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The impact of scenario playing on the efficacy of digital transformations

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THE IMPACT OF SCENARIO PLANNING ON

THE EFFICACY OF DIGITAL TRANSFORMATIONS

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A Research Project

Presented to the Faculty of

The Graziadio Business School

Pepperdine University

_____

In Partial Fulfillment of

the Requirements for the Degree

Master of Science

In

Organization Development

_____

by

Kristy M. Lapidus

June 2019

This research project, completed by

KRISTY M. LAPIDUS

under the guidance of the Faculty Committee and approved by its members, has been

submitted to and accepted by the faculty of The Graziadio Business School in partial

fulfillment of the requirements for the degree of

MASTER OF SCIENCE
IN ORGANIZATION DEVELOPMENT

Date: June 2019

Faculty Committee

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Abstract

Scenario planning projects raise awareness and change mindsets. By weaving narratives comprised of informed future possibilities rather than attempting to predict the future from the data points of the past, scenarios produce adaptive results. Adaptive methodologies are more important now than at any point in history. The rapid advance of technology and globalization contribute to a constant state of change requiring organizations to undergo digital transformations to survive. This study contributes to the literature by examining the impact of scenario planning on the efficacy of a digital transformation in the high-tech industry. All participants in the study predicted that the scenario planning project will have a positive impact on the efficacy of the organization's digital transformation. The study also found that scenario planning improved the organization's readiness for change, agility, and competitiveness.

Keywords: Scenario Planning, Business Planning, Custom Apps, Futures, Digital Transformations, Transformation, Digital, Text Mining, Organizational Agility

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Chapter 1: Introduction

The oft-cited "constant change" in today's complex business environment compels leaders to transform both strategy and operations. As rapidly advancing technology and increasing globalization converge, organizations across diverse industries are forced to transform digitally to stay afloat. Staggeringly, businesses are doomed to last only five years before going out of business or being absorbed by a competitor if they do not undergo digital transformations (Couchbase, 2017). However, two out of every three digital transformation projects are shown to fail (Consultancy.uk, 2015). The question this study explores is how scenario planning might impact the efficacy of digital transformations. Specifically, the research examined how the combination of action research-based scenario planning with text-mining of futuristic data, as explicated by Kim, Han, Lee, and Park (2016), impact the digital transformation efforts for a consultancy supporting the high-tech industry in Silicon Valley.

The academic definition of digital transformation continues to evolve. At the time of this writing, it encompasses a wide range of business undertakings, including the establishment of new business models, the optimization and automation of business processes, the enhancement of customer experiences, the optimization of infrastructure, the deepening of insights from data analytics (machine learning), and the virtual evolution of new ways of thinking about business, people, creativity, and revenue streams (Evans, 2017).

Further, for a change to have been considered transformational it must have intrinsically altered standard ways of doing business by redefining business capabilities and/or processes and relationships (Dehning, Richardson, & Zmud, 2003). Traditionally,

technology was firmly entrenched in the mostly hidden center of enterprises, supporting administrative operations and Enterprise Resource Planning (ERP) needs. At the time of this writing, technology had permeated every aspect of human life and it had become a living, breathing, inescapable part of the entire enterprise ecosystem (Gray, El, Asper, & Thordarson, 2013).

Thus, this study uses the following definition of digital transformations: organizational change that fundamentally improves business performance via technology (Wade & Marchand, 2014, p. 2). The need for digital transformations in today's turbulent business environment has been studied and elucidated thoroughly prior to this study. As well, the decision-making process regarding which digital transformation an organization might undertake had for nearly 50 years been accomplished through such disciplines referred to as technology foresight, technological forecasting, and/or technology forecasting (Miles, 2010). These disciplines comprise a slice of the field known as futures studies, which assess a broad range of current affairs to extrapolate future possibilities and recommend adaption options (Marlen, 1984, p. 36). Scenario planning comprised another slice of the futures field. Long a tactic employed by the military (Tolk, 2012), scenario planning first became known in the civilian world in the mid-19th century through the work of Herman Kahn at the RAND Corporation and later through his work at the Hudson Institute, which Kahn founded in 1961 (van der Hiejden, 1996). Soon after, Ian Wilson of General Electric (GE) met Kahn and they began theorizing on how to apply scenarios to the business world. Not long after that, Pierre Wack of Royal Dutch/Shell joined in the conversation (Millett, 2011). Wack (1985b), who is widely considered the progenitor of corporate scenario planning, defined scenario

planning as a decision-making methodology based on a rigorous analysis of reality that fundamentally changes the mindsets of the decision makers about how the world, and thus how their business, works. Scenario planning differs from most single stream strategic planning in that it produces a range of possible outcomes built upon uncertainty.

The difference between technology foresight and scenario planning is that technology foresight employs systematic analysis and fixed processes and does not include a process for changing mindsets (Boe-Lillegraven & Monterde, 2015). The goal of this study is to combine systematic quantitative analysis such as that used in the technology foresight discipline with a qualitative, intuitive, action-research based approach to arrive at a dualistic methodology in applying scenario planning to a digital transformation. The systematic quantitative analysis used in this study comprised text mining futuristic web sites using the software RapidMiner to collect and analyze the data. The process included selecting ten futuristic web sites across the technology, environmental, and ergonomics industries.

Purpose

Combining quantitative and qualitative methods in a scenario planning project is not new. This study contributed to the body of literature in a novel way by applying the combined scenario planning approach to digital transformations. Specifically, it explored the following research question: "What is the impact of scenario planning on a digital transformation in a consultancy supporting the high-tech industry in Silicon Valley?"

The project was executed in four phases – a fifth phase was performed after the digital transformation itself was completed, which occurred after the completion of this study.

Phase 1: Scenario planning project preparation: built support with the client team, defined the decision focus, developed interview questions, and selected participants.

Phase 2: Quantitative analysis of futuristic data: text-mined web sites to stimulate the brainstorming module in the scenario planning project.

Phase 3: Scenario planning workshops: gathered information regarding the internal and external environments of the organization.

Phase 4: Action research: performed interviews with participants. The participants evaluated the predicted impact of the scenario planning project on the planned digital transformation.

Phase 5: Since the digital transformation project was not completed within the timeframe allowed for this thesis, the participants were interviewed again after the completion of the digital transformation.

Study Setting

This study examined the literature on scenario planning. It conducted qualitative action research in the form of interviews and observation journals taken during scenario planning workshops facilitated with the internal team of a small consultancy serving the high-tech industry in Silicon Valley. While the scenario planning project included quantitative analysis in the form of text mining, the study itself only examined the qualitative aspects of participant' perceptions of the efficacy of leveraging scenario planning in the planning phase of a digital transformation. The organization at which this study was performed was an ergonomics consultancy serving complex high-technology companies across the globe.

The founder and president of the organization was a physical therapist by training who became a successful entrepreneur. She employed about 25 people: a mix of five full-time ergonomic consultants, office administrators, strategic account managers, and around 20 contract consultants. The organization was embedded in one of the major high-tech companies belonging to what analysts refer to as FAANG (i.e., Facebook, Apple, Amazon, Netflix, and Google). The organization consultants evaluated employees globally across the United States, Europe, Asia, South America and the Middle East. Her client list included 80 other high-tech firms. Exact sales volume has not been shared, though it was readily apparent that her market was growing exponentially each year.

Significance of Study

Over the years, multiple studies have been conducted on scenario planning, and just as many methodologies have been deployed, both qualitative and quantitative in nature. Much like digital transformations, scenario planning itself continued to evolve and respond to the changes in the global business and sociotechnical environments. This study was novel in that it combined action research with futuristic data-driven methodologies and qualitatively measured their impact on a digital transformation.

While both scenario planning and digital transformations have been studied in depth, the existing research on the intersection of scenario planning and digital transformations was less abundant. This study aimed to contribute to the research by interweaving modern technological innovations in the planning and workshop phases of a scenario planning project with traditional action research workshops and subsequently measured the results of the intertwining methodologies. This study did not differentiate between the impact of the quantitative analysis versus the impact of the qualitative

analysis. Rather, it only measured the combined impact on a digital transformation. Similar to digital transformations, scenario planning required creativity and imagination. The study explored whether the combined impact could bring critical benefits to improving the success rate of digital transformations for established companies that were constantly under threat of being left behind in the digital dust.

Organization of the Study

Chapter 1 introduced the concepts of the study as well as provided a brief history of both scenario planning and digital transformations. It included a synopsis of the purpose and it outlined the study setting while also describing its significance. Chapter 2 includes a review of the extant literature on scenario planning, futuristic data-driven design of scenario planning, participatory design of scenario planning, digital transformations, and the intersection of all of the above. Chapter 3 specifies information regarding the qualitative research approach that was used to design the research questions. In Chapter 4, the research findings are categorized into common themes that emerged during the data analysis. The three themes that arose were Participant Growth, Business Performance, and Scenario Planning Project Process. Finally, Chapter 5 provides a summary along with conclusions, limitations, and recommendations for further research and practice in organization development consulting.

Chapter 2: Literature Review

This study explored the impact of scenario planning on digital transformations in a consultancy supporting high-tech organizations in Silicon Valley. The literature review focuses on assessing the landscape of scenario planning including quantitative and qualitative methodologies along with a discussion of scenario planning projects as applied to the modern phenomenon of digital transformations. It assesses the literature on futuristic data-driven scenarios and action-research based scenarios to explore what impact a combination of the two might have on the effectiveness of digital transformations.

The material discovered was organized into the following conceptual elements: scenario planning, futuristic data-driven design of scenario planning, participatory design of scenario planning, and the effect of applying the combination of both on the software evolution application strategy of a digital transformation, as well as any gaps in the extant literature regarding the intersection of the above.

Scenario Planning

Over the last 50 years, ample studies have indicated that scenario planning was undergoing a resurgence due to the increasingly turbulent business environment in the age of uncertainty (e.g., Chermack, 2017; Chermack & Lynham, 2002; Favato & Vecchiato, 2017; Kleiner, 2003; Oliver & Barrett, 2018; Ralston & Wilson, 2006). Thus, scholarly research needed to keep apace. And it has. In fact, the uncertainty of the age was reflected in the literature. According to Bradfield, Wright, Burt, Cairns, and van der Heijden (2005), consensus was not to be found. Analysis of the literature showed chasms

between conflicting definitions, widely different characteristics, and subtle nuances in principles and methodological ideas.

Scenario analysis evolved from Kahn's method as it emerged from its chrysalis in military planning in the 1960's. Kahn used scenarios in the form of multiple narratives detailing the hypothetical sequence of events leading to alternative futures (van der Hiejden, 1996). Wack refined scenario planning into a process of applying qualitative causal analysis to strategic decisions brought to life via multiple narratives describing possibilities of the future; his method at Shell stretched mental models in an attempt to guide the organization to ask critical questions rather than predict the most likely future (van der Heijden, 1996). Wack (1985b), somewhat infamous for his thoughtful Zen gardening, yoga, and meditation practices, said it exquisitely:

> Almost by definition, scanning the business environment and crystallizing the findings in a set of scenarios means dealing with a world outside the corporation: for example, the evolution of demand, supply, prices, technology, competition, business cycle changes, and so forth. But this is only a half-truth and dangerous because there is another half. Because the raw materials of scenarios are made from this stuff of outer space, it is not realized that more is needed: scenarios must come alive in inner space, the manager's microcosm where choices are played out and judgment exercised. (p. 140)

An important aspect of Wack's method involved leveraging remarkable people, or as Kleiner (2008) put it: "acute observers with keen, unending curiosity, who pay constant attention to the ways the world works" (p. 135). These remarkable people brought in fresh perspectives shedding light on the process of re-perceiving the potentials

that the rapids of the future might hold. They form the crux of Wack's method as it was

their insights into the future that replaced the probabilistic trend predictions based on the

consequences of past events that were previously used in corporate planning (Chermack,

2011). Wack also stressed that scenarios were useless unless they successfully applied to

steering strategic decisions (Kleiner, 2008). Wack's legacy was commonly referred to as

the Intuitive Logic scenario approach, which was markedly different from Wilson's

approach at GE in that it deliberately and adamantly ruled out the use of probability

(Millett, 2011). A point in which they coincided was that some aspects of the future did

not change – the predetermineds (Wack, 1985a). In fact, Godet and Roubelat (1996)

found that often in forecasting the pace of technological change was overestimated while

the gradual pace of change in structures and behaviors was underestimated. Thus, most

successful scenario planning schemes included a phase dedicated to identifying the

immutable aspects. Wilson, Wack, and Newland, who partnered with Wack at Shell, also

agreed on the tenant that scenarios required both diversity in input as well as skillful

communication techniques (Ralston & Wilson, 2006). As Newland opined to Chermack

(2017), the creation of scenarios required expert communication to be effectively

received by the intended audience.

Wack and Newland helped Shell to see the impending oil crises and thus

catapulted its position to among the top of the large oil and gas firms when the crises

finally did hit in 1973 (van der Heijden, 1996) and again in 1979 (Chermack, 2011).

Throughout the 1970's the success of scenario planning at Shell became renowned and a

multitude of the world's largest companies began using it in some way (Ringland, 1998).

The field experienced a decline in the early 1980's. It wasn't until 1985 that a formal

definition of scenarios was put forth (Chermack & Lynham, 2002). Chermack and

Lynham (2002) found 18 definitions of the term scenario planning in the literature. The

most recent of which was Godet (2001), "A scenario is simply a means to represent a

future reality in order to shed light on current action in view of possible and desirable

futures" (p. 63). While Ralston et al. (2006) offered: "Scenarios are frameworks for

structuring executives' perceptions about alternative future environments in which their

decisions might be played out" (p. 16).

Beyond the surfeit of definitions, what stands out in the latest literature was the

preponderance of methodologies that arose since the scenario planning renaissance of the

turbulent 21st century. According to Amer, Daim, and Jetter (2013) there were three main

schools of (intersecting) thought: 1) intuitive logics, 2) probabilistic modified trends

(PMT) methodology, and 3) the French approach of La Prospective, which their study

detailed in Figure 1 (p. 26-28).

Figure 1

Comparison of the Principal Scenario Development Techniques

Scenario characteristics	Intuitive logics methodology	La prospective methodology	Probabilistic modified trends (PMT) methodology
Purpose	Multiple, from a one-time activity to make sense of situations and developing strategy, to an ongoing activity	Usually a onetime activity associated with developing more effective policy and strategic decisions	A onetime activity to make extrapolative prediction and policy evaluation
Scenario type/perspective scope	Descriptive or normative Can be either broad or narrow, ranging from global, regional, country, industry to a specific issue	Generally descriptive Generally a narrow scope but examines a broad range of factors within that scope	Scope is narrowly focused on the probability and impact of specific events
Time Frame	Varies: 3-20 years	Varies: 3-20 years	Varies: 3-20 years
Methodology Type	Process oriented approach, essentially subjective and qualitative	Outcome oriented approach, which is directed, objective, quantitative and analytical relying on complex computer-based analysis and modeling	Outcome oriented approach, very directed, objective, quantitative and analytical using computer based extrapolative simulation models
Nature of scenario team	Usually an internal team from the organization for developing scenarios	Combination of some members from client organization led by an expert (external consultant)	External teams, scenario developed by experts (external consultants)
Role of external experts	Experienced scenario practitioner to design and facilitate the process. External experts are used to obtain their views for new ideas	Leading role of external expert using an array of proprietary tools for comprehensive analysis	Leading role of external expert using proprietary tools and expert judgments to identify high impact unprecedented events
Tools	Generic tools like brainstorming, STEEP analysis, and stakeholder analysis	Proprietary and structural tools like Micmac, SMIC and Mactor analysis etc.	Proprietary tools like trends impact and cross impact analysis etc.
Starting point	A particular management decision, issue or general concern	A specific important phenomenon of concern	Decisions/issues for which detailed and reliable time series data exists
Identifying key driving forces	Intuition, STEEP analysis, research, brainstorming techniques, and expert opinion	Interviews with stakeholders and comprehensive structural analysis using sophisticated computer tools	Curve fitting to past time series data to identify trends and use expert judgment to create database of unprecedented events
Developing scenario set	Defining the scenario logics as organizing themes or principles	Matrices of sets of possible assumptions based on the key variables for future	Monte Carlo simulations to create an envelope of uncertainty around base forecast
Output of scenario exercise	Qualitative set of equally plausible scenarios in narrative form with strategic options, implications, and early warning signals	Multiple quantitative and qualitative scenarios supported by comprehensive analysis, implications and possible actions	Quantitative baseline case plus upper and lower quartiles of adjusted time series forecasts
Use of probabilities	No, all scenarios are equally probable	Yes, probability of the evolution of variables under assumption sets of actors' behavior	Yes, conditional probability of occurrence of unprecedented and disruptive events
No. of scenarios	Generally 2–4	Multiple	Usually 3–6 depends on the no. of simulations
Evaluation criteria	Coherence, comprehensiveness, internal consistency, novelty, supported by rigorous structural analysis and logics	Coherence, comprehensiveness, internal consistency tested by rigorous analysis; plausible and verifiable in retrospect	Plausible and verifiable in retrospect

(Amer et al., 2013, p. 28)

Chermack (2011) delved deeply into ten approaches, loosely mapped to the three schools above, where applicable: Royal/Dutch Shell and Global Business Network (Intuitive Logics), The French School (La Prospective), The Futures Group (Probabilistic Modified Trends), Wilson & Ralston (Intuitive Logics), Lindgren and Bandhold (Intuitive Logics), Reference scenarios, Decision Strategies International (Intuitive Logics), Procedural scenarios (Combination), Industry scenarios, and Soft creative methods (Combination).

Bishop and Collins (2007) provided a review of 23 techniques, while Ralston et al. (2006) divided the schools of thought into three camps: objective/normative, subjective/intuitive, and a third approach they termed the Stanford Research Institute (SRI) approach that blended the two. Interestingly, Chermack (2011) indicated that the method explicated in Ralston et al. (2006) was based on the Shell approach developed by Wack.

Contrasting narratives regarding who was the first to popularize scenario planning run as a subtle undercurrent throughout the literature as do tensions concerning quantitative versus qualitative methodologies. Contemporary developments in technology increased the possibilities available in linking the two practices. The conversation enlarged from the paradox of probabilities versus intuitive alternatives to the exploration of their combination aided by advances in technology, which has the power to improve the process (Ralston et al., 2006). This study aimed to further the exploration of the combinative method using a multi-step approach that included futuristic data-driven design along with participatory design.

Participatory Design Approach to Scenario Planning

Both the Intuitive Logics approach and La Prospective involved phases of participatory action research while the Trend Impact Analysis approach did not. In keeping with the debate in the field, many regarded participatory design as integral to the definition of scenario planning even though it was not a required aspect of any of the main schools of thought. Chermack (2011) stresses the dialogic aspect of scenario planning. Godet (2000) expounds on that idea while stressing that collective and rigorous resolution of strategic problems was necessary due to the complexity of the issues with which organizations had to contend.

There were just as many participatory design approaches as there were approaches to scenario planning. This study did not delve into the differences among them. Instead it focused on following the participatory design charted by the Intuitive Logics approach as outlined and modernized in Chermack's (2011) work.

Futuristic Data-Driven Design Approach to Scenario Planning

The substantial rise of the capacity of information technology to enhance the scenario planning process was evidence of the value inherent in even further scholarly research. Ralston and Wilson (2006) delineated the following areas of opportunity: computer models of the external environment, expanding the number of participants involved in the process, increasing the productivity of workshops, improving the communication of scenarios, environmental analysis systems, and structured evidential argumentation (SEAS™) (p. 237 – 244).

As with participatory design methods, a number of combinative approaches arose that utilized new technologies. Schatzmann, Schäfer, and Eichelbaum (2013) illuminated

the underlying technical structures of Web 2.0 that empowered the new modes of insight and collaboration as well as provided an overview of technology-supported approaches to scenario planning and technology foresight, or Foresight 2.0, as they termed it. Advances in technology were revolutionizing the causal analysis process of scenario planning through such methods as futuristic data-driven modeling of Fuzzy Cognitive Maps (FCMs). The most widely cited research on this method was Kim et al. (2016). Kim and her colleagues developed an innovative way of mining futuristic data via technology foresight websites to provide quantitative data with which to inform the FCMs. Text mining of futuristic web sites was especially pertinent for scenario planning projects designed to guide technology strategy, such as this study.

Digital Transformations

The digital arena was not driven by technology but business strategy, according to Kane, Palmer, Phillips, Kiron, and Buckley (2015). The authors suggest that when planning a cutting-edge digital strategy, the most effective approach was to work toward a future vision rather than focusing on the consequences of past events. The future narratives that this study developed focused on the digital transformation of a custom business application, therefore, the research literature on digital transformations was examined.

As the digital revolution upended nearly every sector of the industrialized and developing worlds, the literature bounded to keep up. Although digitalization of processes began almost 30 years prior, 3rd Platform technologies began permeating every aspect of business including the creation of new business models in the 21st century (Auriga, 2016). Researchers and practitioners defined digital transformations broadly.

There was not consensus in the field. According to Schallmo and William (2018), digital transformations had to be sustainable, improve profitability, and impact the enterprise level. Gartner analysts, however, made a clear and forceful distinction between digital transformations and digital optimizations, maintaining that transformations required a change in revenue and business model while optimizations did not (Prentice, 2018). While there was not agreement on definition there were other areas in which there was widespread agreement. For example, the literature pointed to a consensus that digital business transformations were driven by strategy more than they were by technology; that change management was a vital part of digital transformation success; that there was a difference between digital disruption and digital transformations. Finally, it could only be surmised that the digital revolution could not be escaped (Kane et al., 2015; Main, Lamm, & McCormack, 2018; Schallmo & Williams, 2018).

The literature for this review focused on the digital transformation of a custom business software system at a small to medium size consultancy through the application of a scenario planning project performed in partnership with the founder and owner. Time did not allow for the study to include the execution of the digital transformation project and no observations of the change management processes were measured; it focused instead on integrating text mining into the scenario planning process to explore the holistic impact on the efficacy and output of the brainstorming module of the scenario planning workshops. Thus, further investigation into the digital transformation literature was not performed.

Knowledge Gaps

The literature review uncovered knowledge gaps in the research on the subject of applying integrative scenario planning to digital transformations. While a plethora of literature was available on each subject individually, the intersection of the two subject matters left room to be explored. This research project aimed to contribute to exploring the gaps extant in applying integrative scenario planning to digital transformations.

Due to the vastness of the scenario planning body of knowledge, there were specific areas that were not examined as part of this literature review: how scenario planning fit into the firmament of strategic planning, learning organization characteristics, and change management were among the most notable areas not covered in this study.

Summary

Put succinctly: the disquieting rate of change disrupting businesses due to digital advancements spurred a resurgence in scenario planning, which itself has been transformed by digital innovations. Scenario planning methodologies were born out of military tactics, matured in the age of big oil, and experienced a renaissance in the information technology revolution. Technology tools such as text-mining optimized the process and democratized access to remarkable people and information while the turbulence created by technology advances and globalization created a growing need for strategic planning tools that would prepare organizations for the vagaries of an unknowable future.

The literature review highlighted contrasting schools of thought on scenario

planning regarding the tension concerning quantitative versus qualitative methods. This study aims to explore the impact of an integrative scenario planning approach on the efficacy of digital transformations.

Chapter 3: Methods

This study examined the impact of integrative scenario planning on the efficacy of a digital transformation in a consultancy supporting the high-tech industry in Silicon Valley. This chapter describes the research design, sample, participants, eligibility, data collection, survey development, Institutional Review Board conformance, and data analysis procedures used in the study.

Research Design

The research design was qualitative in nature. Interview data was collected immediately following the final scenario planning workshop via six in-person interviews and two interviews that occurred over video conference. Since the digital transformation project was not completed during the timeframe that the thesis research occurred, an additional set of data was planned to be collected at the completion of the digital transformation project. Observations of the participants in the scenario planning workshops and in other encounters was collected.

Sample, Participants, and Eligibility

As this study leveraged a qualitative approach, the proposed sample size was small and selected purposefully, centering on a case study of a scenario planning project as applied to a digital transformation at a small to medium size consultancy. Given the relatedness of digital transformations to the high-tech industry, a consultancy serving the high-tech industry was selected.

The scenario planning workshops included 10 participants while the sample size of the interviewees consisted of eight participants. Interviews were conducted with the founder of the consultancy as well as seven of her consultants and administrators. These

participants were selected based on the criticality of their use of the application impacted by the digital transformation. Another characteristic that was considered when selecting the participants was their level of tribal knowledge of the business.

        The study participants were all adult volunteers who were employees of the ergonomics consultancy. They were all notified that they could withdraw at any time without penalty and were studied following all of the Human Subjects protections as outlined in the IRB. Interviews were conducted with subjects via in-person conversations or video conference when an in-person meeting was not possible. The interviews were not recorded. The subjects' responses were typed up or written in a journal at the time of the interview. The subjects' identities were not collected nor stored with the subjects' responses, instead, serial numbers were assigned to each interview in the order in which they were scheduled. During observations, serial numbers were assigned to each subject participating in the scenario planning workshops. A master list of the serial numbers was kept in a separate location only until the analysis of the data was complete, at which point it was destroyed.

        These steps to protect the identifying information were taken given the slight risk of breach of confidentiality of client information identified in this study. Thus, no research study questions asked for any information about specific clients. To further mitigate this risk, participants were instructed not to mention client names during the study and no identifying information about the consultancy's clients was collected at any time during the study.

Interview Protocol Development

An interview protocol (Appendix A) was constructed to explore the staff's perception and the founder's perception (Appendix B) of the impact of scenario planning on the efficacy of a digital transformation. The interviews focused primarily on participant experience, how participants defined and measured success, and any challenges that might have arisen during the course of the scenario planning workshops.

Data Collection

The research questions were structured in an open-ended fashion to allow the participants to provide a free-flowing account of their perceptions, tapping into episodic memory when possible given that the subject matter was not emotionally troubling in nature. An email invitation (Appendix C) introducing the study and requesting participation was sent to all potential interviewees. The interviews were conducted in person immediately after the scenario planning workshops or via virtual meetings when in-person interviews were not be possible. The interview sessions spanned approximately 45 minutes and were transcribed verbatim during the interviews.

Additional data was gathered during the scenario planning workshops and other interactions during the course of consulting with the client. Beyond the scenario planning workshops, consulting services were provided in the form of technology strategy advisory services, design and facilitation of change management plan, software development, and participation in informal dialog. The data in these interventions was typed or written in a journal during the observation or upon reflection after the observation.

Sampling Methodology

10 people participated in the scenario planning workshops. Only eight participants were interviewed due to logistical challenges. The interviewees consisted of the company founder, the head of operations, three ergonomics consultants, one account manager, one front office manager, and one project manager. Each participant, except the founder, was asked the same set of questions (see Appendices A and B).

Institutional Review Board Conformance

Prior to collecting any data, human subjects training was completed and approval to conduct the proposed research study was obtained from Pepperdine University's Institutional Review Board (Appendix D). The organization's founder was provided with an executive summary (Appendix E) and she signed a letter of agreement (Appendix F). Further, an email was sent to the invited participants explaining the nature and purpose of the research project. The email explained the voluntary nature of the interviews. The consent of the recipients to participate was implied by their participation. The founder provided her consent via the Company Consent form.

To protect the confidentiality of the participants' responses, no names were recorded with the interview results or with other observational data. Participants were exposed to very little risk of any kind by participating in this study. There was no cost to the participants or the company to participate nor was any financial incentive given for participation. The only inconvenience of participating in the study was the time spent in the scenario planning workshops and the interviews. All data collected was encrypted electronically and will be destroyed five years after the completion of the study. An abstract of the study was provided to the founder.

Data Analysis Procedures

The qualitative data collected in this study was organized into themes and categories to understand the impact of integrative scenario planning on the efficacy of a digital transformation in a consultancy serving the high-tech industry.

A bias toward the belief that scenario planning would benefit digital transformation projects has been identified and thus multiple steps to test the validity of conclusions regarding the data analysis were taken. First, the data collected was rich, in the form of verbatim transcripts of specific, concrete events, and all interviews and any other interactions were documented. In addition, systematically seeking out feedback about summarized data and conclusions from respondents assisted in ruling out the possibility of misinterpreting the participants' perspectives. An analysis of the responses included a focused search for conclusions that did not validate the bias. Effort was also made to explicate the quasi-statistical basis of the conclusions.

Summary

Chapter 3 outlined the qualitative research methodology used to examine the impact of scenario planning on the efficacy of digital transformations in a consultancy supporting the high-tech industry. It comprised research design, sample, participants, eligibility, data collection, interview development, Institutional Review Board conformance, and data analysis procedures.

Chapter 4: Data Analysis and Research Findings

This study explored the impact of scenario planning on the efficacy of a digital transformation in a consultancy supporting the high-tech industry in Silicon Valley. This chapter presents the qualitative analysis of the data gathered during action research that took place in the form of observations of the participants and their interactions during two workshops as well as eight interviews conducted after the completion of the scenario planning project. The interviews inquired into the participants' perspectives on topics related to the impact of scenario planning on an upcoming digital transformation such as: efficacy, successes, challenges and desired performance measures. This chapter covers the themes that emerged around these topics and presents data to support each theme identified.

Key Themes

The questions posed during the interview process were categorized in three areas: participant experience, participant definition and measurement of success of the digital transformation with the results of the scenario planning project applied, and any challenges faced during the scenario planning project process. These assessment categories were referred to in the study as: Experience, Success, Challenges.

Analysis of the responses to those questions revealed that all eight of the participants interviewed predicted that the scenario planning project would have a positive impact on the digital transformation project. In addition, a secondary finding discovered in both the interviews and the observations of the participants during and after the study revealed that the participants had a positive reaction to participating in the

project. In total, three major themes along with some subthemes arose from the

participants responses:

1. Experience: Participant Growth (Learning & Development, Employee

     Engagement)

2. Success: Business Performance (Scenario Planning Impact, Digital

     Transformation Impact, Change Readiness, Cross-Functional

     Communication)

3. Challenges: Scenario Planning Project Process (Technical, Collaboration

     methodologies)

Each participant, except the founder, spoke appreciatively regarding the chance to

have their voice heard and to be able to connect with their colleagues. All eight

participants expressed excitement about the new possibilities that were uncovered by the

scenario planning project. Many used the term "eye-opening" to describe their new

understanding of the business and of the possibilities that the scenario planning project

revealed to them. Table 1 contains key messages for each theme and sub-theme.

Table 1

Summary of Findings

Theme	Sub-theme	Key Messages
1. **Participant Growth**	Learning & Development	This was illuminating in a lot of ways. I now have important takeaways that I can apply about how the business is run and overseen. It got me thinking about how I could listen and research and go look things up and I realized that the more I know the more valuable player I could be at work. It really opened my eyes. I can say that strongly and honestly.
	Employee Engagement	I was grateful to be included as part of this planning team. I admired (the founder) as a business owner for undertaking this exercise for her business and with us.
2. **Business Performance**	Scenario Planning Impact	It definitely impacted my strategy and success in being ahead of my competitors and provided really nuanced data that clients are going to need for their own decision-making processes.
	Digital Transformation Impact	Yes, it would have an impact on the DBMS. At this juncture, having more people provide input into what those upgrades would be and with the intent of looking into the future as well as intentionally saying, what is going to change externally and how can we be ahead of that and how can we factor that into what we are going to do. It was interesting to think about the technology advances, wearables, AI, and the trends that we had to be adaptable to support. It brought more mindfulness to what our plans surrounding the digital transformation might have meant.
	Change Readiness	I found it really interesting about how far-afield we were looking out. I found that through this process that many of the things we were

		considering do have a possibility of happening and they do have consequences for the business. It was powerful to create a space to think about potential changes and develop possible plans for them.
	Cross-Functional Communication	The scenario planning workshops improved information sharing across the company. We were all so different and we all heard and saw so differently so getting together and hearing the conversations was powerful. I'm hoping that it raised management's understanding of the importance of cross-functional sharing and communication of information. It was valuable to learn and raise awareness at different levels.
3. Scenario Planning Project Process	Technical / Administrative	I would have liked more in-person meetings. The onscreen forms that we used in the first workshop did not work well. You ran the meeting agenda well and kept us on schedule even while allowing for conversation. The three-hour long workshop was draining over Zoom. I was distracted by the backgrounds on people's video conferencing connections.
	Collaboration Methods	I really enjoyed using the Zoom breakout rooms that was really fun. It was seamless how you were able to bring us back and send us out. Being a remote employee and being able to have side discussions was a nice change. Awesome.

Themes related to Business Performance and the Scenario Planning Project

Process itself were expected. Interestingly, the data in Table 1 exhibited multiple

secondary impacts that emerged from this project – all centering around the co-creative aspect of the workshops. Interviewees expressed gratitude and excitement at being able to participate. For example, interviewee A1 said, "We were all so different and we all heard and saw so differently, so getting together and hearing the conversations was powerful." Participant A3 said, "I was grateful to be included as part of this planning team," while Participant A4 said, "We were able to talk about some difficult things that people felt and experienced like burnout and it was so great to be able to just talk about it and get it out in the open."

Another prominent secondary message that emerged concerned the state of Change Readiness of the business. Many hoped that this project would provide the impetus for the digital transformation to occur at long last. A total of five interviewees mentioned their hope in this regard. For example, Interviewee A4 said, "I hoped that it would help us push to get the changes accomplished." The reaction of the participants in this regard led to the conclusion that embedding a recurring, as-needed scenario planning process into the organization could be a tool to help organizational leaders operate in a state of change readiness.

In the area of Business Performance, and specifically, the impact on the planned digital transformation, the founder stated:

> Yes, it would have an impact on the [digital transformation]. At this juncture, having more people provide input into what those upgrades would be and with the intent of looking into the future as well as intentionally saying, what is going to change externally and how can we be ahead of that and how can we factor that into what we are going to do.

Seven of the eight participants echoed her sentiments. For example, Interviewee A4 said it brought more mindfulness to what the plans surrounding the digital transformation could have meant. Interviewees also used words like "illuminating," "enlightening," and "mind-expanding" to describe their thoughts on how the scenario-planning project would impact not only the digital transformation but the organization as a whole. Participant A5 said, "I think we could capitalize on the thinking that we did in the scenario planning in terms of avenues to get ahead in the industry such as with wearables and biofeedback." Participant A6 said it had a positive impact on the organization as a whole, "It was helpful to discuss some scenarios that are already happening as well that we hadn't discussed internally. It was nice to have it illustrated with multiple parties."

And there again popped up the theme of how much the interviewees valued cross-functional communication and open dialog.

Chapter 5: Discussion

This research studied scenario planning with a decision focus on a digital transformation. Specifically, it endeavored to answer the research question: "What is the impact of integrative scenario planning on the efficacy of a digital transformation in a consultancy supporting the high-tech industry?"

Chapter 5 presents a summary of findings, draws conclusions, makes recommendations, cites study limitations, and provides suggestions for future studies. It focuses primarily on the impact on both Business Performance and Participant Growth, two themes that were uncovered during the study. The third theme, the Scenario Planning Project Process, was explored to a lesser degree given its finite nature.

Summary

The impact of scenario planning was found to be multi-dimensional. Scenario planning prepared the case organization to fathom environmental opportunities, take advantage of internal strengths, and to consider technical advances that would impact the digital transformation. In addition, a set of secondary themes emerged. The secondary themes showed a positive impact on creating a general state of change readiness, building team cohesion, improving internal communication pathways, and contributing to participants' personal growth and development.

Further, applying the scenario planning process to a digital transformation for a client organization increased the client's trust in the digital transformation consultancy. The scenario planning process increased transparency; provided sophisticated internal and external environmental scans; and furnished an analysis of the digital landscape. Taking an agnostic approach to determining the appropriate digital platform via scenario

planning increased the information available to decision makers and thus inspired greater confidence in the project and the consultancy.

Conclusions

The data analysis of findings revealed six conclusions. In regard to the research question, the study found in Phase 4 that organization members predicted there would be a significant positive impact on the digital transformation. It also found there was an impact on the Business Performance of the organization as well as the Personal Growth of the participants. Furthermore, this chapter explicated conclusions drawn regarding the use of the combination of futuristic data-driven scenarios with action-research based scenarios. The conclusions in each of these areas was discussed below:

Impact on Business Performance

The impact on Business Performance was divided into four sub-themes: Scenario Planning Impact, Digital Transformation Impact, Change Readiness, and Cross-Functional Communication.

Scenario planning impact. Increased competitiveness: The participants reported that participating in the scenario planning workshops opened their eyes to the strengths, opportunities, aspirations, and results that were possible for their organization. In addition, three participants indicated they would be applying the results of the workshops to planning in their personal lives. Both the founder and head of operations reported that scenario planning would help the organization to be more competitive. This result was to be expected given that scenario planning has been a proven strategic planning tool for many decades. Indeed, as Wack (1985b) stated, scanning the business environment and synthesizing the findings in a set of scenarios that guide leaders to ask critical questions

helped organizations prepare for multiple futures. Participant reports of feeling enlightened as well as their further statements of intending to take advantage of their heightened awareness to continue to scan the environment as they made business decisions, brought the literature on scenario planning to life in this study. The action research showed the positive impact scenario planning can have in changing mindsets. The next section explored the analysis as related to the research question of how scenario planning might impact a digital transformation.

Digital transformation impact. Digital Strategy Identification: The performance of environmental scans, including futuristic text-mining, brought important information to light about technology advances that might impact the organization's service offerings and operating model. Since the digital business application managed the business architecture underlying both, it was predicted that there would be a positive impact on transforming the digital application. The study supported the conclusions in the literature review, which indicated that the most effective strategy to approaching digital transformations was to work toward a future vision rather than dealing with the outcomes of past events (Kane, et al., 2015).

Beyond improved decision-making as it pertained to the technical and business considerations of the digital transformation, scenario planning also increased the confidence of the participants in the team that led the digital transformation. Early involvement of stakeholders in a broad-thinking, participative decision-making process positively impacted a digital transformation in the planning stages and was predicted to do so in the execution and final results.

Change Readiness. Increased Agility: The scenario planning project identified emerging trends and co-constructed multiple alternative futures for which the organization began to prepare through awareness-raising dialog. Thus, the organization became more prepared to respond to change. Bracing for multiple alternative futures could help organizations to survive the VUCA environment.

Cross-Functional Communication. Improved Business Performance: Participants reported that gathering together a distributed, diverse group of organization members who normally had limited opportunity to connect was beneficial. It provided an opportunity to share knowledge, discuss best practices, and to forge stronger relationships among team members. Further, the workshop structures allowed for each member to have a voice by encouraging equality in the distribution of conversational turn-taking, which has been shown to be an integral part of high performing teams (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010).

Impact on Participant Growth

The data analysis found a secondary impact emerged from the scenario planning project in the area of Participant Growth, which was divided into two sub-themes: Learning & Development and Employee Engagement.

Learning & Development. Increased Skills: Interviewees reported that participating in the scenario planning workshops was enlightening, mind-expanding, and provided them with more confidence in the organization and its leader. Not one of the interviewees had ever participated in such a planning exercise before. They reported that having the opportunity to do so increased their knowledge and ability to contribute to the organization's growth and competitive advantage. This study concluded that involving a

wide-range of employees in strategic planning exercises like scenario planning contributed to the positive growth of participants' learning and development.

Employee Engagement. Magnified Meaning: Participants reported a deep gratitude for being able to participate in the scenario planning project. They felt recognized and valued. It brought meaning to their work. Thus, the conclusion that can be drawn was that involving organization members in strategic planning increased engagement. Employee engagement has been found to lead to employee happiness at work and at home as well as seventeen percent better productivity, twenty percent higher sales, and twenty-one percent greater profitability (Gallup, 2017).

Recommendations

The following recommendations were intended for both organization leaders who had to make complex decisions in their organizations as related to digital transformations, and to OD practitioners who sought to advise and appropriately guide those organization leaders.

1. Analyze Environment

    a. Dialog with Internal and External Experts: As the business environment continued to evolve at a dizzying pace, having an understanding of both the internal and external factors that impacted digital transformation projects was key to success. Scenario planning that included dialog with remarkable people increased awareness of trends.

    b. Text-mine futuristic data: The quantitative text-mining of futuristic online resources contributed to increasing the probability of the success of a digital transformation project.

2. Continuously Improve: Performing one scenario planning project was not enough. The ever-changing and uncertain business environment required that scenario planning projects were performed on an as-needed basis for complex, strategic decisions.

3. Ensure Inclusivity: To have the greatest positive impact on multiple aspects of the organization's performance, involve a rotating selection of employees.

4. Feedback Sessions. The results of the integrated scenario planning projects should be discussed with the leadership team to determine the actions that would be taken if the scenario were to come true. As well, continually scanning the environment for signs that the scenarios were materializing should prepare the organization for appropriate and timely response.

5. Increase Agility Scenario planning had positive impacts on employee learning and development as well as engagement, thereby increasing agility and the organization's capability of evolving with the turbulent business environment.

Study Limitations

Three limitations can be found in this study.

1. Limited Diversity of Subjects. This study was limited to only one small to medium size consulting firm in the high-tech industry in Silicon Valley considering a digital transformation, thus it was possible that the findings may not apply to large consulting firms or to any organization not connected to Silicon Valley or the high-tech industry.

2. Relationship to High-Technology Market Volatility. The consulting firm's services involved recommending furniture and equipment that was subject to

the volatility of advancing technology. Therefore, it was possible that the findings would not apply to consulting firms that do not provide such services. However, in the age of rapidly advancing technology, an organization that was not subject to the volatility created by advancing technology was difficult to find.

3. Sample Size of Interviewees. Finally, the study would have benefitted from the inclusion of more participants within the case consulting firm. Due to schedules and labor costs, that was not a possibility.

Suggestions for Future Study

The suggestion for future study was to conduct more studies with additional organizations in a variety of industries. In these future studies it was suggested:

1. That all workshops be held in person. There was also an opportunity to add quantitative questions to the interview that would provide greater opportunity to evaluate the data from a multi-dimensional perspective.

2. The interview questions could also be improved by shaping them in a more appreciative style, this would take advantage of the human capacity to move toward positive visions of the future based on the language they use to describe that future (Avital, Lyytinen, Boland, Butler, Dougherty, Fineout, Jansen, and Venable, 2006).)

3. That the study ran the course of the digital transformation project and measured the actual impact after completion of the digital transformation.

4. Given the secondary findings of this study it would be interesting to follow up on how an inclusive approach to scenario planning impacted team

performance and organizational agility. More research was needed to understand the depth of this impact and if it could be replicated in other organizations.

Summary

Chapter 5 compared research findings to the literature review, as well as secondary findings that emerged. It cited limitations and provided recommendations for applying scenario planning to digital transformations for both organization leaders and OD practitioners. Finally, it provided suggestions for future study.

The pace of change reached a rate not seen before in recorded history over the last 10 years. At the time of this writing, that rate was no longer novel. Thus, organizations who were intent not only on surviving but on thriving, needed to institute infrastructure that would enable organizational agility as it pertains to digital transformations and other complex, strategic decisions. Scenario planning is a tool that helped organizations prepare for multiple alternative futures. It could be applied to strategy decisions as well as digital transformations. Further, as technology continued to advance, digital transformations themselves became strategic decisions, thus applying scenario planning to determine an approach to a digital transformation project was predicted to have a positive impact on the efficacy of the digital transformation and on the overall performance of the organization.

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Appendix A - Staff Interview Protocol

Staff Interview Protocol

Introduction:
We are conducting interviews regarding the efficacy of applying scenario planning to the digital transformation of the Database Management System (DBMS).
- As a critical user of the DBMS you have been selected as a key figure in understanding the impact of the scenario planning workshops.
- The questions are designed to elicit your personal experience while your answers will be summarized into aggregate themes along with other participants' responses.
- Your responses will be kept confidential.
- Your participation in this survey is voluntary and you can request that we stop at any time.

Meeting Agenda:
- We will spend approximately 45 minutes in discussion.
- I will ask you to provide your perspective on the impact of the scenario planning process on the improvement of the DBMS.
- Do you have any questions before we get started?

Phase 4: Predicted Impact – Staff Interview

Describe your experience of the scenario planning workshops:
- What was it like to participate in the workshops? Why is that?
- How was this process different than any previous experiences with project planning for DBMS improvements that you have had?
- How would you describe the impact of the scenario planning workshops on the future of the DBMS? How will that impact the organization as a whole? How will it impact your role?
- What do you think will be different about the digital transformation of the DBMS because of the use of scenario planning, if anything?

Definition of Success:
- What impact do you think the scenario planning process will have on key challenges facing the efficacy of the improvements to the DBMS?
- What would your ideal vision of success for the improvements to the DBMS be? How does scenario planning play into that?
- How would you like to see it measured?
- How would the organization's business results improve as a result of the scenario planning workshops? Why is that?

Challenges:
- What aspects of the scenario planning process did not work?
- What obstacles did we face in the process?

- Was any part of the process frustrating?
- How could we improve the process?
- Have we identified the right issues facing the organization and how they will impact business operations as related to the DBMS? What's missing?
- Did we have the right resources involved in the scenario planning process?

Close
- That completes the questions that I have. Is there anything else you would like to add, or do you have any other questions?
- Thank you for your forthright feedback. We have completed the interview.

Phase 5: Actual Impact (Time Permitting) – Staff Interview

Describe your experience of applying the results of the scenario planning workshops
- What was it like to apply the results of the workshop to the improvement of the DBMS? Why is that?
- How would you describe the impact of the scenario planning workshops on the improvements to the DBMS? How did it impact the organization as a whole? How did it impact your role?
- Was anything different about the digital transformation of the DBMS because of the scenario planning work that we did?

Definition of Success:
- What impact do you think the scenario planning process had on key challenges facing the efficacy of the improvements to the DBMS?
- Did we achieve your ideal vision of success for the improvements to the DBMS? How did scenario planning play into that?
- What does success look like?
- How do we measure it?
- How did the organization's business results improve as a result of the scenario planning workshops, if at all? Why is that?

Challenges:
- What aspects of the scenario planning process did not work?
- What obstacles did we face in the process?
- Was any part of the process frustrating?
- How could we improve the process?
- Through the user of scenario planning, have we identified the right issues facing the organization and how they will impact business operations as related to the DBMS? What's missing?
- Did we have the right resources involved in the scenario planning process?

Close
- That completes the questions that I have. Is there anything else you would like to add, or do you have any other questions?
- Thank you for your forthright feedback. We have completed the interview.

Appendix B - Founder Interview Protocol

Founder Interview Protocol

Introduction:
- We are conducting this interview regarding the efficacy of applying scenario planning to the digital transformation of the Database Management System (DBMS).
- The questions are designed to elicit your personal experience while your answers will be summarized into aggregate themes along with other participants' responses. As the founder and owner of the organization your perception is unique and some of your responses will not be aggregated.
- Your responses will be kept confidential.
- Your participation in this survey is voluntary and you can request that we stop at any time.

Meeting Agenda:
- We will spend approximately 45 minutes in discussion.
- I will ask you to provide your perspective on the impact of the scenario planning process on the improvement of the DBMS.
- Do you have any questions before we get started?

Phase 4: Predicted Impact – Founder Interview

Describe your experience of the scenario planning workshops
- What was it like to participate in the workshops? Why is that?
- How was this process different than any previous experiences with project planning for DBMS improvements that you have had?
- How would you describe the impact of the scenario planning workshops on the future of the DBMS? How will that impact the organization as a whole? How will it impact future decision-making?
- What do you think will be different about the digital transformation of the DBMS because of the use of scenario planning, if anything?

Definition of Success:
- What impact do you think the scenario planning process will have on key challenges facing the efficacy of the improvements to the DBMS?
- What would your ideal vision of success for the improvements to the DBMS be? How does scenario planning play into that?
- How would you like to see it measured?
- How would the organization's business results improve as a result of the scenario planning workshops? Why is that?
- How do you think leveraging scenario planning in the DBMS project will impact customer experience?
- How do you think leveraging scenario planning in the DBMS project will impact the organization's growth strategy?

Challenges:
- What aspects of the scenario planning process did not work?
- What obstacles did we face in the process?
- Was any part of the process frustrating?
- How could we improve the process?
- Have we identified the right issues facing the organization and how they will impact business operations as related to the DBMS? What's missing?
- Did we have the right resources involved in the scenario planning process?

Close
- That completes the questions that I have. Is there anything else you would like to add, or do you have any other questions?
- Thank you for your forthright feedback. We have completed the interview.

Phase 5: Actual Impact (Time Permitting) – Founder Interview

Describe your experience of applying the results of the scenario planning workshops
- What was it like to apply the results of the workshop to the improvement of the DBMS? Why is that?
- How would you describe the impact of the scenario planning workshops on the improvements to the DBMS? How did it impact the organization as a whole? How will it impact future decision-making?
- Was anything different about the digital transformation of the DBMS because of the scenario planning work that we did?

Definition of Success:
- What impact do you think the scenario planning process had on key challenges facing the efficacy of the improvements to the DBMS?
- Did we achieve your ideal vision of success for the improvements to the DBMS? How did scenario planning play into that?
- What does success look like?
- How do we measure it?
- How did the organization's business results improve as a result of the scenario planning workshops, if at all? Why is that?

Challenges:
- What aspects of the scenario planning process did not work?
- What obstacles did we face in the process?
- Was any part of the process frustrating?
- How could we improve the process?
- Through the user of scenario planning, have we identified the right issues facing the organization and how they will impact business operations as related to the DBMS? What's missing?
- Did we have the right resources involved in the scenario planning process?

Close
- That completes the questions that I have. Is there anything else you would like to add, or do you have any other questions?
- Thank you for your forthright feedback. We have completed the interview.

Appendix C - Email Request to Interview Staff

Email Request to Interview Staff

From: Kristy Lapidus (Kristy@ccgroup.io)
Sent: TBD
To: Interview Participants
Subject: Request for Interview: Study on Scenario Planning for the DBMS Improvement
Project

As we launch the planning stage of the DBMS improvement project, we will leverage a
technique called scenario planning. You have been identified as a critical user of the
DBMS and thus I am requesting your participation in a research study that will help us
understand the impact of the scenario planning technique on the DBMS improvement
project. After the close of the last scenario planning workshop, I would like to conduct a
45-minute interview with you to discuss your perspective on such topics as: impact,
efficacy, successes, challenges, and performance measures.

A summary of the results of our interviews will be shared with leadership to understand
the impact that the scenario planning process had on the DBMS improvement project. All
information gathered will be aggregated and will not be attributed to individual
responses.

Please let me know if you have any questions.

Thank you in advance for your time and participation in this significant study.

Regards,
Kristy

Appendix D - MSOD Human Subjects Training

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COMPLETION REPORT - PART 1 OF 2

COURSEWORK REQUIREMENTS*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Kristy Lapidus (ID: 6661564)
- **Institution Affiliation:** Pepperdine University (ID: 1729)
- **Institution Email:** kristy.lapidus@pepperdine.edu
- **Institution Unit:** MSOD

- **Curriculum Group:** MSOD Human Subjects Training
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 1 - Basic Course

- **Record ID:** 24745022
- **Completion Date:** 24-Sep-2017
- **Expiration Date:** 23-Sep-2020
- **Minimum Passing:** 80
- **Reported Score*:** 96

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
History and Ethical Principles - SBE (ID: 490)	24-Sep-2017	5/5 (100%)
Defining Research with Human Subjects - SBE (ID: 491)	24-Sep-2017	5/5 (100%)
Informed Consent - SBE (ID: 504)	24-Sep-2017	5/5 (100%)
Privacy and Confidentiality - SBE (ID: 505)	24-Sep-2017	5/5 (100%)
Internet-Based Research - SBE (ID: 510)	24-Sep-2017	4/5 (80%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.
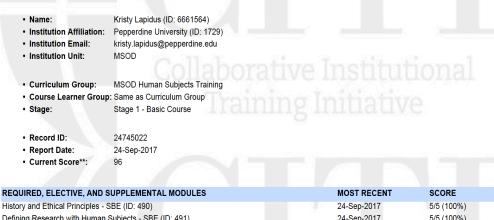
Verify at: www.citiprogram.org/verify/?kcfa5d110-b188-4f52-92ae-93390158703b-24745022

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COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)
COMPLETION REPORT - PART 2 OF 2
COURSEWORK TRANSCRIPT**

** NOTE: Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:** Kristy Lapidus (ID: 6661564)
- **Institution Affiliation:** Pepperdine University (ID: 1729)
- **Institution Email:** kristy.lapidus@pepperdine.edu
- **Institution Unit:** MSOD

- **Curriculum Group:** MSOD Human Subjects Training
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 1 - Basic Course

- **Record ID:** 24745022
- **Report Date:** 24-Sep-2017
- **Current Score**:** 96

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES	MOST RECENT	SCORE
History and Ethical Principles - SBE (ID: 490)	24-Sep-2017	5/5 (100%)
Defining Research with Human Subjects - SBE (ID: 491)	24-Sep-2017	5/5 (100%)
Informed Consent - SBE (ID: 504)	24-Sep-2017	5/5 (100%)
Privacy and Confidentiality - SBE (ID: 505)	24-Sep-2017	5/5 (100%)
Internet-Based Research - SBE (ID: 510)	24-Sep-2017	4/5 (80%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

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Appendix E – Research Study Executive Summary

Research Study Executive Summary

This study aims to understand if using a scenario-based planning technique can help improve the efficacy of an enhancement to a business software application. Scenario planning is a strategic management tool that considers multiple alternative futures to raise awareness of the possibilities of what the future might hold. Scenarios are not predictions. They are stories that describe alternate ways that the future might unfold and to help you anticipate some of the important decisions you might need to make about policy, resources, and key activities.

The process will involve scanning the environment with a long-term view, considering multiple futures, and discussion of how the organization might prepare. Two workshops will be held with between 4 -10 participants. The research portion of the process will involve interviews of the scenario planning workshop participants immediately after the workshop and immediately after the completion of the enhancement project if time allows. The participants will be asked qualitative questions focused on their experience of the workshop, how the scenario planning process can be improved, and how they think the technique will impact the enhancement project.

Appendix F – Company Consent Form

Company Consent Form
Pepperdine University | Graziadio Business School

Consent to Participate in a Research Study

Principle Investigator: Kristy J. Lapidus, contact number: 773-865-6140
Faculty Advisor: Miriam Lacey, Ph.D.: 310 568-5598

You are invited to participate in a research study conducted by Pepperdine University on

the Impact of Scenario Planning on the Efficacy of Digital Transformations because you

are the founder of an established SMB consultancy with an interest in performing a

digital transformation. Your participation is voluntary. You should read the information

below and ask questions about anything that you do not understand. Please take as much

time as you need to read the consent form. You may also decide to discuss participation

with your family or friends. You will be given a copy of this form for your records.

Title of Study: The Impact of Scenario Planning on the Efficacy of Digital

Transformations

PURPOSE OF THE STUDY

This study aims to understand if using a scenario-based planning technique can help

improve the results of an enhancement to the Database Management System (DBMS).

PARTICIPANT INVOLVEMENT

Active involvement by each of your staff and consultants will take approximately 8 hours

for the scenario planning workshops and 2 hours for each staff person to participate in

two 45-minute interviews by video conference or face-to-face interviews. Active

involvement from you personally will include the above as well as 10 – 20 hours of planning and analysis time. The scenario planning workshops will be used to give you a fuller understanding of what the future might hold so that you can prepare your business to respond and thrive in multiple future scenarios and in the face of various environmental factors.

The steps required by you to participate in this study are as follows:

1. Read, understand, and sign the consent form.
2. Collaborate with the principal investigator to define a decision focus for the scenario planning project.
3. Identify 4-10 staff/consultants, including yourself, who will participate in the study.
4. Approve/Modify the futuristic web site text-mining plan.
5. Approve/Modify the inclusion of the results of the text-mining for use in the scenario planning workshop.
6. Approve/Modify the scenario planning workshop plan including staff/consultant time.
7. Allocate staff/consultant resources and time for the scenario planning workshop and post-workshop interviews.
8. Participate in the scenario planning workshop.
9. Participate in post-workshop interview.
10. Approve/Modify the presentation plan for the scenarios to be presented to the study participants.

11. Allocate staff/consultant resources and time for the scenario planning presentations.

12. Participate in the scenario planning presentations.

13. If time and plans allow, collaborate with the principle investigator on how to apply the results of the scenario planning technique to the DBMS enhancement project.

14. If time and plans allow, after the DBMS enhancement project is complete, allocate time and resources of staff/consultants to participate in post-project interviews.

15. If time and plans allow, after the DBMS enhancement project is complete, participate in post-project interview.

Due to the risk of breach of confidentiality of client information, multiple steps will be taken to mitigate that risk. Interviews will not be recorded. Any identifiable information obtained in connection with this study will remain confidential. All research data collected will be coded with a pseudonym and transcript data will be encrypted and maintained separately. Participants will be instructed to refrain from referencing specific clients or specific people. No research questions or data collected will reference specific clients or specific people.

You have the right to ask, and have answered, any questions you may have about this research. If you have questions, complaints, or concerns, you should contact the researcher, Kristy, at 773.865.6140 or her supervisor, Miriam Lacey, Ph.D., at 310.568.5598.

All research on human volunteers is reviewed by a committee that works to protect your

rights and welfare. If you have questions, concerns or complaints about your rights as a

research participant or research in general please contact Dr. Judy Ho, Chairperson of the

Graduate & Professional Schools Institutional Review Board at Pepperdine University

6100 Center Drive Suite 500 Los Angeles, CA 90045, 310-568-5753 or

gpsirb@pepperdine.edu.

Investigator: Kristy J. Lapidus

Participant's Agreement:

I have read the information provided above. I have asked all the questions I have at this

time. I voluntarily agree to participate in this research study.

       Signature of Research Participant   Signature of Principle Investigator

By: _____   By: _____

Name: Name: Kristy Lapidus
Title: Founder   Title: Principle Investigator