2019

Process Management Strategies of Successful Small Manufacturing Companies in Massachusetts

Daniel R. Champagne
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral dissertation by

Daniel R. Champagne Jr.

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Richard Schuttler, Committee Chairperson, Management Faculty
Dr. Marcia Steinhauer, Committee Member, Management Faculty
Dr. David Cavazos, University Reviewer, Management Faculty

The Office of the Provost

Walden University

2019

Abstract

Process Management Strategies of Successful Small Manufacturing Companies in Massachusetts

by

Daniel R. Champagne Jr.

MBA, Nichols College, 2006

BS, Becker College, 2003

Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

Leadership and Organizational Change

Walden University

November 2019

Abstract

The manufacturing industry has been on a decline. Companies have been closed, and employees have lost their jobs. The purpose of this qualitative exploratory multiple case study was to understand how 5 small manufacturing companies in Massachusetts remained competitive. Systems theory was used to focus on process and innovation management implemented by organizational leaders. A purposeful sampling was conducted to identify 15 organizational leaders from 5 small manufacturing companies in Massachusetts. Data were collected through semistructured interviews with the 15 participants. Interviews were recorded and transcribed with NoNotes software. Data were compiled and submitted to participants to member check information. Once participants confirmed the data, data were compiled with NVivo 12 software. Through the compilation process, 10 themes emerged. Seven of the themes were directly related to the positive steps of process management: employee involvement, customers, communication, products, innovation, knowledge, and analysis. Three emergent themes regarding negative strategies were managing from a distance, lack of communication, and no buy-in from stakeholders. Positive social change could emerge from the results of this study if organizational leaders use this information to increase their success and help grow the Massachusetts manufacturing GDP. The increase of business may lead to more jobs and revenue to help support local communities in Massachusetts.

Process Management Strategies of Successful Small Manufacturing Companies in Massachusetts

by

Daniel R. Champagne Jr.

MBA, Nichols College, 2006

BS, Becker College, 2003

Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

Leadership and Organizational Change

Walden University

November 2019

Dedication

This dissertation is dedicated to my family for support through the entire process to obtain my doctoral degree. To my wife Sarah, your love of learning and support enabled me to achieve my dreams of furthering my education. My son, Jason, my daughter, Hailey, and my stepson, Alex, your support helped me keep pushing forward. My father, who was taken from us too soon. I am thankful I got to tell you about the doctoral program before you passed. My mother, Ann Champagne, I cannot thank you enough for the lifelong support you have provided. You were always there and helped me through some tough times. I completed this journey with the neverending support of my family and friends.

Acknowledgments

Thank you to my dissertation committee chair, Dr. Richard Schuttler. Your guidance, patience, and leadership enabled me to complete my doctoral journey. With your support, I was able to achieve my dream of earning a doctorate. I also would like to thank my second committee member, Dr. Marcia Steinhauer for excellent advice in formatting my final dissertation. I also thank my URR, Dr. David Cavazos, for constructive feedback on my research. I would also like to thank Dr. Sandra Kolberg and the entire faculty at Walden University who contributed to my completion of this study. Finally, I want to thank all my friends, family, and everyone who helped me complete this program.

Table of Contents

List of Tables vi

List of Figures vii

Chapter 1: Introduction to the Study 1

Background of the Study 3

Problem Statement 4

Purpose of the Study 6

Research Question 6

Conceptual Framework 6

Nature of the Study 7

Research Method 7

Research Design 8

Definitions 9

Assumptions 9

Scope, Limitations, and Delimitations of the Study 10

Scope of the Study 10

Limitations 11

Delimitations 11

Significance of the Study 11

Significance to Practice 11

Significance to Theory 12

Significance to Social Change 12
Summary and Transition 12
Chapter 2: Literature Review 14
Introduction 14
Literature Search Strategy 15
Conceptual Framework 16
Small Businesses 17
Manufacturing 18
New Product Development 21
Market Entry 25
Process Management 29
Innovation Management 42
Knowledge Sharing 43
Gap in Literature 44
Summary and Conclusion 45
Chapter 3: Research Method 46
Research Design and Rationale 46
Role of the Researcher 47
Methodology 47
Participant Selection 48
Instrumentation 48

Recruitment Process....49
Participation....50
Data Collection....50
Interview Questions....51
Data Analysis Plan....51
Issues of Trustworthiness....51
Credibility....52
Transferability....52
Dependability....53
Confirmability....53
Trustworthiness....53
Ethical Considerations....54
Summary....54
Chapter 4: Results....56
Research Setting....56
Demographics....57
Data Collection....58
Inclusion Criteria....58
Identifying Potential Participants....59
Recruiting Participants....59
Participants....60

Variations in Data Collection 60
Data Analysis 61
Evidence of Trustworthiness 61
Credibility 62
Transferability 62
Dependability 62
Confirmability 63
Study Results 63
Hand-Coded Themes 64
Emergent Themes from Data 65
Emergent Theme One: Employee Involvement 66
Emergent Theme Two: Customers 67
Emergent Theme Three: Communication 67
Emergent Theme Four: Products 68
Emergent Theme Five: Innovation 68
Emergent Theme Six: Knowledge 69
Emergent Theme Seven: Analysis 69
Emergent Theme Eight: Managing from a Distance 70
Emergent Theme Nine: Lack of Communication 70
Emergent Theme 10: No Buy-in from Stakeholders 71
Summary 71

Chapter 5: Discussion, Conclusions, and Recommendations 73
Interpretation of Findings 74
Communication 74
Innovation 75
Knowledge 75
Lack of Engagement 76
Limitations of the Study 76
Recommendations 77
Implications 78
Significance to Theory 79
Significance to Positive Social Change 79
Conclusion 80
References 82
Appendix A: Interview Questions 96

List of Tables

Table 1. Demographic Data of Respondents 58

List of Figures

Figure 1. NVivo 12-word frequency cloud positive aspects.....65

Figure 2. NVivo 12-word frequency cloud negative aspects.....66

Chapter 1: Introduction to the Study

Manufacturing in the United States has been on a decline. From 2007 to 2016, the national manufacturing gross domestic product (GDP) declined by .3% (U.S. Bureau of Economic Analysis [BEA], 2018). In the same timeframe, the manufacturing GDP in the Commonwealth of Massachusetts declined by 8% (BEA, 2018), which is 27 times greater than the national manufacturing GDP average decline. The decline in manufacturing indicates a need for further research. Several factors may have contributed to a decline in manufacturing. However, in this study, I will focus on process management and innovation management. Innovation management is linked to successful manufacturing organizations (Datta, Reed, & Jessup, 2013).

Datta et al. (2013) posited that innovation is vitally important to ensure the success of any organization. Every part of an organization must use process management to support and promote innovative projects (Băjenescu, 2017). The purpose of this study was to understand the specific process and innovation management strategies that have provided success for small manufacturing businesses in Massachusetts. With an enhanced understanding of innovation management strategies, other organizational senior leaders may benefit from the results of this study. In addition, leaders of educational institutions may be able to enhance curriculum in leadership programs to focus on critical components of innovation strategies when teaching innovation management processes.

A review of the literature on innovation has identified a need in manufacturing organizations for a better understanding of processes that organizational leaders can use to manage innovation effectively. Innovation may be able to create additional

manufacturing jobs (Datta et al., 2013). Robbins and O'Gorman (2016) identified that 23% of organizational leaders surveyed in their study have a formal innovation process. The lack of formal innovation processes may lead to confusion for organizational leaders and all employees when trying to understand what innovation techniques may work. A formal process or documented procedure may help organizations duplicate internal innovation successes.

Leaders of small businesses have inherent limitations because they do not have the same resources available compared to leaders of larger organizations to support innovation management strategies (Berends, Jelinek, Reymen, & Stultiëns, 2014; Peña Ponce, Lorenzo, & Fernández Concepción, 2017; Robbins & O'Gorman, 2016). Additional challenges caused by fewer resources place higher demands on leaders in small businesses to ensure positive results even with the reduced amount of resources. The additional pressure on leaders of small business to succeed should be recognized when trying to understand potential success factors.

Small businesses have contributed 62% of the new jobs created in the United States from 1993 to 2016 (U.S. Small Business Administration [SBA], 2017). The SBA (2017) described a small business as an organization with fewer than 500 employees. The limited resources of small businesses combined with the high number of jobs produced by these organizations increases the need for organizational leaders for further research to ensure there is information available for the organizational leaders to enhance their innovation practices.

Background of the Study

The steep decline in the manufacturing sector may have a significant effect on the Massachusetts economy. As noted, in Massachusetts, the manufacturing GDP decreased by a rate of 27 times that of the national U.S. manufacturing GDP. Business leaders must understand why organizations decline. Innovation practices should be evaluated, adapted, and redesigned as needed to learn from past experiences to enhance chances for success (Van de Ven, 2017). Organizational leaders should understand the potential for failure of the process management strategy to help the leaders implements positive process management strategies that may lead to success.

The speed of global competition increases the need for organizational leaders to adopt innovations quickly to remain competitive (Xin, Yeung, & Cheng, 2008). Additionally, the volatility of global markets increases the need for organizational leaders to ensure they have positive innovation management strategies in place in their organizations (Jayaram, Oke, & Prajogo, 2014). In the global environment, Positive process management strategies can be a successful tool to enable organizations to remain competitive (Sanders Jones & Linderman, 2014). The speed and volatility of the global marketplace further enhances the need for organizational leaders for research regarding innovation strategies. Effective innovation processes positively contribute to successful capabilities of small businesses (Woschke & Haase, 2016).

Innovation in manufacturing companies is increasingly complex within the manufacturing organizations (Gloet & Samson, 2015). Innovation is defined as a new system or process, new technology, or new plan implemented in an organization (Keupp,

Palmié, & Gassmann, 2012). The leaders of companies should focus on innovation capabilities of their organization because it is an essential part of sustained competitive advantage.

Leaders of successful small manufacturing businesses may have information that will be beneficial for other organizational leaders. Once the information is available, it may be useful for organizational leaders to standardize their operations. Standardization has a significant impact on realizing successful innovation (Wang, Zhang, Sun, & Zhu, 2016). Process and innovation management are crucial for leaders to ensure alignment of their organizations for future successes. Positive innovation management is crucial to ensure desired results. The limited resources available for small business leaders force them to focus on the short-term success of one or a limited number of projects (Berends et al., 2014). The balance between process management and innovation strategy may help organizational leaders ensure positive results for their company.

In this study, the systems theory will be used as the framework and foundation to understand process and innovation management. Neumann (2013) stated systems theory is used to identifying all the parts of a system by focusing on the entire system and each part of the system. The information obtained in this study may explain successful innovation management strategies that could help other small manufacturing companies in Massachusetts thrive.

Problem Statement

The decline of manufacturing in the United States has resulted in a reduction in the number of U.S. manufacturing companies and related jobs. Charles, Hurst, and

Notowidigdo (2016) reported 33% of U.S. manufacturing jobs were lost from 2000 to 2015. Levinson (2017) concluded that there was a 32% decrease in active manufacturing organizations in the United States from 1998 to 2015. The United States GDP grew 11% from 2007 to 2016, but the manufacturing GDP decreased by .3% (BEA, 2018). The decline of the national manufacturing GDP at a time when the overall national GDP grew highlights the general problem of the reduction of the manufacturing sector and the decreased contribution of manufacturing to the national economy.

There was an 18% decrease in manufacturing jobs in Massachusetts from January 2007 to January 2017 (U.S. Bureau of Labor Statistics [BLS], 2018). The Massachusetts GDP increased by 14% from 2007 to 2016 (Statista.com, 2018) and the GDP for manufacturing in Massachusetts decreased by 8% (BEA, 2018). The GDP for manufacturing in Massachusetts was 12% of the state GDP in 2000 and reduced to 11% in 2016 (BEA, 2018).

The specific problem is that organizational leaders of small businesses have inherent challenges with limited resources, as they may not have access to the same process management resources available for the development of innovation processes that larger organizations have available. Proper innovation processes are essential to remain competitive (Kohl, Orth, Riebartsch, & Hecklau, 2016). Robbins and O'Gorman (2016) identified that formal innovation processes are in place at only 23% of the organizations surveyed. Innovation management is critical to the success of an organization as it encompasses all the functions of an organization to promote and support innovative projects (Băjenescu, 2017).

Purpose of the Study

The purpose of this qualitative multiple case study is to understand the process management practices of successful small manufacturing organizations in Massachusetts. Innovation is vital to the success of organizations (Datta et al., 2013). Doussard, Schrock, and Lester (2017) identified that positive innovation practices could lead to increased job creation in manufacturing organizations. From a purposeful sampling, 15 senior leaders from five successful small manufacturing companies were interviewed with open-ended questions through semistructured interviews to identify commonalities among innovative practices that have led to success. Each Massachusetts manufacturing organization is considered a separate case in this multiple case study, and data collected during the interviews were also analyzed to determine overall common understandings. Employees interviewed consisted of frontline managers, executives, and ownership for a total of 15 participants for this research study. Available documentation regarding innovation management processes from each organization was reviewed to understand the degree of focus organizational leaders had on innovation and process management.

Research Question

RQ1: What are the process management practices of successful small manufacturing organizations in Massachusetts?

Conceptual Framework

During the study, process management information was collected and might identify critical factors that have contributed to the success of small manufacturing companies. The systems examined in this study are process management strategies for

the innovation management process to create a new product or process. The conceptual framework for the study is systems theory. Systems theory enables the researcher to uncover problems by viewing the system as a whole entity (Batra, Kaushik, & Kalia, 2010). A system is a connected assembly of the parts of an organization (Stewart & Ayres, 2001). Von Bertalanffy (1972) posited the idea that general systems theory provides a way to identify problems that may have been previously overlooked in research by focusing on the entire system.

The goal of using a conceptual framework is to understand phenomena instead of attempting to predict them (Jabareen, 2009). The framework helped clarify shared guiding principles of process management. There were commonalities between the five manufacturing organizations that are beneficial to the study.

Nature of the Study

The study used a qualitative exploratory multiple-case design. The process of a case study involves collecting data, analyzing data justly, and presenting with in-depth and relevant information (Yin, 2014). In qualitative research, the researcher is an instrument for gathering information (Patton, 2015). The data collected in this study came from answers to semistructured interview questions presented to successful innovation management professionals in small manufacturing companies in Massachusetts to identify common themes.

Research Method

The research was conducted using a qualitative methodology. The qualitative method can be used to understand a topic by focusing on the how and why (Patton,

2015). The qualitative method was used in this research to help understand the specific innovation management strategies of organizational leaders through interviews. The quantitative method was considered for this research. The quantitative method involves a focus on proven measurements to uncover the facts of a phenomenon (Barnham, 2010, 2015). Barnham (2015) assessed the qualitative method as providing a deeper understanding of a phenomenon by asking why to evaluate the focus of the study. Thomas and Magilvy (2011) posited that the qualitative method allows researchers to develop a greater specific understanding of a phenomenon. The research associated with this study was designed to understand how and why involving the innovation management practices of successful small manufacturing companies in Massachusetts, so the qualitative method was selected over the quantitative method.

Research Design

The selected research design for this study is an exploratory multiple case study. The multiple case study may create an understanding of the process management strategies used by organizational leaders of each case and identify cross-comparison themes to achieve an enhanced understanding of a phenomenon (Miles, Huberman, & Saldana, 2014). The research for this study was focused on five individual successful small manufacturing organizations. Each organization was treated as a single case study, and the data retrieved via interviews with organizational leaders were compared between organizations to identify common themes. The exploratory case study enables an understanding to document a phenomenon and analyze the results of the investigation to present findings (Yin, 2014). The information obtained through semistructured

interviews may enable an enhanced understanding for organizational leaders of the process management strategies used by successful organizations.

Definitions

The following are operational definitions of keywords used throughout the study to support the research:

Gross domestic product (GDP): The GDP is the total capital of goods and services provided by a location (Organization for Economic Co-operation and Development [OECD, 2017). The focus for this study are the GDP of the United States and the Commonwealth of Massachusetts.

Innovation management: Innovation management is the combination of all organizational strategies from the creation of an idea to the commercialization of an innovative process regarding a service or product (Song, Ming, Han, Xu, & Wu, 2015).

Manufacturing: The process of taking a raw material or component and converting items into a specific part or finished product to meet the needs of a consumer (Manufacturing, n.d.).

Process management: The creation, implementation, and control of the entire process that encompasses the organization as a whole (Berman, 2014).

Small Business: An independent business that has fewer than 500 employees (U.S. Small Business Administration [SBA], 2017).

Assumptions

Assumptions must be acknowledged to appropriately interpret the findings of a study (Kirkwood & Price, 2013). Foss and Hallberg (2017) posited that assumptions are

details that are presumed valid by the author. There are four assumptions associated with this study. The first assumption was that the qualitative method is the correct choice for the study. The second assumption is that systems theory was the best choice as the foundation for research into innovation management practices in each organization.

The third assumption was that the participants of the study would be willing to discuss strategies that led to success. The participants were organizational leaders, and it was assumed they would want to help by adding to their knowledge base regarding innovation management practices. The fourth assumption was that the participants were truthful and answered the questions to the best of their ability. Participants may feel they were obligated to answer questions based on what they believe their stakeholders would want to hear and may omit vital information for this study.

Scope, Limitations, and Delimitations of the Study

Scope of the Study

The study involved interviews with 15 organizational leaders of small manufacturing businesses in the Commonwealth of Massachusetts with a focus on process management strategies. The topic for this study was chosen to understand how small manufacturing businesses used process management practices to remain successful from 2007 to 2016 when the manufacturing GDP for Massachusetts was 27 times less than the national average. The participants in the study consisted of leaders of successful companies who are at the management level including frontline supervisors and business owners.

Limitations

Limitations are identified to provide awareness for readers of potential shortcomings in a study (Brutus, Aguinis, & Wassmer, 2013). There were three limitations identified in this study. The first limitation was the potential for researcher bias due to more than 20 years of experience in the manufacturing sector. The second limitation was that the five organizations might not represent all the manufacturing businesses in Massachusetts. The third limitation involved participants in the study as they may not share the same views as their coworkers in the organization. Individual perceptions may vary depending on personal experiences.

Delimitations

Delimitations are the boundaries set by the researcher to support the scope of the study (Bartoska & Subrt, 2012). There are three delimitations in this study. The first delimitation was that participants worked in successful small manufacturing businesses in the Commonwealth of Massachusetts. The second delimitation was the semistructured nature of the interviews with leaders of manufacturing companies. The third delimitation was the willingness of the participants and the option to remove themselves from the study at any time.

Significance of the Study

Significance to Practice

The study may lead to valuable information that can be used by future organizational leaders to meet increased global demands. The information generated may help business leaders change their processes to lead to a higher likelihood of success.

The information may also be added to the knowledge base for manufacturing leaders to assist organizational leaders from other regions.

Significance to Theory

There is an abundance of literature focused on business innovation, but there is a lack of information regarding specific successful innovation management techniques in small manufacturing businesses. This study has a heightened focus on innovation management practices of small manufacturing businesses. The case study research design is useful when attempting to understand the narrow focus of an organizational process. Additionally, leaders of educational institutions may be able to enhance their curriculum to include a heightened focus on specific process management skillsets for students to learn process management strategies.

Significance to Social Change

The decline in manufacturing organizations and reduction of jobs has directly affected the national and local economy. The organizations studied in this research include successful companies that have been in business for more than 5 years. That length of time was chosen to cover the period of manufacturing decline addressed in this study. This study may be able to help small manufacturing organizational leaders in Massachusetts improve their innovation management strategies, possibly increase their number of jobs, and potentially improve the economy in their geographical region.

Summary and Transition

There is a lack of significant research documenting specific innovation practices of small manufacturing organizations. Chapter 2 contains a review of the literature

concerning the body of knowledge related to innovation management. In addition, Chapter 2 includes literature to support the qualitative exploratory case study design used to perform the research. The qualitative exploratory multiple case study and systems theory in this study were designed to understand innovation management practices of successful small manufacturing businesses.

Chapter 2: Literature Review

Introduction

Manufacturing organizations strive to survive in the global landscape. Competition in the marketplace is growing, and the need for organizational leaders to adapt to market conditions is crucial for survival. From 2007 to 2016, the United States manufacturing GDP decreased by .3% while the national GDP grew by greater than 10% (BEA, 2018). During the same timeframe, the GDP of Massachusetts increased by 11% while its manufacturing GDP decreased by 8% (BEA, 2018). The steep decline in the manufacturing sector in Massachusetts compared to the national GDP supports the problem identified for this research.

The economic effect of manufacturing is vital for society as the output of manufactured goods is useful for consumers, and jobs provided by businesses help support local economies. Small business is essential to the economy as they provide jobs for 50% of the workforce and comprise greater than 99% of all businesses (Warren & Szostek, 2017). The contribution to the local economy drives the need for small manufacturing businesses to succeed as the successful manufacturing organization may provide more money to local economies.

Many factors contribute to the success of manufacturing businesses. A common theme in the literature review is the importance of process and innovation management to enhance the likelihood of success in manufacturing organizations. Positive innovation practices can lead to more manufacturing jobs (Doussard et al., 2017). Robbins and O'Gorman (2016) identified 23% of organizations in their study have formal innovation

processes. This research may be able to identify some common themes between successful small manufacturing companies in the Commonwealth of Massachusetts.

The purpose of this qualitative exploratory multiple case study was to gain an understanding of the typical process management practices of successful small manufacturing businesses in Massachusetts. The steep decline in the manufacturing GDP and the importance of manufacturing organizations to local and national economies was the motivation for this research to support the continual need of organizational leaders for research and continuous improvement. Using the multiple case study approach enable of many companies to be compared in order to find similarities and commonalities related to the success of the organizations.

The first section of the literature review begins with an overview of Chapter 2 and data-gathering strategies. Then, an overview of the conceptual framework used for research is provided. The literature review starts with relevant data regarding manufacturing businesses and current market conditions locally and globally. The next several sections contain information regarding process and innovation management strategies and the potential effects these areas of management may have on the ultimate success or failure of organizations. Last, information is provided regarding new product development processes to provide information regarding this valuable part of manufacturing organizations.

Literature Search Strategy

The search strategy for this study included Internet searches of these online library databases: ABI/Inform, Academic Search Complete, EBSCOHost, ERIC, Google

Scholar, OECD iLibrary, (h) ProQuest Central, SAGE Journals, and Thoreau. Online libraries included Boston Public Library, Becker College Library, Nichols College Library, Walden University Library, and Walden Library Books. The following keywords and phrases were used to obtain pertinent information for the literature review: *Commonwealth of Massachusetts GDP*, *business*, *business leadership*, *innovation management*, *innovation strategy*, *leadership*, *management*, *manufacturing*, *Massachusetts manufacturing*, *new product development*, *process management*, *small business*, *small business administration*, *small manufacturing business*, and *United States GDP*. Additionally, key phrases were set up in Google and Google Scholar to receive alerts as new information was added to the knowledge base. Keywords were crucial to obtaining proper information to address the research question for the study and provide a framework for the research.

In addition to online databases, information was obtained at local libraries in Massachusetts to ensure appropriate data were gathered for research. A manual literature review in local libraries involved the same terms that were used in the online research to provide a thorough examination of information. Books from were used referenced in this chapter.

Conceptual Framework

Two conceptual frameworks were used for this study. The first conceptual framework used for this exploratory qualitative multiple case study is systems theory. Systems theory is used to identify and examine multiple parts of a system to gain a complete understanding of a subject (Von Bertalanffy, 1972). Systems theory was used

to understand innovation management commonalities regarding process management strategies between small manufacturing businesses leaders in Massachusetts.

The second framework I used provided an understanding of the product innovation philosophies of manufacturing organizational leaders included in this study. The diffusion of innovations theory (DOI) provides a general understanding of the new product development process to determine the customer adoption stages targeted by the manufacturing organizational leaders. Rogers (2003) said the five adopter categories for new product innovation are innovators, early adopters, early majority, late majority, and laggards. Understanding the manufacturing philosophies of organizational leaders may help provide insight into the data during interviews. Process and innovation management successes may be influenced based on the specific product lifecycle or product adoption category that is being pursued in the marketplace. The DOI enables a general understanding of the products designed for the market and the particular entry level of the consumer to provide an understanding to manufacturing organizational leaders to determine what market their products will enter.

Small Businesses

Small businesses are crucial to the economy of the United States. From 1992 to 2013, 63% of all new jobs in the United States were in small businesses. Small businesses in the United States represent over 99% of all companies (SBA, 2017). Warren and Szostek (2017) said that 50% of all jobs in the U.S. are in small businesses.

The survival rate of small businesses in the U.S. is 79% after the first year (SBA, 2017). The survival rate of small business at 10 years is reduced to 34% (SBA, 2017).

The inherent fragile nature of small business should be continually researched to understand how to protect these organizations and help organizational leaders obtain market sustainability and potential growth in the industry. The essential nature of these businesses in the U.S. economy drives the need of organizational leaders for further research to understand how to protect these resources. The need to obtain relevant data from five manufacturing organizations helped achieve a better understanding from organizational leaders of the strategies that may have led to success.

Manufacturing

Manufacturing is the process of using raw material or components to convert them into a part or finished product that is available to the marketplace. Massachusetts has been a dominant figure in the manufacturing industry (Best, 2015). The manufacturing industry is a significant contributor to the national and state-level GDP. Doussard et al. (2017) examined the information provided by organizational leaders in the manufacturing sector in the United States. The authors found that corporate leaders believed that manufacturing jobs historically had provided high wage jobs that support the local economic development in regional and urban areas. The top-paying jobs can be beneficial to the community by giving wages to the members of the local community that may spend the money locally and boosts the financial stability of the community. The opinion of manufacturing leaders will be addressed during the interview process in this study.

Wingard and Connerty (2014) conducted a quantitative study to obtain information from manufacturing organizational leaders in the United States. The focus of

the study was on specific manufacturing industries including, (a) electronics, (b) automotive equipment, (c) industrial components, (d) chemicals, (e) defense equipment, and (f) aerospace. The results included a belief from organizational leaders that the future of manufacturing will consist of commodity products that are manufactured outside of the United States while sophisticated, innovative made items will remain in the United States. Some scholars believe the manufacturing sector is not essential to the United States economy. Ezell (2012) summarized a conference in Washington, D.C., expressing the opinion that some groups believe the U.S. economy can succeed even if the manufacturing sector is no longer viable. Ezell asserted that, in the postindustrial world, the U.S. could thrive with a knowledge-based and service-based economy. Ezell also identified that there is some disregard for the contribution of manufacturing on the economy. Most of the information, from Ezell, identified the manufacturing sector as a crucial part of the economy and presented that an enhanced focus by the leaders of the country. These leaders must take steps to revitalize the manufacturing industry with a national strategy to ensure the continued success of the manufacturing sector.

Industry data can drive manufacturing process and innovation management. The National Institute of Standards and Technology (NIST) compiles data from many organizations and presents information to enhance the measurement of science, standards, and technology to help promote information to organizations to improve innovation and industrial competitiveness (NIST, n.d.). The data retrieved and identified for this study provide information regarding the importance of the manufacturing sector in the national and local communities.

Key points presented by the NIST (n.d.) include data that manufacturing companies contribute $2.9 trillion to the national economy per year. Also, each manufacturing job creates an additional 2.5 more other positions in local services and goods provided to the population. There are 12.4 million jobs in the U.S., and for every dollar of products produced by manufacturing organizations an additional $1.37 is generated in the economy. The information provided by the NIST supports the affirmation that manufacturing companies are valuable to the local and national economies. The $2.9 trillion would be challenging to replace if the manufacturing sector of the economy ceased to exist.

The importance of manufacturing extends beyond the direct effect of taxes paid and wages earned by the employees of a manufacturing company. Manufacturing organizations are entrenched in the U.S. economy with direct and indirect contributions to the economy. The local communities that support small manufacturing businesses may realize the benefit of successful companies by incurring revenue from taxes generated from the organization and tax revenue provided from the employees that work for the local organizations.

The need to sustain a manufacturing company will rely on customers to purchase the products that have been produced for the marketplace. Organizational leaders of small manufacturing companies have added challenges as they may be competing against leaders of larger manufacturing organizations that have more resources available, but not have as many resources available to produce new products (Woschke & Haase, 2016). Bolumole, Calantone, Di Benedetto, and Melnyk (2015) emphasized the need for

resources to develop new products as the new product development (NPD) processes are becoming more critical to the sustainability of organizations. Wilson and Perumal (2010) pointed out that the competitive strength of a manufacturing organization relies on providing new compelling products expeditiously to the marketplace. The need for new products created in manufacturing organizations must be explained in the research for this paper.

New Product Development

This section includes the need for new products and the new product development (NPD) process in manufacturing companies. There are many factors for organizational leaders to consider when creating new products or processes. The NPD processes are steps that outline the entire organizational procedures to provide a new product to the marketplace to realize a lower-cost product, that has high quality, and a minimal time to reach the final product to offer to the market (Nafisi, Wiktorsson, & Rösiö, 2016). Ultimately, the NPD processes are set in place to produce a product that will meet the expectations of the consumer (Webb, 2016). The data-gathering event for this study may include the goal of NPD for the organizational leaders to be interviewed as the NPD process is relevant to the research. Process management and innovation management practices of organizational leaders must be understood to add value to this study.

There is high pressure on leaders of manufacturing organizations to bring new products to the marketplace (Webb, 2016). The competitive strength for manufacturing organizations is the process of establishing new products quickly in the market (Wilson & Perumal, 2010). Calantone and Di Benedetto (2012) created a quantitative study to

understand the effect of timing and the launch of a new product in a lean launch process. Calantone and Di Benedetto did see a relationship between the product lean launch timing and the enhanced chance of product success. Calantone and Di Benedetto also indicated the lean product launch approach enabled the organizational leaders to use only necessary resources to limit the risk if the product is not accepted in the marketplace, this way reducing the probability of harming on the success of the company. Company leaders must understand the chance to plan their NPD process properly.

Manufacturing leaders must understand the products they want to bring to the marketplace. The leadership must decide what level of maturity their new products will be by ensuring they realize the risks associated with the various life cycles of a product or process. Jennings, Wu, and Terpenny (2016) designed a study to understand product life cycles and NPD processes. Jennings et al. indicated that organizational leaders must include an upfront understanding of the obsolescence for a product or process. Obsolescence is a part of the product life cycle and should be considered to ensure cost is controlled by not overproducing. Overproduction of products is directly linked to waste (Liker, 2004). Jennings et al. explained the product life cycle as (a) introduction, (b). growth, (c) maturity, (d), saturation, (e), decline, (f), and phase-out. Below is the explanation of the 6 stage product life cycle of a product or process (Jennings et al., 2016).

The first stage in the six-stage product life cycle is the introduction of a new product or process to the marketplace. The introduction of a new idea is the first step

after the initial concept of the product or process. This step is the end of the new product development process as the product reaches the market.

The second stage in the six-stage product life cycle is growth of the product in the marketplace. The growth stage is when an established product is in the market. This stage enables the organizational leader to realize the benefit of the new product in the marketplace almost immediately as the product has already achieved acceptance in the market and maybe proven to be a worthwhile endeavor as it has customers interested in purchasing the product. Some organizational leaders may consider this product to have low risk as there is an established market.

The third stage in the six-stage product life cycle is the maturity of the product. The maturity phase is when the established product has reached the end of the growth phase of the product life cycle. The maturity stage is where the product has market acceptance and has reached the height of growth. Leaders should understand if this is a viable option for entry into the marketplace. There is risk associated with entering this phase of the market as there is little chance for growth and is probably a commodity item that multiple companies can provide to the marketplace. The company with the lowest price may have the advantage in this stage.

The fourth stage in the six-stage product life cycle is the saturation in the marketplace. Once in the saturation phase, the product has exceeded the growth phase and is at the fullest implementation phase. This stage is where the products have been commercialized, and the companies that have the most cost-effective production events will realize the business. The saturation phase is when there is no additional room in the

market for entry from organizations. Leaders of companies may start planning to exit the market while they are working on new products to bring to the market.

The fifth stage in the six-stage product life cycle is the decline of a product. The product has reached its highest potential and is now losing market acceptance. There are fewer customers, and the production of the product has diminished. If there are multiple manufacturers, this is the stage where some company leaders may decide to eliminate the declining product from their product offerings. In the declining phase, companies that leave the market to leave a small void for the remaining manufacturing organizations to realize minimal success. There is a high risk associated if an organizational leader attempts to enter the market when the product has reached this stage. There is little chance of success.

The sixth stage in the six-stage product life cycle is the phase-out of the product. The final step is the phase-out where the product is not being considered in the marketplace and has reached a level of obsolescence. Many manufacturing companies are not producing the product as it has reached the end of its usefulness to the marketplace and manufacturing leaders. The phase-out phase will see a much-diminished need by customers. The customers have moved away from the product or are attempting to move away from the product. Organizational leaders should prepare for this phase to ensure they do not carry excess inventory or utilizing too many resources for this product.

Organizational leaders should understand the stage of the product life cycle their products are in during the duration of the production event. The study by Jennings et al. (2016) of the obsolesces as the ultimate fate of most products. The authors estimate

organizational leaders can save millions of dollars by factoring in the planned obsolesces of their products in the early phases of the new product development process. Berends et al. (2014) reported that leaders of small companies typically have limited resources and must focus on feedback from short-term successes as they do not have the time to wait out a costly long-term program. Product lifecycles are becoming consistently shorter as the global market demands have increased the need for the product to enter the market faster to meet the growing needs of the customer (Linzalone, 2008). Due to the high cost in product development, organizational leaders must understand the product lifecycle of their new products and plan for the ultimate obsolescence of their products to ensure they can adequately plan their process management strategy. The need for faster market entry may help leaders to realize a sustainable product.

Market Entry

There are several areas for new manufacturing products to be designed for the marketplace. The entry point into the market may help understand the potential success or struggles of the manufacturing organizational leaders interviewed for this study. The authors also indicated the lean product launch approach enabled the corporate leader to use only necessary resources to limit the risk if the product is not accepted in the marketplace. Ferrarese and Monteiro de Carvalho (2014) compiled information and summarized the time to market is a constant variable that must be monitored and planned by organizational leaders. Ferrarese and Monteiro de Carvalho also identified leaders must understanding the time to market to enable them to implement alterations to the innovation management processes as needed to get a product to the market in time meet a

need faster than the competition by reallocating resources as needed. The faster time to the market may ensure the outcomes of the company are available to consumers more quickly than the competition with the hope of realizing a profitable product that will help enhance the likelihood of a sustainable business.

The time to market does not guarantee success in the marketplace of new products as there will be some products that may fail in the market and not gain customer acceptance. Derbyshire and Giovannetti (2017) compiled information that supported the idea that not all new products developed for the market will succeed. Derbyshire and Giovannetti summarized one reason there are high failure rates in NPD is due to a failure to recognize the uncertain nature of the NPD process and the continued attempts by organizational leaders to use a probabilistic approach.

Chiesa and Frattini (2011) identified a 40-50% failure rate on new high-tech products. Sok and O'Cass (2015) summarized that organizational leaders should want to improve the failure rate related to expensive new products. Corporate leaders should understand the risk associated with bringing a new product to the market place and be prepared to be able to accept the failure of some products and still ensure the sustainability of the organization and have the necessary resources to pursue additional avenues for revenue.

The target market is essential to organizational leaders as they need to know the requirements of the end-user to increase the chance of market acceptance. The diffusion of innovations theory (Rogers, 2003) is used to compare the level of adoption of a new product or process in the marketplace. Leaders of organizations need to understand the

consumers they have targeted for new products or processes. During the interview process of this research may include the participants discussing the consumers targeted by the leaders. Rogers (2003) formulated the level of these adapters to understand the customers in the marketplace and how the consumer accepts products. Below is a list of the five levels of innovation adoption by consumers, as explained by Rogers.

The first adoption level are the innovators. The innovators are at the forefront of technology and take a higher risk as the new products had more uncertainty and associated with higher risk. Organizational leaders may choose to accept a higher risk if there is an opportunity for a higher reward. Also, the leaders will have to ensure they can absorb the loss if the new product is not profitable.

The second adoption level are the early adopters. Early adopters are like the innovators as the early adopters take some risk but have a higher level of certainty; they are more open to new ideas that have been available and shared with their colleagues. The early adopters have a reduced risk from the innovators, but organizational leaders still need to be aware of the risk and ensure they can accept the risk.

The third adoption level are the early majority. Early majority adopters are cautious about new ideas and take their time to understand the latest products. The old majority of entering the latter than the early adopters and have a reduced amount of risk. The early majority adopters should be more comfortable for organizational leaders to focus their efforts. The early adopters are having less risk associated within the marketplace. Corporate leaders should still be cautious about targeting Early adopters, with a reduced amount of risk.

The fourth adoption level are the late majority. The late majority are the skeptical members of the adopters and represent one-third of the entire group of adopters. The late majority group are more cautious and may become consumers, as a necessity when they decide there is a need to adopt the new product or process. Organizational leaders that target the late majority have a lower risk of product acceptance as the group represents one-third of the consumers, and the product is no longer on the forefront of technology. The late majority are more willing to explore the new technology that has been through the initial stages of adoption in the marketplace.

The fifth adoption level are the laggards. Laggards are the last group to adopt a new innovative product or process after there is an acceptance in the market. The laggards tend to stay away from innovations and wait to see how the new product or process performs in the market. The laggards are the least level of risk out of the group of adopters. Organizational leaders may have less risk associated with targeting these consumers, but the reward may be reduced as the product may become obsolete by the time the laggards decide to entire the market

The five levels of adopters (Rogers, 2003) may help leaders understand the new product requirements and implement process management strategies that will ensure success and sustainability in the marketplace. There are several areas for new manufacturing products to be designed for the market. Frattini, Bianchi, De Massis, and Sikimic (2014) created a study to understand the early adopters of new products; they determined that managers should focus on the targeted segment of consumers that would be the most appropriate for a new product. The entry point into the market may help

understand the potential success or struggles of the manufacturing organizational leaders interviewed for this study. During the data gathering process, the entry into the marketplace may be relevant for the understanding of process management in an organization.

During the interview process of this study, information regarding the target market may be provided by the participants to describe part of their innovation process management practices of their organizations. Participants may or may not understand the five levels of adoption explained by Rogers (2003) diffusion of innovations theory but, they should know the target market based on the level of innovativeness of their standard product offerings. Information regarding the target market was expected to be discussed during the data gathering interview process.

Midler, Killen, and Kock (2016) emphasized the need for organizational leaders to have a heightened focus on organization innovativeness required to compete in the global market effectively. The consistent changes in the marketplace drive the demand for leaders to create a more disciplined and consistent innovation process (Jones, Cope, & Kintz, 2016). Organizational leaders may be able to implement process management strategies based on the level of adoption in their target market.

Process Management

Process management is the set of guidelines that govern all the elements involved with an organization. The process management steps are set in place by the organizational leadership, and the information is distributed throughout the company. The process management strategies of corporate leaders are essential to understand the

philosophy that guides the organization. The plan and the communications to all employees may be able to uncover some practices that have led to the success of the company.

Managing the processes in an organization is the responsibility of all the employees. The leaders should put the correct procedures in place and communicate effectively throughout the company to ensure everyone is working for the same common goals. The knowledge sharing through organizations may be identified during the interview process and displayed in the results of the research in this study as a common theme among organizational leaders.

Leaders of manufacturing organizations must find more efficient ways to enable new products and processes to ensure a competitive advantage. Löfsten (2014) presented a correlation between innovation processes and business performance. Frederick Taylor is the first person to start monitoring processes by performing time studies for each step of the events in a process (Flynn, 1998). Flynn (1998) provided information that Taylor was starting using quantitative methods to conduct time studies during the manufacturing process. Flynn identified that Taylor introduced scientific management that would be the basis for future process management endeavors with the need to understand and measure the operations of an organization.

The work provided by Taylor enabled organizational leaders to focus on the time required for each step in a process. The separation of the process steps allowed corporate leaders the ability to improve a smaller scale the helped the entire process complete a task quicker and achieve the result faster than previous methods. As leaders evaluated each

process step and developed, the whole process can be completed quicker and allow products or services to be available to the consumer quicker and possibly more cost-effective.

The time to market is vital to organizational leaders. The products must meet a quality level that is acceptable to the consumer. There is a history of corporate leaders that realize quality management is required, but they struggle trying to implement processes to provide the desired level of quality for the consumer (Fisher, Elrod, & Mehta, 2011). To ensure a valued product or service in the marketplace, the expected level of quality must be met to satisfy the wants of the consumer. There are several avenues for ensuring a quality product.

Fisher et al. (2011) reported W. Edwards Deming as a critical leader in the field of quality management. Deming provided several process management improvements, including one called Plan, Do, Check, Act (PDCA) to help organizational leaders to make changes to an organization. Deming advised that all employees of the organization must be involved in the process management steps and devise the PDCA cycle to help reduce waste (Jagusiak-Kocik, 2017). The Deming PDCA improvement cycle steps are explained below as provided by Jagusiak-Kocik (2017).

Plan is the first step of the cycle as provided by Deming. The planning phase involves identifying the possibility of changes focused on improvement. This step allows employees to analyze the cause behind problems and develop a plan to correct the issue(s). In this step, many improvement tools are available to support the improvement

effort. In the initial plan step, measurements will be taken to provide a benchmark to evaluate the impact that will be realized after the new processes are established.

Do is the second step of the cycle as provided by Deming. After the initial step has been completed, and all the problems are identified and analyzed by employees, this is the step to develop a plan to make the necessary changes to be implemented. The changes may include a plan to increase quality or productivity and to eliminate the root causes of the initial problem.

Check is the third step of the cycle as provided by Deming. The check step where the employees of the organization can check if the solutions have provided acceptable results. Once the steps are in place, the new results must be compared to the benchmark measurement to confirm the new processes have allowed the organizational leaders to realize the anticipated results. If the desired result is not achieved, the team of employees must return to the Plan stage of the PDCA to reevaluate and create different solutions.

Act is the fourth step of the cycle as provided by Deming. Once the team completes the first three steps, and they achieve the desired result; the new processes are now the new standard. The results are now the new benchmark for the organizational leaders to follow.

The Deming PDCA cycle can help organizational leaders make changes to the organization and help reduce waste while improving quality (Jagusiak-Kocik, 2017). Corporate leaders may be able to utilize the PDCA to incorporate all employees in process improvements. When the entire organization is focused on refinements, there is a higher likelihood of success.

The PDCA cycle is one form of process management. Pyzdek (2001) presented the Select, Experiment, and Adapt (SEA) model that is used to is a dynamic system that can quickly implement changes. Pyzdek also described the Select, Experiment, and Learn (SEL) model is also set up in a dynamic environment to enable organizational leaders to use the information from a process to apply to future steps. The SEA and SEL models are systems that move faster than the PDCA and may help realize short term gains sooner (Pyzdek, 2001). Organizational leaders should understand the short- or long-term goals when implementing process management strategies. The strategies for a specific selection of process management strategies may be obtained during the interview process in this research.

Total quality management (TQM) is a concept utilized by organizational leaders to provide controls to ensure conformance to the quality of a product or service to eliminate waste (Crosby, 1984). The TQM process has been successful for company employees to all help provide a superior quality product with a reduction of unusable products (Crosby, 1984). The goal of reducing quality issues is a goal that can help lead companies to provide a successful outcome.

Six-sigma is a process that can be used to measure the defect levels of products to help organizational leaders identify the areas that must be improved to help meet the quality standards to deliver usable products to the end-user (Pyzdek, 2001). This process allows employees to help companies reduce the number of defects in their products and significantly reduce waste while improving customer satisfaction (Harry & Schroeder, 2000). Harry and Schroeder (2000) argued that the fault of a product is costly to the

entire supply chain as the negative effect related to a non-conforming product can reduce sales and future business and may reduce the potential for sustainability.

Kaizen event is designed to have employees from different perspectives work on solving an issue or on improving a workflow that will enable a more efficient process. A 5S can be used during a Kaizen event. The 5s process identifies the five areas to sort, set in place, shine, standardize, sustain (Chee Houa, Haslinda, Muliati, Mariam Miri, & Rahim, 2018). Chee Houa et al. (2018) provided the following definitions of each of the steps in the 5S process.

The first step in the 5S process is sort. Sort is the process of going through all the elements in a work area with a focus on every variable including tools, machinery, and anything else in the work area to fully understand what is required to do a job to ensure a product can be produced as efficiently as possible. The employees work together to identify all the items that are in the workspace.

The second step in the 5S process is set. Set in place is the event of organizing the supplies and machinery to set them in an area that will help ensure the processes can be followed in the most efficiently. The employees decide what needs to be in the workspace to properly do the job or required tasks. All employees have a voice and must determine what is needed in the workspace.

The third step in the 5S process is shine. Shine is the act of cleaning the entire section of the workplace that is being evaluated for process improvements: the elimination of dirt and broken pieces of machinery. By removing dirt and cleaning the

area, the thought is it will motive employees to help keep the area clean and will quickly identify if something is out of place or in need of repair.

The fourth step in the 5S process is standardize. Standardization is a way to obtain the best practice for employees to follow. With standard methods, organizational leaders will be able to ensure employees are all following the same procedures that have been identified as the best practices for the workflow. The employees have decided on the tools or equipment required in the workspace to complete a task. In the standardization phase, the employees decide on the best way to perform the activity. Ideally, they are deciding on the best practices to ensure there is little to no waste.

The fifth step in the 5S process is sustain. Sustain is the step that can be the most difficult as this is the process that all employees follow the best practices have been identified and implemented. This is the step to ensure all the new procedures are accepted and supported throughout the changes that may occur. Employees have decided to the best practices, in the sustain step, they must reevaluate the process in the future to ensure the best practices are being followed as designed during the 5S event.

The Kaizen 5S event was designed to help employees identify best practices and set up the organization to eliminate waste and be set up for success. A part of the 5S event may include implementing a Kanban to identify when action must occur. A Kanban is a visual system for employees to see that an action must be taken to fulfill part of the process (Liker, 2004). This may be a simple marking to show an employee some needs focus, or it can be an elaborate design that will identify an entire process.

There are many styles of process management that are utilized by organizational leadership from a wide variety of companies in locations all over the world. The Toyota company has the Toyota Production System (TPS) that has been utilized to increase production in manufacturing facilities (Ōhno, 1988). Ōhno (1988) detailed many steps involved with the success of the Toyota organization and identified several actions that enabled the success of the company.

The TPS is based on the elimination of waste in a process. The Just-In-Time system supports the assurance there are only the parts in the system that is needed at that specific time to produce something. The flow of supplies is set in place to keep minimal to zero inventory. Ohno (1988) recognized inventory as a waste that must remain low.

The 5-Why is utilized by employees to understand the root cause of a problem. The process is designed to allow employees to ask why five times to unravel the reason for an issue to find the actual root cause that can then be addressed by the organizational leaders to implement a solution to the issue that solves the problem. Ohno (1988) recognized the need to identify the root cause to fix issues.

Ohno (1988) identified cost reduction as the goal of leadership to focus on efficiencies to eliminate cost associated with the operation of the organization. Production flow in the TPS system was streamlined by combining production activities with one operator running several machines to complete several steps of the manufacturing processes. This eliminated the need for multiple employees, each handling every action in the entire process. The elimination of required employees may save the organizational leaders money.

The Toyota production system has been expanded as the years of progress needed to be improved upon to keep up with industry changes and to be sure the leaders implement new best practices. The *Toyota Way* has helped organization leaders improve their processes and enhance the sustainability of their company's. Liker (2004) expanded upon the Toyota Production System and had presented the following 14 principles that explain the methods that have continued to help Toyota succeed in the marketplace.

The first principle is a long-term philosophy designed to ensure the employees are focused on a common goal of the entire organization. This includes the long-term goals that may mean a reduction in the short-term successes and maybe even a loss of profits. The second principle is continuous process flow. Leaders utilize this step to improve the process to drive out and eliminate waste continually. This can include design changes and process changes. The third principle is to use a pull system to ensure the production area to receive the parts they require when they need it. This step can help ensure inventories are limited to only the in-process work that is necessary. The fourth principle is level the workflow by setting up the production events to work in unison and only producing the optimal amount of work to ensure the entire workforce of the organization is working together. The fifth principle is Build a culture of employees that stop to fix problems to ensure quality is completed the first time and not waiting to do rework or overproduction of defective materials. The sixth principle is to standardize tasks as the foundation of the entire process. The standardize tasks are designed to ensure all employees are working the same way while using best practices.

The seventh principle is visual controls Use visual controls to ensure that problems are not hidden in the process. This includes limiting the number of items employees must look at so they can be focused on the process. Essential visual control is using an optical signal to explain any issue, no matter the complexity. The eighth principle is to use reliable technology that has been tested to ensure you will achieve intended success. The ninth principle is to Improve leaders by providing they understand the work, include the organizational philosophy in their private lives, and can teach philosophy to other employees. The tenth principle is to develop people and teams that can perform at a high level and follows the company philosophy. The eleventh principle is to respect your entire network and help them improve by challenging then and assisting them to do better. The twelfth principle is to perform a Gemba to go out and see the processes yourself to fully understand each step of the process. The thirteenth principle is to make decisions by a consensus and do not rush the process. The members of the group should agree on the decision. The fourteenth principle is to ensure the organization is learning orientated and continue to educate the workforce.

The Toyota Production System has been successful and has been implemented by many organizational leaders. Ohno (1988) provided an excellent overview of the entire TPS program utilized at the Toyota company. Liker (2004) presented information to show the evolution of the TPS program. The TPS is one program. Organizational leaders may use other programs to ensure success.

The awareness, desire, knowledge, ability, and reinforcement (ADKAR) system has been created to help people implement long-lasting change in business, their personal

lives, and careers (Hiatt, 2006). Hiatt (2006) designed the ADKAR model to help organizations succeed. Hiatt had extensively researched many organizations and discovered that the reason for success was not related to one aspect of the process being perfect, but rather the success was dependent on all employees working together on a common goal with a clear focus and individual desire to be successful. Hiatt explained his ADKAR system and the need for change and potential factors that influence success.

The awareness part of the ADKAR system involves in the need for change is the area to ensure that everyone understands what is going. This is the how and why explanation. This is the opportunity to educate people to know why things should change and to alert them to understand the repercussions of the change does not take place. It is essential to help people understand the risk associated with not making the change to give them a full view of the change. In the awareness step, it is also essential to explain what the benefit is to the individual to ensure they understand their interest is for this change. The factors associated with influencing success for awareness are (a) the individuals understanding of the current state, (b) the ability for the person to perceive problems, (c) the credibility of the person relaying the information, (d) rumors that could impact the perception of the individual, and (e) the potential that the suggested change is blatantly wrong when trying to implement the change.

The desire part of the ADKAR system is used once the presenter established the initial goal, they need to create the passion for the difference. The willingness to is dependent on an individual's unique situation and is up to them to want to change. The key to this stage is dependent on the information provided during the awareness stage.

Once the presenter has established a desire within the individual, the presenter can move forward to the knowledge stage of the ADKAR model. Influencing factors for the success of the desired stage are (a) the effect the change will have on the individual, (b) the personal situation of everyone, (c) the entire environment of the organization, and (d) the individual motivating factor for the employee.

The knowledge part of the ADKAR system is used once the presenter has conclusively established desire, the knowledge stage information, training, tools, and education that must be presented to produce the necessary change. The knowledge section will also include information regarding the new processes, systems, tools, techniques, and job roles required to meet the new expectations of the desired change. The change or changes must be shared with all stakeholders involved. The knowledge sharing of the organization is critical to support the change. Influencing factors for the knowledge stage are (a) the current level of knowledge possessed by the individual, (b) access to the correct materials required for training, (c) the ability for the individual to learn, and (d) the ability for someone to teach the individual.

The ability part of the ADKAR system is the stage where the components of change can now be executed at an appropriate level by employees. Hiatt (2006) specified that knowledge itself could not ensure success at the ability level. The individual employee must have the ability to execute the task successfully. At this stage in the change process, there should be a noticeable difference as the change should affect the result of a process.

The reinforcement part of the ADKAR system is an essential step in the process as employees have executed the change. In the reinforcement stage, the actions are any recognition, either private or public. The recognition is important to show positive consequences to complete a transition. The recognition will show employees that their contributions have helped the organization achieve a change that organizational leaders deemed necessary to sustain their business. The recognition should fit the individual needs of the employee to ensure the recognition is meaningful. The influencing factors for success in the reinforcement stage are (a) how meaningful the reinforcement is to the individual, (b) the practical use of the change to show the individual that they have accomplished something for the organization, (c) no negative consequences, and (d) a mechanism that ensures there is meaningful on-going change that will be reinforced by all the employees.

The ADKAR process is one of many potential process improvement techniques that can be utilized by organizational leaders. The steps of the ADKAR process are included in this paper to solidify the understanding that there is a higher likelihood of success when all employees are focused on a common goal. The data gathered in the interview process will include knowledge sharing.

Most of the information in this section includes processes that are a part of lean manufacturing. Lean manufacturing is the process of identifying all wastes in an organization and eliminate everything that does not add value to the customer (Liker, 2004). Other facets are not directly involved in lean manufacturing.

Kastalli and Van Looy (2013) sought to understand how manufacturing leaders utilized enhanced services to improve organizational performance. The authors posit that manufacturing leaders must ensure their customers are serviced beyond their product offerings as the global marketplace is increasingly competitive. Implementing service innovations are challenges that organizational leaders must face when making changes to the organizational structure (Bustinza, Vendrell-Herrero, & Baines, 2017). Enhanced services may be identified in the interview process for this study.

Innovation Management

In this section, several aspects of innovation management are presented to support the research in this study. Innovation management is the steps that link the conception of an innovative idea to the fruition of the idea to the implementation of a product or process. Innovation is a product, process, or idea that is believed to be new by an individual (Rogers, 2003). Becheikh, Landry, and Amara (2006) also included that innovation can be a current product or process that has been significantly improved by organizational leaders. As manufacturing leaders continue to implement new products to the marketplace, they must ensure the process management structure will support the innovation aspect of the entire process to create new or redesigned products for the customer.

Leaders of manufacturing organizations must ensure they have implemented proper innovation processes to support providing new products to the marketplace. Löfsten (2014) concluded that organizational leaders must focus their efforts on positive innovations to enhance the likelihood of a successful business. Raymond and St-Pierre

(2010) asserted that the leadership of small and mid-sized manufacturing companies must continually grow their innovation practices.

Kafetzopoulos and Psomas (2015) conducted a quantitative study and summarized that managers must emphasize the innovation capabilities for achieving a sustainable business that can compete in the global marketplace. Increased innovation practices of company managers may ensure the ability to quickly respond to market changes (Becheikh et al., 2006). The leadership individuals interviewed for this study were able to explain their level of innovativeness. The level of innovativeness has helped identify a common theme that ultimately may be able to use innovativeness as a critical attribute of success.

In a study by Doussard et al. (2017), the authors hypothesized a correlation between positive innovation management and new product development success in the manufacturing sector. Datta et al. (2013) recognized innovation as crucial to the survival of organizations. Crowley (2017) assessed that product innovation has a significant effect on product success. Innovation management may lead to the ultimate success of a manufacturing business by providing new sustainable products to the global marketplace.

Knowledge Sharing

Leaders that design the process and innovation management techniques utilized by an organization must communicate the policies throughout the company to ensure the strategy is understood by the stakeholders (Becheikh et al., 2006). Jones et al. (2016) contended that for innovativeness to seep through the entire organization, leaders must adequately manage the internal and external complexities. A successful leader must be

able to recognize the needs of employees to provide a proper medium to communicate effectively.

The identification and implementation of knowledge creation, continuous learning, and knowledge sharing must be developed by organizational leaders to strengthen the company (Evans & Bosua, 2017). M. Song and Chen (2014) pointed out that leaders may be able to use past experiences as a template to create a best practice model for the employees to follow. Yu, Chen, and Nguyen (2014) conducted a quantitative study and summarized the need for knowledge management for organizational leaders to learn from past successes and failures to understand how to enhance the chance for improved processes for success. The communication of innovation may be a key attribute identified in the results of this study.

Gap in Literature

The gap in the literature is related to the specific reason for a sharp decline in the manufacturing industry. According to the U.S. BEA (2018), from 2007 to 2016, the manufacturing GDP of the U.S. declined by .3%, and the manufacturing GDP for Massachusetts declined twenty-seven times greater at 8%. The purpose of this study is to examine the steep decline in the manufacturing GDP of Massachusetts. The target population was leaders of manufacturing companies in Massachusetts. The goal was to discover what enabled these leaders accomplished to survive through the significant decline from 2007 to 2016.

Many sources of data were used to explain how organizational leaders utilize various process management techniques and a variety of innovation management

strategies to help organizations remain competitive. The increased global marketplace demands have increased pressure on leaders that must react quickly to customer requirements. The focus on the need for innovation is essential for organizations to remain sustainable.

Summary and Conclusion

The goal of this study was to identify the techniques utilized to manage organizational processes and what strategies may lead to success. There are limited resources explicitly identifying the small manufacturing industry in Massachusetts. An in-depth understanding of how small manufacturing companies in Massachusetts survived from 2007 to 2016 is required to help leaders understand what may be done to help ensure their companies are sustainable in the growing global marketplace. In addition, the research findings may add to the knowledge base and used by future leaders of manufacturing organizations.

Chapter 3: Research Method

In the literature review, a gap was identified regarding process management practices used by leaders in successful manufacturing organizations. The purpose of this qualitative exploratory multiple case study was to understand the process management strategies of organizational leaders of small manufacturing companies in Massachusetts. The focus of the study was to understand how employees use and understand successful process management techniques throughout organizations. The research question for this study is: What are the process management practices of successful small manufacturing organizations in Massachusetts?

Research Design and Rationale

The research design for this study is a qualitative exploratory multiple-case study. Yin (2014) said that the research design is the systematic plan that links the research question with the information that is to be collected and analyzed. Researchers use the exploratory case study to understand how or why something happened (Yin, 2014). The purpose of this study was to explore process management techniques used by organizational leaders in small successful manufacturing companies in Massachusetts.

Yin (2014) explained that a descriptive case study is used to describe a phenomenon. The goal for this study was to understand the process management techniques that organizational leaders believe have led to a successful manufacturing business. The exploratory study design is best suited to produce data required to address the research question.

Role of the Researcher

The role of the researcher for this study was to conduct interviews to collect data to address the research question. In a qualitative study, the researcher is the principal research instrument to gather data (Erlingsson & Brysiewicz, 2013; Maxwell, 2013). Patton (2015) said that the interview process is the most common source for data collection in a qualitative study. Interviews were conducted with leaders from successful small manufacturing business in Massachusetts.

I have lived in Massachusetts for more than 45 years, with the past 23 years working for a large manufacturing organization. I am familiar with multiple process management techniques that have worked in a large manufacturing company. My years of manufacturing experience helped during the interview process regarding additional topics not addressed in the literature review about process management functions in relation to the manufacturing environment.

For this study, I selected leaders of manufacturing companies that I did not know. To help reduce any bias I may have had toward the research, I informed all interview participants about my background in manufacturing. Janesick (2011) said that the researcher should recognize and understand their personal bias that may affect the research study. I understand my personal bias might have influenced the study and worked to ensure I did not allow this potential bias to skew the results.

Methodology

A qualitative exploratory case study was selected as the best research method. Maxwell (2013) stressed the need for researchers to ensure proper procedures for

recruiting participants, site selection for interviews, instrumentation, transcription, and data analysis for qualitative research. In this section, I present the plan for ensuring all concerns associated with the qualitative research method are addressed.

Participant Selection

This study included 15 organizational leaders from five small manufacturing businesses in Massachusetts. This study defined small businesses as any company with fewer than 500 employees. The organization had to have been in business since 2006. Participants had at least 5 years experience in their company. Participants were able to explain the process management structure of their individual organization.

Instrumentation

I conducted one face-to-face interview in person and 14 via phone conversations. I planned on conducting interviews using an Internet-based program similar to Skype to allow for audio and video conferencing. The participants preferred phone interviews. The ideal setting was wherever the participant was most comfortable to be able to ensure a stress-free interview process. The semistructured open-ended interview questions allowed for open dialogue to identify critical components of process management techniques used by organizational leaders of each small manufacturing company.

Interview protocols enhanced the formality of the interview process. Jacob and Furgerson (2012) composed an outline for interview protocols and stressed the importance of having the protocols in place before the interview process. The interview protocols for this study included the background of this study, procedures that guided the interviews with the same interview questions, personal research bias associated with

manufacturing, risk mitigation for each participant, the understanding by each participant that there is no compensation, and the option for each participant to remove themselves from the study at any time during the interview process. The formal interview protocol process helped enable an environment conducive to gathering data relevant data to the research.

Recruitment Process

The target population for this study was organizational leaders from small manufacturing businesses located in Massachusetts. For this study, 15 organizational leaders from five different small manufacturing businesses were interviewed to obtain data. The participants had to have been in a leadership role for a minimum of 5 years. Each organization used in this study must have been in business between 2007 and 2017 to ensure the organizations were in business during the time of decrease in the Massachusetts GDP identified in this study.

I began the recruitment process by contacting a high-level executive from each organization to request permission to interview some of their leaders. I found a person within the targeted small manufacturing organizations for this study, who were able to commit to allowing the participation of employees. When I first sent out the outline of my research, I did not receive any replies. When I reached out to the contacts at each organization, they indicated I initially sent an overwhelming amount of information. I narrowed down the information and initiated discussion with the organizational contacts to provide information for the research study.

Once I realized there was too much supporting data, I sent out the necessary information required for the study and spoke to my organizational contacts and proceeded with the study. I asked that the organizational contact provide my contact information to potential candidates for the study. I found the organizations through Internet searches, the Massachusetts Chamber of Commerce, SBA, and personal contacts of people I know that work at the targeted companies that could provide the data required for this study.

Participation

Once potential participants were vetted and qualified for the study, I reached out to them to discuss the next steps of the process. I had participants read and sign a consent form and schedule an interview based on their selected location. The participants were asked the same open-ended interview questions (see Appendix B), and the interviews were audio-recorded. All participants were provided detailed instructions regarding the interview process. All participants had the option to remove themselves from the study at any time up until the completion of the member check step that was conducted immediately after the interview.

Data Collection

I used the interview protocols from the participant consent form and the interview questions (see Appendix A) to facilitate the outline of the semistructured interviews. I use e-mail and phone calls to set up interviews with participants. All interviews were recorded utilizing an automated NoNotes.com recording program. Before the start of the interview, I ensured there was an informed consent form signed or a valid email stating the individuals understands the process and is willing to participate.

Interview Questions

Process management is the set of guidelines that govern all the elements involved with an organization. The process management steps are set in place by the organizational leadership, and the information is distributed throughout the company. The process management strategies of corporate leaders are essential to understand the philosophy that guides the organization. The plan and the communications to all employees may be able to uncover some practices that have led to the success of the company. Process management is the set of guidelines that are in place to govern all areas of the organization.

Data Analysis Plan

Once the data were collected from the interviews, the data were hand-coded to look for themes among the varies answers provided by the participants. After the hand-coding was complete, I used software like NVivo 12 to analyze the data further to identify the commonalities between the answers. I used the software to examine each question from all interviews and then used the data collected from all interview questions to find a combined theme or themes to understand the process management techniques that have been effective and the themes that shown less than adequate results.

Issues of Trustworthiness

The point of trustworthiness is connected to the internal and external components of the study that can solidify the validity of the study. Maxwell (2013) asserted the need for trustworthiness in a research study. In this section, I will explain how I have approached and will address the issues of credibility, transferability, dependability,

confirmability, trustworthiness, and ethical considerations. I used the qualitative method to ensure the meaning of the answers provided by the participants. Patton (2015) asserted the data retrieved during a qualitative study has a focus on the meaning provided by the participants. By utilizing the qualitative method, I had a higher chance of obtaining the correct information for my research.

Credibility

Credibility is crucial to support the internal validity of the research study. To establish credibility, I utilized triangulation of the data and member checking. Member checking is when the researcher shares the recorded answers with the participants to ensure the interpretation is accurate (Patton, 2015). The participants were in an interview area that they have chosen. The data collection event was conducted in semistructured interviews that allowed for open and honest dialog. The information collected was expected to be the honest opinion of the participants. The additional step of member checking ensured the information captured was the true meaning of the answers.

Transferability

Transferability must be established to ensure someone else can replicate the study (Houghton, Casey, Shaw, & Murphy, 2013). The participants I targeted for this study included organizational leaders from different companies. There was enough of a variation to ensure the results were not inaccurately skewed towards one area. Multiple themes arose that most likely would be addressed in a similar research study focusing on process management in a small manufacturing company.

Dependability

The data collected in the interview process are stored to ensure they are readily available for review as needed. The field notes, transcriptions, audio recordings, and the member checking documentation were saved. The data were processed through coding software will also be stored to ensure the information is available for future review. All the collections of data were utilized to analyze the result.

Confirmability

To ensure confirmability, I used all the information from the interviews, along with notes taken during the interviews notes. These notes were compared to examine with the resulting themes to understand how well the data have been analyzed and to demonstrate data saturation was achieved. The recording of the interviews enhanced the likelihood of obtaining and processing the correct data.

Trustworthiness

This section included some of the countermeasures used to ensure trustworthiness in this study. To ensure trustworthiness, there must be a clear research question, the proper research design, data management, and appropriate analysis of the data (Baxter & Jack, 2008). I have provided examples of the research method and design, my process for facilitating the data collection, and analysis.

Field tests were distributed to qualitative subject matter experts (SME) to determine the appropriate interview questions to align with my research question were being used and ensure there was the presence of validity and trustworthiness. The research questions and interview questions to 10 SME's. A brief background of the

problem statement and the purpose of the study was provided. Four replies were received and noted that the number of questions should be reduced, and the focus of the research study should be narrowed. Appropriate updates were made from the field test participants, and the study is now in better alignment with the purpose.

Ethical Considerations

In this section, the ethical considerations that were addressed during the study are noted. Consideration was given that ethical implications that may arise during this study, to the participants, and the results of the study. First, approval was needed from the university institutional review board (IRB) to conduct the study. No data were collected until the IRB approval number 04-25-19-0564072 was received.

All participants were provided with an informed consent form. The informant consent is necessary when interviewing people (Janesick, 2011). The researcher is responsible for ensuring the participants are aware of what is being requested and how the data will be used. All participants were informed and only agreed to participate in the study after their questions were answered. A code was assigned to each participant to identify them and their organization and maintain the anonymity of each interviewee.

Summary

In this chapter, the research method and design for the study is presented. The goal of this study was to identify the process management techniques utilized by organizational leaders in small manufacturing companies located in Massachusetts. The expectations of the interviews would produce data, that if analyzed, would discover themes and commonalities between the companies. In addition, some techniques were

identified that have been detrimental to organizations. Chapter 4 also includes the collected data and the analysis performed with the raw data.

Chapter 4: Results

The purpose of this qualitative exploratory multiple case study was to understand the process management techniques used by leaders of successful small manufacturing companies located in Massachusetts. From 2007 to 2016, the manufacturing GDP in the Commonwealth of Massachusetts decreased by 8%, and the manufacturing GDP for the entire United States declined by 0.3% (BEA, 2018). The decline in the Massachusetts manufacturing GDP led to my research to understand how companies have survived through this period. Datta et al. (2013) identified process and innovation management techniques are linked to successful manufacturing companies.

A semistructured interview process to interview 15 leaders from five different small manufacturing companies in Massachusetts was used. Chapter 4 includes the research setting, demographics, research participants, recruiting process, data collection, data analysis, evidence of trustworthiness, and emergent themes that have been identified through hand-coding of data using NVivo 12.

Research Setting

The participants for this study had the option of being interviewed in person outside of their organization, through a video conference, or by telephone. Of the 15 participants, 14 (93%) chose to be interviewed via telephone. One person wanted a face-to-face interview. All research participants checked a transcript of their interview to ensure the accuracy of their answers.

Five companies were included in this study. Three employees from each company volunteered to participate in the data collection interview process. The same

processes to conduct all semistructured interviews were followed for all participants. The interview protocols set in place were followed and were repeated for each interview. The interviews and member checking were completed during May 2019. The interviews lasted an average of 31 minutes. Years of employment for participants ranged from 5 to 39 years, with an average of 19 years of work at participating organizations.

Demographics

The research participants for this study were organizational leaders of small manufacturing businesses in Massachusetts. Each participant has worked at his or her company for at least 5 years. All businesses were located in the Commonwealth of Massachusetts. Participants knew internal processes at these organizations and were willing to participate with the understanding that they could remove themselves from the study up until member checking was complete. Of the 15 participants, 12 (80%) were men, and three (20%) were women. Participants included managers and presidents.

Table 1

Demographic Data of Respondents

Participant	Male/Female	Title	Number of Years employed at company
A.1	Male	President	39
A.2	Male	Operations manager	6
A.3	Male	Technical manager	10
B.1	Female	Manager	32
B.2	Male	Production manager	19
B.3	Female	Manager	29
C.1	Male	CEO	30
C.2	Male	Process manager	16
C.3	Male	Director Manufacturing	6
D.1	Male	Sales Manager	9
D.2	Male	Production Manager	11
E.1	Male	Production Manager	16
E.2	Male	President	30
E.3	Female	Purchasing Manager	5

Data Collection

There were many steps involved in the process of collecting data. This section includes information regarding how research participants met the criteria for the study, how potential research participants were identified, recruitment strategies and methods for the participants, how data were collected, and data analysis procedures. In addition to data collected in interviews, data were also collected through a thorough review of the literature. To identify companies for this study, many organizations were researched to ensure they met criteria.

Inclusion Criteria

For manufacturing organizations to be included in this study, they must have been in business in Massachusetts from 2007 to 2016, and they must have had fewer than 500

employees during that period. A purposeful sampling strategy was used to identify organizations through Internet searches, business periodicals, industry knowledge, and personal contacts. Participants had to meet the following criteria to be considered for the study: be in a leadership role, (b) be employed in the organization for a minimum of 5 years, not all of which need to be in a leadership role, and be willing to participate in an interview for data collection. Fifteen participants were identified to ensure relevant data was collected.

Identifying Potential Participants

Potential research participants were identified by searching for manufacturing companies that met preset requirements. I contacted 30 companies to arrive at five companies willing to participate. Information on each company was collected to ensure they met the criteria. The first company contacted was willing to participate, but they did not have three people in leadership positions. Sixteen companies did not return initial telephone calls. The identification strategy was modified to a purposeful sampling strategy to meet the preset requirements.

Recruiting Participants

Once qualified business leaders who were interested in this study were identified, a brief overview of the research study was presented, followed by a question and answer session to clarify any of the study and participant requirements. To further the purposeful sampling strategy, potential participants were encouraged to share researcher contact information to employees who met the research participant criteria. Once likely companies were identified, initial contact with potential participants was made via email.

Potential employee participants were requested to contact me via email to discuss the research to be conducted, at which point the study was presented and any questions were answered. Potential participants received the consent form, and interview dates, times, location, and methods (telephone, video conference, or face-to-face) were arranged to fit the participants preferences.

Participants

Fifteen employees willing to participate in the study were identified. Of the 15 research participants, three (20%) were women, and the remaining 12 (80%) were men. Fourteen (93%) of the interviews were conducted via telephone calls. One (7%) interview was in person. The participants typically picked telephone calls after 6:00 p.m. Eastern Standard Time. During the initial contact with the participants, further information about my study was presented and a question and answer session was provided. Interviews lasted from 18 to 38 minutes. The average time for all interviews was 31 minutes.

Variations in Data Collection

Face-to-face interviews, video chat via Skype or similar software, and telephone interviews were used. Expectations of a higher frequency of face-to-face interviews or variations of potential interview protocols were not met. Almost all participants (93%) selected telephone interviews. The data collection was satisfactory, and all interviews were recorded with NoNotes software. The basic transcription services provided by the software was an issue: The software program transcribed most of the interviews but missed some parts. Each interview needed to be replayed and compared to the initial

transcription, and numerous corrections and updates were required. The extra steps of manually transcribing the interviews took extra time but was a necessity for accuracy.

Data Analysis

After all interviews were completed and transcriptions verified by the participants, data were hand-coded to identify themes. NVivo 12 software was used to process the data collected during the interviews, and to code the entire collection of data from all the questions combined. The interview questions were separated the questions into two segments. One segment included the processes that worked for process management. The other segment contains two questions that identified what process and innovation management techniques did not work.

Of the nine interview questions, seven (78%) were intended to gather information about the positive effect of process and innovation management. The remaining two (22%) questions were focused on the adverse effects of process and innovation management. The seven questions about the positive effect were analyzed with NVivo 12 software remaining two questions were combined to identify common themes.

Evidence of Trustworthiness

Maxwell (2013) asserted the requirement of trustworthiness in a research study. Topics include (a) credibility, (b) transferability, (c) dependability, and (d) confirmability. Patton (2015) stated that the data collected in a qualitative study must have a focus on the information provided by the research participants. In this qualitative study, data provided from the research participants were used to analyze the process and innovation practices of small manufacturing companies in Massachusetts.

Credibility

Semistructured interviews were used to gather data. Member-checking was used to verify the accuracy of the data. Interview data were collected, transcribed, and sent to each research participant to allow them to correct or change their responses. Each participant was allowed to change their responses to ensure the data effectively captured the meaning provided by each participant. The interviews were completed with a comfortable open and honest dialog. The same interview protocol was used for each research participant. This protocol helped to keep the interview on track and allowed each participant time to reply to the questions.

Transferability

Research participants who are leaders in small manufacturing businesses in Massachusetts were recruited. Each research participant had to meet the preset criteria to participate in the study. The research study must be set up in a way that would allow another researcher the ability to replicate the study to achieve transferability (Houghton et al., 2013). The variation in the product line for each company ensured the results would not be skewed in one direction. In addition, participants from companies located in various parts of Massachusetts and not all in one small geographic area. It is expected that results and themes identified would be similar if another researcher replicated this study.

Dependability

Pursuant to this research study, data have been collected from the interview process, field testing, transcriptions, audio recordings, and member checking documents.

The physical information is secured in a safe in the researcher's home. The electronic data collected stored on computers is password protected. The physical data and the electronic data will be stored for at least 5 years and available for review if required.

Confirmability

To ensure confirmability, all interview collected data were used. The data were first hand-coded, then coded the data with NVivo 12 software. Before the interviews, a field test was conducted to ensure the interview questions were appropriate to achieve the desired results. Some of the initial interview questions were changed based on feedback from the field-testing participants.

The field test was conducted by sending an outline of the study and the interview questions to 10 people with Ph.D.'s considered subject matter experts (SME) in qualitative studies. I received constructive feedback from four (40%) participants in the field test. Three (30%) people did not reply, three (30%) people replied and told me they could not help me. I used the information provided by the remaining four individuals. Initially, my questions were too broad and were beyond the scope of my study. The final alignment of my questions helped gather relevant data during the interview process.

Study Results

The conceptual framework for this study is systems theory. Stewart and Ayres (2001) advised that a system is a connected assembly of the various parts of an organization. Systems theory provides a way for the researcher to identify problems that may otherwise be overlooked as system theory in research is used to focus on the entire system (Von Bertalanffy, 1972). Systems theory was used in this study to understand the

process and innovation management strategies used by organizational leaders. Questions were constructed to provide an in-depth view of the subject matter for my research.

A qualitative exploratory multiple-case study was used for this research. Yin (2014) categorized the purpose of a case study is to collect data, analyze justly, and to present the results with in-depth, relevant information. The research participants for this study included employees from five different manufacturing companies in Massachusetts. The research question was: What are the process management practices of successful small manufacturing organizations in Massachusetts.

Hand-Coded Themes

Once the data were collected, and after member checking to assure the information was collected and the appropriate information contained within, the answers were reviewed to ensure the proper information was being used for analysis. From interview questions 1, 2, 3, 4, 6, 7, and 8, I identified several themes in the hand-coding event. The codes are customer involvement, employees, evaluation, and communication. I used these questions as they relate to the need for innovation and process management, along with the implementation of the processes.

Question 5 and 9 related to what did not work for process and innovation management. I identified not achieving buy-in from the stakeholders, lack of communication, and managing from behind a desk like a common theme of what did not work. I used this step to get an understanding of the data I had collected. Once I completed the hand-coding activity, I used NVivo 12 to help identify additional codes or themes or to supplement the findings I observed in the hand-coding event.

Emergent Themes from Data

Results from analyzing the data with NVivo 12 are presented (see Figure 1). Some of the apparent findings in my hand-coding are apparent in the emergent themes from NVivo 12. The data were collected from the questions involving the positive aspects of process and innovation management. Seven emergent themes were identified, including employee involvement, customers, communication, products, innovation, knowledge, and analysis (see Figure 1).

Figure 1. NVivo 12-word frequency cloud positive aspects.

Emergent themes from the negative aspect of process and innovation management were identified. The data were obtained by asking participants: What process management techniques were not successful? and What process management techniques

have had a negative effect on innovation management? The three emergent themes were (a) managing from a distance, (b) lack of communication, and (c) no buy-in from stakeholders, as shown in Figure 2.

Figure 2. NVivo 12-word frequency cloud negative aspects.

Emergent Theme One: Employee Involvement

The central theme was identified as employee involvement. Employees have been directly mentioned in six (86%) out of the seven questions that were based on the positive aspects of the research. Of the 15 participants, 13 (87%) mentioned employees during the data collection interviews.

During the interviews, several references directly related to employee involvement. Participant A.2. stated, “Get feedback from everyone involved” and, “I ask

employees what they think." Participant E.3. explained the need to "Talk to the employee(s) that are closest to the process."

Emergent Theme Two: Customers

The participants identified customer involvement as being critical to the process and innovation management strategies. In manufacturing, customers are crucial to the sustainability of the organization. Customers were mentioned in five (71%) out of seven questions. Of the 15 participants, 12 (80%) said employees during the data collection interviews.

During the interview process, Participant A.3. identified the need to update a process as, "due to a customer request" and they would, "develop a new process to meet customer specifications." In the interview, Participant C.1. stated, "We are responsive to customers. To be successful in this business, you would have to be able to adapt very quickly and to provide a very high level of service".

Emergent Theme Three: Communication

The participants identified communications as an essential strategy. Communication was mentioned in three (43%) of seven interview questions. Of the 15 participants, 15 (100%) noted communication during the data collection interviews. Communication was prevalent throughout the interview process with all the participants referencing communication.

Participant B.3. stated, "We just verbalize, or we show people how things are done." Participant B.1. identified communication as, "The owners have two meetings a day." The identification of the theme revolves around communication. The

communication can be with employees, customers, or any stakeholder that is affiliated with the organization.

Emergent Theme Four: Products

The theme of products was mentioned in three (42.86%) of seven interview questions. Of the 15 participants, 15 (100%) noted products during the data collection interviews. The basis of this study is on process and innovation management techniques within small manufacturing businesses. Manufacturing businesses must have a product. Participants had a wide variety of references to products such as, "product specifications are documented" from Participant B.3. and Participant B.2. stated, "I use a hands-on approach and show the employees how to produce a product." Participant C.1. offered, "Once we have a conforming product, we document the process." Products are essential as the products are the main form of revenue from the organizations included in this study.

Emergent Theme Five: Innovation

Innovation was mentioned in four (57.43%) of seven interview questions. Of the 15 participants, 14 (93%) identified innovation during the data collection interviews. The theme of innovation was expected, as this study includes innovation management as one of the critical elements to be researched. Innovation does not necessitate major changes as Participant D.3. stated,

> Innovation in our industry is not the same as innovation and maybe the electronics industry. Our products have been very stable and relatively consistent throughout its life. There are not too many crazy designs coming out. I think for us it's

> managing the process and providing products to people that their processes are changing. So for us it's important to be aware of what our end users are doing and making sure that whatever we're converting and creating is a finished good that is the bet best fit for use for our customers That's how we handle innovation, is how do we change our industry that has stayed the same for so many years to match what our end users need.

Emergent Theme Six: Knowledge

Knowledge was mentioned in three (43%) of seven interview questions. Of the 15 participants, 15 (100%) stated knowledge during the data collection interviews. Knowledge of industry expertise is valuable as Participant D.3. stated, "I think at first it is always kind of a brainstorming session, and I think usually new processes are developed based on identifying the problem correctly." The level of understanding identifies the need to have and maintain knowledge.

Emergent Theme Seven: Analysis

Analysis was mentioned in two (29%) of seven interview questions. Of the 12 participants, 15 (80%) stated analysis during the data collection interviews. Analysis can be a set of metrics like tracking scrap numbers as stated by Participant E.3., "Tracking product scrap numbers for each department, tracking new supplier product samples, Continuous improvement/eliminating waste." The analysis can be used in a wide variety of processes as indicated from Participant A.3. who stated, "A focus on safety, quality management, and a continuous Plan, Do, Check, Act process helps ensure the benefit of our processes. In addition, communication with customers and employees."

The continual feedback loop after the analysis and subsequent additional analysis was prevalent in many interviews. The plan, do, check, act process was directly mentioned by other organizational leaders. In another interview, Participant B.1. stated, "When you change your process, you have it implemented and then see whether the change is working. Communicate the changes and receive feedback. Troubleshoot any issues that may come up."

Emergent Theme Eight: Managing from a Distance

Managing from a distance was mentioned in two (100%) of two interview questions regarding a negative or unsuccessful technique. Of the 15 participants, 13 (87%) cited *managing from a distance* during the data collection interviews. Managing from a distance was explained by Participant D.1. as, "Delegating, by principle, does not work. You cannot sit down and tell people what to do. Management from a distance; pure delegation does not work. Implementing the latest 5S process without support will not work." Participant B.3 stated an unsuccessful technique as, "Managing behind a desk does not work" and Participant B.3. identified managing behind a desk as harming innovation management. The managing from a distance or behind a desk was critical to many of the participants.

Emergent Theme Nine: Lack of Communication

Lack of communication was mentioned in two (100%) of two questions regarding a negative or unsuccessful technique. Of the 15 participants, 14 (93%) cited a *lack of communication* during the data collection interviews. Communication is mentioned as positive and negative. Both variations of communications are identified as they were

prevalent in the data collection process. Participant B.1. stated, "Lack of communication" as an unsuccessful process management technique. Participant E.3. added, "Not communicating the goals or just telling someone what to do. People need to understand the value they add".

Emergent Theme 10: No Buy-in from Stakeholders

No buy-in from stakeholders was mentioned in one (50%) of two questions regarding a negative or unsuccessful technique. Of the 15 participants, 12 (80%) mentioned *a lack of buy-in* from stakeholders during the data collection interviews. Also, Participant E.3. who stated, "Not communicating the goals or just telling someone what to do; people need to understand the value they add." If the employee does not understand their value, they may not have the optimal level of buy-in. Participant D.3. added, "People may not buy into a new plan if it is presented as the next thing."

Summary

This chapter contains the data collected during interviews of 15 participants. The semistructured interviews were conducted with open-ended questions to explore the process management techniques of successful small manufacturing businesses in the Commonwealth of Massachusetts.

During the analysis of the data, 10 themes were produced by utilizing NVivo 12 software. The seven themes are identified as the positive effects of process management are (a) employee involvement, (b) customer, (c) communication, (d) products, (e) innovation, (f) knowledge, and (g) analysis. The positive aspect of process management was represented with seven interview questions.

The negative effect of process management was identified with two interview questions. The three themes associated with negative or unsuccessful process management are (a) managing from a distance, (b) lack of communication, and (c) no buy-in from stakeholders. Chapter 5 contains the findings from the study and the interpretation of the findings.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to understand the process management techniques used by leaders of successful small manufacturing companies in Massachusetts. Fifteen purposely sampled leaders were identified from five small manufacturing companies in Massachusetts. Three of the companies were in central Massachusetts, one company was in eastern Massachusetts, and one company was in western Massachusetts.

The research question involved how small manufacturing companies survive tough economic times and what process management strategies helped. Between 2007 and 2016, the United States Manufacturing GDP decreased by .27% (BEA, 2018). During the same timeframe, the manufacturing GDP of Massachusetts declined by 8% (BEA, 2018). The decrease in the Massachusetts manufacturing GDP is an appropriate topic area to study. Specifically, the focus was on leaders of small manufacturing companies who have sustained their businesses.

The systems theory was used to focus on process management techniques used by organizational leaders. Batra et al. (2010) said that systems theory allows the researcher to uncover issues by viewing the whole entity of the system to be analyzed. A qualitative multiple case study method was used. Interviews were used to gather relevant data. Each company was treated as an individual case.

Based on the research question, problem statement, and nature of the study, purposeful sampling was used to identify companies and participants for the study. Fifteen participants were interviewed who were in leadership roles with at least 5 years of employment at their company. A semistructured interview approach was used with nine

open-ended questions for each participant during telephone and face-to-face interviews. The nine questions were designed to extrapolate relevant information for the study. Once data were collected, results were hand-coded to identify common themes. NVivo 12 software was used to expand on themes and commonalities in the collected data. In the next section, data interpretation is presented through the analysis of data collected during the literature review and interviews.

Interpretation of Findings

During the coding of data, 10 themes emerged that were relevant to the study. Seven themes that contributed to the positive aspects of process and innovation management were employee involvement, customers, communication, products, innovation, knowledge, and analysis. Three themes which were negative aspects of process and innovation management were managing from a distance, lack of communication, and (no buy-in from stakeholders. To present the interpretation of the findings, all 10 themes are grouped into four sections: communication, innovation, knowledge, and lack of engagement.

Communication

The communication theme was predominantly acknowledged in the data collected from participants. In this section, communication included interactions with employees and customers. Participants referred to communicating with employees and customers throughout the interview process. Participants identified the importance of employee involvement with process management to keep them engaged in the process management procedures and provide feedback regarding any process changes. Employees were

identified by the leaders to obtain feedback from employees that are closest to the process. Customers were also included as a critical element in interviews as new processes could be designed to meet the needs of customers. As customer requirements increase, company leaders need to ensure they create processes that can adapt quickly to changes. To continue to provide quality products to their customers.

Communication throughout the organization and with customers is crucial to the success of a small manufacturing company. Ensuring communication with all stakeholders was identified as a necessity to ensure positive results of a new process. Collaborative efforts with all stakeholders are essential for manufacturing leaders to ensure they are working on correct processes.

Innovation

Innovation in processes and products was identified as being necessary for the success of manufacturing companies. Fourteen (93%) of the 15 participants said that proper innovation processes are essential to remaining competitive in the global environment. Products must meet constantly changing product requirements set by customers.

Knowledge

Industrial Knowledge was mentioned by all 15 participants in the data collection process as meeting with stakeholders to understand requirements, and brainstorming meetings were discussed as necessary to ensure organizational leaders set optimal processes in place to ensure success. Participants discussed the need in their organization to retrieve and understand data to ensure the customers desired results with proper

processes. Participants also focused on waste as unit costs per product must be kept low to remain competitive.

Lack of Engagement

The negative aspects of process and innovation management may lead to negative results for process or innovation management. Lack of engagement was mentioned by 14 (93%) of the 15 participants in the interview process as a hindrance that does not work. Managing from a distance is described by participants as a leader that is trying to manage work without an understanding of what is happening at the point of work. The participants explained that managing from a distance would not produce positive results as a leader may not achieve the optimal level of buy-in from all stakeholders.

Limitations of the Study

Researchers must know the potential limitations of their study to ensure they are aware of shortcomings (Brutus et al., 2013). The potential limitations mentioned in Chapter 1 included researcher bias. To offset any possible bias (advertent or inadvertent), a thorough explanation of the study was provided to participants who worked with the current manufacturing company where I was employed. The interview script approved by the Walden University Institutional Review Board (IRB) was followed and the IRB approval number is 04-25-19-0564072.

Another limitation noted in Chapter 1 was the number of manufacturing companies included in the study. The five companies selected may not represent all of the manufacturing organizations in Massachusetts. To mitigate this limitation, companies from various geographical locations of Massachusetts were included. The third limitation

was the inclusion of only companies located in Massachusetts as the study may be more comprehensive if several States in the U.S. were included.

Recommendations

A qualitative exploratory multiple case study design was used to understand the process management strategies of successful small manufacturing companies in Massachusetts. A purposeful sampling strategy was used to recruit 15 participants who were in leadership roles from five different manufacturing companies. Participants were in leadership roles that included front line managers and owners of organizations. The multiple case study was ideal to obtain data required for analysis to understand successful manufacturing strategies used by each leader. Successful communication techniques, innovation strategies, and industry knowledge are beneficial for organizational leaders to achieve success. Lack of engagement was identified as having a negative impact when trying to implement and maintain a new process or product.

During the interview process, a semistructured approach guided by the research question was used to gather data from 15 participants. The questions were focused on the positive and negative effects of process and innovation management. This study was to understand what process management techniques worked for each organization and what leaders identified that did not work. The interview questions (Appendix A) were used during each interview.

A focus on five companies might not provide optimal data. A future researcher may consider expanding the research to include more organizations, use the same study design and focus on one specific type of manufacturing (the companies included in this

research study were based on various manufactured products —a focus on one product may be able to extrapolate data for that industry, expand the study to include the entire United States with a similar emphasis on process management, or focus on individual states in the United States. The collected in expanded studies may be used to validate the results from this quantitative study.

The themes of communication, innovation, knowledge, and lack of engagement might be included in the academic curriculum for institutions that are focused on producing future leaders that may be employed by manufacturing organizations. A specific focus on curriculum may help future organizational leaders apply strategies that have led to success in other companies. Organizational leaders may be able to enhance the knowledge of future leaders by learning from previous leaders.

Current manufacturing company leaders may be able to incorporate strategies such as communication and knowledge sharing to help improve their present performance. In addition, current organizational leaders may be able to filter out and identify potential future leaders based on the strengths inherent in the potential leader that align with positive results in the company. Current leaders may change some of the key performance indicators (KPIs) to align the company goals with processes that are known to lead to success.

Implications

The implications of the study are current to manufacturing company leaders in Massachusetts. Future researchers might address the declining of manufacturing companies and jobs. The implications of the research finding may help highlight the

strategies to increase the success of manufacturing companies and increase the number of manufacturing jobs. In addition, the lack of engagement that has been highlighted in this research study might help organizational leaders avoid the common negative issue in organizations.

Significance to Theory

Systems theory was used to conduct this study. The systems theory approach allowed the researcher to focus on the process management strategies of organizational leaders by asking specific questions that would uncover the relevant data. The findings may support the assertion of the effectiveness of systems theory. This concept was solidified by narrowing the focus of process management from the viewpoint of 15 participants.

Current researchers focus on business innovation, but there is a lack of specific data regarding what strategies work in small manufacturing businesses in Massachusetts. A case study design was used to focus on each manufacturing company as an individual case. Information was extrapolated from each company; aggregate data were analyzed to identify themes and commonalities that existed between each company and the individual leaders.

Significance to Positive Social Change

Company leaders who adopt the themes identified in this study might improve the success rate in their business. A successful manufacturing company may offer more jobs in the local community. In addition, the companies may be able to produce more revenue that can support the local community through increased taxes at the local and state levels.

This increase in tax revenue may lead to increased amounts of money available to the governing bodies; thus, providing more money to go back into the communities. Company leaders who increase revenue in their organizations may be able to hire more employees. Each new employee may be able to positively affect the local community by paying individual taxes and by supporting local business as patrons to various companies in the local community. Manufacturing jobs are considered a good-paying job. With good-paying jobs, individuals may be able to thrive in the local community.

Educational institutions might improve their academic programs by offering focused courses based on meeting the criteria necessary in manufacturing leaders. The programs may be beneficial as future graduates may be more appealing to organizational leaders as they may have a skill set that matches the needs of the various companies. This type of focused educational program may benefit new employees to organizations as well as the long-term leaders that could use new techniques.

Conclusion

The steep decline in the manufacturing industry prompted research in this area. The loss of manufacturing jobs and companies was apparent in the 8% decline (U.S. BEA, 2018) in the manufacturing GDP of Massachusetts from 2007 to 2016. Numerous factors may have contributed to the steep decline. In this study, the focus was on process management strategies. Băjenescu (2017) posited that every part of an organization must implement and use process management techniques to promote and support innovation projects. In the study, the emphasis of process management and the effect of process management on innovation management was the driver for this research.

The main themes identified as success strategies included (a) communication, (b) innovation, and (c) knowledge. The negative aspects uncovered in the data gathering process included a lack of engagement. Communication, innovation, and knowledge may help reduce the lack of engagement that leaders see as a negative. Enhanced communication with customers, employees, and all stakeholders may help organizational leaders to ensure their companies are successful and achieve sustainability in the global marketplace.

References

Băjenescu, T. (2017). The business value of innovation management. *FAIMA Business & Management Journal*, *5*(2), 40-51. Retrieved from http://www.faimajournal.ro/

Barnham, C. (2010). Qualis? The qualitative understanding of essence. *International Journal of Market Research, 52*, 757-773. https://doi.org/10.2501/S1470785310201648

Barnham, C. (2015). Quantitative and qualitative research: Perceptual foundations. *International Journal of Market Research, 57*, 837-854. https://doi.org/10.2501/IJMR-2015-070

Bartoska, J., & Subrt, T. (2012). The effect of human agent in project management. *Central European Journal of Operations Research*, *20*, 369-382. https://doi.org/10.1007/s10100-011-0209-4

Batra, A., Kaushik, P., & Kalia, L. (2010). System thinking: Strategic planning. *SCMS Journal of Indian Management, 7*(4), 5-12. Retrieved from https://www.SCMS.edu.in/journal

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report, 13*(4), 544-559. Retrieved from https://nsuworks.nova.edu/tqr/

Becheikh, N., Landry, R., & Amara, N. (2006). Lessons from innovation empirical studies in the manufacturing sector: A systematic review of the literature from 1993-2003. *Technovation*, *26*, 644-664. https://doi.org/10.1016/j.technovation.2005.06.016

Berends, H., Jelinek, M., Reymen, I., & Stultiëns, R. (2014). Product innovation processes in small firms: combining entrepreneurial effectuation and managerial causation. *Journal of Product Innovation Management*, *31*, 616-635. https://doi.org/10.1111/jpim.12117

Berman, P. K. (2014). *Successful business process management: What you need to know to get results.* New York, NY: American Management Association.

Best, M. H. (2015). Greater Boston′s industrial ecosystem: A manufactory of sectors. *Technovation, 39-40*, 4-13. https://doi.org/10.1016/j.technovation.2014.04.004

Bolumole, Y. A., Calantone, R. J., Di Benedetto, C. A., & Melnyk, S. A. (2015). New product development in new ventures: The quest for resources. *International Journal of Production Research*, *53*, 2506-2523. https://doi.org/10.1080/00207543.2014.975858

Brutus, S., Aguinis, H., & Wassmer, U. (2013). Self-reported limitations and future directions in scholarly reports: Analysis and recommendations. *Journal of Management, 39*, 48-75. https://doi.org/10.1177/0149206312455245

Bustinza, O. F., Vendrell-Herrero, F., & Baines, T. (2017). Service implementation in manufacturing: An organisational transformation perspective. *International Journal of Production Economics*, *192*, 1-8. https://doi.org/10.1016/j.ijpe.2017.08.017

Calantone, R. J., & Di Benedetto, C. A. (2012). The role of lean launch execution and launch timing on new product performance. *Journal of the Academy of Marketing Science*, *40*, 526-538. https://doi.org/10.1007/s11747-011-0258-1

Charles, K. K., Hurst, E., & Notowidigdo, M. J. (2016). The masking of the decline in manufacturing employment by the housing bubble. *Journal of Economic Perspectives, 30*, 179-200. https://doi.org/10.1257/jep.30.2.179

Chee Houa, S., Haslinda, M., Muliati, S., Mariam Miri, A., & Rahim, A. F. (2018). Implementation of 5S in manufacturing industry: A case of foreign workers in Melaka. *MATEC Web of Conferences*, *150*. https://doi.org/10.1051/matecconf/201815005034

Chiesa, V., & Frattini, F. (2011). Commercializing technological innovation: Learning from failures in high-tech markets: Commercializing technological innovation. *Journal of Product Innovation Management*, *28*, 437-454. https://doi.org/10.1111/j.1540-5885.2011.00818.x

Crosby, P. B. (1984). *Quality without tears: The art of hassle-free management*. New York, NY: McGraw-Hill.

Crowley, F. (2017). Product and service innovation and discontinuation in manufacturing and service firms in Europe. *European Journal of Innovation Management, 20*, 250-268. https://doi.org/10.1108/EJIM-03-2016-0027

Datta, A., Reed, R., & Jessup, L. (2013). Commercialization of innovations: An overarching framework and research agenda. *American Journal of Business, 28*, 147-191. https://doi.org/10.1108/AJB-08-2012-0048

Derbyshire, J., & Giovannetti, E. (2017). Understanding the failure to understand new product development failures: Mitigating the uncertainty associated with innovating new products by combining scenario planning and forecasting. *Technological Forecasting and Social Change*, *125*, 334-344. https://doi.org/10.1016/j.techfore.2017.02.007

Doussard, M., Schrock, G., & Lester, T. (2017). Did US regions with manufacturing design generate more production jobs in the 2000s? New evidence on innovation and regional development. *Urban Studies (Sage Publications, Ltd.)*, *54*, 3119-3137. https://doi.org/10.1177/0042098016663835

Erlingsson, C., & Brysiewicz, P. (2013). Orientation among multiple truths: An introduction to qualitative research. *African Journal of Emergency Medicine, 3*, 92-99. https://doi.org/10.1016/j.afjem.2012.04.005

Evans, N., & Bosua, R. (2017). Exploring innovation in regional manufacturing SMEs. *Small Enterprise Research*, *24*, 149-166. https://doi.org/10.1080/13215906.2017.1334226

Ezell, S. (2012). Revitalizing U.S. manufacturing: The United States suffered a precipitous decline in manufacturing during the past decade key to a reversal will he greatly expanded efforts to support the competitiveness of small - and medium - sized firms. *Issues in Science and Technology, 28*, 41. Retrieved from https://issues.org/

Ferrarese, A., & Monteiro de Carvalho, M. (2014). Time-to-need: A portfolio tool to balance the time-to-market. *Journal of Manufacturing Technology Management*, *25*, 812-826. https://doi.org/10.1108/JMTM-09-2011-0085

Fisher, C. M., Elrod, C. C., & Mehta, R. (2011). A replication to validate and improve a measurement instrument for Deming's 14 Points. *International Journal of Quality & Reliability Management*, *28*, 328-358. https://doi.org/10.1108/02656711111109928

Flynn, J. (1998). Taylor to TQM. *IIE Solutions, 30*(11), 30. Retrieved from http://www.iise.org

Foss, N. J., & Hallberg, N. L. (2017). Changing assumptions and progressive change in theories of strategic organization. *Strategic Organization, 15*, 410-422. https://doi.org/10.1177/1476127016671099

Frattini, F., Bianchi, M., De Massis, A., & Sikimic, U. (2014). The role of early adopters in the diffusion of new products: Differences between platform and nonplatform innovations: Early adopters of platform innovations. *Journal of Product Innovation Management*, *31*, 466-488. https://doi.org/10.1111/jpim.12108

Gloet, M., & Samson, D. (2015, January). Capturing value through knowledge and innovation management: Comparisons across the manufacturing and services sectors. In *48th Hawaii International Conference on System Sciences* (pp. 3730-3739). https://doi.org/10.1109/HICSS.2015.449

Harry, M. J., & Schroeder, R. (2000). *Six sigma: The breakthrough management strategy revolutionizing the world's top corporations* (1st ed.). New York, NY: Currency.

Hiatt, J. (2006). *ADKAR: A model for change in business, government, and our community* (1st ed.). Loveland, CO: Prosci Learning Center Publications.

Houghton, C., Casey, D., Shaw, D., & Murphy, K. (2013). Rigour in qualitative case-study research. *Nurse Researcher, 20*(4), 12-17. https://doi.org/10.7748/nr2013.03.20.4.12.e326

Hyder, S., & Lussier, R. N. (2016). Why businesses succeed or fail: A study on small businesses in Pakistan. *Journal of Entrepreneurship in Emerging Economies*, *8*, 82-100. https://doi.org/10.1108/JEEE-03-2015-0020

Jabareen, Y. (2009). Building a conceptual framework: Philosophy, definitions, and procedure. *International Journal of Qualitative Methods, 8*(4), 49-62. https://doi.org/10.1177/16094069090080040

Jacob, S. A., & Furgerson, S. P. (2012). Writing interview protocols and conducting interviews: Tips for students new to the field of qualitative research. *The Qualitative Report, 17*(42), 1-10. Retrieved from https://nsuworks.nova.edu/tqr/

Jagusiak-Kocik, M. (2017). PDCA cycle as a part of continuous improvement in the production company - a case study. *Production Engineering Archives, 19.* Retrieved from https://www.doaj.org

Janesick, V. J. (2011). *"Stretching" exercises for qualitative researchers* (3rd ed). Thousand Oaks, CA: Sage.

Jayaram, J., Oke, A., & Prajogo, D. (2014). The antecedents and consequences of product and process innovation strategy implementation in Australian manufacturing firms. *International Journal of Production Research*, *52*, 4424-4439. https://doi.org/10.1080/00207543.2013.849363

Jennings, C., Wu, D., & Terpenny, J. (2016). Forecasting obsolescence risk and product life cycle with machine learning. *IEEE Transactions on Components, Packaging and Manufacturing Technology*, *6*, 1428-1439. https://doi.org/10.1109/TCPMT.2016.2589206

Jones, J. N., Cope, J., & Kintz, A. (2016). Peering into the future of innovation management: As the world changes, innovation professionals consider what the future holds for innovation and innovation management. *Research-Technology Management*, *59*(4), 49-58. https://doi.org/10.1080/08956308.2016.1185344

Kafetzopoulos, D., & Psomas, E. (2015). The impact of innovation capability on the performance of manufacturing companies: The Greek case. *Journal of Manufacturing Technology Management, 26,* 104-130. https://doi.org/10.1108/JMTM-12-2012-0117

Kastalli, I. V., & Van Looy, B. (2013). Servitization: Disentangling the impact of service business model innovation on manufacturing firm performance. *Journal of Operations Management*, *31*, 169-180. https://doi.org/10.1016/j.jom.2013.02.001

Keupp, M. M., Palmié, M., & Gassmann, O. (2012). The strategic management of innovation: A systematic review and paths for future research. *International Journal of Management Reviews*, *14*, 367-390. https://doi.org/10.1111/j.1468-2370.2011.00321.x

Kirkwood, A., & Price, L. (2013). Examining some assumptions and limitations of research on the effects of emerging technologies for teaching and learning in higher education: Examining assumptions and limitations of research. *British Journal of Educational Technology, 44*, 536-543. https://doi.org/10.1111/bjet.12049

Kohl, H., Orth, R., Riebartsch, O., & Hecklau, F. (2016). Integrated evaluation system for the strategic management of innovation initiatives in manufacturing industries. *Procedia CIRP*, *40*, 335-340. https://doi.org/10.1016/j.procir.2016.01.057

Levinson, M. (2017). Job creation in the manufacturing revival. *Congressional Research Service: Report*, 1-21. Retreived from https://fas.org/sgp/crs/

Liker, J. K. (2004). *The Toyota way: 14 management principles from the world's greatest manufacturer*. New York, NY: McGraw-Hill.

Linzalone, R. (2008). Leveraging knowledge assets to improve new product development performances. *Measuring Business Excellence*, *12*(2), 38-50. https://doi.org/10.1108/13683040810881180

Löfsten, H. (2014). Product innovation processes and the trade-off between product innovation performance and business performance. *European Journal of Innovation Management, 17*, 61-84. https://doi.org/10.1108/EJIM-04-2013-0034

Manufacturing. (n.d.). In *Business dictionary.* Retrieved from http://www.businessdictionary.com/definition/manufacturing.html

Maxwell, J. A. (2013). *Applied social research methods series: Vol. 41. Qualitative research design: An interactive approach* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Midler, C., Killen, C. P., & Kock, A. (2016). Project and innovation management: Bridging contemporary trends in theory and practice. *Project Management Journal, 47*(2), 3-7. https://doi.org/10.1002/pmj.21587

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: Sage.

Nafisi, M., Wiktorsson, M., & Rösiö, C. (2016). Manufacturing involvement in new product development: An explorative case study in heavy automotive component assembly. *Procedia CIRP*, *50*, 65-69. https://doi.org/10.1016/j.procir.2016.04.201

National Institute of Standards and Technology. (n.d.). Manufacturing in America economic and innovation success. Retrieved from https://www.nist.gov/sites/default/files/making-it-in-america-v1-869.png

Neumann, K. (2013). Know why thinking as a new approach to system thinking. *Emergence: Complexity and Organization*, *15*, 81-93. Retrieved from https://journal.emergentpublications.com/

OECD. (2017). *Gross domestic product (GDP) [Data set]*. https://doi.org/10.1787/dc2f7aec-en

Ōhno, T. (1988). *Toyota production system: Beyond large-scale production*. Cambridge, MA: Productivity Press.

Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). Thousand Oaks, CA: Sage.

Peña Ponce, D. K., Lorenzo, A. F., & Fernández Concepción, R. R. (2017). Innovation management: the need of a model for manufacturing micro - enterprises. *Quality Innovation Prosperity / Kvalita Inovácia Prosperita*, *21*(3), 1-14. https://doi.org/10.12776/QIP.V21I3.933

Pyzdek, T. (2001). *The Six Sigma handbook: A complete guide for greenbelts, blackbelts, and managers at all levels*. New York, NY: McGraw-Hill.

Raymond, L., & St-Pierre, J. (2010). Strategic capabilities for product innovation in SMEs: A gestalts perspective. *The International Journal of Entrepreneurship and Innovation, 11*, 209-220. https://doi.org/10.5367/000000010792217236

Robbins, P., & O'Gorman, C. (2016). Innovation processes: Do they help or hinder new product development outcomes in Irish SMEs? *Irish Journal of Management*, *35*, 88-103. https://doi.org/10.1515/ijm-2016-0006

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed). New York, NY: Free Press.

Sanders Jones, J., & Linderman, K. (2014). Process management, innovation and efficiency performance: The moderating effect of competitive intensity. *Business Process Management Journal*, *20*, 335-358. https://doi.org/10.1108/BPMJ-03-2013-0026

Sok, P., & O'Cass, A. (2015). Examining the new product innovation – performance relationship: Optimizing the role of individual-level creativity and attention-to-detail. *Industrial Marketing Management*, *47*, 156-165. https://doi.org/10.1016/j.indmarman.2015.02.040

Song, M., & Chen, Y. (2014). Organizational attributes, market growth, and product innovation: Organizational attributes and product innovation. *Journal of Product Innovation Management, 31*, 1312-1329. https://doi.org/10.1111/jpim.12185

Song, W., Ming, X., Han, Y., Xu, Z., & Wu, Z. (2015). An integrative framework for innovation management of product–service system. *International Journal of Production Research, 53*, 2252-2268. https://doi.org/10.1080/00207543.2014.932929

Statista.com. (2018). *Real Gross Domestic Product (GDP) of the federal state of Massachusetts from 2000 to 2018 (in billion U.S. dollars).* Retrieved from https://www.statista.com/statistics/551624/gdp-of-the-us-federal-state-of-massachusetts/

Stewart, J., & Ayres, R. (2001). Systems theory and policy practice: An exploration. *Policy Sciences, 34,* 79-94. https://doi.org/10.1023/A:1010334804878

Thomas, E., & Magilvy, J. K. (2011). Qualitative rigor or research validity in qualitative research: Scientific inquiry. *Journal for Specialists in Pediatric Nursing, 16*, 151-155. https://doi.org/10.1111/j.1744-6155.2011.00283.x

U.S. Bureau of Economic Analysis. (2018). *Gross domestic product.* Washington, DC. Retrieved from https://www.bea.gov/data/gdp/gross-domestic-product

U.S. Bureau of Labor Statistics. (2018). Databases, tables, & calculators by subject. Washington, DC. Retrieved from https://www.bls.gov/data/

U.S. Small Business Administration. (2017). *What is SBA's definition of a small business concern?* Washington, DC. Retrieved from https://www.sba.gov/sites/default/files/Whats-New-w-Small-Business-2017.pdf

Van de Ven, A. H. (2017). The innovation journey: You can't control it, but you can learn to maneuver it. *Innovation*, *19*, 39-42. https://doi.org/10.1080/14479338.2016.1256780

Von Bertalanffy, L. (1972). The history and status of general systems theory. *Academy of Management Journal*, 407-426. Retrieved from http://amj.aom.org/

Wang, Z., Zhang, M., Sun, H., & Zhu, G. (2016). Effects of standardization and innovation on mass customization: An empirical investigation. *Technovation*, *48-49*, 79-86. https://doi.org/10.1016/j.technovation.2016.01.003

Warren, G. E., & Szostek, L. (2017). Small business strategies for sustainability beyond 10 years. *International Journal of Applied Management and Technology, 16*(1), 111-122. Retrieved from https://scholarworks.waldenu.edu/ijamt/

Webb, J. R. (2016). Scrapping new product development efforts: When to keep going, when to fold. *Journal of Business Strategy*, *37*(4), 32-40. https://doi.org/10.1108/JBS-09-2014-0104

Wilson, S. A., & Perumal, A. (2010). *Waging war on complexity costs: Reshape your cost structure, free up cash flows, and boost productivity by attacking process, product and organizational complexity*. New York, NY: McGraw-Hill.

Wingard, C., & Connerty, M. (2014). The rebirth of U.S. manufacturing: Myth or reality? *Harvard Business Review Digital Articles,* 2-4. Retrieved from https://www.hbr.org

Woschke, T., & Haase, H. (2016). Enhancing new product development capabilities of small- and medium-sized enterprises through managerial innovations. *The Journal of High Technology Management Research*, *27*, 53-64. https://doi.org/10.1016/j.hitech.2016.04.005

Xin, J. Y., Yeung, A. C. L., & Cheng, T. C. E. (2008). Radical innovations in new product development and their financial performance implications: An event study of US manufacturing firms. *Operations Management Research*, *1*, 119-128. https://doi.org/10.1007/s12063-009-0017-3

Yin, R. K. (2014). *Case study research: Designs and methods* (5th ed.). Thousand Oaks, CA: Sage.

Yu, X., Chen, Y., & Nguyen, B. (2014). Knowledge management, learning behavior from failure and new product development in new technology ventures: Learning from failure in new product development. *Systems Research and Behavioral Science*, *31*, 405-423. https://doi.org/10.1002/sres.2273

Appendix A: Interview Questions

Process management is the set of guidelines that are in place to govern all areas of the organization.

1. What would cause leadership to change a process?
2. How is a new process developed?
3. How do you ensure processes are the best practices for the organization?
4. What are 3 to 5 process management techniques that are the most beneficial to realize positive gains?
5. What process management techniques were not successful?
6. How are process management changes communicated throughout your organization?

Innovation management are the process management steps that guide the facilitation of a new innovative project (Băjenescu, 2017).

7. How are the innovation management processes documented in a formal process?
8. How are the process management techniques used to ensure a successful innovation management process?
9. What process management techniques have had a negative impact on innovation management?