher tested the following hypotheses:

$H2_0$: There is no statistically significant relationship between ICMP and PS.

$H2_a$: There is a statistically significant relationship between ICMP and PS.

Cronbach's alpha (α) for PS was 0.69. The group statistics for PS in ICMP sample

confirmed that the sample size was 35 with no missing data as shown in Table 8.

Table 8

Case Processing Summary for the ICMP Sample

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
ICMP-PS	35	100.0%	0	0.0%	35	100.0%

The box and whisker diagram for PS in ICMP is illustrated in Figure 4.
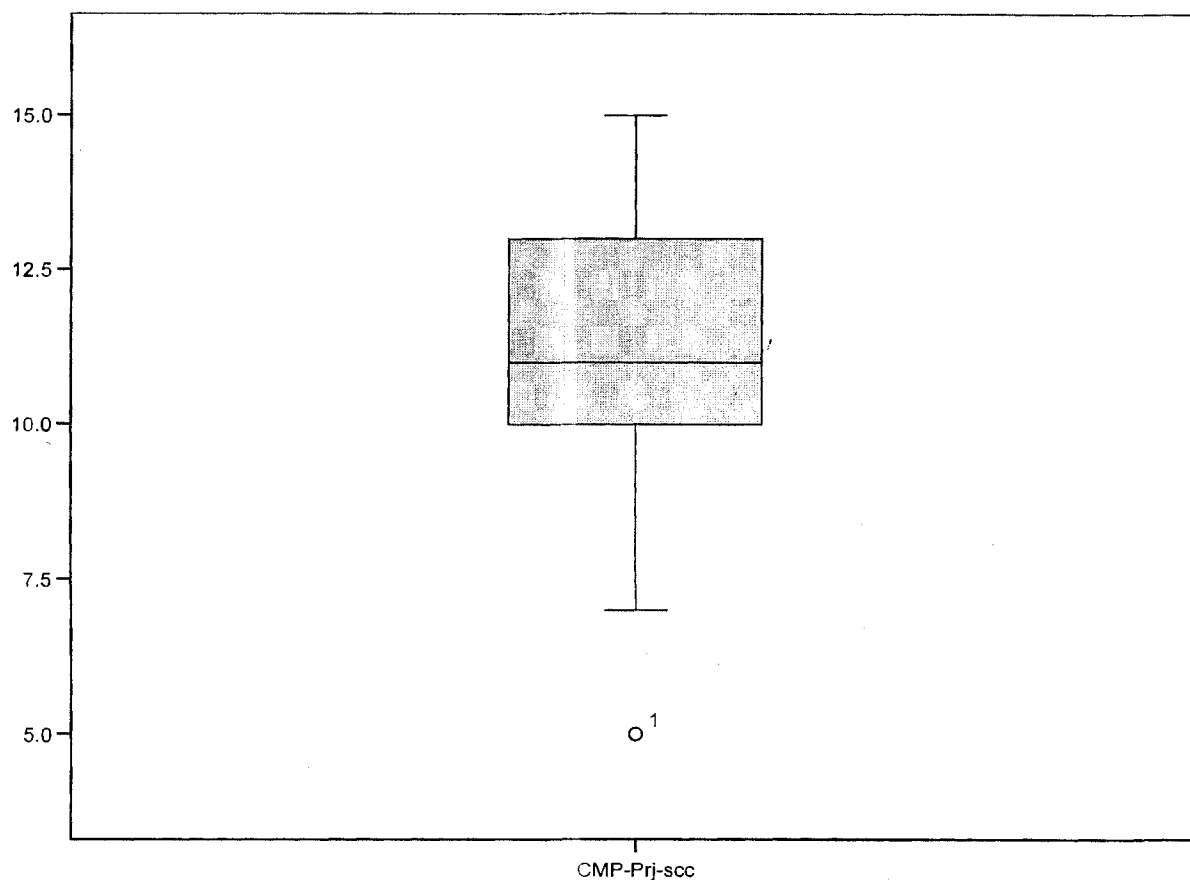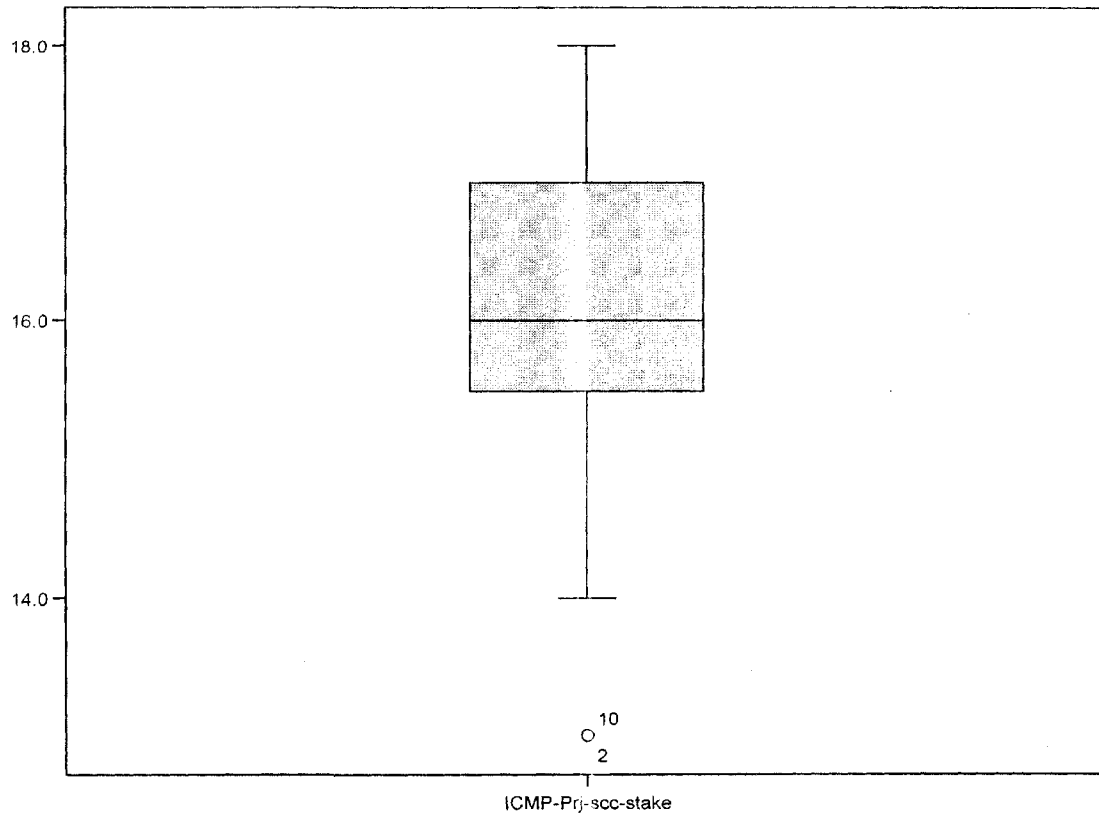

Figure 4. A box and whisker diagram for PS in CMP

In Figure 4, the box boundaries are 15.5 and 17 while the upper and lower

whiskers are 14 and 18. The median is not in the middle of the box which indicates that

the data was not symmetric. The researcher identified two outliers; both with a PS value of 13. The statistics for PS-ICMP correlation are shown in Table 9.

Table 9

Descriptive Statistics for PS-ICMP Correlation

	Mean	Std. Deviation	N
PS	16.114	1.4302	35
ICMP	1.34	0.482	35

The sample group was composed of 35 subjects, the mean for PS was 16.11 and the standard deviation was 1.43 while the mean for ICMP was 1.34 and the standard deviation was 0.48. The Pearson correlation statistics for the PS-ICMP correlation are illustrated in Tables 10 and 11.

Table 10

Pearson Correlation Statistics PS-ICMP

		PS	ICMP
Pearson Correlation	PS	1.000	0.582
	ICMP	0.582	1.000
Sig. (1-tailed)	PS	.	0.000
	ICMP	0.000	.
N	PS	35	35
	ICMP	35	35

Table 11

Model Summary ICMP Group

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.582(a)	0.339	0.319	1.1805

a Predictors: (Constant), ICMP

In a sample of 35 subjects, the absolute value of the correlation coefficient between PS and ICMP was 0.58, R square was 0.34. The t-test statistics for the slope of the correlation PS-ICMP is shown in Table 12.

Table 12

t-Test Statistics for the Slope of the Correlation PS-ICMP

Model		Unstandardized Coefficients	Standardized Coefficients		t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.793	0.599		23.037	0.000
	ICMP	1.728	0.420	0.582	4.111	0.000

a Dependent Variable: PS

The sample slope was 1.73, its standard error was 0.42, and the value for the t statistic was 4.11. The sample slope was 4.11 standard error units above the hypothesized value of 0. The significance level was less than 0.0005. A graphical representation of this relationship is shown below. The scattered chart is a graphical representation of the values of PS compared to those of CMP. The chart confirms the R square value of 0.34.

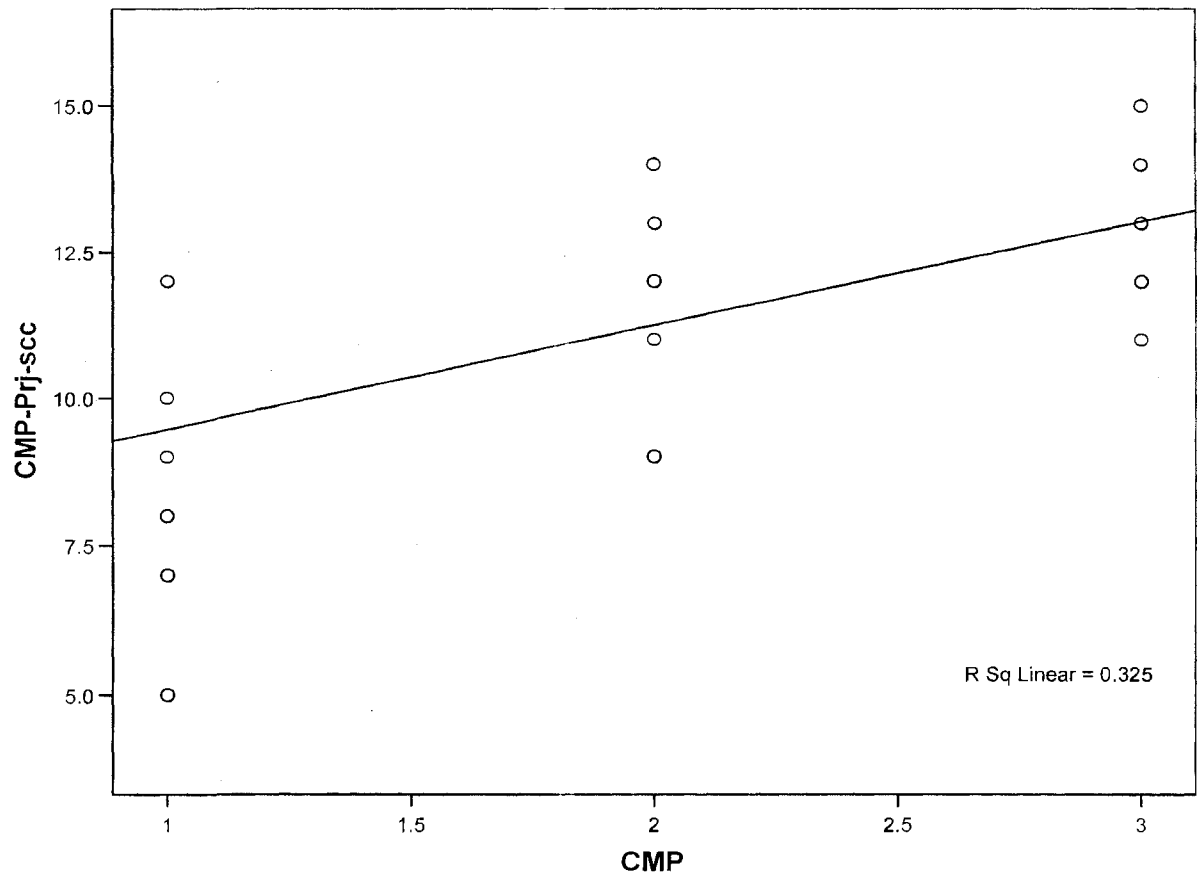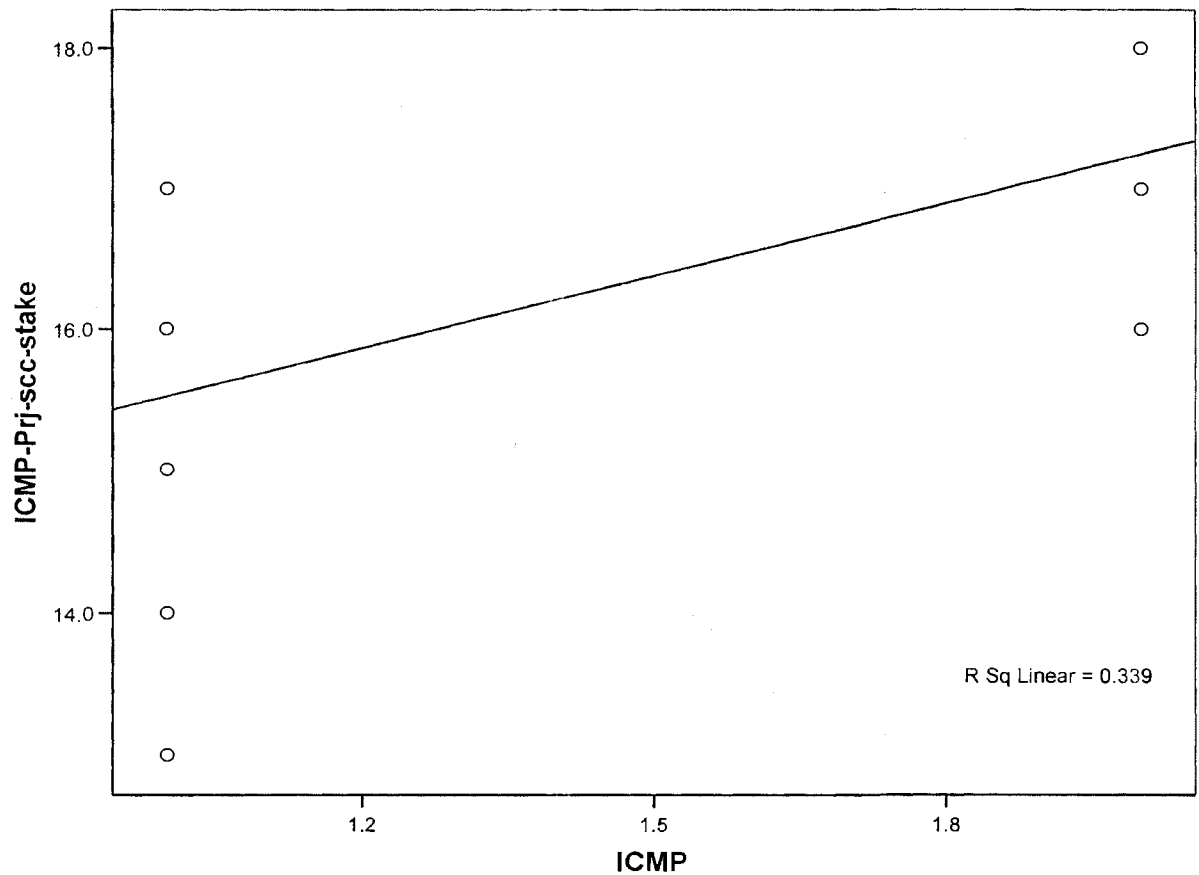*Figure 5*. Scatter diagram PS vs. ICMP

Findings from comparing CMP and ICMP groups. The third research question

that the researcher addressed was: To what extent, if any, is there a difference in PS

values between the use of CMP and ICMP? To answer this research question the

researcher tested the following hypotheses:

$H3_0$: There is no statistically significant difference in PS values between the use

of ICMP and CMP.

$H3_a$: There is a statistically significant difference in PS values between the use of

ICMP and CMP.

A statistical comparison between the two independent PS means of the two groups ICMP and CMP gave the information summarized in Table 13.

Table 13

Statistics for Two Independent Means

	ICMP	N	Mean	Std. Deviation	Std. Error Mean
PS	yes	35	16.11	1.430	0.242
	no	35	11.20	2.207	0.373

The samples contained 35 elements each. For the ICMP group, the PS mean was 16.11, the standard deviation was 1.43 and the standard error of the mean was 0.24. For the CMP group, the PS mean was 11.20, the standard deviation was 2.20 and the standard error of the mean was 0.37.

Table 14

Independent Samples Test ICMP Group

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confid. Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
PS Equal variances assumed	4.713	0.033	11.055	68	0.000	4.914	0.445	4.027	5.801
Equal variances not assumed			11.055	58.275	0.000	4.914	0.445	4.025	5.804

The t-test analysis of the two-independent samples was performed based on two assumptions: (a) equal variances assumed and (b) equal variances not assumed. Levene test gave a significance value of 0.03 indicating that the statistics of the equal variance not assumed should be used. The degrees of freedom were 58, the sample difference was 4.91 and the t statistic was 11.05. The observed two-tailed significance level was less than 0.0005.

Analysis and Evaluation of Findings

Analysis and evaluation of findings from the CMP sample. The following were the analysis and evaluation of findings related to research question 1: To what extent, if any, is there a relationship between project success PS and CMP?

The group statistics for project success in CMP sample confirmed that the sample size was 35 with no missing data. The researcher found that Cronbach's alpha for the latent variable PS in the CMP sample was 0.75. According to Hopkins (2002), a correlation of 0.75 is considered very large. Because Cronbach's alpha is a coefficient of internal consistency, the researcher concluded that the four items or traits (i.e., project cost, project scope, project time, and stakeholders satisfaction) used to measure the consistency coefficient of PS were reliable. Examining Figure 2, the researcher found that the median was not in the middle of the box which indicated that the data was not symmetric. Since the median was closer to the bottom of the box the researcher concluded that there is a tail towards large values (i.e., positive skewness). The researcher identified one outlier with a PS value of five. This outlier was close enough to the lower whisker which had a value of 7. The researcher examined the collected data and found that subjects belonging to low levels of CMP had low PS values. In fact, the means for

subjects belonging to levels 1, 2, and three of CMP were respectively 9.2, 11.5, and 12.75. Since the subject with a PS value of five belonged to the first level of the CMP (i.e., the lowest level of CMP) the researcher considered this as a clear indicator that the value of five was a probable valid value. The researcher decided to include this outlier in the statistical analysis because the value could be considered valid and because there was no clear evidence that logically led to discard this subject.

The researcher used the t-test statistics for the slope of the correlation PS-CMP to (a) test the linear correlation PS-CMP, (b) define the coefficients for the independent variable, and (c) formulate the estimated regression equation. The null hypothesis was that the population slope was zero. The sample slope was 1.78, its standard error was 0.45, and the value for the t statistic was 3.98. The sample slope was 3.98 standard error units above the hypothesized value of 0. The significance level was less than 0.0005. Only five or less times in 10,000, when the null hypothesis was true, one would expect to see a sample slope as large in absolute value as 1.78. The researcher rejected the null hypothesis. There appeared to be a linear relationship between CMP and PS. The estimated algebraic formula to represent this relationship is: PS = 7.69 + 1.78*CMP.

To assess the strength of the correlation PS-CMP, the researcher estimated the Pearson correlation coefficient. The absolute value of the correlation coefficient was 0.57. According to Hopkins (2002), a correlation coefficient of 0.57 is large. Pearson correlation coefficient describes the strength of the linear association between variables (Norusis, 2006). The researcher concluded that the strength of the association between PS and CMP was large.

Analysis and evaluation of findings from the ICMP sample. The following were

the analysis and evaluation of findings related to research question 2: To what extent, if

any, is there a relationship between project success PS and ICMP?

The group statistics for project success in ICMP sample confirmed that the sample

size was 35 with no missing data. The researcher found that Cronbach's alpha for the

latent variable PS in the ICMP sample was 0.69. According to Hopkins (2002), a

correlation of 0.69 is considered large. Because Cronbach's alpha is a coefficient of

internal consistency, the researcher concluded that the four items or traits (i.e., project

cost, project scope, project time, and stakeholders satisfaction) used to measure the

consistency coefficient of PS were reliable. Examining Figure 4, the researcher found that

the median was not in the middle of the box which indicated that the data was not

symmetric. Since the median was closer to the bottom of the box the researcher

concluded that there is a tail towards large values (i.e., positive skewness). The researcher

identified two outliers with a PS value of 13. These outliers were close enough to the

lower whisker which had a value of 14. The researcher examined the collected data and

found that subjects belonging to low levels of ICMP had low PS values. In fact, the

means for subjects belonging to levels 1 and 2 were 15.52 and 17.25 respectively. Since

the subjects with a PS value of 13 belonged to the first level of the ICMP (i.e., the lowest

level of ICMP) the researcher considered this as a clear indicator that the value of 13 was

a probable valid value. The researcher decided to include these outliers in the statistical

analysis because the values could be considered valid and because there was no clear

evidence that logically led to discard these subjects.

The researcher used the t-test statistics for the slope of the correlation PS-ICMP to (a) test the linear correlation PS-ICMP, (b) define the coefficients for the independent variable, and (c) formulate the estimated regression equation. The null hypothesis was that the population slope was zero. The sample slope was 1.73, its standard error was 0.42, and the value for the t statistic was 4.11. The sample slope was 4.11 standard error units above the hypothesized value of 0. The significance level was less than 0.0005. Only five or less times in 10,000, when the null hypothesis was true, one would expect to see a sample slope as large in absolute value as 1.73. The researcher rejected the null hypothesis. There appeared to be a linear relationship between ICMP and PS. The estimated algebraic formula to represent this relationship is: PS = 13.79 + 1.73*ICMP.

To assess the strength of the correlation PS-CMP, the researcher estimated the Pearson correlation coefficient. The absolute value of the correlation coefficient was 0.58. According to Hopkins (2002), a correlation coefficient of 0.58 is large. Pearson correlation coefficient describes the strength of the linear association between variables (Norusis, 2006). The researcher concluded that the strength of the association between PS and CMP was large.

Analysis and evaluation of finding of the independent means of CMP and ICMP. The following were the analysis and evaluation of findings related to research question 3: To what extent, if any, is there a difference in PS values between the use of CMP and ICMP?

To test the third hypothesis, the researcher performed a comparison between the two independent PS means in the two groups ICMP and CMP. Both samples contained 35 elements. For ICMP, the PS mean was 16.11, the standard deviation was 1.43 and the

standard error of the mean was 0.24. For CMP, the PS mean was 11.20, the standard

deviation is 2.20 and the standard error of the mean was 0.37. The sample PS mean of the

ICMP group exceeded that of CMP by as much as 4.91 PS units. The t-test analysis of the

two-independent samples was performed and the observed significance level for the

Levene test was 0.03. Only three times in 100 one would expect to see a sample

difference of 4.91 or larger when the null hypothesis was true (i.e., when the two

population variances were equal based on Levene test). Since this was less than 5%, the

researcher rejected the null hypothesis of equal variance assumed and considered the

statistics produced in the second row (i.e., equal variances not assumed) in Table 14. The

difference between the two sample means was 4.91. The observed two-tailed significance

level was less than 0.0005. Less than five times in 10,000 one would expect to see a

sample difference of 4.91 or larger when the two population means were equal. Since this

was far less than 5%, the researcher rejected the null hypothesis that the two population

means were equal. It appeared that the means were different.

CHAPTER 5 – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Managers achieve their long-term business goals or objectives through strategies. They undertake projects to realize these strategies. Consultants at Price Waterhouse Coopers found that only 2.5% of projects fully succeed and over 50% fail completely (2005). Business Improvement Architects (2006) found empirical evidence that the high failure rate of projects is because managers are not implementing projects that align with the business strategy.

Many researchers have posited as to the possible affects of implementing projects not aligned with the business strategy to the poor alignment between business strategies and project management (Hartman, 2000; Zhang, 2004). However, these researchers did not consider change and its effects on strategy and projects. As such, the researcher through the quantitative research examined the relationships between the use of ICMP or CMP and PS. The difference in PS outcomes, if any, was considered as a potential indicator that managers in companies using ICMP have higher PS than those who use CMP. While a CMP is a stand alone process used to manage changes, ICMP is a change management process that is institutionalized in the company's organization, processes, and policies. To achieve this purpose, the researcher needed to answer the following questions:

Q1: What is the degree of the relationship, if any, between CMP and PS?

Q2: What is the degree of the relationship, if any, between ICMP and PS?

Q3: To what extent, if any, is there a difference in PS values between the use of CMP and ICMP?

For the study, the research hypothesis was that managers using an integrated ICMP achieve higher levels of PS than those who use a CMP, and thus a closer degree of alignment between business strategy and projects can be inferred. To test this hypothesis, analysis was conducted on three constructs: PS, CMP, and ICMP.

To test the research hypotheses, the researcher used a comparative correlational design. While random selection and assignment were not possible in this ex post facto inquiry, the researcher took many actions to include a fair representation of the population. First, the use of an on-line questionnaire gave equal opportunities for all potential subjects independently of their geographic location, time zone, type of business, culture, and other factors. Second, the researcher invited potential subjects directly through e-mail and indirectly through on-line advertisement in international competency centers and on-line university. Subjects decided autonomously to join or discard the survey. Subjects had no obligation to take the inquiry and the researcher had no power to identify who took the survey and who did not. Accordingly, the researcher has a valid reason to consider that non-response bias was at least limited.

The 70 responses received represented the target set by the researcher to perform a study with $|r|$, the smallest effect worth detecting, to be high and a power of 95%. Both CMP and ICMP were measured using specific levels of change management implementation based on the works of Fuchs, Goff, Levinson, and Prosci (2004,2000, 2006,2004a). PS was measured as the summated scaling of four project success traits PS(cost), PS(time), PS(scope), and PS(stake) based on the works of Atkinson, Business Improvement Architects, Collerette and Legris, Hartman, Khan, Project Management

Institute, and Shatz (1999, 2006, 2006, 2000, 2006, 2004, 2006) on project scope, time, cost, and shareholder satisfaction.

Findings from the CMP group. The researcher found that Cronbach's alpha for the latent variable PS in the CMP sample was 0.75. According to Hopkins (2002), a correlation of 0.75 is considered very large. Because Cronbach's alpha is a coefficient of internal consistency, the researcher concluded that the four items or traits (i.e., project cost, project scope, project time, and stakeholders satisfaction) used to measure the consistency coefficient of PS were reliable. The Pearson correlation coefficient suggested that it was unlikely that the population value of the least-square regression line was zero. The t-test statistics showed that there appeared to be a linear relationship between CMP and PS. The estimated algebraic formula to represent this relationship was: $PS = 7.69 + 1.78*CMP$.

Findings from the ICMP group. The researcher found that Cronbach's alpha for the latent variable PS in the ICMP sample was 0.69. According to Hopkins (2002), a correlation of 0.69 is considered large. Because Cronbach's alpha is a coefficient of internal consistency, the researcher concluded that the four items or traits (i.e., project cost, project scope, project time, and stakeholders satisfaction) used to measure the consistency coefficient of PS were reliable. The Pearson correlation coefficient test suggested that it was unlikely that the population value of the least-square regression line was zero. The t-test statistics showed that there appeared to be a linear relationship between ICMP and PS. The estimated algebraic formula to represent this relationship was: $PS = 13.79 + 1.73*ICMP$.

Findings from the comparison of the two independent PS means of the CMP and ICMP group. A comparison between the two independent PS means in the two groups ICMP and CMP confirmed that for ICMP the PS mean was 16.11 while for CMP the PS mean was 11.20. The t-test analysis of the two-independent samples confirmed that it appeared that the means were different; the PS values for in the ICMP group exceeded those of the CMP group.

Conclusions

Conclusions from the CMP group. The researcher found a reliable, linear, and positive correlation between the constructs PS and CMP. The estimated algebraic formula to represent this relationship was: PS = 7.69 + 1.78*CMP. The more managers increased the implementation of change management in their organizations the higher was the project success. The researcher's findings confirmed Edwards' and Underwood (2001; 2005) claims that an efficient change management process could make the difference between project success and failure and that realizing benefits and ensuring project success was largely a change management issue. The researcher's findings confirmed the positive relationship between project success and the level of implementation of the change management process. This study was based on the three levels of CMP and on the four traits of PS. The CMP levels were basically those suggested by Edward, Fielden, Laszlo, researchers at Prosci, and Underwood (2001, 2004, 2004b, 2000, 2005). The four traits of the PS construct (i.e., scope, cost, time, and shareholder satisfaction), were the findings of the works of Fuchs, Hartman, Legris and Collerette, Levinson, and authors at the Project Management Institute (2004, 2000, 2006, 2006, 2004). The positive linear correlation found between PS and CMP linked the literature developed by researchers

who studied the traits of project success to that of those who studied the change management process.

Conclusions from the ICMP group. The researcher found a reliable, linear, and positive correlation between the constructs PS and ICMP. The estimated algebraic formula to represent this relationship was: PS = 13.79 + 1.73*ICMP. The more managers increased the implementation of integrated change management in their organizations the higher was the project success. The researcher's findings confirmed Laszlo's (2004) claims that when change was critical for a company's success then integrated change management became crucial for the survival of the organization. The researcher's findings confirmed the positive relationship between project success and the level of implementation of the integrated change management process. This study was based on the two levels of ICMP and on the four traits of PS. The ICMP levels were basically those suggested by Fuchs, Goff, Levinson, and researchers at Prosci (2004, 2000,2006, 2004a). The four traits of the PS construct, that is, scope, cost, time, and shareholder satisfaction, were the findings of the works of Fuchs, Hartman, Legris and Collerette, Levinson, and authors at the Project Management Institute (2004, 2000, 2006, 2006, 2004). The positive linear correlation found between PS and ICMP linked the literature developed by researchers who studied the traits of project success to that of those who studied the integrated change management process.

Conclusions from the comparison of the two independent PS means of the CMP and ICMP group. A comparison between the two independent PS means in the two groups ICMP and CMP confirmed that for ICMP the PS mean was 16.11 while for CMP the PS mean was 11.20. The t-test analysis of the two-independent samples confirmed

that it appeared that the means were different; the PS values for in the ICMP group

exceeded those of the CMP group. The study results were in line with Goff's (2000)

claims that change management tools and processes were not enough to make change

management succeed; it was people who made companies work. Companies whose

managers deployed ICMP throughout the organization and where change management

was part of the organization's intellectual property achieved higher project success rate

than managers who deployed a traditional change management process. The researcher

concluded that managers using an integrated ICMP achieve higher levels of PS than those

who use a CMP, and thus a closer degree of alignment between business strategy and

projects can be inferred.

Recommendations

    Recommendations for organizations whose managers implement CMP. The

research findings confirm that companies whose managers implement an integrated

change management process achieve higher project success rates than those who

implement a traditional change management process. Companies whose managers

implement traditional change management process should evaluate the cost of migrating

towards implementing an integrated change management process. Besides the traditional

costs of implementing a company-wide process (i.e. hardware costs, license costs, and

operational costs), implementing ICMP requires a management commitment and a

change in the organizational culture because ICMP is a process that is institutionalized in

the company's organization, processes, and policies. While management commitment can

be achieved in a relatively short period of time, changing organizational culture is usually

a difficult task to achieve and may require more time. If such an action is not feasible,

they should try to reach the third level of traditional change management where a detailed approach for managing change is applied in multiple projects in the organization. The linear and positive correlation that exists between project success and CMP confirms that organizations that belong to this level are those with the highest project success rate.

Recommendations for organizations whose managers implement ICMP. The researcher's findings confirmed that managers in organizations who implement ICMP achieve higher project success rates than those who implement CMP. Managers who implement ICMP in their organizations should strive to divulgate the integrated change management process in their organizations. The linear and positive correlation that exists between project success and ICMP should be an excellent motivation for managers who implement ICMP to move forwards in case they are in the first level of ICMP or, remain in the second level of ICMP where an organization-wide standards and methods are broadly deployed for managing and leading change.

Future research. The study was based on the assumption that the smallest effect worth detecting was high and the power of the study was 95%. This limited the sample size to 70 subjects. The intent of the researcher in limiting the sample size was to start an initial investigation to describe a phenomenon and to look for relationships between the studied variables with limited available resources and time. While a power of 95% was relatively high, limiting the study on the smallest effect worth detecting to high excluded medium and low values. As such, the researcher suggests future investigation on larger samples of CMP and ICMP groups to include a power of 95% and the smallest effect worth detecting as low. In this case, G*Power 3 estimates the sample size to 1084 subjects.

Additional future research could include a path analysis to ensure that elements of the conceptual model that is, project success, change management process, and integrated change management process, are appropriately evaluated.

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APPENDIXES

Appendix A:

Informed consent form and questionnaire

Informed Consent Form

Assessing Project Success: Comparing Integrated Change Management and Change

Management

Purpose: You are invited to participate in a research study that is being conducted for a dissertation at Northcentral University in Prescott, Arizona. The objective of this researcher is to improve project success in organizations through the alignment of strategies and projects. The information you provide will not have any impact on your company or on you since the researcher will not receive details about the company you work for or about you and because these details do not add value to the objectives of the research.

Participation Requirements: You will be asked to answer less than 10 questions about the way change management is implemented in your organization and the level of project success. The time needed to complete the questionnaire will be less than 10 minutes.

Research Personnel: The following person is involved in this research project and may be contacted at any time: Mohamad Hammoud, +39 347 6389191 email: hammoud56@yahoo.com.

Potential Risk and Discomfort: The information you provide will not have any impact on your company or on you since the researcher will not receive details about you or about the company you work for.

Potential Benefit: There are no direct benefits or incentives to you for participating in the research. However, the survey will provide a basis for improving project success which will benefit mankind in general and business in particular.

Anonymity/Confidentiality: The data collected in this study are confidential.

Right to Withdraw: You have the right to withdraw from the study at any time.

I would be happy to answer any question that may arise about the study.

Please direct your questions or comments to: hammoud56@yahoo.com

Signatures:

I have read the above description of the research entitled "Assessing Project Success: Comparing Integrated Change Management and Change Management". My electronic signature indicates that I agree to participate in this study.

Please indicate your consent with your electronic signature by checking "I agree"

Thank you

I Agree   I Disagree

Questionnaire

Section 1: Change management

Change management is the application of knowledge, skills, tools, and techniques to incorporate changes into a project and or into a strategy (Prosci, 2004). Since change can be generated either in strategy or in the projects contexts, aligning strategy and projects requires a bidirectional process. Thus change management aligns strategy and projects.

1) Please select one of the following that best describes your company's approach to change management.

☐ Little change management applied in managing projects

☐ Some elements of change management are being applied in isolated projects

☐ A detailed approach for managing change is being applied in multiple projects

☐ Organization-wide standards and methods are broadly deployed for managing and leading change

☐ Change management competency is evident in all levels of the organization and is part of the organization's intellectual property and competitive edge

2) Where does your company's level of adherence to the previously selected change management approach stands

Low side   perfectly match   high side

Section 2: Project success

Project success in most organizations is measured by how much the project meets the triple constraint: time, cost, and scope. Projects are successful when they are

delivered on scope, on time, and within cost. In recent years project success is measured by the level of stakeholders' satisfaction. Stakeholders are entities that are affected by the project. The stakeholders in a project are: customers, end-users, employees, shareholders, community, and the government.

Please answer the followings:

1) How much do you agree with the following statement: "A project in your company satisfies the scope for which it was developed":

Strongly disagree　　Disagree　　Neutral　　Agree　　Strongly agree

2) How much do you agree with the following statement: "A project in your company is delivered on-time":

Strongly disagree　　Disagree　　Neutral　　Agree　　Strongly agree

3) How much do you agree with the following statement: "A project in your company is delivered on cost

Strongly disagree　　Disagree　　Neutral　　Agree　　Strongly agree

4) How much do you agree with the following statement: "A project in your company satisfies its stakeholders":

Strongly disagree　　Disagree　　Neutral　　Agree　　Strongly agree

Appendix B:

File names, data description and simulated data

1) Filename : CMPICMP

a) Data description

CMPICMP.

	Name	Type	Width	Decimals	Label
1	CMPICMP	Numeric	2	0	Levels in CMP and ICMP
2	PS	Numeric	2	0	Prj success triple costraint
3	ICMPYN	Numeric	1	0	Flag to identify type of change

b) Simulated data

CMPICMP

	CMPICMP	PS	ICMPYN
1	1	12	yes
2	1	14	yes
3	1	15	yes
4	1	15	yes
5	1	15	yes
6	2	17	yes
7	2	20	yes
8	2	19	yes
9	1	4	no
10	1	7	no
11	1	7	no
12	2	9	no
13	2	9	no
14	2	11	no
15	3	9	no
16	3	8	no

2) Filename : CMP

   a) Data description

CMP -

	Name	Type	Width	Decimals	Label
1	CMP	Numeric	2	0	CMP
2	PS1	Numeric	2	1	CMP-Prj-scc-scope
3	PS2	Numeric	2	1	CMP-Prj-scc-cost
4	PS3	Numeric	2	1	CMP-Prj-scc-time
5	PS4	Numeric	2	1	CMP-Prj-scc-stake
6	PSC	Numeric	2	1	CMP-Prj-scc

   b) Simulated data

CMP

	CMP	PS1	PS2	PS3	PS4	PSC
1	1	1.0	1.0	1.0	1.0	4.0
2	1	1.0	2.0	2.0	2.0	7.0
3	1	2.0	1.0	2.0	2.0	7.0
4	2	3.0	2.0	2.0	2.0	9.0
5	2	2.0	2.0	2.0	3.0	9.0
6	2	2.0	3.0	3.0	3.0	11.0
7	2	2.0	2.0	2.0	3.0	9.0
8	2	2.0	2.0	2.0	2.0	8.0

3) Filename : ICMP

a) Data description

ICMP -

	Name	Type	Width	Decimals	Label
1	ICMP	Numeric	2	0	ICMP
2	P S1	Numeric	2	1	ICMP-Prj-scc-scope
3	P S2	Numeric	2	1	ICMP-Prj-scc-cost
4	P S3	Numeric	2	1	ICMP-Prj-scc-time
5	P S4	Numeric	2	1	ICMP-Prj-scc-stake
8	P SI	Numeric	2	1	ICMP-Prj-scc-stake

b) Simulated data

ICMP

	ICMP	P S1	P S2	PS3	PS4	P SI
1	1	3.0	3.0	3.0	3.0	12.0
2	1	3.0	4.0	4.0	3.0	14.0
3	1	4.0	4.0	4.0	3.0	15.0
4	1	4.0	3.0	4.0	4.0	15.0
5	1	4.0	4.0	4.0	3.0	15.0
8	2	4.0	5.0	4.0	4.0	17.0
7	2	5.0	5.0	5.0	5.0	20.0
8	2	5.0	4.0	5.0	5.0	19.0

Appendix C:

CMP, ICMP, and CMPICMP Files

CMP File

CMP	PS1	PS2	PS3	PS4	PSC
1	2	1	1	1	5
1	2	2	2	1	7
1	1	2	2	3	8
1	2	3	1	3	9
1	3	2	2	3	10
1	2	2	3	3	10
1	2	2	2	4	10
1	4	3	3	2	12
1	2	3	3	4	12
2	2	2	2	3	9
2	3	2	1	3	9
2	2	1	3	3	9
2	3	2	2	2	9
2	3	2	3	3	11
2	3	2	3	3	11
2	2	5	2	2	11
2	3	2	2	4	11
2	3	3	2	3	11
2	2	3	3	3	11
2	4	2	2	4	12
2	3	3	3	3	12
2	4	3	3	3	13
2	4	4	2	3	13
2	4	2	4	3	13
2	4	4	4	2	14
2	4	3	3	4	14
2	4	4	3	3	14
3	2	2	3	4	11
3	3	3	2	3	11
3	4	2	3	3	12
3	3	3	3	3	12
3	4	2	4	3	13
3	3	4	3	4	14
3	3	4	4	3	14
3	4	3	4	4	15

ICMP File

ICMP	PS1	PS2	PS3	PS4	PSI
1	4	3	3	4	14
1	4	2	3	4	13
1	4	4	4	4	16
1	4	4	3	3	14
1	4	4	5	4	17
1	4	4	4	4	16
1	5	4	4	4	17
1	4	4	4	4	16
1	4	4	2	4	14
1	3	3	4	3	13
1	5	2	3	4	14
1	4	4	5	4	17
1	4	4	4	5	17
1	5	4	4	3	16
1	4	4	3	4	15
1	4	4	5	4	17
1	4	4	3	4	15
1	4	4	4	5	17
1	4	4	4	4	16
1	4	4	4	4	16
1	4	4	3	5	16
1	4	3	4	5	16
1	4	4	4	3	15
2	4	4	4	4	16
2	4	4	4	4	16
2	5	3	4	4	16
2	5	4	4	4	17
2	4	5	4	5	18
2	4	4	5	5	18
2	4	4	5	5	18
2	5	5	4	3	17
2	4	5	5	4	18
2	4	4	5	5	18
2	4	5	5	4	18
2	5	4	4	4	17

CMPICMP File

CMPICMP	PS	ICMPYN
1	14	yes
1	13	yes
1	16	yes
1	14	yes
1	17	yes
1	16	yes
1	17	yes
1	16	yes
1	14	yes
1	13	yes
1	14	yes
1	17	yes
1	17	yes
1	16	yes
1	15	yes
1	17	yes
1	15	yes
1	17	yes
1	16	yes
1	16	yes
1	16	yes
1	16	yes
1	15	yes
2	16	yes
2	16	yes
2	16	yes
2	17	yes
2	18	yes
2	18	yes
2	18	yes
2	17	yes
2	18	yes
2	18	yes
2	18	yes
2	17	yes
1	5	no
1	7	no
1	8	no
1	9	no
1	10	no
1	10	no
1	10	no
1	12	no