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Doctoral School of Management and Business Administration Sciences

# **Project Success and the *Feasibility Formula*<sup>TM</sup>**

**The Thesis of the Ph.D. dissertation**

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## ABSTRACT

The success and failure of projects is a topic of great interest for those seeking answers to maximize project results. Projects typically require a significant amount of investment of both monetary and human capital, so there is often much at stake with the outcome of a project.

The *perception* of a likely outcome of project success or failure is related to undertaking a pre-project determination of feasibility, or the extent to which decision makers are engaged to align project goals with an organization's strategy. There is a significant body of research on the subject of stakeholder engagement as it relates to project success (De Wit, 1988; Baker, Murphy, Fisher, 1983; Pinto and Slevin, 1988; Torp, Austeng and Mengesha, 2004). Understanding the importance of measuring *perceived* success is more relevant today to the project management community than ever before (Belassi, Tukel, 1996). Consultations and extensive communications are key to successful stakeholder engagement and management, and provide a strong contribution to project success (Torp, Austeng and Mengesha, 2004; Pinto and Slevin, 1988).

The aim of this research is to develop a pre-project feasibility tool and methodology that contributes to both the organization and the project management profession in its ability to engage stakeholders to assess the alignment of a project with an organization's strategy, to inform the likelihood of the project outcome, and to support effective decision making. This dissertation will establish a link between the utilization of the pre-project feasibility tool and methodology and the stakeholders' ability to determine a likely project outcome and make informed decisions.

A project feasibility methodology and tool has been developed to facilitate project decision making and is the foundation for this research. The *Feasibility Formula*<sup>TM</sup> is based on the premise that stakeholders have a better opportunity to determine the likelihood of a project's outcome if they are engaged in pre-project feasibility determination: looking at the strategic objectives of an organization and the project's ability to satisfy those objectives. This informs stakeholders of opportunities and risks to the organization, and ultimately

suggests the likelihood of a successful or unsuccessful project outcome. The methodology and tool itself provides an effective mechanism by which to assess an organization's readiness and permits stakeholders to perceive alignment with strategic initiatives.

This research embodies four themes: the first theme is to define project success and its link to project alignment with the strategy of an organization. The second theme is testing and refinement of the *Feasibility Formula*<sup>TM</sup> methodology and tool to support effective decision making. The third theme is to determine the tool's effectiveness in pre-project feasibility determination. The fourth and final theme is to determine the capability and willingness of the project manager and/or project team to utilize the tool in support of favourable project outcomes.

This research primarily adopted a qualitative approach through data collection, an iterative methodology refinement and action research, as well as extensive case studies. Data was collected through document analysis, interviews, workshops, evaluations, case studies, and observation from the application of the *Feasibility Formula*<sup>TM</sup>. Case studies of participant projects, as the primary source of data, were used to solicit feedback from research participants and to enable refinement of the process and tool itself. The iterative methodology refinement sought to obtain participant satisfaction (i.e. no further adverse comments) through successive versions of the tool and methodology.

Findings from the research can be characterized as follows: The *Feasibility Formula*<sup>TM</sup> was evaluated as an effective tool and methodology in determining: i) the extent to which a project is aligned with the organization's objectives; ii) the likelihood of a successful project outcome; and iii) key factors affecting decision making. Further, the research provided a greater understanding of the project manager and/or project team's willingness and capability to use the *Feasibility Formula*<sup>TM</sup> to engage project stakeholders.

This research contributes to the project management body of knowledge through the provision of a tested and refined pre-project feasibility tool and methodology that assesses the alignment of a project with an organization's objectives, informs the likelihood of a successful project outcome and supports effective decision making among stakeholders.

It is anticipated that the *Feasibility Formula*<sup>™</sup> will provide a number of practical benefits as an outcome to this research including: an increase in the number of successful projects, hence increased value to the project organization; an increase in the competency level of project managers; and benefit to the profession through the increased likelihood of project success.

## 1. INTRODUCTION

Projects are *temporary endeavours* that produce a unique result – a product, service, or other outcome. There is a need to conduct due diligence in advance of the project in order to establish viability and the project’s ability to achieve the desired result.

Consider that most types of projects experience high rates of failure: 31.1% of projects are abandoned or cancelled before completion (i.e. total loss); 52.7% of projects average delivery of half of their planned functionality and cost two times their original estimates; and 16.2% of projects are completed successfully<sup>1</sup>. Which leads one to question: Why are projects cancelled or abandoned at such high rates? Why are so few projects completed successfully? These high rates of failure do not *have to* apply to the majority of projects. Project success or failure is strongly influenced by the level of pre-project feasibility determination undertaken by key stakeholders with an “organization perspective”. Within this feasibility determination, it is the identification of an organization’s strategy and clear business objectives, and the extent to which the project can satisfy these objectives, that supports the likelihood of a successful project outcome.

The *Feasibility Formula*<sup>TM</sup>, a project due diligence methodology and decision making support tool, was developed to assist the project community – i.e. project manager and team, and key stakeholders – in this process. The *Feasibility Formula*<sup>TM</sup> is based on the premise that there is a greater likelihood of a successful project outcome if a robust project feasibility tool and methodology is in place to facilitate effective decision making prior to the project being launched. It offers an instrument and accompanying structured process to identify and assess the relative importance of an organization’s goals, and the project’s ability to satisfy these goals.

The benefit of the tool is derivative of the consultative and interactive nature of the process itself, and its resulting analysis. The use and methodology of the *Feasibility Formula*<sup>TM</sup> to engage stakeholders in the active determination of a project’s probability for success is the focus of this research. The goal is to

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<sup>1</sup> The CHAOS Report (1994, 2004), The Standish Group,  
[http://www.standishgroup.com/sample\\_research/chaos\\_1994\\_1.php](http://www.standishgroup.com/sample_research/chaos_1994_1.php)

establish the connection between the use of the tool and methodology - based on its refinement and testing- and its ability to support effective decision making in a project environment.

The research is exploratory and descriptive in nature as it examines an organization's objectives as key decision making criteria, and its importance in various project types within medium to large sized Canadian organizations in both the public and private sector. The research proposition is that project management will be supported by the application of the *Feasibility Formula*<sup>TM</sup> tool and methodology and its ability to determine alignment of a project with an organization's strategy, and in supporting project stakeholders in the key aspect of decision making.

The dissertation explores the progression and cumulative results of action research and an iterative refinement of the prototype tool and methodology, and its effectiveness with participant organizations. It is grounded in qualitative research with data gathered from the numerous and iterative refinements, and from participant evaluations. A series of case studies are presented that harness data from individual consultations, informal and formal meetings, observation, team workshops and review and analysis of project documentation. These case studies further examine the capability and willingness of the project manager and/or project team to use the *Feasibility Formula*<sup>TM</sup> tool and methodology for pre-project feasibility determination and decision making.

This research studies ways to aid project managers and stakeholders in identifying, examining and evaluating an organization's goals and criteria considered essential to project success. The outcome of the research is a dynamic and comprehensive methodology and tool that has been refined and tested in a number of project environments.

## **1.1 Background to the research**

The idea for a robust methodology of engaging stakeholders in a pre-project feasibility determination process arose from my management consulting experiences: projects were often initiated without any prior assessment against an organization's strategy, nor meaningful stakeholder engagement, calling for mid-stream correction (if possible); projects experienced many issues throughout the lifecycle that may have been avoided if assessed up front; and projects frequently had their scope altered or were cancelled outright.

One of the most important aspects leading to this research, was the lack of engagement of stakeholders in a dynamic project feasibility assessment, and moreover, the project manager's absence from this process. Not only were organizational stakeholders "in the dark" about project objectives and outcomes, but the project manager knew less about what the overall project would accomplish.

As such, the *Feasibility Formula*<sup>TM</sup> was developed to foster the engagement of key stakeholders and ensure a common understanding of a project's ability (or inability) to address organizational strategy, and ultimately its likelihood of success.

Much research has been conducted on project success and failure. The Standish Group report (1994, 2004) cited in the Introduction presents staggering statistics of project failure. Other research defining project failure includes the recognition of poor alignment between the project solution and the organization's strategy, business requirements or priorities (Canadian Management Accounting Society, 1998). The literature finds project success, on the other hand, influenced by the alignment of project outcomes to the strategy of an organization.

From this research, there is recognition of the importance of identifying organizational needs and priorities, and senior stakeholder engagement – in all sectors. However, this recognition is not well supported by current tools or methodologies. The development and refinement of the *Feasibility Formula*<sup>TM</sup> and a determination of its effectiveness in fulfilling this need is the subject of this research.

## **1.2 Research Proposition**

*The practice of project management will be advanced by the Feasibility Formula<sup>TM</sup>, a pre-project feasibility determination tool and methodology which seeks to determine alignment of a project with an organization's objectives and support stakeholder decision making. A focused and effective pre-project feasibility tool and stakeholder engagement methodology is necessary to facilitate formulation of perceptions for a likely project outcome and enable informed decision making.*

The four themes arising from this proposition are illustrated below:

**Table 1.2 – Research Themes**

<b>Research Theme 1</b> <i>Project Success and Failure</i>	<b>Research Theme 2</b> <i>Refining the Feasibility Formula™</i>	<b>Research Theme 3</b> <i>Determining Feasibility Formula™ effectiveness</i>	<b>Research Theme 4</b> <i>Project Manager and/or Project Team capabilities</i>
<b>Question 1</b> <b>Objectives 1, 2</b>  Project success and alignment of project with organization’s strategy  AND  <b>Question 2</b> <b>Objective 3</b>  Existing feasibility determination and decision making practices in project management	Prototype <i>Feasibility Formula™</i>  Leading to <b>Question 3</b> <b>Objective 4</b>  Refined and tested <i>Feasibility Formula™</i> methodology and tool	Effectiveness of <i>Feasibility Formula™</i>  <b>Question 3</b> <b>Objective 5</b>  For specified project types  <b>Question 3</b> <b>Objective 6</b>  Measures of effectiveness	<b>Question 4</b> <b>Objective 7</b>  Capability and willingness of PM and/or project team to use the methodology and tool

### 1.3 Research Questions

The research questions developed are:

1. Does the alignment of project goals with the strategy of an organization influence project success?
2. What are the characteristics of effective decision making in a pre-project environment?
3. Does the use of a pre-project methodology supported by a tool such as the *Feasibility Formula™* increase the effectiveness of decision making?

4. How capable and willing is the project manager and/or project team in using the *Feasibility Formula*<sup>TM</sup> methodology and tool to engage with decision makers?

## 1.4 Hypothesis

The hypothesis, therefore, based upon the stated research problem, research questions and objectives is:

*The Feasibility Formula<sup>TM</sup> tool and methodology contributes to both the organization and the project management profession in its ability to inform the likelihood of a successful project outcome and support effective decision making.*

## 1.5 Research Design

This research project is designed to address the research questions identified in Section 1.3, and is carried out in three phases:

**Phase 1:** Literature Review on project success and pre-project feasibility determination

**Phase 2:** Iterative Methodology Refinement and Action Research

**Phase 3:** Case Studies

The research design is shown below in Table 1.5.

**Table 1.5 – Research Design**

<b><u>Phase 1</u></b> <b>Research Theme 1</b>	<b><u>Phase 2</u></b> <b>Research Themes 2 &amp; 3</b>	<b><u>Phase 3</u></b> <b>Research Theme 4</b>
<b>Literature Review</b>	<b>Iterative Prototype Refinement and Action Research</b>	<b>Case Study</b>
Project success and alignment of project with organization's strategy	4 iterations 6 workshops 18 exercises	Interviews Observation and reflection Document analysis Data from Phase 2
Identify existing pre-project feasibility determination and decision		

making practices

<b><i>Outcomes</i></b>	<b><i>Outcomes</i></b>	<b><i>Outcomes</i></b>
Existing feasibility determination and decision making practices in project management to Phase 2	Refined <i>Feasibility Formula</i> <sup>TM</sup> Effectiveness of <i>Feasibility Formula</i> <sup>TM</sup>	Assessment of organization and decision making in the project environment Project manager/project team capability and willingness
Data to formulate questions for Phase 3 interviews	Data for Phase 3	

Objectives 1 and 2, and the first two research questions look to examine influences on project success in a variety of project types – for example, technology, business, and accommodation projects. The Phase 1 literature review obtained data from existing research on project success to identify that project success is linked to strategic project management and the alignment of strategic goals. Further, project managers must possess the skills necessary to facilitate this alignment. This represented Phase 1 of the research.

The characteristics and attributes acquired from Phase 1 then became a key input for the interview questions for Phase 3. These same characteristics assisted in the refinement of the *Feasibility Formula*<sup>TM</sup> methodology and tool prototype, and became the basis for Phase 2, addressing objectives 4, 5 and 6, and question 3 through a series of workshops.

Objective 7 and question 4 sought to understand the willingness and capability of the project manager and/or project teams participating in the study to engage with stakeholders in the use of the tool and methodology. This represented Phase 3 of the research.

## 2. THE FEASIBILITY FORMULA™

The *Feasibility Formula*™ is based on the principle that when key stakeholders of the organization come together to conduct pre-project feasibility, they are able to determine the likelihood of the project's success or failure. The *Feasibility Formula*™ methodology and tool provides a mechanism for stakeholders to define what is important to their organization, determine the necessary criteria, and gauge the project's ability to satisfy these criteria. The true benefit of the *Feasibility Formula*™ is the methodology itself: gathering the stakeholders and decision makers to discuss and assess the objectives of the organization that the project must satisfy.

### 2.1 Feasibility Formula™ defined

The *Feasibility Formula*™ methodology enables project stakeholders to come together in order to determine the feasibility of a project and its likely outcome. It assists in determining, through the discussion and analysis process, if the project is aligned to the organization's strategy and has the potential to meet stakeholder expectations. The *Feasibility Formula*™ captures the organization's goals and the weights assigned to their importance, and measures the project's ability to satisfy these goals. In doing so, it provides an indication of likelihood for project success or failure.

The *Feasibility Formula*™ tool is represented by a set of Excel spreadsheets that captures qualitative and quantitative information and processes numerical data. It is provided as a template with examples, yet the stakeholders must populate the spreadsheets with *what is important to them* and then *weight this importance* with a relative rating/score. There are eleven elements for which the organization's stakeholders are to identify and rate objectives:

1. Strategic Alignment
2. Risk
3. Financial
4. Stakeholder Satisfaction
5. Human Resources
6. Political
7. Brand
8. Organizational Maturity
9. Policy or Strategic Benefits

## 10. Compliance

## 11. Ethics

The eleven elements were developed by the researcher, validated and adjusted during the preliminary research and pilot phase to arrive at this final list.

The stakeholders enter the organizational objectives for each element, and rate the importance to the organization on a scale of 1 to 10. They are then asked to score the identified project's ability to satisfy these objectives. The *importance* is weighted as 65% and the *project's ability to satisfy* as 35%. The weighting is higher on *importance*, because it is the organizational objectives that drive the need for the project. If the formula was equally weighted and an element was not important to the organization, yet the project could meet the objective, it would not be relevant. This was arrived at through the consultation and pilot phases of the research. Further, the research showed that it was this combined assessment and weighting (65%-35% as a reasonable balance between importance and satisfaction) that, according to research participants, yielded the desired characteristics and therefore ranked projects consistent with the organization's intended strategy. The resulting ratio was found empirically to best represent the concept of overall value.

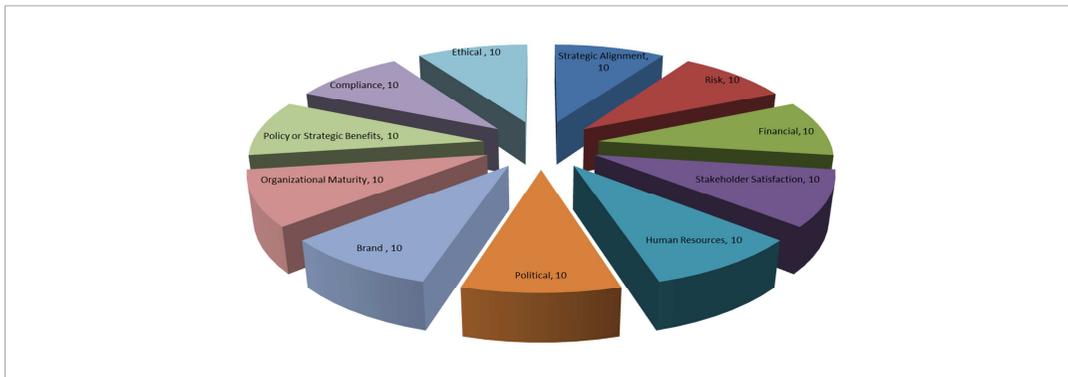
There is an individual worksheet for each element which roll up to the master spreadsheet with an aggregate score and visual. The final version is shown in Figure 2.1 on the following page.

As a group, and as facilitated by the researcher, the stakeholders are requested to identify organizational objectives related to the 11 elements, each on a separate worksheet. The researcher facilitates the discussion and captures the objectives and their rating on each spreadsheet, projected in the room for all to see. The Excel software is programmed with complex calculations for each element, that is then transposed to an aggregate score on the master spreadsheet that will give stakeholders a "dashboard" overview. Each organization will have a customized, or unique *Feasibility Formula*<sup>TM</sup> output. Through stakeholder discussion and in assessing the product of their efforts – the master spreadsheet – the stakeholders are able to make a final recommendation or decision as to whether to proceed with the project.

Feasibility Formula™ Worksheet

Objectives = Decision Criteria "What Matters"	Description	Rating of Importance "What Matters Most"										Project Criteria	Satisfies Criteria "Extent that project satisfies what matters most"										Aggregate Score		
		1	2	3	4	5	6	7	8	9	10		1	2	3	4	5	6	7	8	9	10			
1	<b>Strategic Alignment</b>	Project meets organizational strategy and objectives.										Favourable assessment of anticipated project outcome in supporting organization's objectives as outlined in business plan or other strategy document(s).	10										10		
2	<b>Risk</b>	Project meets organizational tolerance for risk and/or identified risks may be avoided, transferred, mitigated or accepted.										Risk Assessment outcome considered satisfactory based on risk mitigation measures.	10										10		
3	<b>Financial</b>	Project satisfies organizational goals re investment, cost reduction, cost management, cost mitigation.										Satisfactory outcome of financial feasibility review.	10										10		
4	<b>Stakeholder Satisfaction</b>	Project outcome to meet stakeholder objectives.										Expectations of stakeholders (i.e. conceiver, user, financier, developer, deliverer) identified and considered achievable.	10										10		
5	<b>Human Resources</b>	Organization has the human resources capacity and capability to deliver the project and/or has the ability to source the required human resources.										Satisfactory identification and availability of capable internal and/or external resources to plan and deliver the project.	10										10		
6	<b>Political</b>	Project meets political needs and satisfies the decision maker.										Outcome of political scan demonstrates project's ability to meet political needs.	10										10		
7	<b>Brand</b>	Project meets organizational objectives related to brand awareness, development, corporate/organizational image.										Favourable review of project alignment to corporate image and branding strategy.	10										10		
8	<b>Organizational Maturity</b>	Capacity of organization to undertake project given capability, focus of business efforts, maturity level and business performance.										Identification of satisfactory capacity following assessment of the organization's performance and any significant initiatives/changes in progress and/or planned.	10										10		
9	<b>Policy or Strategic Benefits</b>	Project outcome influences organizational policy and/or strategy.										Satisfactory review of project support of and alignment with new or current policies.	10										10		
10	<b>Compliance</b>	Project complies with regulatory and legal requirements.										Assessment of required regulatory measures and legal requirements and project's ability to satisfy.	10										10		
11	<b>Ethical</b>	Project satisfies ethical considerations.										Favourable review of project alignment with ethical standards, practices and policies of the organization.	10										10		
															<b>TL Score</b>										<b>10</b>

Figure 2.1 The Feasibility Formula™ - Version 4



### **3. RESEARCH METHODS**

#### **3.1 Structure of the Research**

The three phases of the research are described in the following sections. The literature research of Phase 1 serves as important input for the development of the questions for the interviews. The structure of the interviews was critical in facilitating the development of the workshops, which themselves supported the refinement of the methodology and tool.

#### **3.2 Literature Search – Phase 1**

The foundational literature search and review was the commencement of this research and established a link between project success and pre-project feasibility determination.

It further supported the development of the prototype methodology and tool through validation of the importance of strategic alignment and the absence of such tools. The outcome of the literature review provided in the full dissertation represents key input for Phase 2 – Iterative Methodology Refinement and Action Research, and Phase 3 – Case Study.

#### **3.3 Iterative Methodology Refinement and Action Research – Phase 2**

The researcher's experience on the significance of observation and reflection as tools for practicing project managers, as well as the literature review and Bourne's thesis (2005), guided the researcher to consider the iterative approach in studying the effectiveness of the *Feasibility Formula*<sup>TM</sup> methodology and tool.

The iterative methodology refinement and action research was based on facilitated workshops that involved project team members using the tool and methodology in their own work environment. This afforded two key benefits: the first was the introduction of a structured process for assessing the viability of the identified project and the refinement of the tool for assessing the organization's future projects; the second benefit was to the research and was the receipt of significant feedback, input and evaluation for the tool and methodology and its effectiveness. The aggregate of this feedback yielded improvements in subsequent iterations of the tool.

### **3.4 Case Study – Phase 3**

Following is an analysis of research techniques to satisfy the needs of Question 4 - *How capable and willing is the project manager and/or project team in using the Feasibility Formula™ methodology and tool to engage with decision makers* using Yen's (2003) strategy:

#### **3.4.1 Case Study data collection**

The unit of analysis, or major entity that the researcher is analyzing, is the project, as embodied by the stakeholders including the project manager, project team and project sponsor. The case studies are projected to yield data to interpret the willingness and capability of the project manager and project team to use the *Feasibility Formula™* methodology and tool.

Data was also collected through interviews conducted with the executive sponsor of each project and the project manager. The approach to the interviews followed a semi-structured format. The interview collected data regarding expectations, current practices of the organization and individual, and definitions of successful and unsuccessful projects. The researcher's personal experience and results of the literature search were the primary inputs to the development of the questions.

Finally, the action research and iterative methodology refinement permitted data gathering through observation and inquiry of the project stakeholders during the workshops. There were additional opportunities for the research to collect same through informal meetings with participants and project sponsors, as well as through the review and assessment of documentation provided by the organization in support of the research.

#### **3.4.2 Case Study data analysis**

The data analysis of the case studies was undertaken by examining the data gathered from each participant project and its sponsoring organization. This examination was conducted within each case and finally as an inter-case analysis, which permitted the comparison of the case studies across a number of dimensions. In analyzing the similarities and disparities both within, and between the projects, an interpretation of the data may guide the researcher to

more extensive conclusions regarding the *Feasibility Formula*<sup>TM</sup> methodology and tool.

### 3.4.3 Validation

The data gathered, the results of its analysis, and conclusions reached were validated through the presentation of the research findings and report to the participants of the research, as well as to project management practitioners and industry professionals.

The organizations and projects are summarized in Table 3.4 below:

**Table 3.4 – Research Organizations and Projects**

	<b>Organization</b>	<b>Project</b>	<b>Project Type</b>
1	Private 1 – Project Management	National Marketing Campaign	Business (Marketing)
2	Private 2 – Wealth Management/Financial Services	National Rebranding Accommodation Project	Accommodation
3	Private 3 – Defense Contracting	International Capture Centre Initiative	Business (Business Development)
4	Public 1 –IT Service Provider	Enterprise Portfolio System	IT
5	Public 2 – Export Development	Regional Office Accommodation	Accommodation
6	Not-For-Profit (NFP) 1 – Medical Association	Real Estate Strategy	Business

### 3.5 Action Research - Iterative Methodology Refinement

The action research was based on its application for the achievement of four criteria (Schmuck, 2009): i) it provides intervention(s) for continuous improvement; ii) it seeks to foster development and planned change, iii) it aims to collect trustworthy data on the multiple perspectives of individuals and groups; and iv) it focuses on local change and improvement. The key elements of action research - improvement, development, perspectives and local change –

would therefore be addressed through the iterative methodology refinement. Further, the process of iterative refinement would be supported by Deming's *plan, do, check, act* and the process of *plan, monitor, evaluate, reflect* (Lusthaus, Adrien, Perstinger, 1999). Systematic analysis of the methodology and tool would provide an understanding of causes for success or failure – and subsequent improvement - and also reduce the likelihood of moving too quickly to the next iteration without reaping the benefits of the current one (Slater, Narver, 1995).

The process consisted of defining the notion, determining the approach, designing the methodology, planning and implementing the activities, monitoring, evaluating and reflecting upon the results. The combined cycle of plan, do, monitor, evaluate and reflect was then repeated for each iteration.

## 4. CONCLUSION

The fundamental aim of my research was to develop a pre-project feasibility tool and methodology that would contribute to both the organization and the project management profession in its ability to facilitate the necessary due diligence to determine the alignment of a project with an organization's objectives, inform the likelihood of a successful project outcome, and support effective decision making.

It was my quest to discover the relevance, applicability and value of the *Feasibility Formula*<sup>™</sup> tool and methodology that I had created with a view to increasing the probability of project success.

In reviewing a number of research methods, I had chosen ones that I believed would best support the collection and analysis of relevant data, namely a comprehensive literature review, robust action research and iterative methodology refinement, and detailed case studies.

### 4.1 Summary of the Research Project

The *Feasibility Formula*<sup>™</sup> methodology enables project stakeholders to come together in order to determine the feasibility of a project and its likely outcome. It further ensures, through the discussion and analysis process, that the project is aligned to an organization's strategy and that it has the potential to meet stakeholder expectations. The *Feasibility Formula*<sup>™</sup> tool defines and weights the organization's goals, and measures the project's ability to satisfy these goals, and in doing so, provides an indication of likelihood for project success or failure.

#### 4.1.1 Themes of the research

The research proposition supposes that: *The practice of project management will be advanced by the Feasibility Formula*<sup>™</sup>, *a pre-project feasibility determination tool and methodology which seeks to determine alignment of a project with an organization's objectives and support stakeholder decision making. A focused and effective pre-project feasibility tool and stakeholder engagement methodology is necessary to facilitate formulation of perceptions for a likely project outcome and enable informed decision making.*

The research embodied four themes: the first theme was to define project success and determine the link between pre-project feasibility determination and project success. Two questions were developed to address this theme: 1. *Does the alignment of project goals with the strategy of an organization influence project success?* 2. *What are the characteristics of effective decision making in a pre-project environment?* This first theme was addressed in the literature review through an examination of project success, project alignment with an organization's strategy, and characteristics of effective decision making.

From the literature review, it was concluded that there is established knowledge in the definitions of project success and project management, although no consensus on success criteria, caused by a universal inability to establish objectives that would be broadly applicable. The *Feasibility Formula*<sup>TM</sup> addresses this issue in supporting organizations to establish specific objectives in advance of proceeding with a project, thereby increasing its likelihood of success.

Further, project success was linked to strategic management in the literature, but there remains a gap in the knowledge related to the tools and methodologies that would facilitate same. The *Feasibility Formula*<sup>TM</sup> is a tool and methodology that links the strategies of an organization with project goals, and therefore presents a likely outcome.

The second theme of the research was the testing and refinement of the *Feasibility Formula*<sup>TM</sup> methodology and tool to support effective decision making. The third theme was to determine the effectiveness of the *Feasibility Formula*<sup>TM</sup> in a variety of project types. The research question developed to address both the second and third themes was: *Does the use of a pre-project methodology supported by a tool such as the Feasibility Formula*<sup>TM</sup> *increase the effectiveness of decision making?* The question was answered through action research and comprehensive iterative methodology refinement.

The fourth theme was to determine the skills and willingness of project managers and/or project teams to utilize the tool in support of effective project outcomes. The question posed and answered was: *How capable and willing is the project manager and/or project team in using the Feasibility Formula*<sup>TM</sup> *methodology and tool to engage with decision makers?*

**Table 4.1.1 – Summary of Research Themes**

<b>Research Theme 1</b> <i>Project Success and Failure</i>	<b>Research Theme 2</b> <i>Refining the Feasibility Formula™</i>	<b>Research Theme 3</b> <i>Determining Feasibility Formula™ effectiveness</i>	<b>Research Theme 4</b> <i>Project Manager and/or Project Team capabilities</i>
<p><b>Question 1 Objectives 1, 2</b></p> <p>Project success and alignment of project with organization’s strategy</p> <p>AND</p> <p><b>Question 2 Objective 3</b></p> <p>Existing feasibility determination and decision making practices in project management</p>	<p>Prototype Feasibility Formula™</p> <p>Leading to <b>Question 3 Objective 4</b></p> <p>Refined and tested Feasibility Formula™ methodology and tool</p>	<p>Effectiveness of Feasibility Formula™</p> <p><b>Question 3 Objective 5</b></p> <p>For specified project types</p> <p><b>Question 3 Objective 6</b></p> <p>Measures of effectiveness</p>	<p><b>Question 4 Objective 7</b></p> <p>Capability and willingness of PM and/or project team to use the methodology and tool</p>

**4.1.2 Findings of the Research**

Key findings of the research are:

- The vast majority of organizations do not undertake any significant due diligence prior to undertaking a project.
- Few organizations utilize a formal tool in support of project decision making, and most do not define the organization’s objectives and seek alignment with project goals.
- There is an absence of stakeholder engagement around project decision making in organizations.

- The greatest value provided by the *Feasibility Formula*<sup>TM</sup> tool and methodology was its ability to generate relevant discussion among stakeholders, an exercise missing from organizations.
- The *Feasibility Formula*<sup>TM</sup> tool and methodology is applicable to all project environments, as it was found to be effective by all organizations studied (i.e. all sectors, industries, typologies, project types).
- The tool and methodology is conducive to being utilized by project managers/project team members, although with further training on its application and facilitation techniques.
- There is a strong willingness of project managers/project team members to utilize the *Feasibility Formula*<sup>TM</sup> in order to improve the likelihood of project success.

A summary of the inter-case analysis and effectiveness of the *Feasibility Formula*<sup>TM</sup> is illustrated below.

**Table 4.1.2 – Summary of inter-case criteria and effectiveness of the *Feasibility Formula*<sup>TM</sup>**

<b>Inter-Case Criteria</b>	<b>Private 1</b>	<b>Private 2</b>	<b>Private 3</b>	<b>Public 1</b>	<b>Public 2</b>	<b>NFP 1</b>
<b>Project Manager/ Project Team capabilities *</b>	√ Yes	√ Yes	√ Yes	√ Yes	√ Yes	√ Yes
<b>Project Manager/ Project Team willingness</b>	√ Yes	√ Yes	√ Yes	X No – mandated, prescribed tool in place	√ Yes	√ Yes
<b>Project Typology</b>	√ Simple	√ Typical to Complex	√ Complex	√ Complex	√ Typical	√ Complex
<b>Project Type</b>	√ Marketing	√ Accommodation	√ Business Development	√ IT	√ Accommodation	√ Real Estate

<b>Industry</b>	√ Project management	√ Wealth management and financial services	√ Defense and aerospace engineering	√ IT	√ Export development	√ Medical
<b>Sector</b>	√ Private	√ Private	√ Private	√ Public	√ Public	√ Not-for-profit

\*all but NFP 1 cited additional training requirement specific to use of the tool and workshop facilitation.

### 4.1.3 New Scientific Findings

The purpose of the research was to present a tool and method for performing project selection based on the relative value (i.e. goal alignment) to the organization of the proposed project and its likelihood of success. It contributes to new scientific findings as:

- An improved technique for assessing project viability and making project selections that is not complex, but rather easy to understand and utilize.
- The resulting score produces a measure of project value that accounts for value as a function of both “what’s important” to the organization and the extent to which the project is aligned with “what’s important”.
- Much of the 11 criteria are novel (e.g. organizational maturity; brand, compliance) developed from experience and research participant input through the iterative tool and methodology refinement
- Represents an alternative, yet robust treatment of an often informal and unstructured approach to project assessment by stakeholders.
- Methodology fully reliant on engagement of stakeholders and essentially peer review through application of the tool.
- The tool is intended to be flexible, and allow manual manipulation to permit population of goals, as well as the rejection of some categories, as relevant to the organization.
- Redefines the project lifecycle: necessary to undertake pre-project feasibility determination *before* project “Initiation”
- Relevance, timeliness and practical importance to “real world” managers has merited ongoing interest and continued deployment of the *Feasibility Formula*<sup>TM</sup>.

#### **4.1.4 Acceptance of Hypothesis**

The formulation and analysis of the research questions in response to the research aim and satisfied objectives has led the researcher to accept the stated hypothesis:

*The Feasibility Formula™ tool and methodology contributes to both the organization and the project management profession in its ability to inform the likelihood of a successful project outcome and support effective decision making.*

Upon holistic reflection of the research work, I conclude from the findings that I have achieved my aim in this research and have developed a tool and methodology in the *Feasibility Formula™* that contributes to the organization and to the project management discipline in its ability to assess a project's relevance to the organization and its likelihood of success, and to facilitate the required decision making.

The research concluded that while the findings appeared generalizable beyond the immediate cases in yielding the same conclusion regarding the *Feasibility Formula™*, namely its relevance and value, despite variations in organizations, stakeholders, sector, type of industry, project typology and nature of the project, the aim was to understand the underlying objectives and principles of the organization and not to create a "one size fits all" measure.

#### **4.2 Contributions of this Research**

This research has provided significant and original contribution in the form of a new tool and methodology developed to make advances on current theories and practices for pre-project feasibility determination in project management. The ability of the *Feasibility Formula™* to facilitate stakeholder decision making through the identification of an organization's strategy and objectives, and the project's ability to meet these objectives is novel. Further, it was lauded as a tool and methodology that would be prescribed for use in many of the participating organizations, hence it can be assumed to have broader applicability in most project environments.

#### **4.2.1 Value to the organization**

The impetus for this research is the researcher's belief that pre-project feasibility determination contributes to project success, and that the absence of such due diligence is one of the major contributors to project failure.

The *Feasibility Formula*<sup>TM</sup> tool and methodology provides value to the organization as it:

- ensures that the projects are fully assessed to ensure alignment with organizational goals
- enables the prioritization of projects among many under consideration
- allows for adjustment to project scope and other criteria in order to support increased likelihood of project success
- shows likely areas of risk to the organization and consideration for mitigation if the project is undertaken
- permits early project termination if applicable (avoiding loss of resources, time and money)
- provides stakeholders with a view to those elements of a project which may need to be revisited along the lifecycle to ensure continued satisfaction of criteria
- engages stakeholders, fosters collaboration, supports team and consensus building

#### **4.2.2 Value to stakeholders/decision makers**

Stakeholders benefit from the *Feasibility Formula*<sup>TM</sup> tool and methodology as it provides an opportunity for stakeholders to:

- express themselves and ensure their expectations are known
- learn about the organization and other stakeholders' perspectives through the process itself
- seek clarity related to the organization's strategy and objectives
- become part of an integrated project team
- enhance communication among team members
- understand the expectations of others
- contribute to the organization in a meaningful way
- assess the project both within and outside of their functional area

Decision makers within the organization benefit from having the necessary data and required stakeholder input to inform their decision. They can further have greater confidence in the accuracy of their decision as a result of the robust process and tool.

### ***4.2.3 Value to the project manager***

The *Feasibility Formula*<sup>TM</sup> provides value to the project manager as it presents a simple and effective methodology to assess project feasibility before the project planning process is undertaken. As a result, the project manager can have greater confidence in the project's ability to proceed with the support of the stakeholders.

The process itself also permits the project manager to engage the stakeholders and develop a relationship at the beginning of the project cycle. The relationship with individual stakeholders will then be in a better position to be nurtured. Stakeholders and project managers can feel more comfortable in approaching each other in conversation regarding aspects of the project. It can also provide the project manager with a view as to which stakeholders he/she should spend more time with in order to understand and manage expectations. Further, he/she can also learn which stakeholder(s) can be a valuable resource or asset to the success of the project.

Through the methodology and tool, the project manager is also introduced to potential risk areas for the organization and can now manage and mitigate these risks at the project level.

Most importantly, the project manager now has the ability to manage the project with an understanding of the organization's goals, and what the project is meant to achieve as an outcome.

Beyond the project manager, the project team now has a better understanding of the stakeholder community, and its members' management styles, perspectives and expectations. They will, both individually and collectively, learn about these stakeholders and the relationships that exist or form among them. The project team members will be in an optimum position to influence and manage these relationships. Ultimately, the project team will have a comprehensive

understanding of the organization's goals and the project's role in satisfying those goals.

It is the combined value that the *Feasibility Formula*<sup>TM</sup> brings to the project manager and project team that supports an increased likelihood of project success.

#### ***4.2.4 Value to the project management profession***

The *Feasibility Formula*<sup>TM</sup> methodology and tool brings value to the project management profession in raising the awareness of the need for pre-project feasibility determination in an effort to increase the number of successful project outcomes. The *Feasibility Formula*<sup>TM</sup> provides knowledge leadership in consideration of the project lifecycle: project planning begins *before* the Initiation phase, and actually commences with the feasibility determination and a measurement of the project's alignment to its sponsoring organization and likelihood of success.

The tool and methodology also contributes to the project management profession by further developing the role of the project manager. Through early involvement and stakeholder engagement, the project manager's reputation is enriched by their ability to contribute to the strategic needs of the organization, thereby elevating the profession to a new level from the traditional tactical, technical level.

The contribution to the project management profession can be summarized as reducing the risk of project failure and resulting waste of financial and human resources. Through an improvement in the number of cases of project success the reputation of the project management profession will be enhanced.

#### ***4.2.5 Addressing gaps in the research***

There are a number of gaps in the research to be acknowledged, including:

- The literature review was lacking in research available related to: a) pre-project feasibility processes, practices, tools and methodologies; and b) decision making processes, tools and methodologies specific to the pre-

project environment. In some respects it must be acknowledged that the *Feasibility Formula*<sup>™</sup> is novel and “breaking new ground”.

- The research did not permit any benchmarking or tracking of results as to actual project outcome of success or failure, hence a determination of the practical effectiveness of the *Feasibility Formula*<sup>™</sup>, as none of the projects were completed prior to the writing of this dissertation.
- Establishing the likelihood of project success through the *Feasibility Formula*<sup>™</sup> tool and methodology at the pre-project stage also assumes that project execution (in the traditional sense) will be successful. Project success therefore remains highly dependent on a successful implementation.
- The results of the scoring produced with the aid of the *Feasibility Formula*<sup>™</sup> tool are purely interpretive and not absolute (although this is not its intent; rather it is to generate discussion and consensus regarding “what matters most” and the project’s ability to satisfy these objectives).

### **4.3 Recommendations for Future Research**

Further benefit would be realized by organizations and the project management discipline if additional research were undertaken to:

- Assess projects at completion, determine success or failure and link to usage of the tool and methodology where it was applied; similarly compare against like projects that did not use the tool and methodology to determine if usage of the *Feasibility Formula*<sup>™</sup> supports project success.
- Determine the usefulness of the tool and methodology in comparing, contrasting and prioritizing projects at the portfolio level.
- Research can continue to test the applicability and effectiveness of the *Feasibility Formula*<sup>™</sup> tool and methodology in other project types and industries.
- Examine other uses of the tool and methodology to identify and/or classify project types (e.g. strategic project (capital) vs. maintenance project (operations)).
- Actual outcomes of the projects can form the basis for future assessment of the evaluation process; comparing pre-project feasibility to post project results, new data may emerge that can be used to improve and refine the project selection process using the *Feasibility Formula*<sup>™</sup>.

## 5. PUBLICATIONS

Publications by the author are listed below (under surnames used of Sanchez and/or Chillingworth).

### FULL PAPERS PUBLISHED IN INTERNATIONAL SCIENTIFIC JOURNALS:

1. Kopolyay, T., **Sanchez, L.**, Lloyd, D., Management of Financial and Economic Issues Along the Market Lifecycle, IEFs Economy and Sociology Theoretical and Scientific Journal, Nr. 3, 2011.
2. Kopolyay, T., **Chillingworth, L.**, Mitchell, B, Corporate Lifecycles: Modelling the Dynamics of Innovation and Its Support Infrastructure), Technology Innovation Management Review (TIM), special issue on Managing Innovation for Tangible Performance, 2013.
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4. Kopolyay, T., **Chillingworth, L.**, Lloyd, D., Makó, C., HR Issues Evolution Along the Market Lifecycle and the Value Chain: Case of the High-Tech Industry, Psychological Issues in Human Resource Management (2014), Volume 2 (1), pp. 7-33.
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11. **Sanchez, L.**, Kopyay, T., Lloyd, D., Stakeholder Issues Along the Market Lifecycle Institute of Economy, Finance and Statistics, Chisinau, Moldova, 2011.
12. Kopyay, T., Lloyd, D., Powers, J., **Sanchez, L.**, Decision Making Along the Market Lifecycle American Society of Engineering Management (ASEM), Texas, USA, 2011.
13. Kopyay, T., Lloyd, D., **Sanchez, L.**, Value Chains Under Shock Loading: An Analysis of the Hi Tech Sector American Society of Engineering Management (ASEM), Texas, USA, 2011.
14. **Sanchez, L.**, Kopyay, T., Lloyd, D., Generic flaws in incentives design; classic mistakes along the market lifecycle Global Management Conference, Rio de Janeiro, 2012.
15. Kopyay, T., Lloyd, D., **Sanchez, L.**, Paquin, JP., Strategy Making in Hi Tech Markets – the “clock-speed” paradigm, Industrial and Systems Engineering Research Conference (ISERC), Florida, USA, 2012.
16. Kopyay, T., Lloyd, D., **Sanchez, L.**, Stakeholder Issues Along the Lifecycle in Hi Tech Markets Industrial and Systems Engineering Research Conference (ISERC), Florida, USA, 2012.
17. Lloyd, D., Kopyay, T., **Sanchez, L.**, The Nationality of a Company American Society of Engineering Management (ASEM), Virginia Beach, USA, 2012.
18. Lloyd, D., Kopyay, T., **Sanchez, L.**, The Influence of Leadership, Incentives and Culture on Innovation in the hi-tech firm, American Society of Engineering Management (ASEM), Virginia Beach, USA, 2012.

#### COMPLETED ARTICLES - SUBMISSION PENDING:

**Chillingworth, L.**, Innovation and the Feasibility Formula™, 2015, submission pending.