The Research Canvas

Framework for Designing and Aligning the "DNA" of Your Research Study

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Acknowledgments

Examples

This eBook includes three example cases to help illustrate the nine components of the Research Canvas. I want to thank Drs. Chad McAllister and Tatiana Zimmerer for generously allowing their work to be included in this book. The examples help the nine key design canvas components "come alive." These examples are invaluable additions to this work. For the complete descriptions of these two outstanding research examples, see their Ph.D. dissertations.

Case Study "A"

Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal, 20*(2), 22.

Case Study "B"

McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. (UMI No. 3226800)

Case Study "C"

Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. (UMI No. 3554993)

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Contents

Introduction

Overview

This book is about the “art” and “science” of research design. It is a “how-to” guide for getting the “DNA” of your study designed and aligned before writing more detailed descriptions of the methodology.

This book has emerged from my experience conducting research over the past several years and helping other researchers learn the “craft” of research. The content is organized around a nine-cell framework I created to help researchers (including myself) design an aligned and coherent research study.

This eBook is not a research methods textbook but rather a textbook supplement. To complete your design details, you must refer to your research methods texts and peer-reviewed papers on research methods.

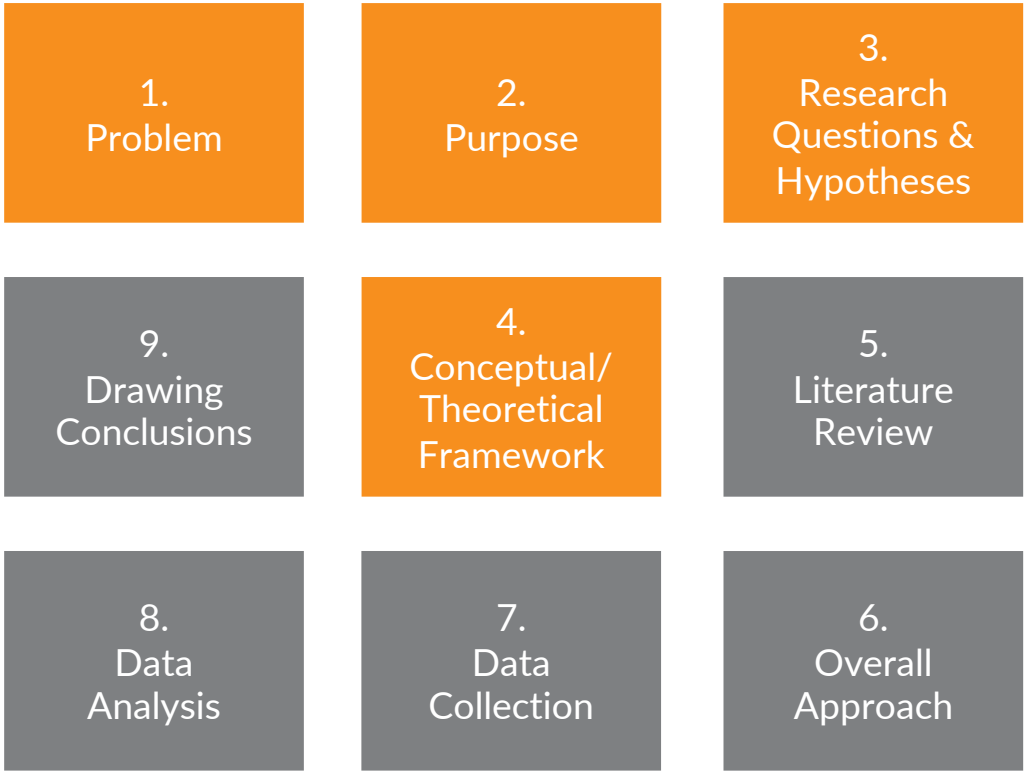
The “journey” can be frustrating and challenging under the best of circumstances. I hope this book will help anyone interested get the “DNA” of their study right early in the process and, hopefully, avoid some of the frustration associated with all research projects.

The book includes an introduction and nine chapters focused on the components of the research design canvas. While the chapters are presented in a sequence, developing a custom research design is iterative and often a “messy” process. Consequently, each chapter is designed as a stand-alone guide for that component.

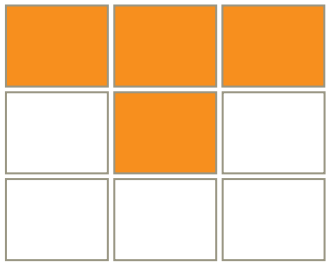
The Canvas

The canvas components are organized into two groups. The “T” or foundation includes the problem, purpose, research questions, and conceptual framework (orange cells). The “U” or methodology consists of the literature review, overall approach, data collection, data analysis, and drawing conclusions (grey cells).

A visual guide to help you design your research and get the "DNA" of your study right at the start!



Getting the "T" or Foundation Right



All too often, new researchers will begin their design process by asking questions like, "could I use an existing survey to measure x, y, z... with a particular population or case?" This is the wrong place to start! You first need a solid foundation.

Step 1 - The Problem

The first step in the research design process is to identify a real-world problem or management dilemma and provide a brief description of the issue, the undesirable symptoms, and our inability or lack of knowledge to solve the problem. All the other canvas components are designed to produce a contribution to knowledge that will help solve this problem.

Step 2 – The Purpose

The purpose statement builds on the knowledge gap in the problem statement and describes what new knowledge and insights the study will produce. Not the specific content or answer but rather the type of knowledge and insights that will be produced. The new contribution should directly address the knowledge gap in the problem statement so we can use the results to help address the problem.

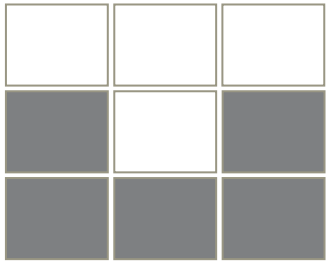
Step 3 – Questions

Nothing in the research process is more important than getting the question(s) right. If the questions are good, the study will likely be good. If the questions are not good, then there is no hope that the study will be good. Good research questions go beyond individual facts and measures to ask about HOW the "world" works.

Step 4 – Conceptual/Theoretical Framework

There is an old Chinese saying a diagram is worth more than 10,000 words. A conceptual or theoretical framework is a diagram that depicts the key constructs or variables (independent, dependent, etc.), the relationships between those constructs, and the contextual factors that influence the constructs and relationships. The development of the conceptual/theoretical framework begins early, and it evolves as the design process unfolds.

Getting the "U" or Methodology Right



Once the foundation is well developed, you are ready to start working on how you will answer the research questions to fulfill the purpose and add new insights to help solve the problem.

Form follows function!

Step 5 - The Literature

How much do we know about the constructs, variables, and relationships identified in the conceptual/theoretical framework and the research questions? Research design begins with theory, and the research results contribute back to theory. The amount and specificity of the current empirical knowledge will influence the choice of an appropriate overall research approach.

Step 6 - Overall Approach

Identify the overall research approach and the rationale for selecting that particular approach. Choose the overall approach (quantitative, qualitative, mixed) and the specific design (e.g., case study). Ultimately, the approach is determined based on whether it is best to contribute the new knowledge specified in the purpose and problem.

Step 7 – Data Collection

The data collection plan consists of methods, instruments, and sources. How will you measure the constructs and variables? What is the sampling strategy? The choices in this step determine the "menu" of data analysis options.

Step 8 – Data Analysis

While measurement and data collection are typically focused on the constructs, variables, and context factors - the analysis is focused on the relationships between the constructs, variables, and context factors. There is a wide variety of options based on the type of data and the purpose.

Step 9 – Drawing Conclusions

The last component puts all the pieces together in a cogent conclusion and discussion on theory and practice implications.

Alignment

One way to help deal with the complexity of a research design is to focus on the conceptual/theoretical framework as the "touchstone" for alignment.

The nine research canvas components form a complete “big picture” research design and methodology from problem to solution.

The research design components must be internally consistent and congruent to accomplish the purpose of the research. This alignment is determined during the design process and often requires many iterations as the design unfolds. Note that the design decisions made for each canvas component impact the design decisions in other components.

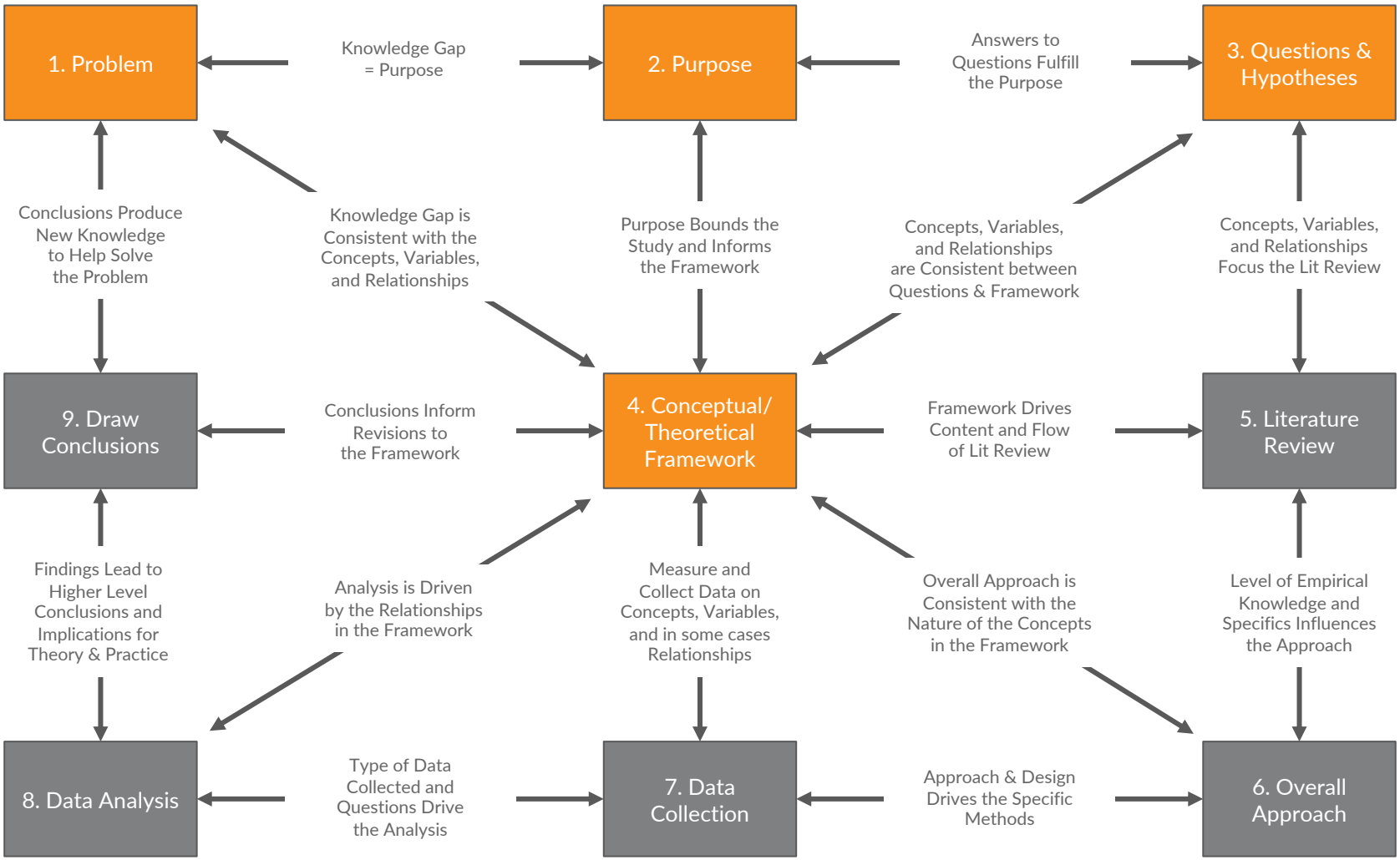
Once a few design decisions have been made, the “menu” of options available in subsequent components is reduced. For example, once the “T” is developed, the methodology or “U” options are reduced as the form follows function!

As the design process unfolds, go back to the conceptual/theoretical framework each time a component is changed. If there is an inconsistency between the component and the conceptual framework, you have two options: (1) revise the conceptual/theoretical framework or (2) revise the component.

You must review the other components for alignment and consistency if you choose to adjust or revise the conceptual/theoretical framework. Each time you change a component, check for alignment and consistency with all the other components. This is why working with a brief document such as a “canvas” is much easier than trying to achieve basic alignment with a more comprehensive plan.

The “basic” linkages between the nine canvas components are depicted on the next page.

Alignment



Principles of Good Research

Significance – Includes new or profound information (content) and best practices versus incremental knowledge in a narrow topic.

Readability - New knowledge and insights are presented in language that employees at all levels of the organization can understand and apply.

Utility – Research produces actionable information to help practitioners improve organization performance (solve the problem).

Transferability - New knowledge can be easily transferred across the organization and, ideally, across industry sectors (corollary to generalizability).

Credibility - The quality of scholarship, including analysis and supporting data, is sufficient to inspire confidence and implementation of the new knowledge.

Timely - New knowledge and insights must be accessible to address real-world problems and challenges.

Access - Easy access to new knowledge and information available in multiple media and formats.

Benefits - There should be a clear connection between new knowledge and solutions, improved organizational results, and overall success.

Involvement - Research involves practitioners in a collaborative process when appropriate and practical.

Dissemination - Present new knowledge and information at public forums and make the new knowledge available to the public (publish in various forms and media).

According to several executives, successful research is not arcane academic language in some obscure journal.

Latham (2008)

Source: Latham, J. R. (2008). Building bridges between researchers and practitioners: A collaborative approach to research in performance excellence. *Quality Management Journal*, *15*(1), 20.

Ethical Considerations

Design ethical principles into your research plan from the beginning!

There are three basic ethical principles to keep in mind when designing research: respect for persons, beneficence, and justice.

Respect for Persons

Humans are autonomous beings capable of self-determination. Consequently, research requires "informed" consent from the participants. Informed means they understand the research methods (procedure), benefits, and risks. Some individuals may have diminished autonomy, such as prisoners, children, those with reduced mental capacity, and so on. Special protections are required in the design and execution of research for specific categories of participants, which should be detailed in the Institutional Review Board (IRB) requirements for your institution.

Beneficence

Beneficence has two components: (a) do no harm and (b) maximize the possible benefits and minimize the risks. Design considerations include weighing the benefits with the risks involved and designing the study to maximize benefits and minimize risks. Poorly designed or "sloppy" research is of little benefit to anyone and, thus, based on this principle, is unethical.

Justice

The third basic principle addresses the issue of who benefits vs. who bears the burden. The history of this principle includes many cases of abuse in the medical research field, where some populations bore the burden while others were the primary beneficiaries of the research. The challenge here is to design research so that there is a fair distribution of benefits and burdens.

For more on research ethics, see The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.
http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

Research Canvas Instructions

Problem 1. Identify a “real world” problem 2. Describe the undesirable symptoms 3. Identify the knowledge gap that needs to be filled in order to help solve the problem 4. Support your discussion with solid peer-reviewed references	**Purpose** Deliverable - Describe the new knowledge and insights the study will produce that will help fill the knowledge gap identified in the problem statement (not the specific content but the "type" of new knowledge)	**Research Questions/Hypotheses** 1. Identify the “type(s)” of questions that need to be answered to fulfill the purpose 2. Develop the main research questions and sub-questions 3. Develop hypotheses as appropriate
Drawing Conclusions 1. Identify the larger application(s) and meaning(s) of the findings 2. Identify how the applications contribute to the knowledge gap 3. Identify the limitations associated with the findings and conclusions	**Conceptual/Theoretical Framework** 1. Identify and diagram the key variables in the research questions 2. Identify and diagram the key relationships between the variables 3. Identify and diagram the key context factors 4. Describe the framework	**Literature Review** 1. Create an outline or “mind map” of the key theories and concepts 2. Dig deep into the “peer-reviewed” literature for each theory and concept and create an annotated bibliography and literature map 3. Write the literature review
Data Analysis 1. Based on the research questions, the overall approach and the data collected, identify the data analysis methods (be specific) 2. Identify the validity and reliability issues and methods to address the issues	**Data Collection** 1. Develop a measurement plan for the variables in the research questions and hypotheses (survey, interview guide, etc.) 2. Develop a data collection plan including sampling strategy and data collection process	**Overall Approach** 1. Identify the "level" of empirical knowledge (see literature review) 2. Identify the type of knowledge needed (purpose statement) 3. Identify the options and select an approach based on the “research arc” 4. Describe the approach

Research Canvas Example - Latham 2013

Problem - Many attempts at organization transformation fail - Less than 10% of Baldrige applicants receive award - World is rapidly changing - workforce, competition, technology, etc. - Little agreement on what constitutes leadership - Numerous theories more added all the time - Little understanding of how to lead transformation based on Baldrige model as main framework	**Purpose** - Explore experiences of upper-echelon leaders who successfully transformed their organizations - Develop a richer understanding of the processes, practices, and behaviors required to lead large-scale transformations - Multiple case study based on in-depth interviews with CEOs (most senior leader) of 14 Baldrige recipient organizations	**Research Questions/Hypotheses** - What are the key upper-echelon leadership approaches, behaviors, and individual leader characteristics, and how do they influence the transformation to performance excellence? - What are the key internal, external, and cultural factors and how do they influence the transformation to performance excellence?
Drawing Conclusions - Theoretical Memos along with Node structure used to develop framework - Framework reviewed by BAR consortium members - Final papers reviewed by some participating CEOs - Identified implications for theory (transformational, transactional, servant, and spiritual leadership) - Identified implications for practice - ID limitations and recommendations for future research	**Conceptual/Theoretical Framework** Began with three leadership constructs and one outcome: - leader activities (what leaders do) - leader behaviors (how they do it, style) - individual leader characteristics - organizational transformation process As research unfolded other constructs were added: - internal and external forces and facilitators of change, organizational culture factors	**Literature Review** - Leadership is a “messy landscape” with many more theories today than 50 years ago - Little consensus on what effective leadership is among practitioners and researchers - Many tested theories but many questions remain - Limited understanding of how the nuances of context influences leadership effectiveness - Majority 88% of leadership studies are quantitative
Data Analysis - Transcripts analyzed for each individual case (within case analysis) - NVivo 8 used to code data (level 1 analysis) - Visual data displays (Miles and Huberman, 1994) - Over 200 nodes explored, 35 top levels codes selected - Constant comparison + open and axial coding - Cross-case analysis with node frequency/case - Enfolded research literature as part of analysis	**Data Collection** - Cases drawn from 49 organizations that received the Baldrige award in the 10 years previous - Purposive sampling approach selected 14 cases which exceeds Eisenhardt’s recommendation of 4 to 10 (made for a lengthy analysis process) - Deep dive interviews conducted with CEOs - Flexible semi-structured interview guide - Verbatim transcripts typed from digital recordings	**Overall Approach** - Theory building qualitative study - Multiple Case Study Design (Eisenhardt, 1989) - Inductive analysis based on in-depth interviews with CEOs who led successful organizational transformations - Incorporates grounded theory methods (Corbin & Strauss, 1990) - Individual case analysis - Cross-case analysis

Research Canvas

Problem	**Purpose**	**Research Questions/Hypotheses**
Drawing Conclusions	**Conceptual/Theoretical Framework**	**Literature Review**
Data Analysis	**Data Collection**	**Overall Approach**

Research Topic

Identify Your Research Topic

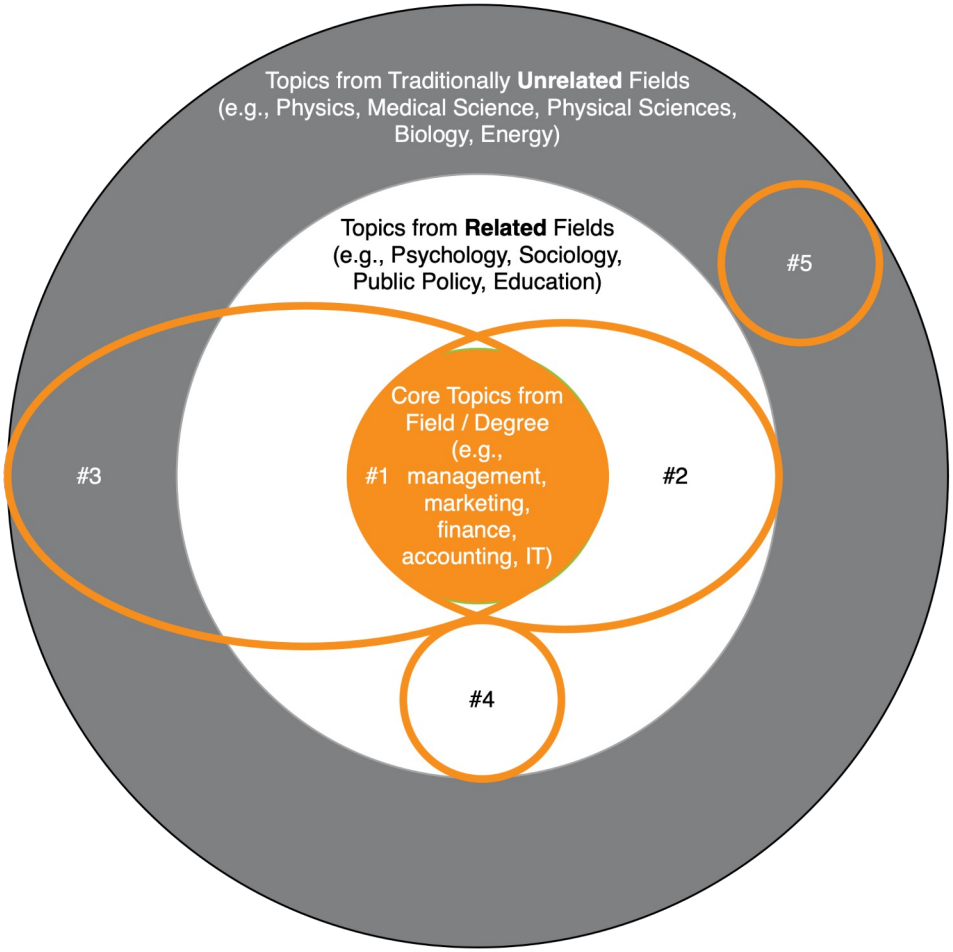
Theories in Your Discipline

Closely related to the problem, or opportunity statement is the “topic” of the study. For doctoral students, there are several things to consider when selecting and narrowing your topic. The research project begins with a foundation of theory and produces new knowledge and insights that contribute to theory. When working on a doctoral thesis/dissertation for a particular degree, the topic must fit within the theories, concepts, and issues in the field or discipline. For example, a doctoral student working toward a Ph.D. in management would not be allowed to do a dissertation focused on medical science. There are two reasons for this. First, the degree earned is in management, not medicine. So, the topic has to match the degree. Second, the faculty in a management school are not qualified to supervise a research study focused on medicine.

Three Rings

The diagram on the next page has three sections or rings: (1) the core topic, (2) traditionally related topics, and (3) historically unrelated topics. Inner Circle - Core Discipline or Field: These are the topics found in the core courses for the degree and the top journals in the field's core disciplines (e.g., business and management). Middle Circle - Traditionally Related Topics: Management and Business are integrated fields often comprised of concepts and theories developed in other disciplines such as psychology, sociology, public policy, etc. Outer Circle - Traditionally Unrelated Topics: These are traditionally not part of business and management theory. For example, medical practices might be related to worker health and well-being. Still, they are based on medical theories and practices that are well outside business and management theories and practices. Topics often span two or three circles.

Scenarios



Scenario #1

The scenario in the middle is the safest. Topics in the middle circle are those found in the core journals in the field. Previous research and articles in the field's journals have established the relevance of these topics.

Scenarios (cont.)

Scenario #2

The second circle from the middle is a common scenario in business and management and is relatively safe. In other words, chances are others have connected these related fields and disciplines. Thus, the connections are logical and, in most cases, are already well-established in the literature. An example might be how organizations consider changing public policy related to environmental issues during the strategic planning process. The focus is on management decisions and strategy development, core business management topics.

Scenario #3

Scenario #3 is less common but is potentially viable if the topic is still focused on core theories in the inner circle. In this scenario, the study connects traditionally unrelated fields and concepts. An example might be a study focused on the business opportunities related to alternative energies or the business impact of alternative fuels on their potential effect on expenses and new or enhanced revenue opportunities.

Scenario #4

For a doctoral student, it is unlikely that a Scenario #4 topic will be approved. Without a connection to the core degree disciplines, it would be difficult for a school to grant a degree based on a research project entirely outside the degree disciplines. An example might be the impact of public policy on carbon restrictions and costs. While this impacts business, the topic is centered on public policy and the impact of public policy. This study would contribute to public policy theories and concepts vs. business and management theories.

Scenario #5

This scenario is a "non-starter." It is well outside the core degree disciplines, and unlikely there are faculty in the program qualified to supervise a research study focused on this topic. An example might be an analysis of the technical applications of alternative energies or energy storage technologies.

Paths for Topic Identification

There are typically two paths for topic identification: (a) practice to theory and (b) theory to practice.

Practice to Theory

Sometimes, a research opportunity will originate in practice. Organizations face many challenges, and only some perform at the level the stakeholders desire. Once the symptoms or problem is identified in a real-world situation, the next step is identifying the theories involved. Once the theories are identified, the next task is to dig deep into the existing scholarly literature (peer-reviewed journals) to determine what we know and don't know about these theories, concepts, etc. If we already have the theories to solve the problem identified in the real-world situation, we don't need additional research. We need to apply what we already know to the situation. However, if the theories and existing knowledge are inadequate to solve the problem, it may be a good candidate for a research project.

Theory to Practice

Another common path for topic identification is, to begin with, the peer-reviewed journals in the field. Journal articles often have sections on "recommended future research" and the "limitations" of the research described in the article. These recommendations are usually a good place to start identifying a topic, as long as the article is recent. Also, all research has limitations, and thus there are many opportunities to conduct further research on a topic focusing on eliminating or mitigating some of the current limitations. Occasionally, you will get lucky, and a journal article overviews a particular topic's current status. Some articles focus on research topics for future research on a specific topic, such as Latham (2008) on performance excellence or a more recent article on the future of research in quality management. Once a gap in the theory is identified, the next question is, what could we do better if we filled that gap? Who would care? What could the practitioners do with this new knowledge?

Regardless of the path, a viable research topic and problem statement have two components - a real-world application and a gap in theory.

1. Problem

Introduction

A problem isn't always a "problem." It might also be an opportunity for improvement. In other words, organizational performance is seldom all that we would like it to be.

What Can't We Solve?

A research problem is one we can't solve with our existing empirical knowledge and theories.

Often, the first step in the research design process is to identify a real-world problem or management dilemma and provide a brief description of the nature of the issue, the undesirable symptoms, and our inability or lack of knowledge needed to solve the problem.

All the other components in the research framework are designed to produce a contribution to knowledge that will help solve this problem. While some fields do "pure" research, there are plenty of real-world management and organization design problems and opportunities for improvement to keep management researchers busy without "dreaming up" new things to study.

So What?

What is the significance of the problem?

The problem statement is the foundation and rationale for the significance of the study. The problem needs to answer the "so what" question. Why would anyone be interested in supporting, participating in, or using the results of this study?

Regardless of whether you plan on having a sponsor, a practical reason to conduct the study will help increase your motivation (and tenacity), and your participant's motivation, thus increasing participation and response rate and the impact on the real world.

Note: If you still need to identify a research topic, work on identifying an appropriate one, then return to this section.

Knowledge Gap

If the knowledge needed to address the problem is already in existing peer-reviewed publications, we don't need more research. Instead, we can simply apply our existing knowledge and theories to solve the problem.

Why Can't We Solve It?

The second required component of the problem statement is a gap in our existing knowledge and theories that prevents us from solving the problem. There MUST be a gap in our current theories and empirical knowledge to justify a research project.

If we already know how to solve the problem, then we can simply apply that knowledge or theory to our particular situation and solve the problem. It is common for organizations to experience many issues that we already know how to solve.

The organization may not know how to solve the problem or may be unfamiliar with the current literature. Hence, the first step is to find out what we know about this problem by conducting a literature review.

Where to Look for Gaps?

The problem is a candidate for a research project if there is a knowledge gap. So, where is the best place to look for a knowledge gap? The peer-reviewed literature should support the knowledge gap in the problem statement.

1. Look at the limitations sections of the most recent peer-reviewed papers related to your topic. Many research studies are designed to reduce the limitations of previous studies.

2. Look at the conclusions and recommendations for future research. Author(s) often identify where they think researchers should go next.

3. Take the time to delve deeply into the research "streams" on your topic.

There is no easy path. You have to do the hard work of reviewing the literature.

Example A

Latham (2013)

"Since the quality crisis of the 1980s, organizations have faced unprecedented change in the areas of global competition, competition for talent, economic turbulence, and uncertainty, along with social and environmental challenges, forcing them to continuously rethink their strategies and redesign their methods for achieving sustainable success" (Latham, 2013, p. 12).

Growing pressure from stakeholders, including investors, customers, employees, supplier partners, the community, and the natural environment. The environment and community find their "voice" through regulation, public policy, social media, customer purchase decisions, etc.

The methods we have used to create our current standard of living are human-created and thus can be redesigned and recreated to meet these challenges.

Unfortunately, many attempts at organization transformation fail, and less than 10% of Malcolm Baldrige Award applicants receive the award.

There is little agreement on what constitutes leadership. It is a messy "landscape," and the number of theories has increased over the past 50+ years.

We now have numerous theories, and more are being added all the time. Unfortunately, seldom are any discarded, making the "mess" worse!

There is little research on and understanding of how to lead organizational transformation based on the Baldrige model as the main framework.

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Example B

McAllister (2006)

Software products fail to meet users' needs, are delivered late, or exceed budgets because the requirements are poorly understood.

Two important parties that must agree on and understand the requirements are users and developers.

Misunderstanding between these two groups leads to requirement errors, which increases the software project's cost and time, jeopardizes quality, and creates work-life imbalances.

While many techniques have promise, the rate of software product failures has not substantially been reduced, hovering around 66%

Fundamental knowledge of the factors involved in misunderstanding requirements between users and developers is lacking in techniques such as Voice of the Customer (VOC).

Without this theoretical foundation, the efficiency and effectiveness of the techniques to improve the understanding of requirements is difficult to determine.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN.

Example C

Zimmerer (2013)

In hypercompetitive environments, corporations seek to maximize output and performance, and leadership is key in influencing performance. More than ever, leaders struggle to motivate, inspire, and encourage followers to produce more and more with less and less.

Unfortunately, followers are cynical, disillusioned, and no longer trust corporate leaders in the US. And charismatic, transformational leaders seem to be less and less effective. If there was any doubt, followers now know that these leaders put the corporation first and followers often last when making decisions.

Servant leadership has emerged as one alternative to the more popular transformational and transactional style. Servant leadership appears well-suited to address the workforce's critical issues, including the lack of trust in leadership.

Increase in workforce diversity, including multiple generations working together. Some research suggests that different generational cohorts need different leadership styles. While we know quite a bit about servant leadership in general, the applicability to the three main generations working today (Baby Boomers, Gen y, Gen x) has not been studied.

We must also determine how servant leadership relates to other followers and organizational outcomes, including job satisfaction, commitment, and turn-over intent.

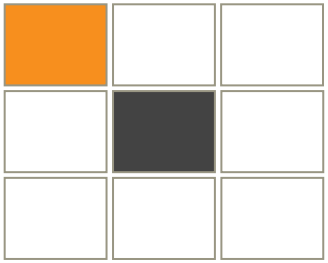
Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 1-16

Problem Alignment

Drawing Conclusions

If it is designed and executed properly, the research process comes “full circle” and produces the new insights and knowledge that was identified in the knowledge gap.

The conclusions and implications discussion should focus on how the research findings will help fill the specific knowledge gap and help resolve the problem.



Conceptual Framework

As with all the components of the research methodology, the problem should be consistent with the constructs, variables, relationships, and context factors identified in the conceptual/theoretical framework.

Ultimately, the conceptual framework serves as a “touchstone” for the other eight components and provides a common basis for alignment and congruence throughout the research design.

Purpose

The knowledge or theory gap in the problem statement links directly to the purpose of the study.

The purpose statement should focus on producing new knowledge and insights that will help fill the knowledge gap described in the problem and, in turn, help solve the problem.

Application

1. Identify a “real world” problem related to your field (e.g., management). While researchers in some fields study basic research without predetermined applications, management researchers (in particular scholar-practitioners) develop and test theories to help inform or improve practice.

2. Describe the undesirable symptoms and dilemmas related to your research problem. Include numbers and specific facts to help clarify the extent and magnitude of the symptoms. Undesirable symptoms might be that current management methods are not producing the desired performance results.

3. Identify the knowledge gaps that need to be filled to help solve the problem. There is no reason to research if we already have the empirical knowledge and theories necessary to solve the problem. Instead, we can simply apply what we already know to the new situation to solve the problem - a much cheaper solution.

Note: The literature review begins here, in this first phase of the design process, and continues throughout the development of the study.

2. Purpose

Introduction

The purpose should address the problem statement's knowledge gap. The purpose or desired deliverable will drive the research questions and subsequent design decisions.

Why?

Describe the new knowledge the study is expected to produce. This is not the specific content nor a specific answer but rather the type of knowledge that will be produced.

Then describe what researchers and practitioners will be able to do better once they have the findings from this study. The generic purpose of a research study is to produce new credible empirical knowledge and insights.

The question here is, what is the specific deliverable, or contribution to the body of knowledge, that this study is expected to produce?

Key Components

Dissatisfaction - There must be some dissatisfaction with the current knowledge of the topic. Why are we motivated to conduct the study? This is a summary that links to the problem.

Vision - Define a reason for or goal of the study. The vision should focus on what can be done with the research output. How will it help?

Who and What – What are the key constructs and variables (independent, dependent, and moderating), relationships, context, and population being studied?

Design and Deliverable – What is the overall research design or approach? The design determines the type of new knowledge that will be produced. Describe the study's expected output and identify the overall approach (e.g., multiple case study).

Example A

Latham (2013)

Multiple case study using grounded theory methods based on in-depth interviews with CEOs (the most senior leader) of 14 Baldrige recipient organizations.

Explore the experiences of strategic (upper-echelon) leaders who successfully transformed their organizations using the Baldrige Criteria for Performance Excellence (CPE) as a tool to guide the assessment and improvement cycles.

Develop a richer understanding of the processes, practices, and behaviors required to lead large-scale transformations.

Ultimately, the purpose was to "take an initial step in developing a more comprehensive understanding, description, and explanation of the key concepts associated with leading the transformation to performance excellence from the top" (Latham, 2013, p. 14).

The deliverable was a framework of interrelated concepts, including forces and facilitators of change, leadership approaches (activities), leadership behaviors, individual leader characteristics, and organizational culture.

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Example B

McAllister (2006)

The purpose of the study is to examine factors contributing to users' and developers' misunderstanding of the requirements of software products.

To limit the scope of the study, software products were confined to information systems created in-house by an organization to be used within the organization.

The study's findings will lay a theoretical foundation for future research, allowing for the creation of more effective and efficient techniques for understanding requirements.

By studying what influences developers' and users' misunderstanding of requirements, software project managers can begin seeking ways to minimize these influences, therefore minimizing misunderstandings.

The result is expected to ultimately enable the creation of software that better solves the intended problem, meets the expectations of its users, decreases development costs, and provides better schedule control.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN.

Example C

Zimmerer (2013)

Identify if exposure to servant leadership is RELATED to follower job satisfaction, organizational commitment, and turn-over intent.

Understand HOW servant leadership resonates with followers from three main generational cohorts currently working in the US (Baby Boomers, Gen Y, Gen X).

VALIDATE the servant leadership dimensions van Dierendonck (2011) proposed and the associated survey instrument in the US.

Understand the nuances of HOW servant leadership is perceived by members of the three generational cohorts, given their differing values, attitudes, goals, ambitions, and needs.

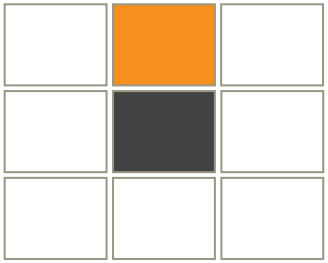
Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 16-19

Alignment

Problem

The purpose statement should identify the new knowledge that will be produced that will help resolve the problem.

The alignment between the knowledge gap in the problem statement and the knowledge the purpose will produce needs to be an exact match and obvious to the reader of any documents produced.



Conceptual Framework

As with all the components of the research methodology, the purpose should be consistent with the constructs, variables, relationships, and context factors identified in the conceptual/theoretical framework.

In other words, the new knowledge produced should be directly related to theories about the constructs, relationships, and context factors described in the conceptual framework.

Research Questions

The purpose statement links directly to the research questions.

The research questions should be crafted so that the answers to the questions will produce new knowledge and insights that will fulfill the purpose and, in turn, help solve the problem.

Application

1. Link to and expand on the knowledge gap in the problem statement. The research aims to produce new insights, knowledge, discoveries, and so forth to help "fill" the knowledge gap identified in the problem.

2. Identify the "tentative" overall research design (overall approach) and briefly clarify who and what will be included in the study. This will evolve as the other components are developed, so come back to the purpose often to keep it aligned with the other components. The type of research leads to the type of new knowledge that will be produced.

3. Identify the intended output of the study or the final "deliverable." Describe the new knowledge and insights the study will produce to help fill the knowledge gap identified in the problem statement. This is not the solution or result but rather the "type" of knowledge that will be produced.

Note: The purpose of a Doctoral dissertation is to contribute to advancing theory or applying theory. Hopefully, that contribution will also be useful for improving practice.

3. Questions + Hypotheses

Introduction

The research questions should be designed so that the answers to the questions will produce the knowledge identified in the purpose statement.

Research Questions

There is nothing in the research process more important than a good question.

If the questions are good, the study will likely be good. If the questions are not good, then there is no hope that the study will be good.

The “nature” of the questions ranges from very deductive-focused questions about specific variables and relationships to broad descriptive inductive questions about constructs and systems.

Questions alone are usually associated with theory-building and exploratory studies, which are often flexible and qualitative or mixed methods studies.

Qualitative methods are usually too limited to be credible for theory testing. However, there may be a rare exception.

Hypotheses

Questions are just that - and by themselves, they do not include or predict an answer.

On the other hand, hypotheses are the predicted answers to the questions.

Questions + Hypotheses (or sometimes hypotheses alone) are usually associated with theory testing studies which are often fixed and quantitative.

A hypothesis is not simply a “guess.” Instead, it is a logical conclusion based on an in-depth analysis of the results from previous research studies.

There are rare studies that are mixed in that they combine theory building (inductive qualitative portion) with theory testing (quantitative hypothesis testing) based on the theory-building work. In most cases, it is enough for two studies.

Quantitative vs Qualitative

As Peter Drucker pointed out, management is [often] about prediction, and thus many management and organization research questions ask how one thing predicts another.

Quantitative Questions

Quantitative research questions ask about measurable variables and their relationships. While they do not establish causation, we conduct regression analysis because we suspect the relationship will provide insights we can act upon. There are two popular types of quantitative questions in management and organization research.

1. What is the relationship between _____ (independent variable) and _____ (dependent variable)?

2. What is the difference between group A and group B (independent variable) with respect to _____ (dependent variable)?

A minimum of two variables and a relationship are required!

Qualitative Questions

Exploratory or discovery questions seek to get at the nature of some phenomenon and not only describe it but also "explain HOW" it works. For example, "HOW does leadership behavior influence how followers feel about the meaning they find in their work?"

Occasionally, these questions do not identify specific factors or constructs and instead ask to identify the factors or constructs. For example, "WHAT key factors influence how employees feel about the meaning they find in their work?" These WHAT questions often make for a highly inductive study calling for highly inductive methods such as grounded theory.

These are just a few examples; research questions come in various "shapes and sizes."

Example A

Latham (2013)

Five qualitative research questions focused on identifying the factors and how they influenced the transformation process.

1. WHAT are the key internal and external forces and facilitators for change, and HOW do they influence the transformation to performance excellence?

2. WHAT are the key upper-echelon leadership approaches (processes and activities), and HOW do they influence the transformation to performance excellence?

3. WHAT are the key upper-echelon leadership behaviors, and HOW do they influence the transformation to performance excellence?

4. WHAT are the key upper-echelon individual leader characteristics, and HOW do they influence the transformation to performance excellence?

5. WHAT are the key organizational culture characteristics, and HOW do they influence the transformation to performance excellence?

These questions led to a multiple case study using grounded theory methods.

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22. p. 15

Example B

McAllister (2006)

The first question is qualitative and focuses on identifying the factors that participants believe cause misunderstandings.

1. Which factors do users and developers believe cause misunderstandings about the requirements for information systems?

The second and third questions are quantitative and ask for measurement and analysis to determine the factors with the most impact and how they differ between the two groups.

2. Which factors do users and developers believe have the most impact on misunderstandings?

3. What is the difference between users' and developers' perceptions of these factors?

This is an example of a sequenced mixed method study - QUALITATIVE then QUANTITATIVE.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 5-6

Example C

Zimmerer (2013)

1. What is the relationship between levels of exposure of Baby Boomer, GenX, and GenY followers to servant leadership attributes as outlined by van Dierendonck (2011) and levels of follower job satisfaction, organizational commitment, and turnover intent?

Is there a difference in the levels of job satisfaction when exposed to servant leadership among Baby Boomer, GenX, and GenY employees?

Is there a difference in organizational commitment when exposed to servant leadership among Baby Boomer, GenX, and GenY employees?

Is there a difference in turnover intent when exposed to servant leadership among Baby Boomer, GenX, and GenY employees?

2. How can follow-up interviews further help explain the relationship between exposure to servant leadership attributes and job satisfaction, organizational commitment, and turnover intent and further elucidate if and how generations view servant leadership constructs through generationally influenced viewpoints?

Example of a sequenced mixed methods study - QUANTITATIVE then QUALITATIVE.

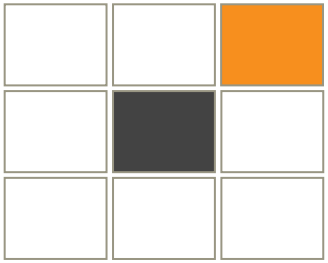
Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 22-25

Alignment

Purpose

The research questions should be crafted so that the answers they produce will be the new knowledge and insights that will fulfill the purpose and, in turn, help resolve the problem.

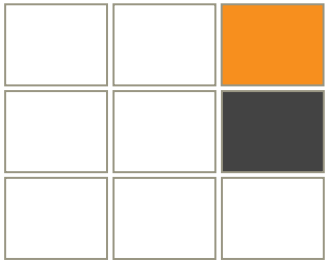
This connection should be explicit and obvious.



Conceptual Framework

As with all the components of the research methodology, the research questions (constructs, variables, relationships, etc.) should be consistent with the constructs, variables, and relationships identified in the conceptual/theoretical framework.

It helps if the words chosen for the constructs, variables, and context factors are consistent throughout the document(s).



Literature Review

The constructs, relationships, and context factors in the research questions link directly to the theories discussed in the literature review.

The literature review should identify what we already know about the constructs, variables, relationships, and context factors identified in the research questions.

Application

1. Identify the “type(s)” of questions that need to be answered to fulfill the purpose (qualitative, quantitative, or mixed).

2. Develop the main research questions. Focus on questions that ask HOW the world works. How does one construct influence another construct? How is one variable related to another variable? WHAT are the factors that influence x, y, z…?

My perspective for this book is that we are designing the research to contribute to theory. Theory that can be used to inform the design of better organizations. For me, a theory is an explanation of HOW something works.

Consequently, a simple description of a phenomenon is not, by itself, a contribution to theory. It can be an excellent first step, and a “thick, rich description” is often a first step toward building a theory. But, without the next step of analysis that produces an explanation, we are left with an anecdote vs. a theory.

3. Develop hypotheses as appropriate. If the questions are quantitative and the level of empirical knowledge is sufficient, develop hypotheses to test. Hypotheses come in pairs. “Ha” is the “Alternative” hypothesis, sometimes called the research hypothesis. “Ho” is the “Null” hypothesis and is the hypothesis where there is NO relationship or difference. “Null” means “None” or “Zero.” Note: We always test the Null hypothesis and either reject or fail to reject the Null.

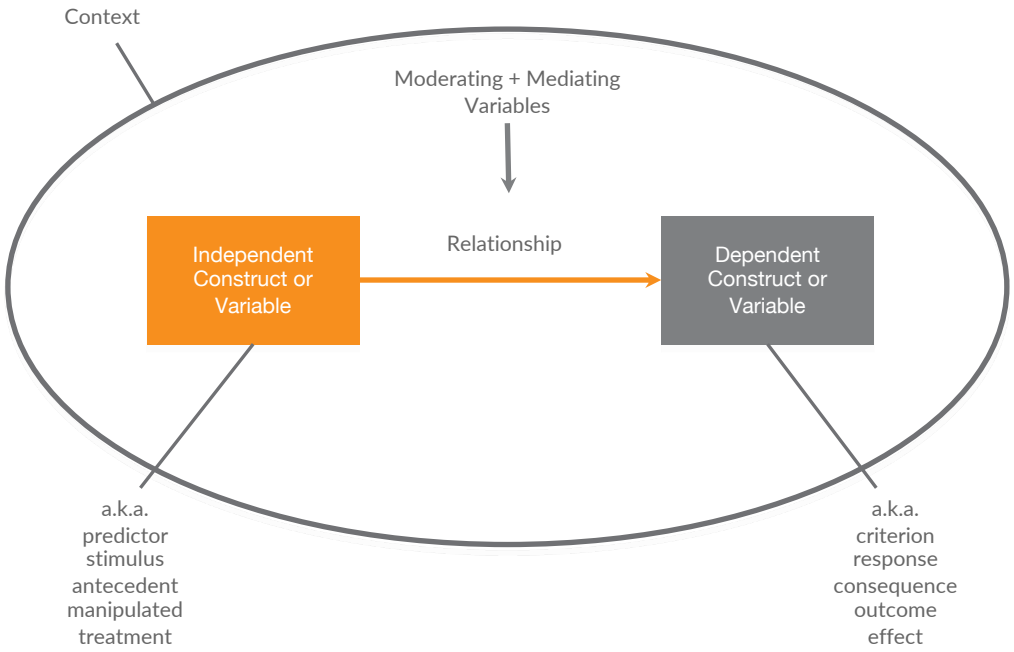
The study's quality, credibility, and utility depend on the research questions. Get this wrong, and the rest is a waste of time!

4. Conceptual Framework

Introduction

Experience suggests that diagraming the problem or topic is very beneficial when developing research questions. This is often called a conceptual or theoretical framework. According to Miles and Huberman (1994), “A conceptual framework explains, either graphically or in narrative form [both are much preferred], the main things to be studied - the key factors, constructs or variables - and the presumed relationships among them” (p. 18). The task here is to create a diagram of the topic that includes clearly defined constructs or variables (independent, dependent, etc.) along with the relationships of those constructs and key factors that influence the constructs and the relationships. This task is typically done in conjunction with developing the research questions, and it is an iterative process.

A diagram of the topic is worth more than 10,000 words.



Conceptual vs Theoretical

"There is nothing more practical than a good theory."

Kurt Lewin

Conceptual Framework

Developing a framework for a topic usually begins with a conceptual framework.

A conceptual framework is typically comprised of constructs (e.g., trust, satisfaction, commitment). While the constructs might be measurable, they are not defined in quantifiable terms at this point in the process.

Presumed relationships between the constructs are identified but are often multi-directional, dynamic, and complex. The context and other factors that influence the situation are also identified and depicted in the framework.

If our understanding of the phenomenon from the research literature is vague, the conceptual framework is as far as we can go until we have additional insights.

Theoretical Framework

If you discover during the literature review that the constructs and relationships in your conceptual framework are measurable using quantitative methods, you may be able to transition your conceptual framework into a quantitative theoretical framework.

A theoretical framework has the same essential components and structure as a conceptual framework. However, a theoretical framework is more specific, with measurable variables in place of constructs. A theoretical framework is appropriate if there is enough knowledge about the variables and relationships to support the development of hypotheses.

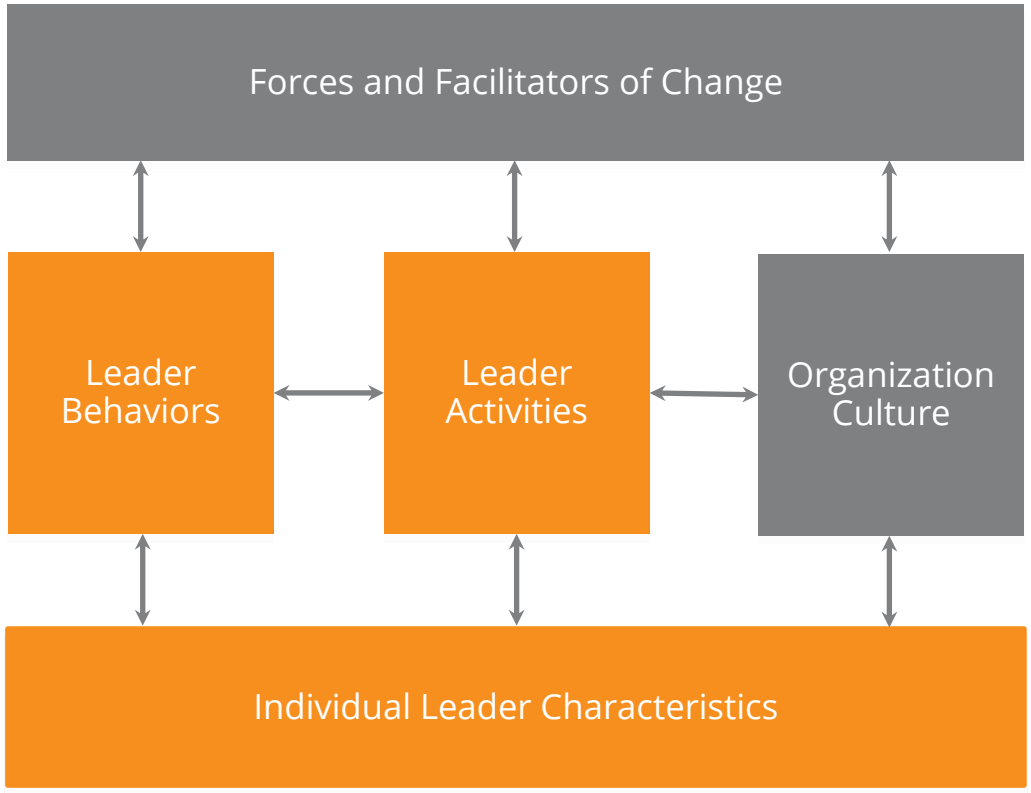
The other "T" components (problem, purpose, and research questions) must align with the framework and the nature of the constructs, variables, and relationships.

Example A

Latham (2013) - The study began with three key leadership constructs and one large process outcome: (a) leader activities (what leaders do); (b) leader behaviors (how they do it, style); (c) individual leader characteristics and (d) organizational transformation process. As the research unfolded, other constructs were added: (a) internal and external forces and facilitators of change and (b) organizational culture factors.

This qualitative study utilized a conceptual framework focused on five "buckets" or categories of factors that influence the process of organizational transformation.

Latham (2013)

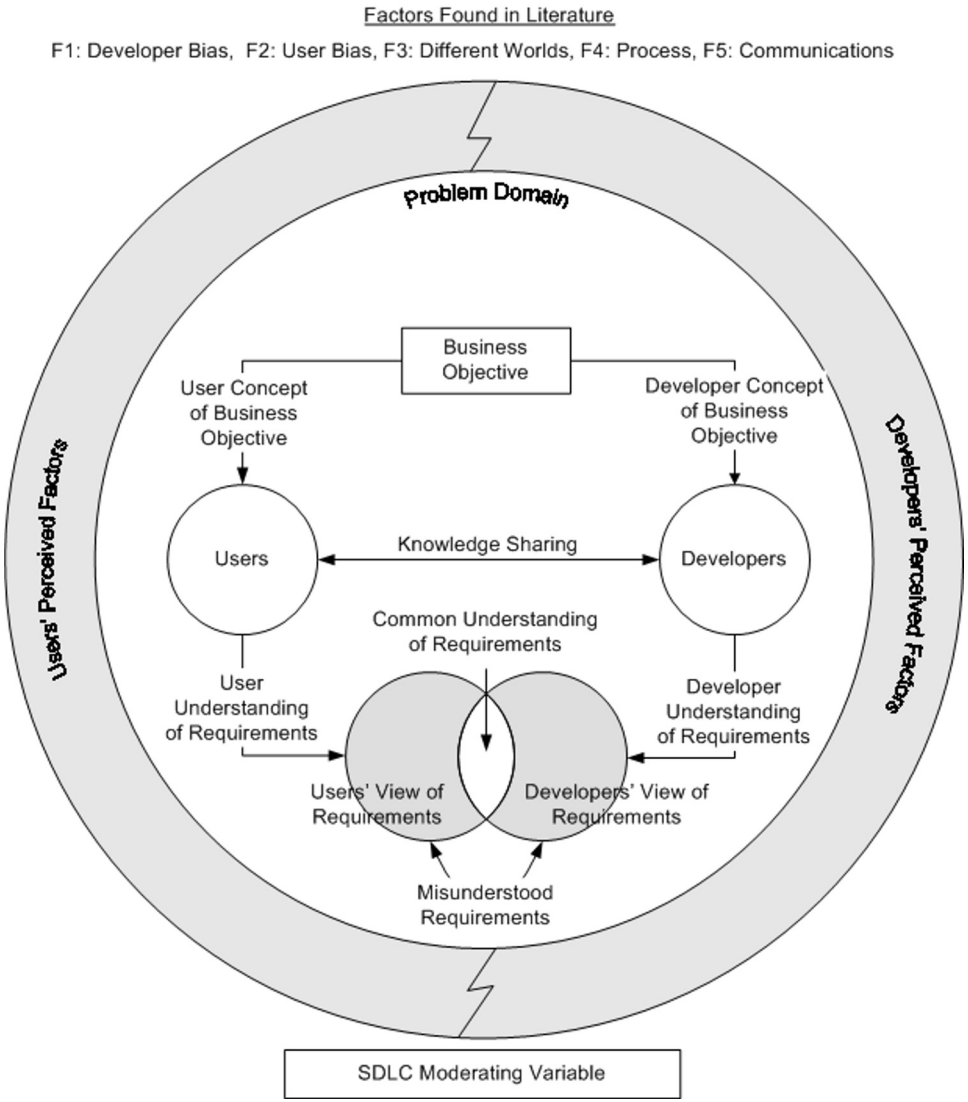


Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal, 20*(2), 22.

Example B

This mixed methods study used a conceptual framework to guide the identification and subsequent weighting of the factors related to the misunderstanding of requirements.

McAllister (2006)



Example C

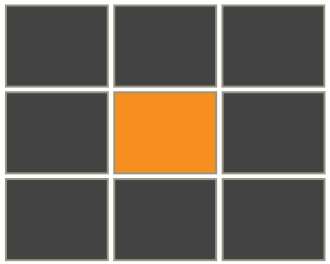
This mixed methods study used a theoretical framework to guide the quantitative analysis of the variables and relationships and subsequent qualitative exploration of the results.

Zimmerer, 2013

Servant Leadership Dimensions and Organizational Outcomes

Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (PhD Doctoral Dissertation), Capella University, Minneapolis, MN. p. 34

Alignment



The conceptual/theoretical framework is the "touchstone" for aligning all research canvas components and subcomponents.

Problem - The problem should be related to the constructs, variables, relationships, and context, identified in the conceptual/theoretical framework.

Purpose - The purpose should be to produce new knowledge and insights related to the constructs, variables, relationships, and context factors identified in the conceptual/theoretical framework.

Questions - The research questions should include the same constructs, variables, relationships, and context identified in the conceptual/theoretical framework.

Literature Review - The literature review should address the theories related to the construct, variables, relationships, and context identified in the conceptual/theoretical framework.

Overall Approach - The research approach should be appropriate for the constructs, variables, relationships, and context identified in the conceptual/theoretical framework.

Data Collection - The data collection methods should be appropriate for the constructs, variables, relationships, and context identified in the conceptual/theoretical framework.

Data Analysis - The data analysis methods should be appropriate for the relationships identified in the conceptual/theoretical framework.

Drawing Conclusions - The conclusions should be appropriate for the constructs, variables, relationships, and context identified in the conceptual/theoretical framework.

Application

1. Identify and graphically depict the research questions' key constructs (or variables). There are two basic options for this step – analog (sticky notes) or digital (diagramming software). Start with a blank page and place the sticky notes or rectangle shapes on a blank page. Or if you have a whiteboard, even better. Any placement or organization will do for now. You can arrange them later.

2. Identify and graphically depict the key relationships between the variables. Once the relationships are identified, organize the constructs so that the relationships can be depicted without too many lines crossing. This might take several iterations.

3. Identify and graphically depict the key contextual factors. Finally, overlay the other factors, including context, onto the diagram to show how these influence the constructs and relationships.

Don't get too "attached" to the first version of your diagram. The framework usually evolves throughout the journey as your thinking evolves. In case you need to backtrack, keep all versions!

5. Literature Review

Introduction

Determine how much we already know about the constructs, variables, concepts, and relationships identified in the conceptual or theoretical framework and research questions.

Do Your "Homework"

Have you ever been on a project or problem-solving team performing well when suddenly, a new team member was added? What happened to the performance of the team? My experiences are consistent; the team returned to the "storming" phase of team development.

Why is this so common? One explanation is that the new member doesn't have the same knowledge and understanding of the problem, project, and where the team has been.

Research begins with our existing knowledge described in the peer-reviewed scientific literature and ends with contributing to that body of knowledge.

Join the Dialogue

When we decide to conduct research and contribute to the body of knowledge, we join a "dialogue" already in progress. This ongoing dialogue is documented in research-based (peer-reviewed) scholarly journals, dissertations, and other research reports.

To avoid causing "storming" in the ongoing discussion, a potential contributor first needs to come "up to speed" on the current state of the discussion. This is accomplished by developing a comprehensive literature review based on an extensive annotated bibliography.

There is no easy path. You have to read and analyze the peer-reviewed literature on your topic. "Elbow grease" and tenacity are keys to a successful literature review.

Literature Review

The Basics

Ideally, the literature review includes recent and classic or foundational contributions. Most of the literature review should be recent contributions (last five years or so) to ensure that you are up to date on the discussion and can determine the following "sentence" that needs to be added for the dialogue to move forward.

Include key classic contributions to ensure that you are building on the main findings of the theoretical foundation of the topic. Many researchers use one technique to find some key current articles and then follow the "trail" backward by going to the articles in the reference list.

You can also go the other direction and follow the trail forward by finding the papers that cited the few articles you used to begin the search.

Critical Review

Don't be timid - point out the limitations of all sources, including those that are famous! This is critical to a credible study.

A solid lit review presents the multiple viewpoints and findings objectively. The task is an objective and critical review of all the key findings and contributions related to your topic found in the research.

This critical review includes not only the findings from the literature but also a description of the strengths and limitations of the findings.

The literature review should take the discussion to the next level and "set the stage" for your research. A literature review does this by drawing conclusions from the discussions that establish the basis for the research questions and, when appropriate, the hypotheses.

For the research canvas, the literature review is only a summary of the key theories and findings in the scientific record.

Example A

Many competing theories and no clear candidate theory to test in the research context drove an inductive grounded theory approach.

Latham (2013)

Leadership is a "messy landscape" with more theories today than 50 years ago. We keep adding theories but seldom actually eliminate any. Consequently, we have made little progress toward narrowing the number of theories down to a reasonable number that explain most leadership phenomena.

There is a wide variety of leadership theories, from Fiedler's Leadership Contingency Model and Path-Goal Theory to the popular Transformational and Transactional leadership theories to Strategic Leadership and Upper Echelon theories.

There is little consensus on effective leadership among practitioners and researchers.

There are many tested leadership theories, but many questions remain. Research has produced many inconclusive results and many inconsistent results in different contexts. We have a limited understanding of how the nuances of context influence leadership effectiveness.

Most (88%) leadership studies are quantitative, and most are theory testing. Unfortunately, few qualitative studies are published in credible journals, many of which are deductive explorations of existing theories.

Several practitioner case studies describe their organization transformation experiences related to Baldrige but few empirical studies on the subject.

Not clear where one should start – with what theory or theories???

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Example B

The lack of an established list of factors led to a sequential mixed methods study, with the first phase focused on developing the list of factors that could then be weighted and compared.

McAllister (2006)

Why Understanding Requirements is Important

The 2002 Standish Chaos report found that 66 percent of IS projects fail, a number that has varied little since their original report in 1994.

Lack of user input, misunderstood requirements, and changing requirements were cited as the key factors for project failures.

A European study to improve the development of quality software found the two main factors were “requirements specifications” and “managing customer requirements.”

Misunderstandings Between Users and Developers

A correct, complete understanding of software requirements is the foundation for quality software and reduces the cost of a software development project. However, communication problems between stakeholders, particularly between users and developers, make requirements engineering (RE) difficult.

A qualitative study of communication in RE found communication issues were a key contributor to many requirements misunderstandings and project failures.

Requirements determination is a communication-intensive process.

The differences between users and developers create additional communication issues.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 13-58

Example C

The current state of the key theories and instruments leads to a mixed methods study to validate the instrument in the US context to see if there is an expected difference among the three generational cohorts.

Zimmerer (2013)

There are many leadership theories, including the popular and extensively researched, Transformational and Transactional Leadership. Unfortunately, these theories don't always work well with the current workforce.

Servant leadership was first introduced in 1970 by Robert Greenleaf. Since that time, several research studies have been conducted. However, until Dirk van Dierendonck, no one had synthesized these diverse efforts and models. Dirk van Dierendonck developed and validated a new survey in the UK and Netherlands.

Generational cohort theories date back to the mid-19th century and Auguste Comte. These theories propose that the socio-cultural environment of humans can and does shape the members' world views.

Karl Mannheim put forth a framework in 1928 that is the basis for much of our research today. It suggests that generational cohort groups have values, attitudes, and approaches to life and work specific to their particular group.

The current US workforce is primarily comprised of three generational cohorts, each with different values, attitudes, and approaches to life and work.

Given the characteristics of servant leadership in the van Dierendonck synthesis model, it appears that servant leadership may be a viable alternative to the current situation.

We would expect servant leadership to be more effective than other leadership approaches, but there will still be differences among the generational cohorts.

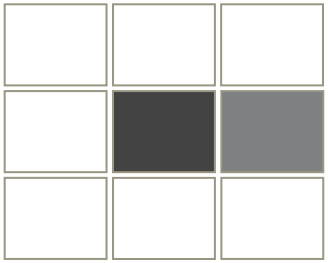
Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 16-19

Alignment

Questions

The literature review describes what we already know about the theories related to the constructs, variables, relationships, and context factors identified in the research questions.

A hypothesis is not a “wild guess” - it is a logical conclusion based on the previous research findings in the literature review.

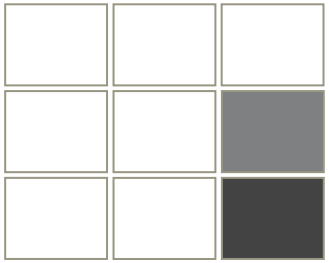


Conceptual Framework

As with all the components of the research methodology, the literature review should address the constructs, variables, relationships, and context factors identified in the conceptual framework.

The literature review typically informs the development of a new or revised conceptual framework.

Remember - Developing a research plan is an iterative process!



Overall Approach

The literature review establishes the current level of empirical knowledge on the topic.

The level of existing knowledge and the decision to include or not include hypotheses will drive the appropriate overall research approach.

Application

One BIG mistake that many new researchers make is to start writing the literature review before they are ready. Before you write “pretty” paragraphs, there are at least four preliminary steps to complete.

1. Create a preliminary outline of the literature review and use it as a guide as you collect and analyze the literature. I often use a mind map to help explore the key concepts, variables, and relationships.

2. Dig deep into the “peer-reviewed” literature for each construct, variable, and relationship and create an annotated bibliography.

3. Then, you can use tables (I use spreadsheet software for this) to create matrices to analyze the various findings. Note: The most recent version of NVivo, a Qualitative Data Analysis software application, also allows you to code PDF versions of papers.

4. Then, you can develop a more detailed outline based on the analysis of the matrices or NVivo analysis.

5. Then and only then will you be ready to write "pretty" paragraphs.

Once the literature review is complete, the conceptual framework should be revised (as necessary) based on new insights gained from the literature analysis and previous research findings.

Note: Seldom is a comprehensive literature review accomplished as part of the initial development of a research canvas. Consequently, revisit and revise the research canvas as you develop a comprehensive literature review.

6. Overall Approach

Introduction

Research traditions vary depending on the field, discipline, and school.

Choosing an Approach

At this point in the design process, it should be clear which "category" of approaches is most appropriate for your particular study.

The most appropriate approach is based on the problem, purpose, and research questions. Also, the "nature" (epistemology and ontology) of the constructs and relationships identified in the research questions and conceptual framework will influence the most appropriate research approach.

For example, If you have constructs that are not measurable and sometimes not even known at this point, then you are limited to qualitative inductive approaches. If, on the other hand, you have quantifiable variables that are predictable and less dependent on context, then quantitative deductive methods are likely to be appropriate.

How Much We Know?

How much we know about the research questions, constructs, and relationships, and the decision whether to use a hypothesis, influences the "menu" of research approaches appropriate for your study - qualitative, quantitative, mixed.

How much do we know about your topic – the constructs, variables, and relationships?

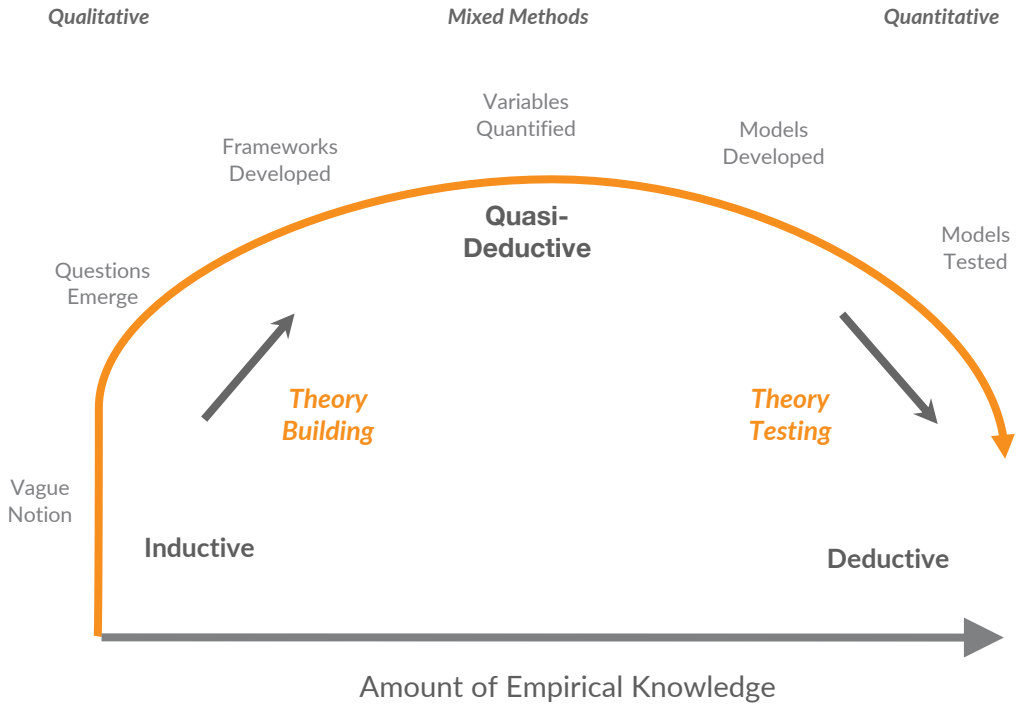
It might be a theory-building situation if little is known about the topic. However, if much is known about the topic, it might be more appropriate to test the theory in a new context or with a new population.

The Research Arc is on the next page, a visual depiction of how the level of empirical knowledge can influence the overall approach.

Research Arc

The research arc visually depicts the relationship between the amount of empirical knowledge we have about a phenomenon and the applicable research approach. When we know little about a phenomenon, we inductively build a theory from a vague notion to identify key constructs for developing frameworks. Due to the "nature" (epistemology and ontology) of some phenomena, we never get to theory testing. However, if the constructs and relationships are measurable, we can test the frameworks and models using quantitative methods. Sometimes we go back to qualitative methods to explore quantitative results that we don't fully understand. It is often an iterative process with many "twists and turns."

For example, if you are using a hypothesis, then it is a theory-testing study, and the overall approach should be a deductive, fixed, quantitative design.



Quantitative Approaches

There are two common quantitative situations. Either you measure the variables at one point in time.

-- OR --

You measure the variables, perform an intervention, and then measure the variables again.

Single Point in Time Options

Survey research that measures the variables at a particular point in time appears to be the most common management research approach published in top-tier journals. These studies either ask about the participant or phenomenon today or how it was at some point in the past (*ex post facto*).

These studies are often characterized as correlation-regression studies and tend to focus on analyzing the relationships between two or more measurable variables. However, researchers are increasingly using more advanced methods, such as structural equation modeling, to develop even greater insights into the variables and relationships.

Other options utilize existing measures from operations, sales, finance, etc. These approaches often use advanced statistical methods to explore and test theories related to large data sets. Longitudinal studies are similar to experiments in that they include multiple measurements with events in between.

Experimental Options

A second common option is to conduct an experiment or quasi-experiment. While we seldom conduct "true" experiments in management and organization research, experiments are the "gold standard" of research. True experiments typically require randomized selection and assignment of participants and treatments, which are often impractical in organizational settings and studies.

More common in management studies are quasi-experiments where we do not use randomized selection or assignment. When it comes to experiments, the main issue we face in management and organizational research is our "lab" is typically the actual organization which includes many uncontrollable variables and many idiosyncratic contextual factors that influence the measurement of the variables and analysis of the results.

Qualitative Approaches

Case Study

The case study is the most common qualitative approach used and published in business, organization, and management research.

There are two basic types of case studies, but both include in-depth treatment of a particular case. First, it can be the overall structure or design of a study that incorporates other quantitative, qualitative, and mixed methods. Second, it can be a specific methodology, as described by Yin (2014).

This flexibility makes the case study a useful approach for management researchers who are often studying the intersections between process, people, and culture.

For more on the case study approach in management, I recommend Eisenhardt (1989) and Eisenhardt and Graebner (2007).

Grounded Theory

While qualitative research generally tends to be inductive, or at the most quasi-deductive, grounded theory is possibly the most inductive of the four approaches presented here. Frameworks, models, and theories are developed by analyzing the data “from the ground up.”

This may be one of the most difficult approaches for a new researcher to use, especially when working at a distance (virtually) from their research supervisor and coach. Grounded theory can be the best option when faced with situations where you don’t know all the factors that influence the studied phenomenon.

Case studies sometimes incorporate aspects of grounded theory when appropriate (e.g., Latham, 2013). For more on grounded theory, read Corbin and Strauss (1990).

Qualitative Approaches (cont.)

Phenomenology

Phenomenology is focused on how the participants interpret and feel about their lived experiences. The focus is on the participant's point of view. This type of research is interested in specific concrete experiences and how the participants perceive and feel about those experiences.

While this approach is not the most common approach used for business, organization, and management research, it is an appropriate option when the focus of the study is on how organization practices, processes, or policies impact the people inside and outside the organization and how they feel about their experiences. For example, how does downsizing impact the employee and their family?

Read Moustakas (1994) and Giorgi (1997) for more on phenomenology.

Ethnography

Ethnography is typically focused on exploring and understanding groups and cultures. Or how people do specific tasks and activities. It is often used in product design but is rare in management research in general. However, organization architects use it frequently when designing organization and management systems.

Cultural anthropologists such as Margaret Meade often use this research type. It typically requires extended field research with multiple visits to the particular site/group. For this reason, pure ethnographic approaches are not typical for doctoral business, organization, and management students who typically want to complete their studies in a reasonable amount of time.

Like grounded theory, it is highly inductive, often starting with less structure than a typical grounded theory study.

Example A

Latham (2013)

This study used a theory-building, qualitative multiple case study design.

The inductive analysis was based on in-depth interviews with CEOs who led successful organizational transformations. Individual cases were analyzed prior to cross-case analysis.

The study began with few preconceived constructs. Consequently, the approach incorporated grounded theory methods (Corbin & Strauss, 1990) into a case study "superstructure" (Eisenhardt, 1989).

Overall Case Study Design = Eisenhardt's nine-step Approach

1. Getting Started

2. Selecting Cases

3. Crafting Instruments and Protocols

4. Entering the Field

5. Analyzing Within-Case Data

6. Searching for Cross-Case Patterns

7. Shaping Hypotheses

8. Enfolding Literature

9. Reaching Closure

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal, 20*(2), 22.

Example B

McAllister (2006)

The nature of the research was theory-building and was conducted as an exploratory mixed-methodology that began with a qualitative investigation followed by a quantitative investigation. Havelka, Sutton, and Arnold (1998) used a conceptually similar mixed methodology and identified factors related to information system quality. The qualitative investigation aimed to identify factors influencing users' and developers' misunderstanding of requirements.

The nominal group technique (NGT) was used with six small groups of six to 12 participants. Pairs of small groups were formed from users involved in requirement specification and developers of the same information system, resulting in three pairs. The small groups were from companies engaged in developing IS for internal use and willing to participate in the research. A total of three companies were used. NGT identified the factors involved in misunderstanding requirements from the perspective of users and developers.

A quantitative analysis was performed to understand the importance users and developers place on each factor. Two survey instruments were created to weigh and rank the factors. The results from each participant were aggregated to make the absolute weightings of factors for users and developers. Analytical Hierarchy Process (AHP) was used to weigh the factors.

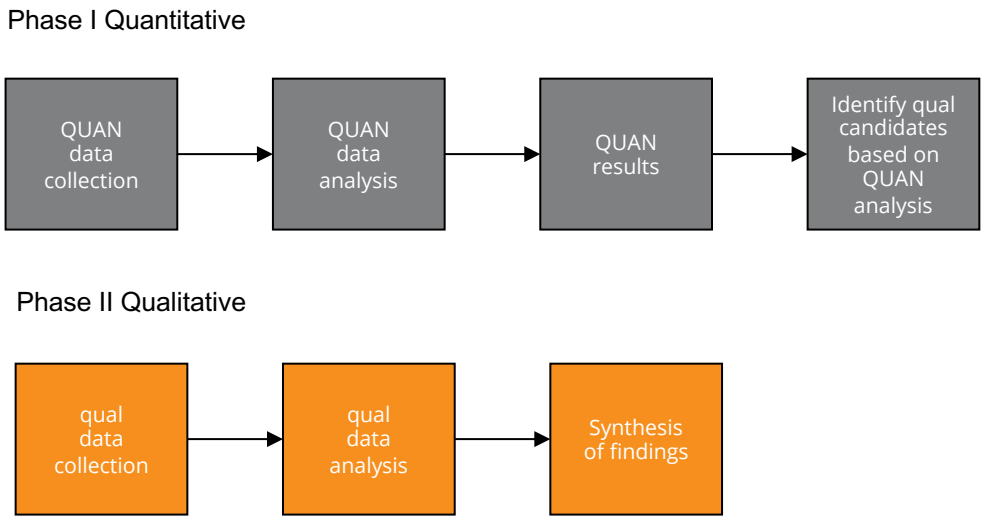
Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 13-58

Example C

Zimmerer (2013)

Sequential non-experimental explanatory mixed methods approach combining quantitative and qualitative research methods.

The dominant phase was the quantitative phase, with the qualitative phase following up on the results from the quantitative study: QUANT, then qual.



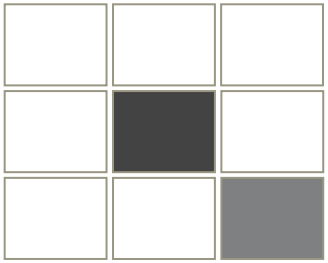
Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 16-19

Alignment

Literature Review

The selection of the overall approach should be, in part, based on the level of existing knowledge identified in the literature review.

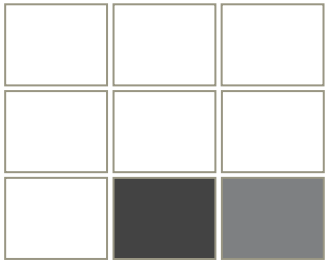
The literature review is the primary input to the Research Arc, which helps to determine the appropriate overall approach options.



Conceptual Framework

As with all the components of the research methodology, the overall approach should be appropriate for the constructs, variables, relationships, and context factors identified in the conceptual/theoretical framework.

The nature (ontology and epistemology) of the constructs and relationship drives the overall approach options.



Data Collection

The overall approach should provide clear guidance for the rest of the research design and methodology: data collection, data analysis, and drawing conclusions.

The overall approach will dictate the “menu” of available data collection options, including the methods, instruments, and sampling strategy.

Application

1. Identify the level of "empirical" knowledge of the constructs and relationships from the literature review.

    a. What do we know about the key constructs and factors?

    b. Do we know how to measure them?

    c. Have the relationships been analyzed in previous research studies?

2. Identify the "type" of knowledge needed to fulfill the **purpose** and help solve the **problem**. What kind of knowledge is required?

3. Using the information from steps 1 and 2 above, identify the options and select an approach based on input from the "Research Arc."

4. Describe the key aspects of the approach.

Decisions made here will drive the remainder of the methodology!

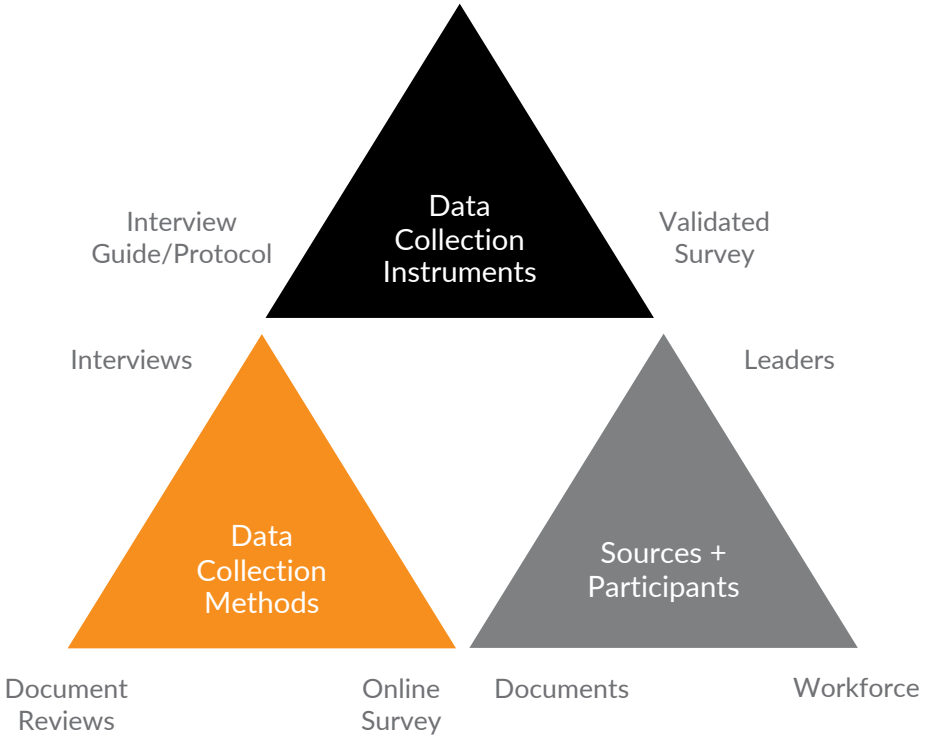
While presented linearly, knowledge development is a messy, iterative, often unpredictable journey with many twists and turns.

7. Data Collection

Introduction

Triangulation is a technique used to mitigate research bias and validity threats. The concept of triangulation originated with surveyors and the process of using known geographic points to determine a location. One survey point provides a line, and we know we are somewhere on (or near) that line. Two points provide an "X" intersection point, but given the measurement error, we could be in any one of four quadrants around the X. The intersection of three points creates a triangle in one of four quadrants that is smaller than the area around the X. Each data point adds additional accuracy to the measurement of our location. This same concept applies to research. The more data sources, data points, data collection instruments, and data types that you have, the greater the potential accuracy of our analysis and conclusions.

There are no free lunches in research! Each additional data source, instrument, and participant requires extra time. Not only additional time for the data collection but also for the analysis, which can be pretty expensive, especially for qualitative research.



Measurement

If the constructs can't be measured, you are left with qualitative options.

If the constructs can be measured, you have both qual and quant options, but there would need to be a good reason to conduct even more qualitative research.

Quantitative

How will you measure the independent and dependent variables? There are two main options for quantitative measurement in management studies: (a) the Likert scale survey and (b) direct measurement using other methods.

For quantitative deductive studies, measurement resulting in nominal or ordinal data limits you to non-parametric statistical analyses. While non-parametric statistics are sometimes acceptable, they are not as powerful as parametric statistical analyses.

The best options are when you have interval or ratio level data which allows for the "menu" of parametric statistical options.

Note – We measure variables and analyze relationships.

Qualitative

The word "measure" in the context of qualitative methods seems odd. For qualitative studies, the measurement is often "thick, rich qualitative descriptions" based on the responses to the questions in an interview guide.

However, the words chosen mean different things, as do the tones used, the non-verbal indicators, etc.

For mixed-method quasi-deductive studies, the measurement plan might include both qualitative descriptions and quantitative measures (e.g., survey questions with scales and performance measures such as financial performance).

The measurement plan should be consistent with the overall approach identified in the previous step and the conceptual framework and research questions.

Levels of Quantitative Data

The levels of quantitative data produced from the data collection instruments and processes will determine the statistical analysis options in the data analysis phase.

Nominal

The lowest level of quantitative data is nominal or categorical data. Examples include color, race, geographic region, yes vs. no, etc. The math that can be performed using this level of data is minimal. Even if you assign numbers to the categories, you cannot add, subtract, multiply or divide the numbers. For example, adding the number of green and yellow crayons and dividing to get the average does not get you blue. We often use categorical data as an independent variable to test differences in a dependent variable - for example, groups A and B differences.

Ordinal

Ordinal data is ordered and ranked, but the intervals between each number are sometimes different. So a scale of “I love it, I like it, I don’t like it, and I hate it” can be assigned numbers where one option is greater than the next in sequence. However, “I like it” might be only three times greater than “I don’t like it” but ten times greater than “I hate it.” Thus the distance is not the same between the options. This limits you to non-parametric statistical tests.

Interval + Ratio

The highest levels of data are interval and ratio. Both have ordered magnitude and the interval between the choices is the same. The difference between the two is ratio data has an absolute zero point, and interval data does not. While Likert scale surveys often produce ordinal data, some can produce interval-level data, which enables the use of parametric statistics.

Sampling

The main sampling strategy differences for each methodology (qualitative and quantitative) are based primarily on the purpose of the research and overall approach.

Probability Sample

If the purpose is to deductively “test” a specific quantitative hypothesis, then a random sample that is sufficiently large to represent the population is the desired sampling approach. That way, the findings can be generalized to that larger population.

In reality, we seldom have access to the target “population” and thus settle for an accessible sub-set or sampling frame. Unfortunately, the sampling frame is often a quantitative case study of a particular organization or a convenience sample.

When combined with the ethical requirement of informed consent, we seldom actually obtain a true probability sample. Consequently, statistical power is an important input to an a priori sample size determination (e.g., G*Power).

Purposive Sample

On the other end of the research spectrum are exploratory qualitative studies to " build” a theory.

Researchers conducting qualitative theory-building studies worry less about representative samples and more about getting the right people to provide a rich data set. Consequently, participants are chosen using explicit purposive criteria.

For practical reasons, qualitative samples are limited in size and often include as few as 15 interviews. Of course, these approaches have many variations, including those used in mixed methods studies.

When practical, you want to work toward a representative sample. However, a purposive sample might be more appropriate unless you are testing the theory to increase generalizability to other populations.

Qualitative Sample Size

While research methods textbooks are a good place to start, I recommend that you study the Guest, Bunce, and Johnson (2006) and Crouch & McKenzie (2006) papers.

Saturation

When planning data collection for a qualitative research study, whether for a Ph.D. dissertation or a new business model, researchers often ask how many participants are enough. The answer is enough is the amount where additional participants don't provide any additional insights. We call this phenomenon "saturation." You reach saturation when you no longer learn much (if anything) from each subsequent interview, observation, etc. So, how many do you "typically" need to reach saturation? Good question.

Minimum Sample Size

Guest, Bunce, and Johnson (2006) propose that saturation often occurs around 12 participants in homogeneous groups. This is consistent with my own experience during a recent CEO study where saturation occurred at about 11 participants (Latham, 2013). To ensure saturation, you must go beyond the point of saturation to ensure no new major concepts emerge in the subsequent few interviews or observations. Consequently, 15 as a minimum for most qualitative interview studies works very well when the participants are homogeneous. Homogeneous, in this case, means a particular "position" or level (e.g., top-level executives) in the organization, a specific type of employee (e.g., customer service representatives), and so forth. For a particular group, saturation often occurs between 12 and 15. However, if you are interviewing different types of participants, you may need 12 to 15 of each type to reach saturation.

Enough is Enough

There is an old saying in research, "the more data points, the better." However, for practical reasons, Crouch & McKenzie (2006) propose that less than 20 participants in a qualitative study helps a researcher build and maintain a close relationship and thus improve the "open" and "frank" exchange of information. Consequently, the "sweet spot" sample size for many qualitative research studies is 15 to 20 homogeneous interview participants.

Quantitative Sample Size

Statistical Power

Statistical power is an important “additional” input for developing a sampling strategy. One helpful resource for computing statistical power is G*Power, a computer application available for free for both PCs and Macs. What is the advantage of statistical power? It can help us avoid both type I and type II errors. For a discussion on this, see Mayr, Erdfelder, Buchner, and Faul (2007). All too often, we are faced with small samples due to access or resource limitations. Small samples run the risk of failing to reject a wrong null hypothesis (type I error). G*Power helps us determine a priori sample size. Now, G*Power is not simple to use. There is a bit of a steep learning “curve,” and it takes some time and experimentation to figure out the correct settings for a particular a priori sample. So, download and start playing but be patient and curious.

Resources

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analysis. Behavior Research Methods, 41(4), 12.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, 39(2), 17.

Mayr, S., Erdfelder, E., Buchner, A., & Faul, F. (2007). A short tutorial of G Power. Tutorials in Quantitative Methods for Psychology, 3(2), 9.

Check out the G*Power website for a more comprehensive list of downloadable papers.

https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower.html

Pilot Study?

It Depends

When developing or choosing a data collection instrument and developing a data collection plan, the question of a pilot study inevitably arises. The need for a pilot study depends on several factors, including (a) the amount of previous experience with the instrument (survey) - what steps others have taken to validate the instrument; (b) where (what participant groups) the survey has been used with; and (c) your situation.

Has the Instrument Been Validated?

a. The first question is, what has been done to validate the data collection instrument (survey)? Just because it is a popular survey used widely doesn't mean anyone has taken the time to validate the instrument. You need to find out how the instrument was validated and document those methods in your methodology chapter.

b. Even if the instrument has been validated with certain groups, that doesn't mean it is valid for all participant groups. You need to find out where and with what groups the instrument has been used and validated.

c. Once you know the answer to a and b above, the last question is where (what participant group) are you using and what are you trying to do? First, how close does your participant group match the groups you identified in (b) above? Second, is this a theory-building exploratory study, or are you testing a theory? If you are theory testing, the requirements are much higher for survey validation. Your purpose will also influence how much validation is needed for your study.

Example A

Latham (2013)

Cases were drawn from the 49 organizations that received the Baldrige award in the ten years preceding the data collection.

A purposive sampling approach was used to select 14 cases.

Participants were active members of the Baldrige Award Recipient's (BAR) Consortium.

The chosen organizations represented the five categories that had received the Baldrige Award, including large manufacturing, large service, small business, education (K-12 and Higher Ed), and healthcare.

The sample size of 14 exceeded the recommended 4 to 10 cases in Eisenhardt (1989), which made for a lengthy analysis process. While 14 individual interviews are often doable, the process can become very time-consuming when those interviews are long, and the analysis includes additional organization data (context).

Deep dive interviews were conducted with CEOs using a flexible semi-structured interview guide.

Verbatim transcripts were typed from digital recordings.

Organization documents that described the key context factors were used to analyze the impact of context on the transformation process and the leader behaviors and activities, culture, and individual leader concepts identified in the analysis.

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Example B

McAllister (2006)

The population explored included users involved in specifying requirements for IS and developers who create information systems.

A purposive sample was used consisting of three companies that meet the following criteria:

- Sufficient size to create NGT groups of users and developers;
- Publicly traded company performing in the top 49% of their industry group (a measure of success determined by the stock market); and
- Each company will be from a different industry to obtain a broader perspective.

After collecting the factors from users and developers via NGT, two aggregated lists will be created—one for users and the other for developers.

Two web-based survey instruments were used to weigh the importance of the factors. One contained the user factors, and users were asked to complete the survey. The other contained developer factors, and developers were asked to complete the survey.

The survey participants were the same individuals who participated in the NGT small groups.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 13-58

Example C

The current state of the key theories and instruments led to a mixed methods study to validate the instrument in the US context to see if there is the expected difference among the three generational cohorts.

Zimmerer (2013)

Quantitative Phase I

452 total participants from the United States

150 Baby Boomers

151 Gen X

151 Gen Y

The survey instrument was emailed by research firm Luth Research, LLC to members of the SurveySavvy Panel who qualified based on employment status, age, and follower status.

Completed survey data was exported into the SPSS data sheet.

Qualitative Phase II

Data analysis of surveys from participants indicating a willingness to participate in a phone interview:

8 Baby Boomers, 8 Gen X, and 9 Gen Y participants with high servant leadership survey scores were interviewed by phone.

30 min interviews were recorded and then transcribed.

Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 16-19

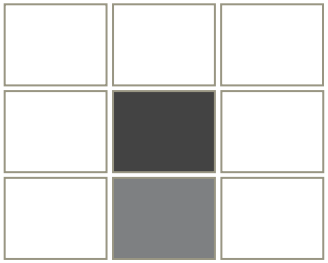
Alignment

Overall Approach

Data collection methods should be derived from and consistent with the overall approach.

While it might seem obvious that a grounded theory approach requires qualitative data, I have reviewed preliminary research plans that proposed a Likert scale survey.

When using a research canvas before a full proposal, it is easier to spot these issues.



Conceptual Framework

As with all the components of the research methodology, the data collection methods should focus on collecting data about the constructs, variables, and context factors identified in the conceptual/theoretical framework.

Data Analysis

Data analysis options will be determined by the type and level of data collected.

Working backward, determine the type of analysis required to answer the research questions. Then, identify the type of data needed to perform the necessary analysis.

Application

1. Develop a measurement plan for the constructs and variables included in the research questions and hypotheses. Include the triangulation strategy and identify the multiple data collection methods, instruments, and participants.

2. Identify or develop the data collection instrument(s). If using a quantitative survey, identify a validated survey that measures the constructs. Developing and validating your survey is an extensive research study in and of itself.

Look for validated surveys that are published in peer-reviewed journals. In addition, look for instruments that have been validated using advanced methods such as confirmatory factor analysis (CFA) and structural equation modeling (SEM). Use surveys from doctoral dissertations as a last resort, and if they did not do CFA/SEM, put that on your “to-do” list and do it yourself.

If doing a qualitative interview study, develop and test an interview guide. I highly recommend using an “expert” panel of researchers in the field to review the instrument and provide feedback. Once refined, conduct “mock” interviews to check for participant understanding and test the type of data they produce.

3. Develop a sampling strategy. Identify the sources of data, including organizations, databases, etc. Identify the sampling approach (probability vs. purposive). If a purposive sample, identify the criteria used for selection. Finally, determine the appropriate sample size. See resources on the next page for more on sample size determination.

8. Data Analysis

Introduction

The type and level of data collected will determine the data analysis options available.

Fundamentals

While measurement and data collection typically describe or measure the constructs, variables, and context factors, the analysis focuses on the relationships between the constructs, variables, and context factors.

The collected data type and level, along with the questions and purpose, will determine the data analysis options available. Remember, the level of measurement (nominal, ordinal, interval, and ratio) will determine the available statistical tests.

The analysis is not limited to statistical tests and thematic analysis. A preliminary exploration of the data using visual displays is a helpful way to "get to know" your data. There is no substitute for an in-depth understanding of the data set before subjecting it to analysis.

Develop Strategy

How will you display the data and analyze the results of the tests and qualitative techniques? If you are doing a fixed design, then a detailed analysis strategy, including specific statistical tests, can be developed prior to conducting the research.

Suppose, on the other hand, you are using a flexible qualitative design. In that case, it might not be possible to know in advance all the analysis techniques that might provide valuable insights into your questions.

In the case of flexible studies, the challenge is to pre-think the analysis options as much as possible, then describe that in the proposal. If you are using qualitative analysis software to assist in the process, that will impact the types of analysis methods you choose. However, the analysis methods used might be quite different than those you predicted at the time of the research plan development.

Quant, Qual, Mixed

Given the limitations of each method, quantitative and qualitative, the use of mixed methods has grown in popularity.

Quantitative

If we have quantitative data from the data collection phase, we can use statistical analysis methods to analyze relationships between the variables. The main advantage of using mathematics is the formula when executed the same way each time, produce the same result (assuming there is no math error).

This is not necessarily the case for qualitative analysis, where the researcher's brain is ultimately the analysis instrument and doesn't follow the exact path each time it analyzes the data.

Qualitative

While quantitative analysis is more objective, it does not always provide a rich understanding of the details behind the numbers.

For example, the correlation between employee turnover and satisfaction as measured by a survey might be significant at the .05 level. What does that mean? How and why did the satisfaction factors influence whether an employee would leave or not?

These are the types of questions qualitative methods are best suited to answer. Then quantitative methods can be used to test the new insights.

Mixed Methods

Given the limitations of each method, quantitative and qualitative, the use of mixed methods has grown in popularity. Most problems or topics in organization research involve easily measurable variables (e.g., time, money, quality) and constructs that are not so easily measurable such as complex interactions. Mixed methods can also help deal with the many context issues we typically face in management research.

Example A

Latham (2013)

Verbatim transcripts were analyzed for each case (within-case analysis).

NVivo8 was used to code the transcripts (level 1 analysis).

Constant comparison + open and axial coding were used to explore the data.

Cross-case analysis with node frequencies by case were analyzed.

Over 200 nodes were explored, resulting in 35 top-level codes selected for the final framework.

The 35 top-level nodes were organized in the five “buckets” at the beginning of the study, including forces and facilitators of change (5), leadership behaviors (9), leadership activities (9), individual leader characteristics (5), and organizational culture (7).

NVivo analysis was supplemented with visual data displays (Miles and Huberman, 1994)

Once the data analysis was finished, the resulting 35 concepts in the framework were compared to the extant literature, using a process described by Eisenhardt (1989) as “enfolding the literature.”

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Example B

McAllister (2006)

Phase 1 will create two lists of factors that influence misunderstanding requirements. The lists will aggregate the work produced by three pairs of small groups using NGT. To produce the aggregated lists, the definitions of each factor will be compared, and similarly defined factors will be consolidated.

Phase 2 will result in weighted lists of factors, indicating the importance of each factor as perceived by users versus developers. Each participant will individually weight the factors. Analytical Hierarchy Process (AHP) or another appropriate technique will be used to create a combined weight across all participants.

Differences between users' and developers' perceptions of factors influencing the misunderstanding of requirements will be analyzed in five ways:

Identifying factors identified by users but omitted by developers.

Identifying factors identified by developers but omitted by users.

The consistency of weightings assigned by users and those by developers using Kendall's Coefficient of Concordance.

Consistency in weighting critical factors between users and developers using the Wilks' lambda test.

For the critically ranked factors, a thematic analysis will be performed of the definitions to identify similarities and differences between users and developers.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 13-58

Example C

Zimmerer (2013)

Quantitative Phase I

Descriptive statistics:

Distribution of age groups

Work experience

Industry

Job tenure of the participants

Normalcy Analysis

Correlation Analysis

Multivariate analysis of variance (MANOVA)

Scheffe's and Tukey's LSD tests were used as post-hoc tests

Qualitative Phase II

Themes were developed and clustered.

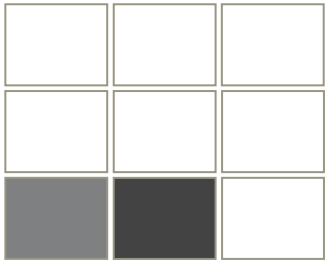
Abbreviated theme codes were assigned to each theme.

Reread the interview transcripts using the theme codes.

Theme codes were added to the appropriate sections in the text and then counted.

Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 16-19

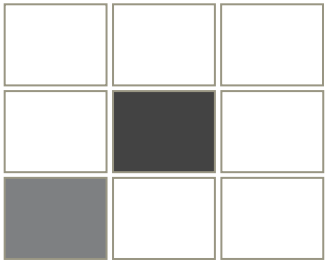
Alignment



Data Collection

The data analysis methods MUST be consistent with the type and level of data that is collected in the previous step.

In the design process, this can be an iterative process of “give and take” as the data collection and analysis plan emerges.



Conceptual Framework

As with all the components of the research methodology, the data analysis methods should be appropriate for the constructs, variables, relationships, and context factors identified in the conceptual framework.

Drawing Conclusions

The data analysis methods should provide the findings in a format that helps answer the research questions, test the hypotheses, and draw conclusions.

The analysis methods chosen need to provide the kind of insights and new knowledge that enable the type of conclusions required to fulfill the purpose and help solve the problem.

Application

Developing an analysis strategy is an iterative process. Remember, we measure variables, and we analyze relationships.

1. Based on the research questions, the overall approach, and the data collected, choose the appropriate analysis methods (be specific). For quantitative studies, identify the specific statistical tests that will be used. For qualitative studies, identify the data analysis tools and techniques that will be used.

Note - Software applications such as NVivo and SPSS are NOT analysis methods. They are applications that perform or help you to perform the analysis methods you identify.

2. Align the analysis methods with the individual research questions.

Tip - One way to show this alignment is with a table that includes the research question, the constructs, the level of data (if appropriate), and the analysis methods or tests. One row for each research question works well.

3. Identify the validity and reliability issues and methods to address those issues. If conducting a quantitative study, identify the validation and reliability methods and tests you will use. If conducting a qualitative study, identify the techniques and methods you will use to mitigate the bias and validity threats.

9. Drawing Conclusions

Introduction

What does it all mean? What are the implications for theory? What are the implications for practice? What are the limitations?

Conclusions

The final step in the research process is to put all the "pieces" together in a cogent conclusion of key findings and their implications for theory and practice.

The conclusions should directly link to the problem statement.

1. How will you draw and test your conclusions?
2. What do you expect **researchers** will be able to do with the findings?
3. What do you expect **practitioners** will be able to do with this new knowledge?
4. What is the expected significance of the conclusions?
5. Acid Test – Will the study, as designed, produce the new insights necessary to fulfill the purpose and help solve the problem?

Limitations

Any discussion of implications for theory and practice should also include the limitations associated with those conclusions.

ALL research studies have limitations!

What are the limitations that you have designed into your study?

The researcher makes many decisions that determine the limitations during the research design process.

Are the limitations that you have designed into your study acceptable?

Example A

Latham (2013)

Theoretical Memos and Node structure were used to develop the framework, with 35 concepts organized into five categories.

Preliminary conclusions and the framework were reviewed by Baldrige Award Recipient (BAR) consortium members at two meetings, one in Cambridge, MA, and the other in New Orleans, LA. Members provided feedback which was incorporated into subsequent rounds of analysis, conclusions, and implications for practice.

Some of the participating CEOs reviewed drafts of the final papers. Feedback was analyzed and incorporated into conclusions and implications for practice.

Identified implications for four leadership theories, including transformational, transactional, servant, and spiritual leadership.

Identified implications for practice, including leadership development and guidance on leading organization transformation.

Identified six limitations including (a) limited to CEO perspective; (b) no female CEOs; (c) no non-profit or government organizations; (d) small sample of 14; (e) U.S. centric; and (f) conclusions not tested using more objective quantitative methods.

The last limitation led to a "spin-off" study on CEO attitudes and motivations, a mixed methods study published in 2012 before the overall study results (Larson et al., 2012).

Source: Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Example B

McAllister (2006)

Conclusions were drawn from three areas:

1. The weighted factors that influence misunderstandings of requirements.
2. The differences in factors and their weightings between users and developers.
3. The similarities and differences in definitions of critical factors between users and developers.

As exploratory research, the study lays a foundation for further work that could show a correlation with minimizing misunderstandings of requirements and quality of software.

By knowing the factors that influence misunderstandings of requirements and the different perspectives between users and developers, methods could be proposed and tested to improve the understanding of requirements. Such improvements are expected to increase the quality of information systems.

By knowing why requirements are misunderstood, we will be better prepared to devise ways to improve users' and developers' understanding of requirements.

Although many methods have been proposed, such as VOC, theoretical knowledge of the factors responsible for misunderstanding is lacking.

Source: McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 13-58

Example C

Zimmerer (2013)

Conclusions were developed by analyzing the quantitative data and adding qualitative insights to explain and enhance the quant results.

Add to the slowly growing body of knowledge on servant leadership by further validating the instrument developed by van Dierendonck (2011) and adding more descriptive data to enhance the granularity with which generational cohorts as a social group can be circumscribed.

By investigating the potential consequences of servant leadership as defined by job satisfaction, organizational commitment, and turnover intent, the study adds to the practitioner dimension of the scholar-practitioner dyad.

Recommendations for the betterment of the leadership process in corporations would be of interest so that all corporate stakeholders, from top management teams, over human resource professionals, to front-line managers, could work together towards a common goal of improving organizational citizenship behavior and organizational outcomes.

This study is focused on leadership attributes. Organizational climate, culture, and economic circumstances can influence on job satisfaction, organizational commitment, and turnover intent but will not be included in this study.

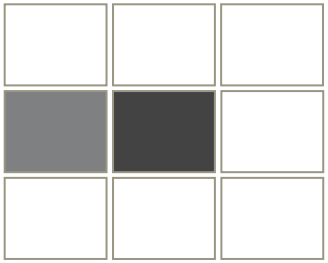
Source: Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (Ph.D. Doctoral Dissertation), Capella University, Minneapolis, MN. pp. 16-19

Alignment

Data Analysis

The conclusions should be derived from and consistent with the data analysis methods.

Will the current data analysis plans produce the findings needed to draw the conclusions that will help solve the original problem?



Conceptual Framework

As with all the components of the research methodology, the conclusions should be appropriate for the constructs, variables, relationships, and context factors, identified in the conceptual framework.

Ultimately, the research should contribute back to the refinement and validation of the conceptual/theoretical framework.

Problem

We have now come “full circle!”

The approaches to drawing conclusions should provide the new knowledge and insights needed to help fill the knowledge (theory) gap preventing us from solving the problem.

Application

1. Based on the planned data collection and analysis, identify what new knowledge and insights you expect to be able to produce?

2. How will the new knowledge and insights contribute to the knowledge gap identified in the problem and purpose?

3. Identify the limitations of this study.

Are these acceptable?

How will these limitations impact the credibility of the study?

How will the limitations impact the motivation to use the findings for future research and practice?

Will the conclusions and associated limitations provide the credible contributions to theory and practice identified in the problem and purpose?

If yes, then you are ready to develop the details of your research design and methodology.

If not, then go back and make the necessary changes so that it will make the necessary contribution.

It is an iterative process!

NOTE – If you fail to identify the study's limitations, your credibility as a researcher and the credibility of the findings will be reduced. Possibly to a point where they are not used.

Epilogue + References

Epilogue

Organization Design is a research-driven practice. Research provides the empirical foundation for creating new and innovative approaches to leading and managing the modern firm. As Kurt Lewin proposed, “there is nothing so practical as a good theory.”

For me, research is recreation. I simply enjoy the process. And I enjoy watching others enjoy the process. Research is often a challenging and frustrating experience. For many new researchers, their first solo research project is the first time they have been asked to come up with everything from the problem to the questions to the methods to answer those questions. This can be both liberating and scary at the same time.

I use terms like “canvas” and “design” because research requires analytical and creative knowledge, skills, and abilities. There is no best way to conduct research, and the answer to ALL research methods questions is, “it depends.” Of course, your next question is, “on what might it depend?” This short eBook is intended to help frame that very question. The canvas is a framework that helps visualize and understand the key linkages between key research design components.

All too often, new researchers will receive feedback on their research proposal, asking them to fix x, y, and z. They then proceed to make those changes and resubmit to their supervisor. The supervisor then sends feedback, asking them to fix a, b, and c. The reaction from the inexperienced researcher is, “Hey, why didn’t you tell me I needed to fix a, b, and c the last time you gave me feedback?” The answer, of course, is that the new researcher's changes to remedy x, y, and z created new problems with a, b, and c.

I hope this work will help researchers identify, for themselves and in advance, the implications that change to one part of the research design have on other aspects of the design and, thus, preempt situations like the one above. The canvas is a flexible framework intended to be used like a “well-tailored suit” vs. a “straight jacket.” Work hard, be tenacious, stay curious, and enjoy the journey!

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References

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices* (Vol. Book 3): USF Tampa Library Open Access Textbooks Collection. Download: http://scholarcommons.usf.edu/oa_textbooks/3/

Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, *13*(1), 20.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles: Sage

Crouch, M., & McKenzie, H. (2006). The logic of small samples in interview-based qualitative research. *Social Science Information*, *45*(4), 18. doi: 10.1177/0539018406069584

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, *14*(4), 19.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, *50*(1), 8.

Giorgi, A. (1997). The theory, practice and evaluation of phenomenological methods as a qualitative research procedure. *Journal of Phenomenological Psychology*, *28*, 47.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, *18*(1), 24. doi: 10.1177/1525822X05279903

Havelka, D., Sutton, S. G., & Arnold, V. (1998). A methodology for developing measurement criteria for assurance services: An application in information systems assurance. *Auditing*, *17*, 20.

Larson, M., Latham, J. R., Appleby, C. A., & Harshman, C. L. (2012). CEO attitudes and motivations: Are they different for high performing organizations? *Quality Management Journal*, *19*(4), 15.

References (cont.)

Latham, J. R. (2013). A framework for leading the transformation to performance excellence part I: CEO perspectives on forces, facilitators, and strategic leadership systems. *Quality Management Journal*, *20*(2), 22.

Latham, J. R. (2008). Building bridges between researchers and practitioners: A collaborative approach to research in performance excellence. *Quality Management Journal*, *15*(1), 20.

Lewin, K. (1951). *Field theory in social science: Selected theoretical papers* (D. Cartwright, Ed.). New York, NY: Harper & Row.

McAllister, C. A. (2006). Requirements determination of information systems: User and developer perceptions of factors contributing to misunderstandings. (PhD Doctoral Dissertation), Capella University, Minneapolis, MN. (UMI No. 3226800)

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage.

Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.

van Dierendonck, D. (2011). Servant leadership: A review and synthesis. *Journal of Management*, *37*(4), 34. doi: 10.1177/0149206310380462

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

Zimmerer, T. E. (2013). Generational perceptions of servant leadership: A mixed methods study. (PhD Doctoral Dissertation), Capella University, Minneapolis, MN. (UMI No. 3554993)

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