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Unlocking Agility: Building Learning Capabilities Within A Consumer Healthcare Organization

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Submitted to the Program of Organizational Dynamics, College of Liberal and Professional Studies in the School of Arts and Sciences in Partial Fulfillment of the Requirements for the Degree of Master of Science in Organizational Dynamics at the University of Pennsylvania
Advisor: Charline S. Russo

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Abstract

Pharmaceutical companies are increasingly infusing the concept of agility to strive for continuous improvement. Significant exploration and research have focused on more technical-driven departments, like Information Technology and Research and Development. However, there has been little research with the focus on more process-driven functions, like Learning and Organizational Development. This action research study presents a case study of the implementation of a new training solution within a consumer healthcare organization from the lens of the project leader. Building upon the case study, this capstone includes a review of existing research and literature of agility with a focus on the healthcare sector, change management, adult learning, and organizational learning. The overall goal of this study is to explore the value of agility in building learning capacities within the pharmaceutical industry. Looking forward, the aim is to provide insights on how agility can be developed to facilitate an organization's transformation to become a learning organization.

Keywords

Consumer Healthcare, Healthcare, Learning and Organizational Development, Information Technology

Disciplines

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Comments

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WITHIN A CONSUMER HEALTHCARE ORGANIZATION

by

Yunqi Tang

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College of Liberal and Professional Studies
In the School of Arts and Sciences
In Partial Fulfillment of the Requirements of the Degree of
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University of Pennsylvania

Philadelphia, Pennsylvania

2020

UNLOCKING AGILITY: BUILDING LEARNING CAPABILITIES
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Approved by:

Charline S. Russo, EdD, Advisor

Stephen G. Hart, MSOD, Reader

ABSTRACT

Pharmaceutical companies are increasingly infusing the concept of agility to strive for continuous improvement. Significant exploration and research have focused on more technical-driven departments, like Information Technology and Research and Development. However, there has been little research with the focus on more process-driven functions, like Learning and Organizational Development. This action research study presents a case study of the implementation of a new training solution within a consumer healthcare organization from the lens of the project leader. Building upon the case study, this capstone includes a review of existing research and literature of agility with a focus on the healthcare sector, change management, adult learning, and organizational learning. The overall goal of this study is to explore the value of agility in building learning capacities within the pharmaceutical industry. Looking forward, the aim is to provide insights on how agility can be developed to facilitate an organization's transformation to become a learning organization.

ACKNOWLEDGEMENTS

A journey of a thousand miles may not be achieved without each small step,
just as the enormous ocean may not be formed without each stream.

- Xunzi, Chinese Confucian Philosopher

Three years ago, I decided to apply to graduate school in the U.S. while continuing my work in Shanghai, China. It was a tough preparation process while continuing to work overtime into the night and traveling for business. One year later, these efforts paid off; I received my acceptance letter from the University of Pennsylvania. Three days after my last day at work, I boarded the plane to Philadelphia. I knew it was the beginning of my journey, a journey of reinventing myself. Time flies. It is hard to believe that I am beginning my capstone study now. Along this journey, many wonderful individuals have shared their hearts with me to help me be where I am today.

I would like to first thank my parents, who live in my hometown in China. They provided unconditional love and support along my journey. When I struggled with the language tests for my application, they always found ways to ease my negative thoughts. When I shared my admission news with them, the only thing they cared about was whether I was happy about it. When this unprecedented COVID-19 pandemic happened, they instilled confidence in my graduation plan. They deeply care about each step of my journey while respecting every decision I make. They trust that I will always do my best in all

my endeavors. They have loved me into being who I am.

I am grateful for Dr. Charline Russo as my capstone advisor. Throughout the past two years of my cohort learning experience, she has offered her wisdom and insightful perspectives. She also helped me see something in myself that I had not seen on my own. As my independent study advisor, she provided timely guidance and inquiries to help me navigate the challenges of the project. She guided me as I worked on the project, helping me cultivate myself as a mindful process referee. When this project turned into a case for my capstone for further study, she became my sounding board and encouraged me. Her kind nudges with a great sense of humor have helped keep me on the right track with pleasure.

My sincere thanks also go to Stephen Hart who generously agreed to be my capstone reader. His extensive experience and thoughtful observations are great gifts for my learning. Lessons from his agile leadership course have broadened and enriched my perspectives. I also would like to recognize Dr. Ingrid Nembhard, Professor of Health Care Management. Her course provided me the breadth and depth of perspectives of managing different healthcare organizations, especially from angles of continuous improvement and implementation.

Finally, I wish to express my appreciation for my special friends Lisette Garza, Wanling Zou, and Nip Dang. They provided emotional support and continuous encouragement to ensure I kept a healthy mentality along the way. The music of J.S. Bach and Yo-Yo Ma has also been a powerful gift for me.

My capstone is a journey of many unknowns, learnings, and surprises. It is a process with many stops. As I am reaching the finishing line, I look back with pleasure on every learning and each stop along the way. The end of something is the beginning of another. The next journey is about to unfold.

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CHAPTER 1

INTRODUCTION

The first known use of “agile” was in the 14th century. The word was borrowed from Middle French and is defined as “having quickness of motion, nimble, active” (Etymology Dictionary, n.d.).

Now, agile related topics have widely attracted attention in industry research and academia. Pharmaceutical companies are increasingly infusing the concept of agility (referring to a set of mindsets, behaviors, and skills) into their operation models and to further re-engineer the organization. Significant exploration and research have focused on more technical-driven departments, like Information Technology (IT) and Research and Development (R&D) (Mahadevan, Paquette, Rashid, & Ustinov, 2019). However, there has been little research written with the focus on more process-driven functions, such as Learning and Organizational Development. This capstone presents a case study of the use of agility as guidance to implement a new training solution within the Consumer Healthcare R&D of a multinational pharmaceutical company.

The case recounts my independent study advised by Dr. Charline Russo through the lens of my role as the project leader of the implementation of a new training solution. Building upon the case study, the capstone paper includes, but is not limited to, a review of existing research and literature of agility with a focus on the healthcare sector, change management, adult learning, and

organizational learning.

The overall goal of this capstone paper is to explore the principles of agility in building an organization's learning capability, specifically within the pharmaceutical industry (herein pharma). It also hopes to provide insights on how agility can be developed to facilitate an organization's transition to a learning organization (Garvin, Edmondson, & Gino, 2008). It is assumed that learning organizations can better adapt to the unpredictable, especially in the era of economic globalization and in the knowledge economy.

Background and Context

In an organization, continuous improvement and innovation are important to ensure long-term success in a dynamic environment. However, in a highly regulated industry like pharma, it seems there is a paradox between stability and dynamics and a primary tension between purpose and safety (Fried, 2017). Constant change seems to be the only thing that does not change in this industry. Like a living organism, pharma needs both backbone elements and fresh blood. The former strives for sustainable excellence to provide safe and high-quality solutions. The latter injects dynamic capabilities (Teece, Peteraf, & Leih, 2016) to adapt to constant changes. However, injecting the dynamic capabilities into pharma is sometimes like renovating a big house by doing everything many times. It is a process that proceeds with small-fit-for purpose performance steps, or say, in an agile way.

The dynamics capabilities have been traditionally related to more

technical-driven areas, like IT and R&D (Mahadevan et al., 2019). To a great degree, this also explains why major attention and resources to agility have been predominantly allocated to these areas in pharma and research study. As the culture of continuous improvement has increasingly permeated in various functions in healthcare organizations (Chandrasekaran & Toussaint, 2019), it is worth studying the value of building agility in other process-driven functions, such as Learning and Organizational Development. This capstone hopes to potentially minimize the current research gap.

In addition, it also expects to provide perspectives and guidance to practitioners like me in the learning and organizational development field. In the last five years, my professional work primarily focused on project management, particularly in the areas of medical-related continuing education and executive leadership development. My experiences and observations lead me to believe that learning plays a crucial role in both professional advancement and organizational development. Now as a full-time graduate student with a major in Organizational Dynamics and a great interest in the healthcare industry, I hope that this capstone will also contribute to my future roles as an organizational development consultant and a professional in the healthcare industry.

Case Overview

The case is developed solely for the learning objectives of this capstone study. Actual names of people, the company, and any other identifiable information have been altered to preserve confidentiality and privacy.

In the summer of 2019, I was employed by BrownNeilsonCarr (herein BNC), one of the world's largest pharmaceutical companies, as the project leader to implement a new training solution to its Consumer Healthcare R&D (herein CHRD). The overarching goal of this solution was to ensure that the Technical Excellence and Operations (herein TEX) scientists verify the compliance status of their equipment and process training and bridge the required knowledge gap before performing the related activity. It was designed to replace the existing solution.

As a multinational company, BNC has offices in over 120 countries. It has three global businesses that research, develop and manufacture pharmaceutical medicines, vaccines, and consumer healthcare products. Each business has a broad portfolio of innovative and established products that effect people living in nearly all countries in the world. To further strengthen its pharmaceutical and vaccine R&D pipelines and businesses, the company announced in 2018 that it would separate its consumer healthcare business through a joint venture with its major rival. This global integration transaction was expected to be completed within three years and has influenced every unit and its daily operations. The senior leadership team and the integration office communicated with the following message:

“BNC Consumer Healthcare (herein BNC CH) is a big muscle to move with around 30,000 employees, brands that are sold in over 100 markets, and 36 manufactures sites. So how do we fight the complexity and start moving our muscles to make things happen? We need to deliver the integration plans to minimize uncertainty, maximize opportunities and deliver synergy commitment.”
(BNC Internal Communication, 2018)

Agility was considered as one of the most important attributes to lead this integration. Employees were encouraged to be more courageous and accountable and involve fewer people in decision-making to facilitate the integration happening within the targeted timeline. Using agile approaches to run experimental actions first was widely advocated in BNC CH since the integration began.

The project I led targeted six CHRD major sites across four countries. It involved more than 350 TEX scientists who worked on analytics, formulation, prototyping and packaging at CHRD laboratories or pilot plants across all product categories and brands. An essential part of this project was to introduce a web-based digital tool called *Masterfinder* to CHRD. The tool was developed by the Vaccine business to fit its business nature and needs. To achieve the project's end goal and ensure a fully successful implementation, a pilot program was launched at one of the six sites. The aim was to configure *Masterfinder* into CHRD use at its best and develop a receptive change process for TEX scientists to better adapt to the new training solution. Evolving from the pilot program, this project was planned to scale up to other sites and achieve the ultimate objective to expand the TEX team's learning and organizational capability.

Literature Review

Building on the experiences of the case study, the literature review includes, but is not limited to, industry research reports, academic studies, and books that explore agility related topics in healthcare and its value in process

management and building learning capability. Considering both my experiences and learning objectives, the literature review focuses on the following areas.

Agility. Agility has been seen as “the organizational capacity to effectively detect, assess and respond to environmental changes in ways that are purposeful, decisive and grounded in the will to win.” (Tilman & Jacoby, 2019, p. 7) According to a recent report published by McKinsey (Mahadevan et al., 2019), organizations across sectors from banking to pharma are realizing the immense value that agility can bring, especially in building organizational capability and continuous improvement. Considered as the hub of innovation, pharma R&D is increasingly turning the concept of agility into operations. As the presented case takes place at CHRD and agility serves as the implementation’s guiding principle, research of agility and its related topics in healthcare grounds the literature review.

Change. “Change never occurs as some sort of happening; it is part of everyday life. All management is change management (Schaffer, 2017, p. 3-4).” From setting goals to achieving them, the process is carried out through change, no matter whether the change is little or transformative. The “8-Step-Process for Leading Change” model (Kotter, 1996), identifies planning and creating short-term wins as the essential step to renew the process. In the process, employees are seen as the most valuable assets for organizations; they are the organizations’ secret change agents (Pascale & Sternin, 2005). From the project leader’s perspective, the solution implementation presented in the case was a process improvement as well as change management. Therefore, it is worth

studying related change methodologies and further explore practices to better engage employees in the change process.

Learning. Learning is commonly recognized as an important attribute to inspire organizations to succeed in a dynamic environment. “Teaching people how to reason about their behavior in new and more effective ways breaks down the defenses that block learning.” (Argyris, 1991, p. 100) Thus, it is necessary to review relevant research on adult learning to study how we may facilitate the training solution design and implementation within an organization, as well as relevant study in the organizational learning field. Three broad factors are essential for organizational learning: a supportive learning environment, concrete learning processes and practices, and leadership behavior that provides reinforcement (Garvin et al., 2008).

Building on the research and study, an evaluation of the value that agility might unlock in learning capability building follows.

Methodology, Assumptions, and Limitations

This capstone study is designed as action research. The detailed case serves as the “action” part, and the literature review is the “research” part.

The case is presented through the lens of my role as the project leader of the solution implementation. Key stages of this implementation process are captured in chronological order. As the organization itself was in an integration, some relevant organizational background information is also provided to enrich the context.

Because the case presents a solution implementation with agility as the main guideline in a constant change context, the literature review focuses on research and study in the areas related to agility, change management, adult learning, and organizational learning. It is a blend of qualitative and quantitative perspectives from various industry research reports, academic studies, peer-reviewed journals, and books. Together with my observations, this case study primarily explores the following questions.

- Does agility bring value in learning capability building in this case?
If so, what is that value?
- From expanding individual capability to building a learning organization, how may we, as practitioners, better unlock agility's value in the process?
- What are the challenges and opportunities we need to be aware of when injecting agility in learning capability within an organization?

It is assumed that the net benefits (i.e., benefits minus costs) that agility brings (Teece et al., 2016) in the presented case are positive. In addition to that, learning organizations can better adapt to the unpredictable, especially in the era of economic globalization and in the knowledge economy, which serves as an important factor to motivate pharma towards continuous improvement and innovation.

My own assumption is that not all solution implementations always need the project leader to have knowledge of organizational dynamics. But for situations that have both technical and people components, like the presented

case, project leaders with organizational dynamic knowledge can bring tremendous value to the implementation process.

Although the literature review considers multidimensional perspectives from both academia and industry, not all perspectives can be shared in-depth within the limited analysis. It by no means serves as an exhaustive review of the vast amount of existing resources on each of the above-mentioned areas but aims to potentially minimize the current research gap across areas. In addition, the case is encapsulated within a defined time period and in the context of an organizational integration. To a certain degree, this integration plays a catalyst role in the solution implementation process from many aspects. And not all observations and events that occurred during the process were incorporated in this case. After all, this is a single-case study.

Conclusion

The last part of the capstone paper provides a summary of the analysis and findings discovered in the case study. It also presents questions and research opportunities that were not within the scope of this capstone but might be valuable for further exploration. Additionally, it will include my own thoughts and reflections in the capstone experience and how this experience has influenced me as a committed lifelong learner and a practitioner.

The overall goal of this capstone paper is to explore the value of agility in building learning capacities within pharma. It also expects to provide insights on how agility can be developed to facilitate an organization becoming a learning

organization. I believe this paper provides insights for a multitude of stakeholders in healthcare, particularly for professionals in learning and capability building and leaders in R&D and process improvement. It will be relevant to the audiences in other highly regulated industries, such as banking.

CHAPTER 2

THE BNC CASE

“We are a science-driven global healthcare company with a mission: to help people feel better and live longer.”

- Company Website

On a pleasant morning in May 2019, I walked into the BNC Consumer Healthcare’s headquarters in New Jersey. Along the lobby, the words *“Everyone at BNC is focused on three priorities – Innovation, Execution, Care”* were painted colorfully in a DNA-shaped molecule on canvas.

As I arrived at the reception area, Vivian Lauder, Consumer Healthcare R&D technical training manager, welcomed me to BNC. She was my line manager. After a few minutes of casual conversation, Vivian began my company tour. Like many companies, this office site had conference rooms named after its flagship products. Many smaller meeting booths were also set up for confidential calls and work that required quiet or privacy. Walking around, it was surprising to see the unique layout: open floor without any table dividers. Vivian explained:

“We used to have individual working stations in the office. We moved to this location three years ago after an integration. The workplace was changed into this flexible seating style in order to increase collaboration and efficiency. Technically, you can work at different spots every day. But normally, your team would choose to stay around a certain area.”

Along the corridors, colorful cabinets were placed for employees to store their belongings. It brought me back to the vibe of high school. Looking around,

people seemed either to be rushing to meetings or deeply involved in their work. Slow steps were seen only at the pantries.

Getting familiar with the space, I sensed a mixed feeling of excitement and nervousness. I wondered what the project would be about; what stakeholders, norms, and organizational dynamics I would need to consider in managing this project? How could I bring my value to best navigate the process?

A History of Striving for Innovation

“Since the 1700s in the UK, our story has always focused on innovation. Today, we have developed a variety of medicines and healthcare products that form the foundations of today’s BNC.”

- Company Website

BNC, a science-driven global healthcare company, is headquartered in the UK with offices in over 120 countries. It has three global businesses that research, develop and manufacture pharmaceutical medicines, vaccines, and consumer healthcare products. Each business has a broad portfolio of innovative and established products that effect people living in nearly all countries in the world. The U.S. is the company’s single largest market and the national headquarters is located in Pennsylvania. Across the country, it has many offices and manufacturing facilities with a different business focus, respectively.

The business model of BNC is as straightforward as it is with many major pharma. New products are discovered, developed, and launched to markets. It then implements continuous improvement and innovation to keep the market

share and revenue from shrinking (Garnier, 2008). Some products have turned into the powerhouse brands and leaped forward over the competition in their areas. Some products may not receive the expected market reaction. Therefore, they exit the market or are sold to their rivals.

To strive for scientific and technical excellence and to achieve the market leader position, R&D drives BNC forward. There are over 16,000 people working across the three global businesses in R&D, including highly focused centers of excellence and functional units. R&D is seen as a team sport with moments of brilliant thinking and hours of painstakingly detailed work (Garnier, 2008). From 2001 to 2010, BNC R&D was reengineered from an obsolete pyramid form of organizational design to a constellation of centers of excellence with the purpose to improve transparency and empower scientists with decision-making autonomy.

Fast forward to 2017, the company welcomed its new CEO, Alex Kirby. With decades of experience in the fast consumer goods industry, the new CEO has injected new perspectives in R&D with an emphasis on developing and strengthening external partner relations, particularly with disease-focused research institutions and advanced technology companies. The goal was to increase the speed of delivering innovative products to the market. In a public letter, Kirby wrote:

“Since starting in this role it has become an incredible journey for me. With more understanding of the challenges and opportunities we confront, I set out three long-term priorities on which everyone in the company is now focused: Innovation, Execution, and Care. I believe these priorities enable us to focus on areas where we can improve and allow us to respond more effectively to our operating environment.” (Kirby, 2017)

In keeping with the new vision, digital transformation would begin at multiple levels across the pharmaceuticals, vaccine, and consumer healthcare businesses.

Integration Leaps Competition Forward

Continuing Interest in Integration

At the end of 2018, BNC announced a separation of its consumer healthcare business through a Joint Venture (herein JV) with its major rival, Spark, a U.S.-based global healthcare company. According to the press release (BNC, Company Secretary, 2018), BNC would have a majority controlling equity interest of 65% and Spark would have an equity interest of 35% in the JV. The goal of this proposed transaction was to accelerate BNC's strategy and strengthen its pharmaceutical and vaccine R&D business and pipelines. Within three years, this integration is expected to position the consumer healthcare business as a new world-leading over the counter (OTC) company. Ultimately, it is designed to lead BNC Consumer Healthcare business to become a separately traded public company. BNC Pharmaceuticals/Vaccines business will be another separate entity.

Before this announcement, BNC just bought a consumer healthcare JV for \$11.5 billion from Galaxy, a Switzerland-based global healthcare company. This JV was formed in 2015 as part of the Galaxy portfolio transformation (Galaxy, Media Relations, 2015). The divestment was completed by August 2018.

Background of the JV with Spark

Consumer healthcare products are dependent on customer loyalty and trademark protection. With heritage products and continuous innovation, BNC Consumer Healthcare has been the market leader in therapeutic oral health and pain relief for decades and has a strong brand loyalty with its targeted customers. It has a portfolio of flagship product brands including: *Ignyte, Griner, Lully, and Phace*. As a result, over half of its annual sales can be generated from these two categories in major developed markets.

Spark has pioneered in introducing affordable consumer healthcare products to China and India, and has a strong performance in the emerging markets. It leads the category of pain relief and vitamin and mineral supplements in the markets. Its powerhouse brands include *Champion, Nourishy and Azurer*.

This proposed JV would leverage the power of both companies' market and brand segmentation, which meant to create a world-leading consumer healthcare company. In this JV's announcement, Kirby said:

"After the integration of BNC and Spark's consumer healthcare businesses we will create greater further value for our shareholders. Meanwhile, incremental cashflows and visibility of the intended separation will help support BNC's future capital planning and further investment in our pharmaceuticals."
(BNC, Company Secretary, 2018)

Integration Guiding Principles

BNC had experience in consolidating market resources and had previously acquired several brands from other rivals before. But this JV with Spark, consolidating the whole business of another company, was unprecedented. Worldwide, BNC has 30,000 employees, 36 manufacturing sites,

and a business presence in over 100 markets. To move this big muscle around, complexity and uncertainty lay ahead.

An integration office was formed with experts from the legal, commercial, R&D and operations teams to manage the process. In every possible communication vehicle, this office iterated guiding principles of integration success. Three key messages are paraphrased as below.

- Business continuity is the top priority.
- Ensure an organized, transparent, and inclusive employee experience with minimal disruption and maximum engagement.
- Deliver the integration plans to minimize uncertainty, maximize opportunities and deliver synergy commitment.

Bill Wheatley, the CEO of BNC Consumer Healthcare encouraged employees to be more courageous and accountable and involve fewer people in decision-making to facilitate this integration and make it happen within the targeted timeline.

In a highly regulated industry like healthcare, there is a primary tension between purpose and safety (Fried, 2017). Changes also need more time to adapt in the healthcare industry. Therefore, the agile approach (Berlin, Smet, & Sodini, 2017) to run experimental actions first was advocated widely within BNC Consumer Healthcare since the integration began.

Learning Drives R&D Capabilities

As innovation and building a competitive product pipeline were priorities for BNC Consumer Healthcare, it had strived for the culture of learning,

particularly in R&D. In R&D, everyone lived with multidimensional learning to achieve continuous improvement.

The Consumer Healthcare R&D developed products in five categories: oral health, pain relief, respiratory, nutrition and digest health, and skincare. Besides the five category/business teams, R&D also had four functional teams focused on clinical development, regulatory, technical excellence and operations, and R&D innovation, respectively. This organizational structure (see Figure 1) had been considered in the re-organization since the beginning of the JV with Spark.

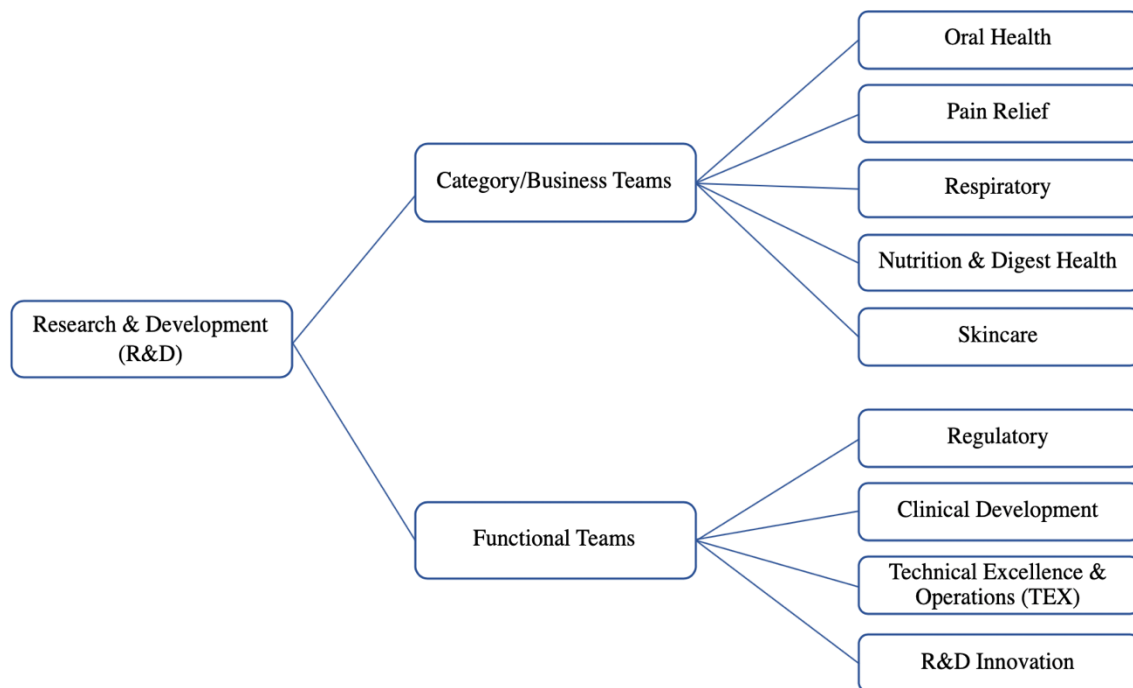


Figure 1. R&D Organizational Structure (Tang, 2020)

A Culture of Continuous Learning

Among all R&D teams, the innovation team served as the bridge for external learning. This team consisted of subject matter experts (herein SMEs) across all business and functional teams. The team not only collaborated with

traditional academic and research institutions but also reached out to diverse partners, like start-ups and investors. By doing so, it aimed to create novel solutions to tackle challenges in the Consumer Healthcare and seize market opportunities in a timely manner. In addition to that, it put some of the R&D needs on BNC's official website to seek innovative ideas from the public.

Valuing external learning, the Consumer Healthcare R&D also had concrete internal learning processes (Garvin et al., 2008). Every R&D staff had a blend of informal and formal learning based on their roles. All R&D functional teams provided formal learning in their fields, respectively. For instance, the learning committee of the clinical development team brought knowledge of clinical research, development, and operations along with the foundation of toxicology and biostatistics to the clinical workforce in R&D.

Within the TEX team, in 2015, a team named Capabilities, Learning, and Development (herein CLD) was created to provide job-role based customized training and expand organizational capabilities. The TEX team consisted of more than 850 scientists in the areas of analytics, formulation, prototyping, and packaging at the Consumer Healthcare R&D laboratories and pilot plants across all business teams. They worked in many countries and had a major presence at R&D sites in the US, UK, Switzerland, and India. Figure 2 illustrates the simplified TEX team structure.

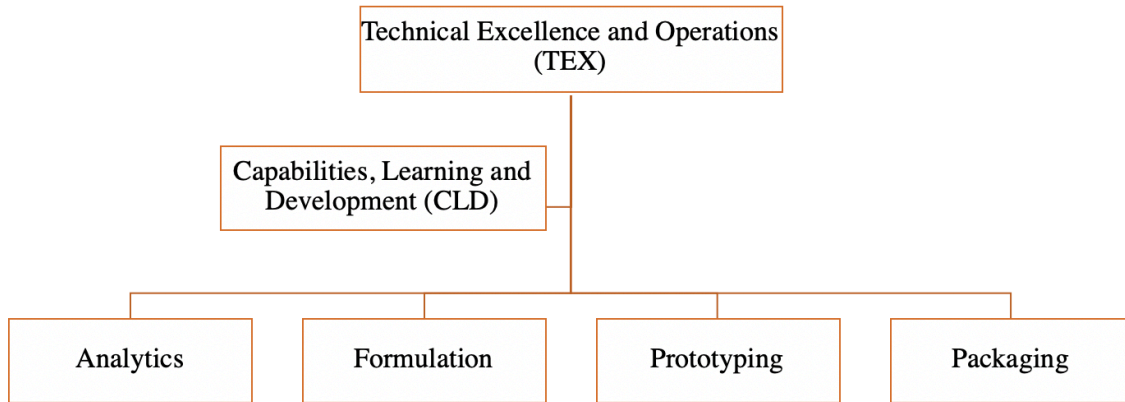


Figure 2. Simplified TEX Team Structure (Tang, 2020)

The Role-Based Training Strategy

The CLD team focused on offering the right training for the right people at the right time. It partnered with both the business functional and quality teams to develop strategic training plans and governance for TEX to drive for the competency of learning and training compliance. The training plan incorporated on-demand learning needs, value-added learning, and development programs. It mainly delivered through *myLearning*, a learning management online system used companywide. Figure 3 illustrates the simplified workflow of how staff receive a learning plan.

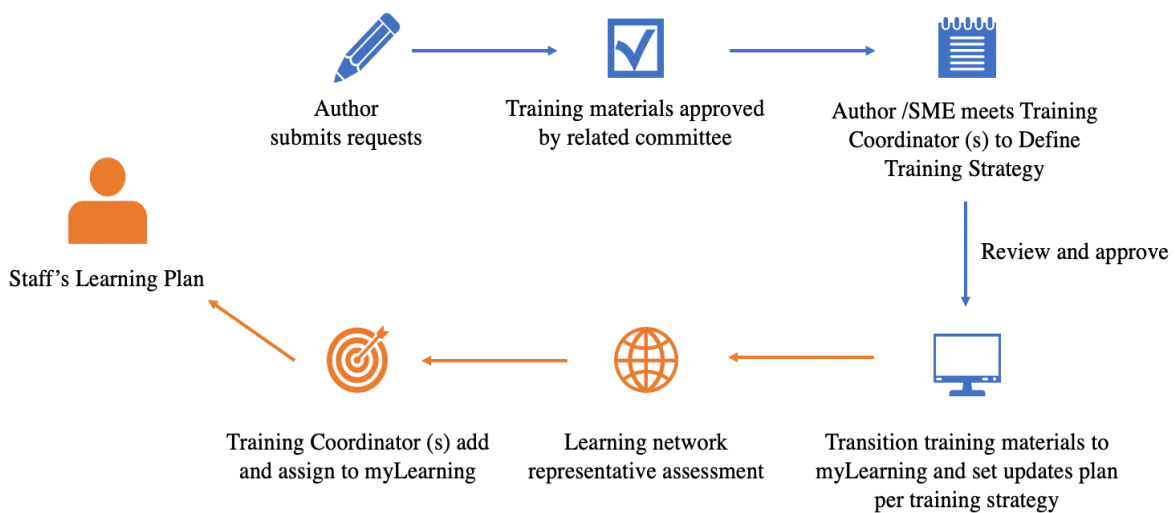


Figure 3. Simplified Workflow of How Staff Receive A Learning Plan (Tang, 2020)

After the CLD team and managers of each R&D sites defined the specific local training strategy, the CLD team took responsibility for assigning the training plan to each TEX staff's *myLearning* folder. The learning plan was usually composed of core learning curricula required by local needs and job roles and optional (also called self-assigned) curricula. These curricula were authored by internal experts and approved by the quality advisory councils.

Understanding the Project

“My father used to work at a major advertising company for many years. He told me questions that he often thought about before he dived into designing any marketing campaign for any client. These questions are: Who cares? What difference does it make? What is in it for its target audience?”

- Vivian Lauder, BNC CH R&D Technical Training Manager

I had two rounds of interviews with Vivian and Dian Heimer, respectively. The conversation with Vivian focused on CLD team's role and responsibility as well as my experience in project management and multiple-stakeholder coordination. Dian was on her second assignment from the Global Regulatory Affairs to the CLD team. When I talked with her, she first asked: “Have you worked in any highly regulated industry before?” I shared with Dian my short experience in a global fast consumer goods company and told her about some experience I had working with some standard operating procedures (herein SOPs). She laughed and responded, “Well, you'll have a summer to know what a regulated industry looks like and what compliance really means.” Through these interviews, it became clearer that Dian would be the project manager I needed to work with directly. But I still had questions in mind. What is the

project really about? What will lead it to success?

The Evolvement of Equipment and Process Related Training

In alignment with the quality requirements, TEX staff had been responsible for completing related equipment and process training (majority is SOPs) at a specific R&D lab/pilot plant before performing corresponding activity. It had been a part of TEX staff's learning metrics and included in their performance review.

Such training was defined as a part of the core learning curricula with an established due date in 2016. It sounded rigorously ensuring that the TEX staff was doing the right thing. In reality, it was not received well. Each R&D lab/pilot plant had numerous pieces of equipment and each piece of equipment associated with at least one SOP. Considering this, it felt like completing all SOPs within limited time was like asking a student to read through all the books at the school library at once. It not only overloaded training to the staffs' daily work, but also led to unknown learning behaviors and unpredictable outcomes.

With collective constructive feedback, in late 2017, the equipment and process related training was changed into self-assigned curricula. It was the same year as Dian started her second assignment away from the Global Regulatory Affairs. Shortly after she joined the CLD team, she identified the risks of assigning the equipment and process related training as the optional curricula. On one side, managers lost visibility of their subordinates' training status as the self-assigned mode in *myLearning* did not reflect on learning metrics by default. On the other side, if any updates on SOPs are made, staff

would not receive automatic notifications to keep up with the latest required training. It is still caused by the same reason.

Simply put, it was hard to know whether TEX staff keep up their compliant training status or not in this self-assigned mode. This presents a potential compliance issue. As the culture of continuous improvement (Chandrasekaran and Toussaint, 2019) permeated in the Consumer Healthcare R&D, Dian initiated the project of implementing a digital tool to help TEX staff verify outstanding training needs for equipment and process. The original plan targeted at seven sites as following: A (US), B (US), C (UK), D (UK), E (UK), F (Switzerland), and G (India).

With a limited full-time staff and a large global audience to support on a daily basis, the CLD team was seeking additional talent to lead this project. That is how I came to my assignment. Though I joined the team as a summer graduate intern, I worked as a project leader.

Getting Closer to the Project

As soon as I started my time at BNC, I realized that I needed to have a thorough understanding of the digital tool that Dian wanted me to implement. This digital tool, named *Masterfinder*, is a web application developed in the summer of 2017 by the Vaccine business. After months of internal system and quality validations, it had been put into use at the Vaccine manufacturing plants since late 2018. The purpose is to ensure staff has adequate training before performing a corresponding activity.

For example, if staff wanted to operate a certain type of laboratory

freezer or perform certain centrifuge process, they needed to verify that they had read the related latest SOPs. By inputting an employee ID number, the series number/barcode of that specific equipment/system, and its location area on the *Masterfinder* web page, they can check whether they had completed related training and fulfilled the compliant training status. At the back end, the *Masterfinder* was integrated with *myLearning* seamlessly. This enabled staffs' learning records to be retrieved in real-time. Figure 4 illustrates the simplified workflow of how staff use *Masterfinder*.

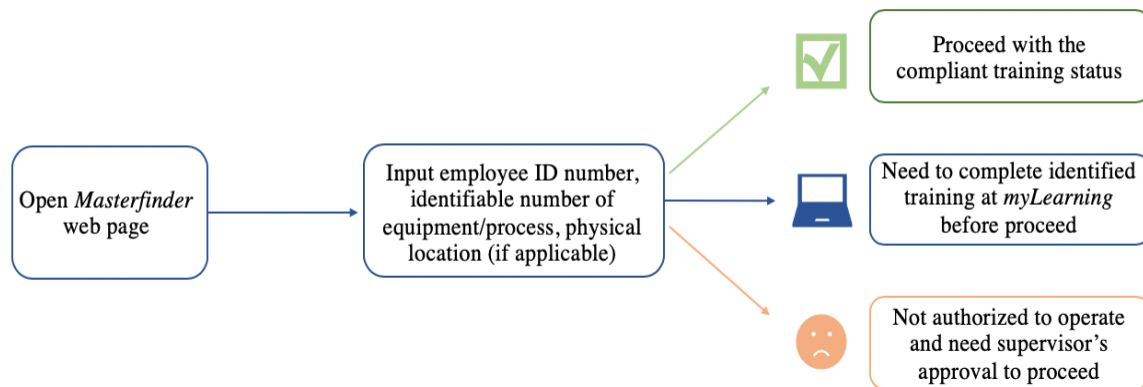


Figure 4. Simplified Workflow of How Staff Use Masterfinder (Tang, 2020)

After a couple of weeks of exploration, it became clear that this project was more than implementing a digital tool to the Consumer Healthcare R&D. It actually consisted of two parts. One was to configure *Masterfinder* to fit the Consumer Healthcare business at best. Another one was to transition all involved training materials from the self-assigned mode to the required mode without a due date set in *myLearning*. By doing so, equipment and process related training would be the required curricula. But setting it without a due date would also give learning autonomy back to the TEX staff.

Up to the time of need, TEX staff can check their equipment and process

training needs on *Masterfinder* first. With identified needs, they can complete related training on *myLearning* to maintain their compliant status. If related SOPs have version updates in the future, they will receive instant *myLearning* notification as the required curricula setting would provide such a function.

It sounded simple, but challenges lay ahead.

Holding the “Adopt while Adapt” Mindset

Unlike the Vaccine manufacturing plants, the Consumer Healthcare laboratories and pilot plants were relatively smaller facilities and had various equipment ranging from small testing tubes to larger prototyping machines. Not all equipment had identifiable, marked series numbers. It did not mention that some small consumable equipment did not register in the equipment inventory at all. In addition, each site was designed differently to meet each country’s regulatory requirements for facilities. The reality of the situation made it impossible to categorize equipment and process related SOPs into specific physical area levels as the Vaccine business had achieved.

Also, making all involved training materials transition from the self-assigned mode to the required without a due date on *myLearning* would take time. It is a manual process like identifying some books in a library and moving them from one shelf to another. During the transition, CLD team can make the primary differentiation between process related training materials and equipment related ones based on the title of SOPs. However, if it goes to a deeper level to associate each SOP with its related process or equipment, CLD team did not have such knowledge. Would such a level of association be

needed within TEX? If so, would there be SMEs from each site working with CLD team on the classification process?

While understanding this project, Dian proposed a potential second phase of the project, to implement *Masterfinder's* newest barcode scanning feature. This new feature was designed to allow users to scan a barcode placed on or next to the equipment instead of inputting information manually. It can work on mobile devices under the *Android* and *Microsoft* environments. It was rolled out only to the Vaccine business.

Known and unknown coupled with each other. It's undoubted that a new process and equipment learning solution was on the way. It also seemed a journey of double-loop learning: "doing the right things is far more important than doing things right." (Argyris, 1996)

Questions kept on spinning in my mind. How to make *Masterfinder* the most effective to meet the needs of Consumer Healthcare R&D? To what extend can CLD team take control? Who should be engaged in this process? As the agile approach was widely advocated within the Consumer Healthcare, in what ways can it bring the most value?

Leading the Efforts to Change

"I have lived in the breath of regulatory every day for decades. If you want to make changes here in pharma, you have to bring the regulatory and quality people on your side. Otherwise, nothing will happen."

- Dian Heimer, BNC CH R&D CLD Senior Manager

With the essential understanding of the project in hand, Dian began thinking of when and where to introduce this project. She deliberately scheduled

a half-hour time slot at the monthly Consumer Healthcare R&D global learning network meeting. Participants of this monthly meeting were leaders from the global and local quality and regulatory councils, related lab managers, and training managers from different functions.

Be Prepared for the Process

Before the meeting, I had two weeks to prepare, including obtaining authorization for *myLearning* and *Masterfinder* and building the introduction presentation. Obtaining system access in other organizations I have worked before was not complicated. Sometimes, it just required a simple procedural application. However, that is not the case in such a highly regulated industry.

For *myLearning*, I had to allocate most of a week's time to study intensively with the purpose of getting the manager level's access. I passed the exam and broke the record of how fast a BNC staff can be certified to that level. At the same time, I worked closely with the system owner of *Masterfinder*, who worked for the Vaccine business in Switzerland, to have access to the system with administrative permission. Access to the backend of both systems enabled me to get closer to turning the initial project idea into reality. The key actions are summarized (see Figure 5).

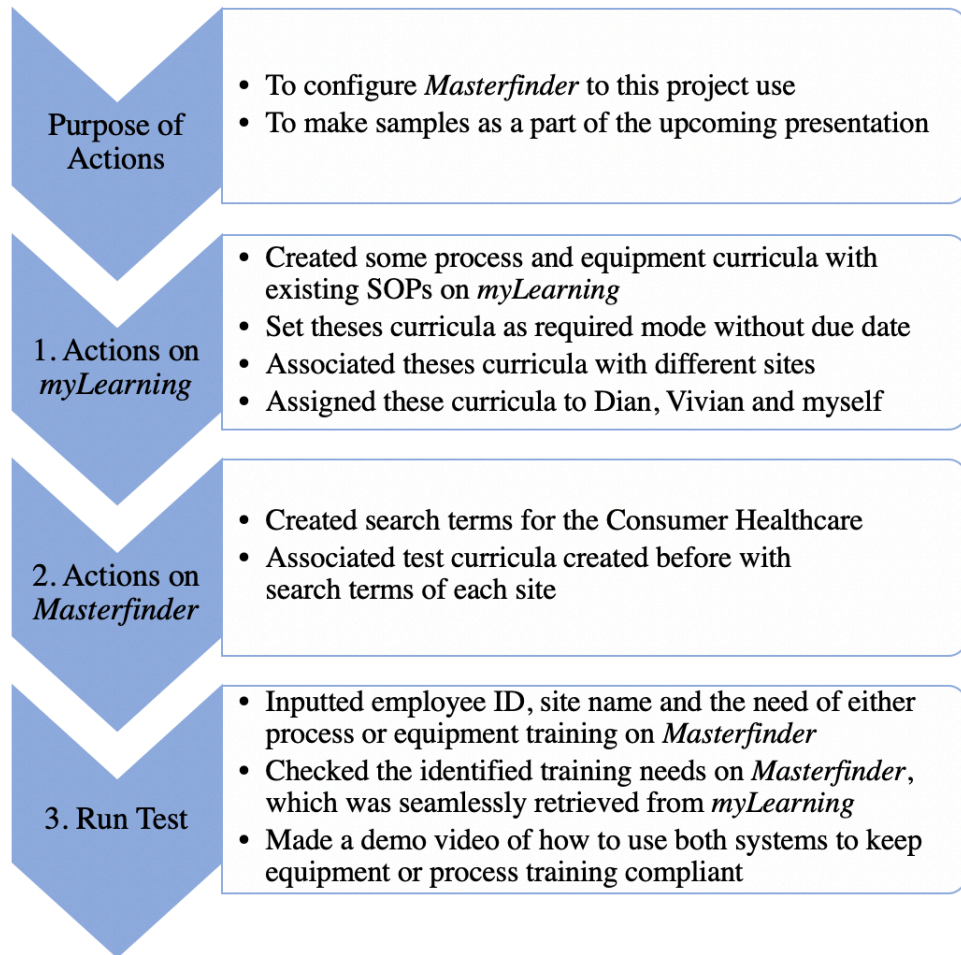


Figure 5. Summary of Preparations before the Project Introduction (Tang, 2020)

Moving forward to preparing the project introduction, Dian suggested that it is necessary to mention upfront that this soon-to-be implemented solution was validated by the Vaccine business. That should add credibility to the project, especially in front of key stakeholders from the quality and regulatory councils.

She was right. My introduction was soon interrupted by a senior quality director at the monthly meeting. He asked me, “Has *Masterfinder* been validated? How’s the track record of success?” After I emphasized it was fully validated and demonstrated some comparative user data that I collected from the

Vaccine business, he seemed relaxed and showed interest in learning more. Toward the end of the presentation, I showed a recorded video demonstration of how to use *Masterfinder* and *myLearning* together to meet the goal of keeping equipment and process training compliant and efficient. The audience at the meeting showed allied support. Such sponsorship from the senior leaders provided the authority and credibility as the foundation of my further work.

Determining Approach

With the success of the first project introduction, I was appraised by the CLD team and dedicated to driving introductions to site managers of the seven targeted locations. That weekend, I reached out to Dr. Russo and shared my thoughts about where I was and how I could better construct the upcoming introduction meetings. With her insightful inquiries, I realized that the essence of this project was a new learning solution as well as a change process. I asked Dr. Russo for her advice on what ways I should better lead the change management. She paused and said something memorable for me, “People often say ‘change management’. I see it as a navigation process. It’s more about navigating as change constantly happens.” Her thoughtful words intrigued me to spend time exploring some studies on change management.

I was influenced most by the “8-Step Change Model” offered by John Kotter and the “ADKAR” model by Jeffrey Hiatt. In the article of “Leading Change” published by Harvard Business Review (Kotter, 1995), John Kotter proposed the 8 steps as following:

1. Establish a Sense of Urgency

2. Form a Powerful Guiding Coalition
3. Create a Vision of Change
4. Communicate the Vision of Change
5. Empower Others
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change

This model places vision and coalition as the gateway to a successful change. Whereas, the ADKAR model (Hiatt, 2006) starts with the awareness of the need to change. ADKAR is an acronym for Awareness, Desire, Knowledge, Ability, and Reinforcement (2006, p. 2). Hiatt described the purpose of ADKAR:

The lifecycle for ADKAR begins after a change has been identified. From this starting point, the model provides a framework and sequence for managing the people side of change. In the workplace, ADKAR provides a solid foundation for manage management activities, including readiness assessments, sponsorship, communications, coaching, training, recognition, and resistance management (2006, p. 3).

The success of the first introduction formed a powerful coalition (Kotter, 1996). It was only the beginning of the process. Moving forward, I planned to use a tailored approach to construct upcoming introductions for site managers with two purposes. The first was to increase their awareness of the need to change. The second was to have their support and take part in the change, which can be seen as creating “Desire” (Hiatt, 2006) in the ADKAR model.

Dr. Russo also invited me to keep thinking of two questions: What can I control? What do I need from others involved in this project? Though I can make

the primary classification of equipment and process SOPs on the learning system, the local teams had to be part of the change journey and to be the change agents (Pascale & Sternin, 2005). A principal consideration is that each site can make sure whether the related equipment and process SOPs fall into the right curricula as expected by verifying the primary classification. In addition to that, each site can utilize the sub-area searching function on *Masterfinder* only if designated SMEs can work with CLD and advise the classification logic.

Put simply, more commitment from each site would create more value for the implementation. A clear project stakeholder map was shaped (see Figure 6).

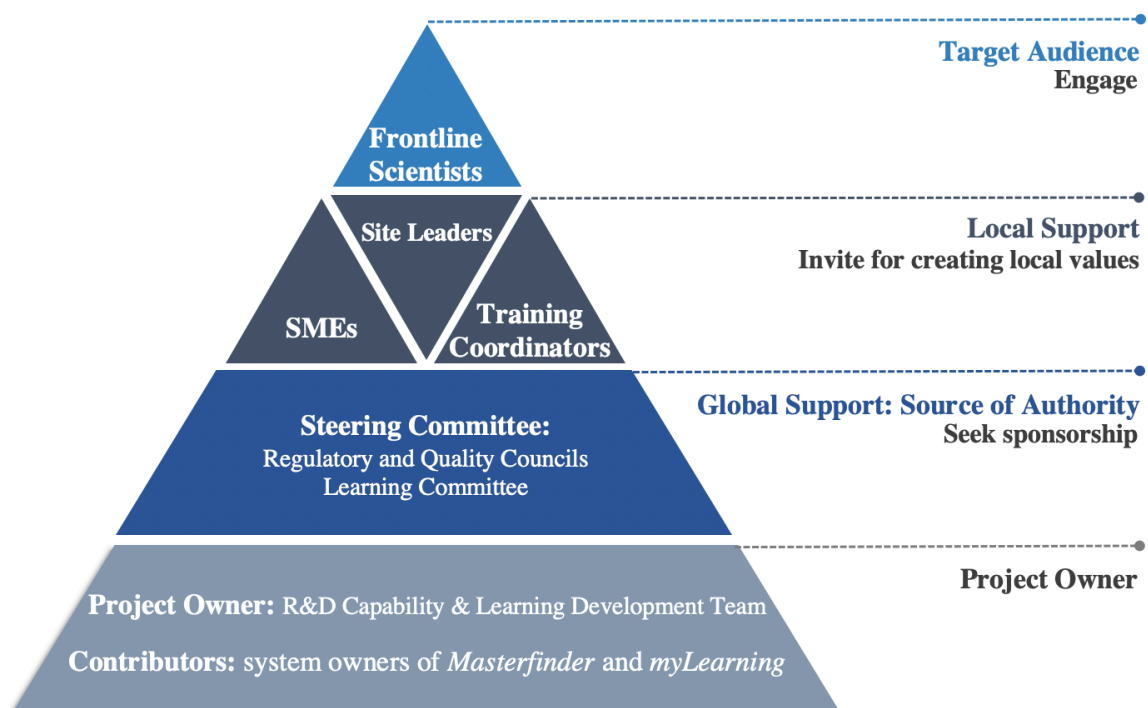


Figure 6. Project Stakeholder Map (Tang, 2020)

Be Strategic for the Roll Out

Over next two weeks, I scheduled meetings with the seven initial targeted sites. Site managers and key influencers of each site were identified by Dian and

invited to each project introduction meeting. Together, we prioritized each site based on the urgency of the needs to change the equipment and process training and the complexity of local implementation. Dian also offered some previous change initiative experience with each site for our consideration. The targeted sites were categorized into three groups:

1. Potential pilot sites: A (US), D (UK)
2. Scale-up sites: F (Switzerland), G (India)
3. Important but not urgent sites: B (US), C (UK), E (UK)

Three key elements of the project (see Figure 7) were framed into the introduction meetings with the hope to answer the question of “What’s in it for me (WIIFM)?” (Hiatt, 2006, p. 9)



Figure 7. Three Key Elements in Project Introduction (Tang, 2020)

Throughout the meetings, there were things that we hoped to see but also some unexpected learning. Site managers and SMEs from A and D showed their enthusiasm for participating as pilot programs. In terms of the general manufacturing plant (herein GMP) sites like F and G, there was local awareness and a desire to be part of this project. However, due to the site size, it would take

more time for both sites to appoint appropriate contact persons and SMEs working with CLD team. At the other end of the spectrum, the manager at site E wanted to opt-out of this project because that site was too small, and all equipment and process training were requested to assign to TEX staff as part of the required onboarding procedure. For sites B and C, the JV put them in the spotlight as some TEX staffs' work may be outsourced to vendors.

Assessing the readiness made me realize that this new learning solution, as well as the change process, had different meanings for each site. Clearly, one size did not fit all. The beauty and value of the assessment process made this project understandable and helped me to see each site's situation and needs.

Opening an Action Invitation

"Learn from the people, plan with the people...when the task is accomplished, the people will say, we have done it ourselves."

- Lao Tzu

Implementing a project to make change happen in a large organization is a major undertaking. With the understanding from these meetings, Dian and I decided to run a pilot program to test, learn, and move forward. Site A was selected for three main reasons. First, the site manager demonstrated a strong interest in participation, which can be turned into further commitment. Second, the project success at the head office of Consumer Healthcare can be impactful for scale-up. Last but not least, it is easier to implement and collect feedback as I was based at this site.

Running the Pilot with New Perspectives

Once we made the decision, I started working on the curricula classification for site A and verified it with the site manager. Meanwhile, I initiated a pilot introduction meeting. I was also invited to present at the monthly R&D staff meeting. Scientists at the laboratory were the target audience for both meetings.

One day before the pilot introduction meeting, Elizabeth Watson, the CLD team director, stopped by my desk and asked me to show her the presentation. I ran through the presentation with an emphasis on how *Masterfinder* can help frontline scientists keep the training status compliant. She reminded me that the target audience was frontline scientists this time. “No other groups are like them. They enjoy trying new things and being part of a solution”, she said. Her comments were insightful. I asked myself how would I feel if someone wants me to try something that seems useful but sounds mandatory? It would feel like another top-down project and I might lose my intrinsic motivation to participate and learn at the beginning.

Most of the frontline scientists were well-educated with advanced degrees. That being said, they had accumulated judgment in learning and were enthusiastic about continuous improvement. I think the essence of Elizabeth’s comments was that I needed to invite them to be part of the solution rather than make them feel the solution was forced on them. I shifted my presentation approach from telling to inquiring. At the meeting the next day, I began by asking the onsite scientists two questions. What kinds of changes would they like to see in equipment and process training? Which change would they most like to have?

One person immediately shared her struggle with finding newly updated SOPs under the self-assigned mode. The introduction started off there and the audience was engaged in interactions.

After the meetings, all TEX staff at site A were invited to test the equipment and process training solution and provide real-time feedback. They needed to evaluate the necessity of the sub-area classification function. They were not provided with a well-designed Lego model but a prototype that they can build bricks on and create value.

Although this roll-out may look like the last step in the pilot program, it was at the beginning of the story. The mindset of continuous improvement and openness to feedback were the driving forces.

The Importance of Timing

A few days after the pilot program launched, all staff at site A were invited to an offsite milestone event. BNC announced at the event that it had completed the JV transaction with Spark. In the press release Bill Wheatley said:

“Now the deal has completed. With our portfolio of exceptional, science-driven brands and strong talent and capabilities, we are striving for creating a world-leading consumer healthcare business.” (BNC, Company Secretary, 2019)

During the following days, I barely heard any program feedback from frontline scientists. One reason was that the JV announcement made a different impact on them. Some seemed worried about potential layoffs due to the upcoming workforce integration. Some sounded excited about potential R&D projects. In either case, participating in this pilot program did not seem like a priority.

Keeping the momentum of the pilot program going was imperative. Dian reminded me about deliverables with the constraint timeline. It was two weeks away from the end of my assignment; I would be leaving BNC.

Bringing the Effort to Scale

To gain momentum, with the lab manager's permission, I worked several afternoons at the laboratory. My physical presence made my connection with the frontline scientists closer. I got the chance to observe how they worked in the laboratory environment and contemplated how this solution can be calibrated to scale up. Scientists stopped at my desk to offer feedback and ask their questions. Some of them said they appreciated me being there as interpersonal communication can save time compared with the back and forth email exchanges.

While the pilot program was in progress, I started working on preparations to scale up. The first was to draft the SOP of *Masterfinder*. The SOP provided the procedure for using the *Masterfinder* application in Consumer Healthcare R&D to check incomplete training for laboratory equipment and processes. The second was to create a training slide with the introduction of the CLD training strategy first. It followed with the detailed instruction on how to use *Masterfinder* and *myLearning* together to keep the equipment and process training compliant. Last but not least, I began exploring the feasibility of *Masterfinder's* barcode scanning function at Consumer Healthcare.

By the time I left BNC, the first two preparations were completed. Dian took over the rest of the project work. At my farewell lunch for me, she expressed

her great appreciation for all achievements and preparations I did for the project.

Moving Forward

When I worked at BNC, every day of the 12 weeks was almost filled with meetings, coordination, planning, and deadlines. I was put on an accelerated track in extraordinary organizational circumstances. There were fulfilling moments as well as frustrations. Dr. Russo guided me through it and instilled the reflective learning mindset to my journey.

When I ruminate my summer experience, it feels like a capsule enriched by many layers and many colors. It can be seen and analyzed from many perspectives. Through the lens of influencing and persuasion, it taps into engaging with different levels of stakeholders and creating value to get their opt-in. From the organizational learning point of view, it is about an organization seeking continuous improvement. It is also a change management process with deliberate planning and starting from small steps, which is a core value of agile approaches.

As I write this capstone, I have realized that this case is not singular. Many organizations in pharma are confronted with similar challenges, to keep the backbone functioning while striving for continuous improvement and innovation. Meanwhile, I have come to realize that my education from the Organizational Dynamics Program at Penn, as well as my working experience, can bring enormous value to facilitate the process. It has shaped the innovative exploration of this capstone study.

CHAPTER 3

LITERATURE REVIEW

My working experience at BNC in the summer of 2019, along with my current study in the Organizational Dynamics program, has inspired me to further explore the value of agility in building the learning capability in pharma. Building from the experiences of the case, the literature review is outlined and based on three major areas that serve my learning objectives.

- Agility: What is agility? What makes it matter to pharma?
- Change: What change management methodologies are most effective to facilitate change initiatives in pharma? Do they contain agile components?
- Learning: What role does agility play in extending the focus from individual learning to organizational learning?

The literature review includes, but is not limited to, industry research reports, academic articles, and books with broad theoretical and practical topics. It by no means serves as an exhaustive review of the vast amount of existing resources on the areas mentioned above. In addition to achieving my learning objectives, the literature review hopes to provide a novel bridging of agility, change, and learning and bringing clarity and potential minimizing the current research gap.

Each of these areas is analyzed in consideration of the BNC case. And

the case provides a real context to reflect and explore both theoretical and practical topics presented.

The Rise of Agility

While agility may be the buzzword most often associated with startup and technology businesses, it is drawing attention in the pharma world. A Google search of the term “pharma agile” returned nearly seven million search results (Google.com, n.d.). The research results include R&D, supply chain, digital transformation, employee capability building, leadership, and beyond.

In a media interview, a senior marketing executive at GSK, a UK-based global healthcare company, describes how digital transformation helps the company move forward more efficiently and programmatically and further explains:

Whereas we have some resources that we can invest into all sorts of ideas and we are learning how you call time on them if they're not going to work, because we know that 95% of new ideas fail. You have to set yourself up to not invest the whole business in those experiments, but instead have lots of experiments and pour gasoline on the ones that work. (Rogers, 2018)

In another executive interview conducted by McKinsey, a senior human resources executive at Roche, one of the world’s largest biotech companies, discusses the company’s agile transformation and emphasizes its preparation of its leaders to be more agile:

In this dynamic environment, our ability to respond well to whatever happens requires a different approach and a more agile mindset, especially for our senior leaders across the organization...It is not just about delivering the business but also focusing specifically on people

leadership. (Lowry, Lurie, & Byrne, 2019)

Despite the company size and expertise, it seems executives at pharma are equipping their organizations with agile capabilities. So, what is agility? And what makes it matter to pharma?

What is Agility?

Borrowed from Middle French and Latin, the word “agile” was first known to be used in the 14th century. It is defined as “having quickness of motion, nimble, active” (Etymology Dictionary, n.d.). And “agility” is defined similarly as “mobility, nimbleness, quickness” (Etymology Dictionary, n.d.). Agility is not in an immovable state, but an ongoing process, much like a continuous improvement (Harraf, Wanasika, Tate, & Talbott, 2015).

Agility is also defined as “the organizational capacity to effectively detect, assess and respond to environmental changes in ways that are purposeful, decisive, and grounded in the will to win.” (Tilman & Jacoby, 2019, p. 7), noted



Figure 8. Agility: An Overarching Quality
(Tilman & Jacoby, 2019, p. 48)

They describe agility’s distinctive nature (see Figure 8).

in the book “Agility: How to Navigate the Unknown and Seize Opportunity in a World of Disruption.” The authors of this book believe agility is an overarching quality that can prepare organizations to go much further in their domains.

At the basic level, agility has two distinct parts: flexibility and adaptability (Harraf et al., 2015). It does not mean organizations have to trade stability for flexibility and adaptability. A 2015 McKinsey report highlights that agility rhymes with stability, “truly agile organizations, paradoxically, learn to be both stable (resilient, reliable, and efficient) and dynamic (fast, nimble, and adaptive).” (Aghina, Smet, & Weerda, 2015) The authors of this report highlight that balancing the tension between stability and flexibility is critical.

To master this paradox, companies must design structures, governance arrangements, and processes with a relatively unchanging set of core elements—a fixed backbone. At the same time, they must also create looser, more dynamic elements (capability) that can be adapted quickly to new challenges and opportunities. (Aghina et al., 2015)

A similar perspective is also offered by David Teece, Professor of Global Business of University of California, Berkeley in a 2016 article published in the California Management Review. He and his colleagues further categorize dynamic capabilities into three primary clusters.

- identification, development, co-development, and assessment of technological opportunities (and threats) in relationship to customer needs (the “sensing” of unknown futures);
- mobilization of resources to address needs and opportunities and capture value from doing so (“seizing”); and
- continued renewal (“transforming” or “shifting”).
(Teece, et al., 2016, p. 6)

Despite different focuses on agility, most studies and researchers acknowledge that the global economy is experiencing innovation and complexity more than ever. And the globalized competition and competitive intensity (Harraf, et al., 2015) drive organizations to become agile to respond to market

changes promptly.

History at a Glance

As the words agile, agility, and many related words get attention, it is a common assumption that agility stems from software development, where most agile successful stories seem to be known. As a matter of fact, the origin of agility is rooted in the manufacturing industry (Harraf, et al., 2015) where changes in the product development and supply chain require both adaptability and flexibility. The history of agility and agile manufacturing comes from that of LEAN manufacturing (Marchwinski & Shook, 2007). Taking a look back at history, several studies are the cornerstone for exploring the evolvement of agility.

In January 1986, Hirotake Takeuchi, Professor in the Strategy Unit at Harvard Business School and his colleague Ikujiro Nonaka published an article, “The New New Product Development Game” in the Harvard Business Review. With years of study of multinational companies such as Fuji-Xerox, Canon, Honda, NEC, Epson, Brother, 3M, Xerox, and Hewlett-Packard, they pointed out that the successes of these companies are mainly attributed to an overlapping development process, the “rugby approach” (Takeuchi & Nonaka, 1986), rather than the older sequential approach. They provide an illustration (see Figure 9) and further explain:

Sequential (A) vs. overlapping (B and C) phases of development

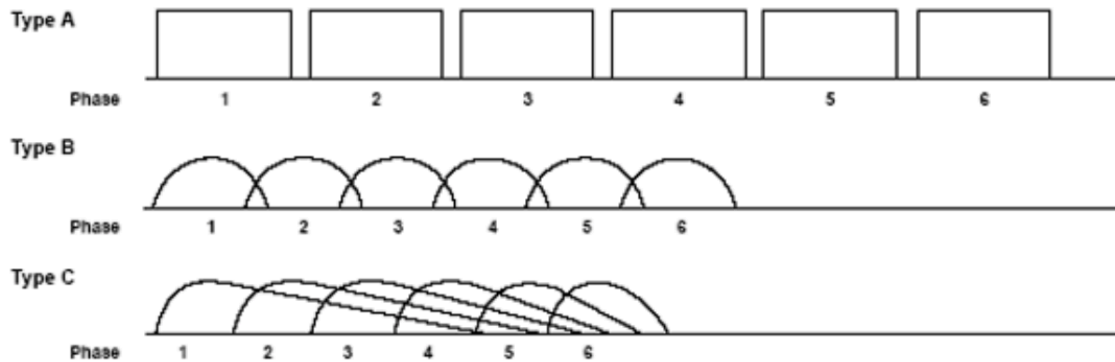


Figure 9. Sequential (A) vs. Overlapping (B and C) Phases of Development (Takeuchi & Nonaka, 1986)

This new emphasis on speed and flexibility calls for a different approach for managing new product development... The shift from a linear to an integrated approach encourages trial and error and challenges the status quo. It stimulates new kinds of learning and thinking within the organization at different levels and functions... The energy and motivation the effort produces can spread throughout the big company and begin to break down some of the rigidities that have set in over time. (Takeuchi & Nonaka, 1986)

They decided to call this cross-functional team and multi-disciplinary process as the Scrum (Takeuchi & Nonaka, 1986) project management.

This article attracted attention since it was published, and its significance was amplified in software development in the early 1990s by Ken Schwaber and Jeff Sutherland. They worked together and tested the Scrum framework (Scrum Alliance, n.d.), a lightweight, iterative, and incremental framework for managing complex work. With continued improvement, they joined with 15 developers and built the Agile Manifesto (Agile Manifesto, n.d.) in 2001. Some principles behind the Agile Manifesto are stated:

- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- The most efficient and effective method of conveying information to

- and within a development team is face-to-face conversation.
- Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
 - The best architectures, requirements, and designs emerge from self-organizing teams.
 - At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.
- (Agile Manifesto, n.d.)

“If you think about the fundamental principles of the Agile Manifesto, the core is that ability for speed and efficiency.” (McCall, Sarrazin, & London, 2018, p. 2)

It’s about breaking things into increments and making sure value is delivered each time.

Since 2002, agile methods have permeated software development. As the agile methods are based on customer collaboration, teamwork, iterative development, and adaptability, studies show both tangible and intangible benefits can be generated. “On average, agile methods are about 25 times more efficient than traditional methods.” (Rico, Sayani, & Sone, 2018, p. 128). The net benefits of agile methods can be calculated in cost and quality metrics, models, and measurements.

Embracing Agile in Pharma

Though first adopted in the software development world, over time agile methods have spread across a broad set of industries and functions. In a 2016 Harvard Business Review article, Takeuchi, Sone, and Sutherland stated that “the spread of agile raises intriguing possibilities.” (p. 42) Living in a dynamic and global environment, organizations confront constant changes more than ever and need to respond swiftly. They further explain the right conditions for

agile (see Figure 10) and emphasize that “innovation is what agile is all about.”
(Takeuchi et al, 2016. p. 42)

CONDITIONS	FAVORABLE	UNFAVORABLE
MARKET ENVIRONMENT	Customer preferences and solution options change frequently.	Market conditions are stable and predictable.
CUSTOMER INVOLVEMENT	Close collaboration and rapid feedback are feasible. Customers know better what they want as the process progresses.	Requirements are clear at the outset and will remain stable. Customers are unavailable for constant collaboration.
INNOVATION TYPE	Problems are complex, solutions are unknown, and the scope isn't clearly defined. Product specifications may change. Creative breakthroughs and time to market are important. Cross-functional collaboration is vital.	Similar work has been done before, and innovators believe the solutions are clear. Detailed specifications and work plans can be forecast with confidence and should be adhered to. Problems can be solved sequentially in functional silos.
MODULARITY OF WORK	Incremental developments have value, and customers can use them. Work can be broken into parts and conducted in rapid, iterative cycles. Late changes are manageable.	Customers cannot start testing parts of the product until everything is complete. Late changes are expensive or impossible.
IMPACT OF INTERIM MISTAKES	They provide valuable learning.	They may be catastrophic.

Figure 10. The Right Conditions for Agile (Takeuchi et al, 2016, p. 46)

The healthcare sector strives for solving complex life-science problems; it is where innovation often incubates. In the article, “Innovation in Health Care: A Primer” published in the American Journal of Medical Quality, the authors point out that the need for innovation is critical to enhance the quality of care (Varkey, Horne, & Bennet, 2008). They elucidate three types of innovation in the healthcare: product, process, and structure. The product includes whatever pharma companies and life science organizations can provide. The process is more about innovation offered by the care providers, like telemedicine and digital imaging. And the structural innovation relates to the health business model.

As one of the innovation pillars in healthcare, pharma companies have realized the immense value that agility can bring, especially in building organizational capability and continuous improvement to enable innovation (Mahadevan et al., 2019). It is also believed that innovation leads to competitive advantages; studies show that being fast to market and product sales are highly correlated in pharma (Grabowski & Vernon, 1990; Roberts, 1999). In addition, in a highly regulated industry like pharma, “there are clearly industry rules that need to be followed and laws to be aware of.” (Fried, 2017). The primary tension between purpose and safety makes instilling dynamic capabilities (Teece, et al., 2016, p. 6) in pharma a delicate process. And not to mention that agile ways of working can deliver value in multiple contexts through experimentation, digitization, and cross-functional teams (Srikant, Freeland, Lopez, & Greber, 2019).

For a long time, R&D has been considered as the innovation engine at pharma. Given the capital-intensive and process-rigorous nature of pharma R&D, R&D productivity is continuously examined (Berggren, Fleming, Keane, & Moss, 2018). In the 2019 Harvard Business Review article “Why Science-Driven Companies Should Use Agile”, the authors highlight the emergence of “agile science: a new way of working characterized by pragmatic and context-specific use of agile methods and tools.” (Fiore, West, & Segnalini, 2019, p. 3) With real case studies, they point out the importance of cross-functional teams and prototype testing in increasing pharma R&D productivity. They further outline an action framework and emphasize that it is critical to communicate the “why” of

the change to agile rather than just tell people “what” to do. In addition to that, they pivot to a point that “learning and adapting is, after all, at the heart of what science is all about.” (Fiore, et al., 2019, p. 5)

Adopting agile in any organization is a process. It comes with an extra layer of complexity in pharma R&D due to the science-driven nature as well as the risk-adverse mind-sets. In the McKinsey report “Designing an Agile Transformation in Pharma R&D” (Apple, Keane, Moss, & Sartori, 2019), the authors expressly point out that R&D staff tend to have habitual ways of doing things that are rigid and sequential, which may make them less willing to adopt the agile model until its benefits start to materialize. To unlock the value of agile in pharma R&D, the authors further offer an approach called “aspire, design, pilot, and scale-and-improve” (Apple, et al., 2019). It starts from a top-team aspiration and soliciting earlier stakeholder input to set the shared agile vision. Then design-thinking is suggested to be used to reimagine key processes and resource allocation. Conducting a pilot follows with a goal to create success stories as well as identify improvement opportunities.

Put simply, embracing agile in pharma needs both top-down vision and bottom-up support within organizations.

Navigating the Change Process

“Everything flows, nothing stands still.”

- Heraclitus

“The only thing constant is change.” written by Heraclitus, an ancient Greek philosopher, back in 500 BC. A similar perspective is offered by Robert

H. Schaffer, an educator and management consultant, who believes “change never occurs as some sort of happening; it is part of everyday life.” (2017, p. 3) He advocates that leaders see change as the most important essence of the management job rather than an occasional disruptor. “Change management is management, and all management is change management.” (2017, p. 4)

Change is not always easy. It seems even harder in a highly regulated industry as pharma where change has to balance with safety and quality (Bhandola, 2015, p. 64). For organizations that want to stay competitive, an accelerated change environment can be created, like the integration presented in the BNC case. From the operation level, the BNC case can be summarized as implementing a training solution for continuous improvement with agile principles as guidance. Implementing something is not an event, it is a process. A process can only proceed with changes at multiple fronts. So, it is critical to have an understanding of change management.

Although there are many studies and models of change management, some of them are deliberately chosen here in consideration of both the macro context and the micro-processes presented in the BNC case. The expectation is to explore effective interventions to facilitate change initiatives in pharma while minimizing resistance to change from the people side.

Paths of Realizing Change

As summarized in the first part of this literature review, change with agile components in pharma is not fully top-down or bottom-up. It needs elements from both. Thus, two change models are reviewed accordingly next.

John Kotter, Professor Emeritus of Leadership at Harvard Business School, has been known as an expert on the topics of leadership and change. In his 1995 Harvard Business Review article “Leading Change: Why Transformation Efforts Fail”, he reflects on his decade-long observation of different change initiatives that happened across industries. He points out that from the more successful change cases, the most general lesson to be learned is that “the change process goes through a series of phases that, in total, usually require a considerable length of time.” (Kotter, 1995. p. 59). He further develops the “8-Step Process for Leading Change” (see Figure 11).



Figure 11. Kotter's 8-Step Process for Leading Change (1995)

This process starts with creating a climate for change, which includes three steps: establishing a sense of urgency, forming a powerful guiding coalition, and creating a vision (Kotter, 1995. p. 61). Building urgency for change is about identifying and focusing on a window of opportunity that can

further align people together. The guiding coalition is seen as the nerve center of the 8-Step Process (Kotter, 2018, p. 13). It is about assembling a group with enough power to lead and accelerate the change efforts. In pharma, despite the varied nature of change, quality assurance and regulatory affairs can be seen as the guiding coalition as they are the most important members to evaluate and endorse change (Bhandola, 2015, p. 64). Kotter (1995) also emphasizes the importance of defining a clear vision of the aim of the change. From his perspective, if a vision cannot be communicated clearly to someone in five minutes or less, it is challenging to have fast enough actions from frontline employees.

The next three steps of this process are about empowering actions from a broad-based level to make change happen. He highlights that “action is essential, both to empower others and maintain the credibility of the change efforts as a whole.” (Kotter, 1995, p. 65). As successful change often takes time in organizations, it is critical to create visible short wins, like an improved process and a new behavior, to acknowledge the change progress as well as to boost the credibility of the renewal process. In agile project management, the short wins can be considered as the success of pilots (Cohn, 2009, p. 82).

Moving forward with small wins, it is important to consolidate improvement opportunities to further fuel the change and stay the course of change over time. Kotter (1995) anchors the last step of the process in integrating the change into the organizational culture. He articulates that “change sticks when it becomes ‘the way we do things around here’...until new

behaviors are rooted in social norms and shared value, they are subject to degradation as soon as the pressure for change is removed.” (1995, p. 67)

Kotter’s 8-Steps Process has been seen as one of the first models that focuses less on change itself and more on the people side of the change. Though more than two decades passed since its first release, this model continues to have a definitive impact. While this model incorporates collaborative steps, it emphasizes the importance of leadership and is often considered as a top-down approach for leading change.

By contrast, the “ADKAR” model (see Figure 12) is a bottom-up approach with a focus on the individuals behind the change. It is created by Jeff Hiatt, the founder of the Change Management Learning Center in 2006 with the goal of guiding both individual and organizational changes. ADKAR is an acronym that represents five elements for realizing a change.

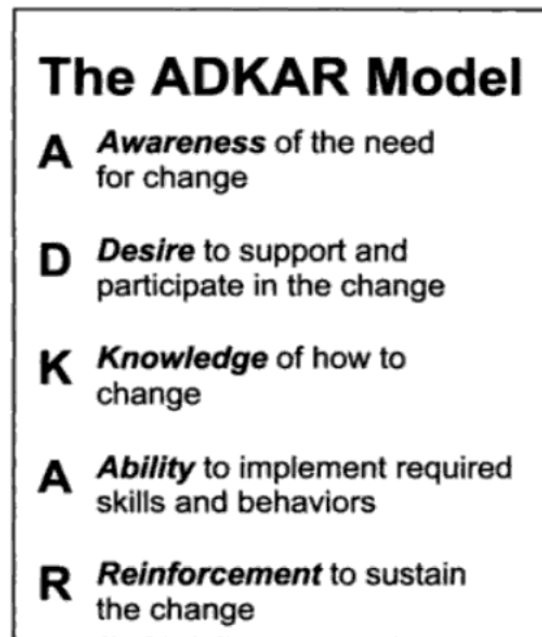


Figure 12. The ADKAR Model (Hiatt, 2006)

Hiatt outlines this model considering “the natural order of how one person experiences change” (Hiatt, 2006, p. 2). In the ADKAR model, change starts with an *awareness* that the status quo is no longer desirable. Building such awareness requires the following questions to be addressed.

- What is the nature of the change and how does the change align with the vision of the organization?
- Why is the change being made and what are the risks of not changing?
- How will the change impact our organization or our community?
- What’s in it for me (WIIFM)? (Hiatt, 2006, p. 9)

The awareness-building enables people to start the process of evaluating a change and hopes to trigger the *desire* to engage in the change. Hiatt (2006) elucidates four following factors that contribute to an individual’s or organization’s desire to engage in change.

- Factor 1: The nature of the change (what the change is and how it will impact them)
- Factor 2: The organizational or environmental context for the change (their perception of the organization)
- Factor 3: An individual’s personal situation
- Factor 4: What motivates them (those intrinsic motivators that are unique to an individual) (Hiatt, 2006, p. 18)

With established awareness and triggered desire, it now moves into *knowledge*, the third element of the ADKAR model. Knowledge is about to make sure people know how the change will be realized. Our current knowledge level, our capacity to learn, the availability of resources, and the access to needed information are considered as important factors (Hiatt, 2006, p. 27).

“Awareness, desire, and knowledge are all essential building blocks, but fall short of realizing change if *ability* is absent.” (Hiatt, 2006, p. 31-32). Ability,

the fourth element of the ADKAR model, emphasizes the capability to implement the change and achieve the desired goal. This model ends up with *reinforcement*, which includes any action or event that can sustain the change and keep people away from old behaviors or old ways of doing work. Hiatt (2006) emphasizes that reinforcement is successful when:

- They are meaningful to the person recognized.
- They are associated with actual accomplishments.
- There is an absence of negative consequences for desired behavior.
- Accountability mechanisms are in place. (Hiatt, 2006, p. 41)

The bottom-up and people-centric attributes make the ADKAR model distinct from other change models. Such focus on individual efforts behind the change is also shared by the “Positive Deviance Approach to Change” (Pascale & Sternin, 2005) in different ways. This approach is recommended to work best when major behavioral and attitudinal changes are required in the change process. Richard T. Pascale and Jerry Sternin, professors from Oxford University and Tufts University respectively, co-coined this approach in their 2005 Harvard Business Review article, “Your Company’s Secret Change Agents”. They believe that people in organizations are “indigenous sources of change” (Pascale & Sternin, 2005, p. 75). And they advocate that leadership in the change progress needs to be positioned as inquiry and facilitation, which is seen as the key to engage people throughout the process. Moreover, they articulate this approach as below.

- The positive deviance approach to change, by contrast, is bottom-up, inside out, and asset based. It powers change from within by identifying and leveraging innovators. (Pascale & Sternin, 2005, p. 75)
- The positive deviance approach to change requires a role reversal in

which experts become learners, teachers become students, and leaders become followers. Leaders must relinquish to the community the job of discoverer. (Pascale & Sternin, 2005, p. 81)

The essence of the positive deviance approach is captured by the Chinese Taoist sage Lao Tzu as Pascale and Sternin encapsulate at the end of the article.

Learn from the people
Plan with the people
Begin with what they have
Build on what they know
Of the best leaders
When the task is accomplished
The people all remark
We have done it ourselves (Pascale & Sternin, 2005, p. 81)

It is aligned with some perspectives offered in the book “Strategic Doing: Ten Skills for Agile Leadership” (Morrison, Hutcheson, Nilsen, Fadden, & Franklin, 2019). Authors of this book iterate that agile leaders need to make sure each member of a group shares the responsibility for implementation. Leadership does not reside in a single person in the group, but rather is shared by members of the group. And such shared leadership can give flexibility for the group when it is confronted with complex, strategic issues. They further provide some suggestions for cultivating an organizational culture of shared leadership.

- Give power away to individuals to allow them to strengthen the abilities.
- Define clear boundaries for the decisions they are empowered to make.
- Give people the discretion and autonomy they need to complete tasks and deploy their resources.
- Managers should consider themselves a resource rather than a supervisor.

- Set up an agile, iterative process that allow for regular check-ins to review progress and make adjustments if necessary.
(Morrison et al, 2019, p. 118)

Shared leadership seeks small commitments from individuals. This can move change forward agilely in the group. Change agility also requires leaders “to ask ‘why not?’ and to establish opportunities for pilots, prototypes, and experimentation” (Onderick-Harvey, 2018).

Reactions to Change

Knowing different change management approaches is like building a toolbox. Yet, such knowledge needs to be tested in different contexts just as doctors perform the same procedure on different individuals. Reactions for change come in various forms, typically like acceptance, avoidance, and resistance (Wittig, 2012).

Change is intensely personal (Duck, 1993, p. 109). Change is fundamentally about feelings (Smollan & Sayers, 2009). The most successful change programs reveal that organizations connect with their people most directly through values – and those values ultimately are both beliefs and feelings (Duck, 1993, p. 109). A model often referred as the “Four Rooms of Change Model” or the “Change House Model” provides a novel perspective to see reactions coupled with emotions in the change. This model was created by Claes Janssen, a Swedish psychologist, in 1970s as part of his research on the dynamics of change (Cook, 2012).

The model proposes four frames of mind seen as rooms in an apartment as in Figure 13. The underlying assumption of this model is that change is a

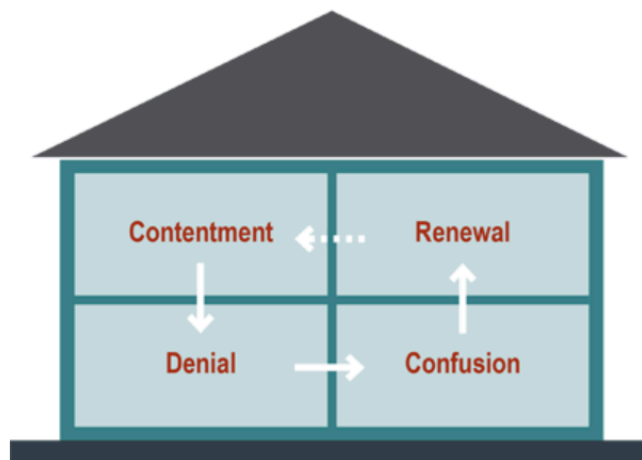


Figure 13. Four Rooms of Change Model
(Janssen, 2011)

cyclical process involving different frames of mind, each with different emotions. And managing the change process requires that individuals acknowledge the emotions of each room.

In the “Contentment” room, individuals are satisfied with the status quo and no change seems desired. There is a sense of being relaxed. However, when change emerges, individuals may begin to worry that the change will negatively impact them in some way. It leads them to the “Denial” room, where there is a focus on defending the status quo. Ultimately, individuals have to acknowledge that change is about to happen no matter how they feel. In addition, they have to make the psychological transition from “It won’t happen here” to “Where is it going to happen?” (Baruch & Hind, 1999).

Moving forward the next room is coupled with ambiguity and it is aptly titled the “Confusion” room. Individuals may begin putting puzzles of the change together and explore options for realizing change, which may feel like an overwhelming process. Finally, individuals push through into the “Renewal” room, where they are committed to the change. This room fuels with positive energy towards change (Janssen, 2011).

While we are standing at different rooms in front of the change, sometimes our emotions are easy to be perceived. What might seem like a conundrum is the resistance to change in various behavior forms. Robert Kegan and Lisa Lahey are two Harvard professors of adult learning and experts in organizational psychology. Their work, *Immunity to Change*, reveals a psychological dynamic called the “competing commitment” behind the change-resistant behavior with an insightful conclusion.

Resistance to change does not reflect opposition, nor is it merely a result of inertia. Instead, even as they hold a sincere commitment to change, many people are unwittingly applying productive energy toward a hidden competing commitment. The resulting dynamic equilibrium stalls the effort in what looks like resistance but is in fact a kind of personal immunity to change. (Kegan & Lahey, 2001, p. 85)

Kegan and Lahey (2001) highlight that competing commitments are very personal and tapping into vulnerabilities that people fear, which are sometimes a result of self-protection. Underneath the self-protection is “big assumptions”, which is deeply rooted in our beliefs about ourselves and the world around us and is driving our behaviors away from realizing the change. They further offer a process framework of unfolding the immunity to change (see Figure 14). The process is to “help people cope with the inner conflict that is preventing them from achieving their goals” (2001, p. 92)

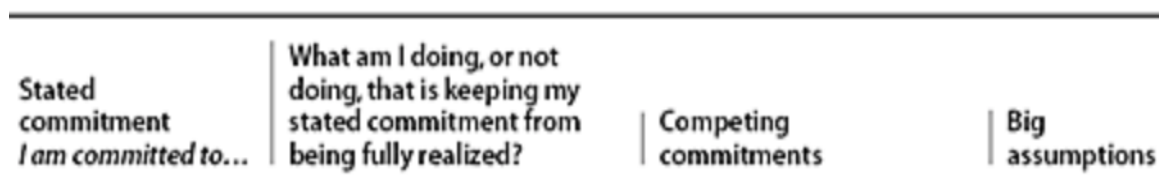


Figure 14. A Diagnostic Test for Immunity to Change (Kegan & Lahey, 2001)

The process starts with understanding why people behave in ways that undermine their own success. Several facilitative questions to get there are provided.

- What would you like to see changed at work, so that you could be more effective or so that work would be more satisfying?
- What commitments does your complaint imply?
- What are you doing, or not doing, that is keeping your commitment from being more fully realized? (Kegan & Lahey, 2001, p. 87)

Moving forward is to invite people to envision the consequences of the behavior.

An example question is, "If you imagine doing the opposite of the undermining behavior, do you detect in yourself any discomfort, worry, or vague fear?"

(Kegan & Lahey, 2001, p. 88) The next step is to transform that passive fear into a statement that indicates a commitment to prohibiting certain outcomes. The last step is to examine the big assumptions that hold commitment back. Often, it does not uncover all at once as we may accept the assumptions as reality, or the uncovering makes us uncomfortable.

Once the competing commitments and big assumptions are identified, Kegan and Lahey (2001) suggest people prepare to take action to overcome the change-resistant behavior.

Learning in Organization

"We now accept the fact that learning is a lifelong process of keeping abreast of change. And the most pressing task is to teach people how to learn."

- Peter Drucker

The dictionary definition of learning states that learning is "knowledge or skill acquired by instruction or study" and "modification of a behavioral tendency

by experience” (Merriam-Webster Dictionary, n.d.). Argyris and Schön (1996) assert that learning occurs only when knowledge is translated into different behavior that is replicable. There are two important elements of learning: what people learn (know-how) and how people understand and apply that learning (know-why) (Kim, 1993).

“Human beings are designed for learning.” (Senge, 1990) In an environment where the only certainty is uncertainty, the one source of a lasting competitive advantage is learning (Nonaka, 1991). Takeuchi and Nonaka (1986) argue that the essence of agile is learning and has two dimensions: across levels (multilevel learning) and across functions (multifunctional learning).

All individuals as well as all organizations learn. Organizations ultimately learn from their individual members. Meanwhile, individuals are influenced by organizations to learn (Kim, 1993). Numerous studies show that learning needs effort from both the individual and organizational levels. It is just like growing a tree, which needs the right soil and the ability to adapt to various weather conditions. Considering the learning objectives of this capstone, I focus next on learning related studies in two aspects: individual learning at work and organizational learning. Some neuroscience studies serve as the foundation.

Adult Learning with Two Minds

Learning is defined as a change in long-term memory and works as a key to realizing the principles of andragogy (Hagen & Park, 2016). In 1980s, Malcolm Shepherd Knowles coined andragogy as “the art and science of helping adults learn” (Knowles, 1980, p. 43) and pioneered studies in this area.

Knowles (1980) defined four assumptions of adult learners. In 1984, he added an additional assumption.

1. Adults have a self-directed self-concept;
2. Adults bring a growing reservoir of experience to the learning process;
3. Adults enter the learning process ready to learn relevant information;
4. Adults are gravitated toward immediate application of learning;
5. Adults are driven by intrinsic motivation to learn.

Based on these assumptions of adult learners, Knowles (1984) suggests four principles of adult learning as following.

1. Adults need to be involved in the planning and evaluation of their instruction.
2. Experience, including mistakes, provides the basis for the learning activities.
3. Adults are most interested in learning subjects that have immediate relevance and impact on their job or personal life.
4. Adult learning is problem-centered rather than content-oriented.
(Kearsley, 2010)

Further study in the field of neuroscience shows that learning generates physiological changes in the brain, which is important to the notion of plasticity (Posner & Robarth, 2005). In a recent study, Hagen and Park (2016) provide an integrative analysis of why and how andragogy works through the lens of cognitive neuroscience. After reviewing a great deal of research, they pinpoint that adult learning involves major processing occurring in the brain, which requires interactions among multiple brain areas. Based on the findings, they provide a model (see Figure 15) that bridges the adult learning theories and cognitive neuroscience and further offers some educational techniques to facilitate the learning experience.

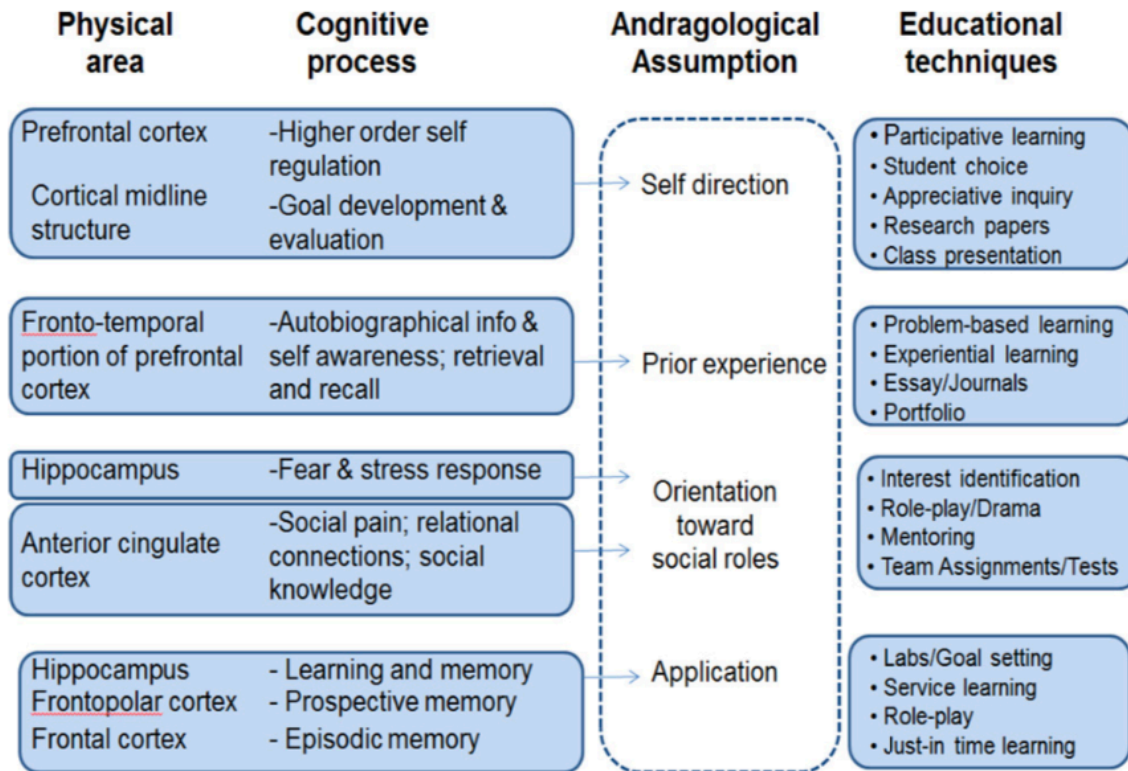


Figure 15. A Model of Adaptive Cognitive Neuroscience - Adult Learning Structure (Hagen & Park, 2016, p. 183)

In this model, Hagen and Park (2016) illustrate that the self-directness, the relevance of learning experience, and the application of learning (Knowles, 1984) are heavily connected to the prefrontal region of the brain, where supports higher executive functions and is particularly well developed in humans (MacLean, 1978; Rock, 2008).

Knowles (1984) highlights that adults learn best when learning is connected to a social role. Moreover, the need for social connection and acceptance is a strong psychological basis for adult learning. Hagen and Park's model (2016) confirms this with strong biological evidence. Through studies, Hagen and Park (2016) find that when learning is relevant to adults' social roles, the hippocampus and the anterior cingulate cortex are activated. Hippocampus

is the area where prior experience resides and can encode the emotional context from the amygdala, particularly fear and stress-related defensive responses (Blakemore & Frith, 2005). And the anterior cingulate cortex involves certain cognitive functions, like error detection, anticipation of tasks, and pain derived from social situations (Eisenberger & Lieberman, 2004). From the brain evolution perspective, hippocampus and anterior cingulate cortex are considered as important parts of the mammalian social brain (MacLean, 1978; Rock, 2008).

In short, when adults learn with social roles, like in the workplace, both the prefrontal human brain and the social mammalian brain are in active state.

What Keeps Us from Learning?

For years, the common assumption is that getting people to learn at work is mainly driven by a matter of motivation. When rewards are in place and people have the right attitudes and commitment, learning should automatically follow (Argyris, 1991). Various studies in the field of social psychology show that extrinsic motivation may change people's behavior temporarily. However, a lasting commitment can only be achieved by intrinsic motivation (Kohn, 2018).

Knowles (1984) asserts that adults come to the learning process with a wealth of experience. It is widely accepted that adults learn better when they are encouraged to apply prior knowledge to new learnings. Interestingly, it has been argued that prior experience can also play a demotivator role in learning if adults have negative emotions associated with it. To address this, problem-based learning and experiential learning are broadly advocated (Kearsley, 2010).

Chris Argyris, a former Professor Emeritus at Harvard Business School, found that every company faces a learning dilemma: the smartest people find it hardest to learn (1991). In “Teaching Smart People How to Learn”, published in Harvard Business Review, Argyris points out:

Highly skilled professionals are frequently very good at single-loop learning. After all, they have spent much of their lives acquiring academic credentials, mastering one or a number of intellectual disciplines, and applying those disciplines to solve real-world problems. But ironically, this very fact helps explain why professionals are often so bad at double-loop learning. (Argyris, 1991, p. 100)

The single-loop learning is about problem-solving (know-what). Whereas, the double-looping learning is more than just fixing the problem and involves questioning the underlying assumptions, values, and beliefs behind what we do (know-why) (Argyris, 1977). Because many professionals are almost always successful at what they do, they barely have experience with failure. So, when their single-loop learning strategies go wrong, they become defensive, which affects their cognitive reasoning ability. Eventually, defensive reasoning can block learning (Argyris, 1991).

Edgar Schein, a former professor at MIT Sloan School of Management, indicates that anxiety can also inhibit learning (2002). Through studies, he found that there are two kinds of anxiety associated with learning: “learning anxiety” and “survival anxiety”.

The learning anxiety comes from being afraid to try something new for fear that it will be too difficult, that we will look stupid in the attempt, or that we will have to part from old habits that have worked for us in the past. Learning something new can cast us as the deviant in the groups we belong to. It can threaten our self-esteem and, in extreme cases, even our identity...Survival anxiety-the horrible realization that in order

to make it, you're going to have to change. (Schein, 2002, p. 104).

He further explains that learning becomes possible when survival anxiety is greater than learning anxiety. It can also be interpreted as people's anxieties contributing to their resistance to learning.

On the surface, it appears that professionals shy away from using different behaviors while learning. From the cognitive neuroscience point of view, the social mammalian brain is heavily activated in negative emotions, like defensive or anxious situations (MacLean, 1978). When the mammalian brain takes over the prefrontal human brain, higher intellectual functions, like learning and making decisions, tend to shut down. Or in the words of Argyris, "professionals' ability to learn shuts down precisely at the moment they need it the most." (1991, p. 100)

Learning to Learn

Effective double-loop learning is not only simply a function of how people feel but also a reflection of how they think (Argyris, 1977). Knowles (1984) also believes that adults need to know the reason for learning something. To have effective double-loop learning, Argyris (1991) underscores the importance of teaching people how to reason about their behavior in new and more effective ways, which lays the groundwork for continuous improvement that is truly continuous.

To break down defensive reasoning and avoid embarrassment, Argyris (1991) offers four basic values behind designing one's actions.

1. To remain in unilateral control;
2. To maximize "winning" and minimize "losing";

3. To suppress negative feelings; and
4. To be as “rational” as possible, meaning that people define clear objectives and evaluate their behavior in terms of whether or not they have achieved them. (Argyris, 1991, p. 103)

Feeling vulnerable and incompetent are typical sources of defensive reasoning (Argyris, 1991). We are taught to play to our strengths most of the time. So, the idea of learning something new, particularly not applying our frequently used strengths, can make us feel uncomfortable and vulnerable (Argyris, 1991; Edmondson, 1999). Such discomfort can be exacerbated when we learn slower than we expect and even make mistakes at the beginning. Interestingly, social cognitive studies find that when people are encouraged to expect mistakes and learn from them early in the process of acquiring new skills, the learning interests are heightened and better performance comes along (Woods & Bandura, 1989). Other researchers suggest that if we shift our focus from negative feelings to benefits associated with learning, we are more likely to learn initially unappealing things (Andersen, 2016).

Our desire to know and to experience is often driven by curiosity. Peter Senge (1990), the founding chair of the Society for Organizational Learning at MIT, highlights the significance of mobilizing the intellectual capacity of individuals in the organization, in other words, getting individuals curious, learning, and acting within all levels of the organization. Many studies reveal that the nature of curiosity as an emotional-motivational state is in a positive correlation with the pleasure associated with learning (Litman, 2005; Reio &

Callahan, 2004). Great learners preserve this childhood drive or regain it through another application of self-talk. Changing the inner narrative (see Figure 16) can help spark our curiosity to learn (Andersen, 2016).

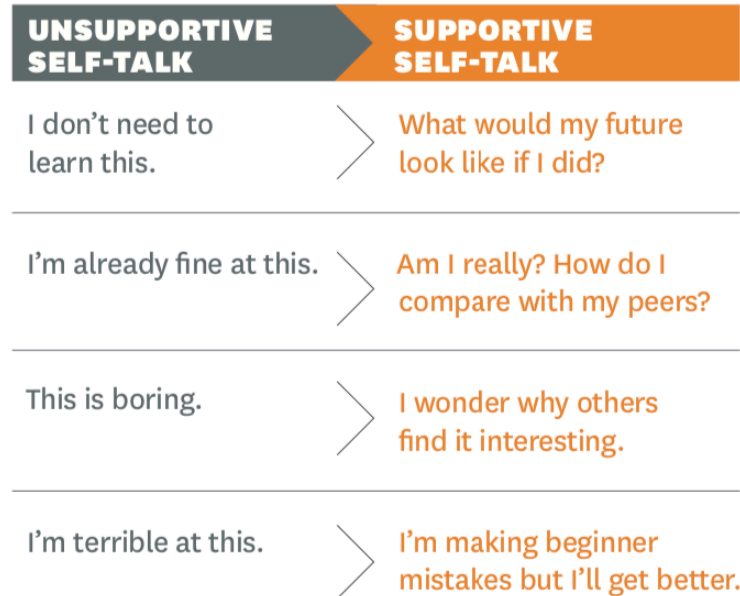


Figure 16. Changing Your Inner Narrative
(Andersen, 2016)

Learning to reason about our behaviors, focusing on positive sides associated with learning, and bringing more curiosity are some proven ways to get us to learn. Learning also requires efforts from the organizations we live in.

Make It Safe to Learn

Argyris and Schön (1996) believe that defensive reasoning is widespread and focusing on an individual's attitudes or commitment is never enough to make a real change. Perhaps the discovery of mirror neurons in the 1990s can provide the most scientific reason for this point of view. Through a series of studies, researchers found that the mirror neuron system that links perception and motor areas in the creation of presentations of international states creates presentations of other's minds (Gallese, Fadiga, Fogassi, & Rizzolatti, 1996;

Carr, Iacoboni, Dubeau, Mazziotta, & Lenzi, 2003). It demonstrates that interpersonal attunement is wired in our brain, which also creates emotional resonance (Seigel, 2007, p. 164-169). Because of mirror neurons, both positive and negative emotional signals, especially from team leaders, can be picked up and followed quickly among individuals within organizations (Goleman & Boyatzis, 2008).

What if people live in organizations that can make them feel less defensive or, in other words, safer? Would it make their learning behaviors different? Creating an environment that provides people psychological safety has been widely advocated (Pascale & Sternin, 2005). Psychological safety refers to being able to show and employ one's self without fear of negative consequences to self-images, status, or career (Kahn, 1990, p. 708). Studies show that four factors most directly influence psychological safety: interpersonal relationship, group and intergroup dynamics, management style and process, and organizational norms (Kahn, 1990). Thus, psychological safety can be seen as a group-level phenomenon.

Much of psychological safety-related research, particularly with the focus on organizational learning, comes from the work of Amy Edmondson, Professor of Leadership and Management at Harvard Business School. Organizational learning is defined as a process of detecting and correcting errors by Argyris and Schön (1996). Edmondson has pioneered the use of both quantitative and qualitative methods in understanding the relationship between learning behaviors in teams and psychological safety. Edmondson (1999) articulates

psychological safety as a shared belief that the team is safe for interpersonal risk taking. She also describes a team climate characterized by interpersonal trust and mutual respect in which people are comfortable being themselves.

In the late 1990s, Edmondson distinguished herself with a study of 51 work teams (team type including functional, self-managed, and product/project development) in a manufacturing company. Seeking feedback, sharing information, asking for help, talking about errors, and experimenting are considered as examples of learning behaviors (Edmondson, 1999). Through extensive interviews, observation, and surveys in this study, she found that teams with higher psychological safety score 60% higher on innovation, engagement, and performance (Edmondson, 1999). The study results also prove her hypotheses that psychological safety can facilitate learning behavior in teams. It is mainly because psychological safety can alleviate one's concern about others' reactions to actions that have the potential for embarrassment or threat.

In the following years, the focus of her research shifted to the healthcare sector. In a study of work system failures on the front lines of care delivery in hospitals, Edmondson and Tucker (2003) analyzed data from 239 hours of observations of 26 nurses at nine hospitals. They uncovered that first-order problem solving can be counterproductive. "It keeps communication of problems isolated so that they do not surface as learning opportunities." (Edmondson & Tucker, 2003, p. 60). They also attribute the lack of organizational learning from failures to an emphasis on individual vigilance, unit efficiency concerns.

Furthermore, they point out that people need to be able to talk about failures without fear of ridicule or punishment to learn from them. Additionally, they provide a comparison of the traditional and learning views of desirable employee behaviors (see Figure 17).

When the Employee Faces:	“Ideal Employee” Behaviors	Employee Behaviors Conducive to Organizational Learning
Missing materials or information	Adjust to shortcomings in materials and supplies without bothering managers or others.	<i>Noisy Complainer:</i> Remedies immediate situation but also lets the manager and supply department know when the system has failed.
Others' errors	Seamlessly corrects for errors of others – without confronting the person about their error:	<i>Nosy Troublemaker:</i> Lets others know when they have made a mistake with the intent of creating learning, not blame.
Own errors and problems	Creates an impression of never making mistakes.	<i>Self-Aware Error-Maker:</i> Lets manager and others know when they have made a mistake so that others can learn from their error. Communicates openness to hearing about their errors discovered by others.
Subtle opportunities for improving the system	Committed to the current way of doing business—understands the “way things work” around here.	<i>Disruptive Questioner who won't let well enough alone:</i> Questions why do we do things this way? Is there a better way of providing the service to the patient?

Figure 17. Comparison of the Traditional and Learning Views of Desirable Employee Behaviors (Edmondson & Tucker, 2003, p. 69)

As psychological safety can cultivate an environment that supports learning, this may eventually lead to a learning organization (Edmondson, 1999).

Co-Creating A Learning Organization

The notion of the learning organization flourished in the 1990s, stimulated most notably by Peter Senge. He asserts that in an increasingly dynamic, interdependent, and unpredictable world, organizations have to solicit efforts across levels rather than just follow the traditional top-down command approach. Integrating thinking and acting at all levels, organizations can leap

competition forward (Senge, 1990). To achieve that, he advocates that organizations become learning organizations. As Senge explained:

The basic meaning of a “learning organization” – an organization that is continually expanding its capacity to create its future. For such an organization, it is not enough merely to survive. “Survival learning” or what is more often termed “adaptive learning” is important and indeed it is necessary. But for a learning organization, “adaptive learning” must be joined by “generative learning,” learning that enhances our capacity to create. (Senge, 1990)

Furthermore, he underscores the importance of distinguishing generative learning from adaptive learning as a part of intrinsic motivation.

The impulse to learn in children goes deeper than desires to respond and adapt more effectively to environmental change. The impulse to learn, at its heart, is an impulse to be generative, to expand our ability. (Senge, 1990)

Building on the works of Peter Senge and other scholars, Amy Edmondson and her two colleagues, David Garvin, and Francesca Gino published the article “Is Yours a Learning Organization?” in Harvard Business Review. They present a comprehensive survey instrument for assessing learning within an organization through the lens of where individuals sit in the organization (Garvin et al., 2008). Through studies, they outline factors that are essential for organizational learning and adaptability in three building blocks: a supportive learning environment, concrete learning processes and practices, and leadership behavior. And each block has its vital subcomponents.

As the nourishing soil, a supportive learning environment has four distinguishing attributes: psychological safety, appreciation of differences, openness to new ideas, and time for reflection (Garvin et al., 2008). Without

feeling safe, people in the workplace can barely disagree with peers or authority figures, not to mention offering a minority viewpoint or appreciating alternative views from others. However, if people are comfortable expressing their thoughts as well as appreciating others, they are encouraged to take risks and explore unknowns. Their ability to think analytically can be further stretched in a supportive learning environment where time is allowed for reflection.

A learning organization is not cultivated effortlessly. It needs a series of concrete steps and systematically distributed within the organization. With this in mind, Garvin et al (2008) encourage organizations to build learning processes and practices around four areas: experimentation to develop and test new products and services; intelligence gathering to keep track of competitor, customer, and technological trends; analysis and interpretation information to identify and solve problems; and provide education and training to develop employees continuously.

Organizational learning is actively influenced by the behavior of leaders. Garvin et al (2008) consider leadership as the source of reinforcing learning behaviors. Peter Senge (1990) asserts that in a learning organization, leaders' roles differ from that of the traditional decision-maker. They have to be designers, teachers, and stewards. As designers, they need to design share mental models and foster learning behaviors across levels. As teachers, they must give explicit attention to people, listen and inquiry.

In short, building a learning organization needs efforts across levels. The process is hard, such multidimensional learning can also reinvent organizations.

Summary

For the purpose of this capstone, this literature review has encompassed key research in agility, change, and learning from both theoretical and practical studies. By tracing agility from its origin in product development to its recent involvement into pharma, it surfaces some veins of “agility”, the buzzword. Embracing agility in pharma is neither fully top-down nor bottom-up. The review follows with an exploration of several intentionally selected change management models and gravitates toward navigating the people side of change. Takeuchi and Nonaka (1986) underscore that the essence of agile is multilevel learning and multifunctional learning. Thus, this review is anchored in a study of learning with two dimensions: individual learning at work and organizational learning.

While “agility” and “agile” related topics have been widely discussed in recent years, surprisingly, it has less systematic studies compared with the other two discussed topics. However, it is commonly recognized that agility can incubate continuous improvement and innovation, which are considered as essential dynamic capabilities in pharma (Mahadevan et al., 2019). Albeit a limited agile related review with the focus on both pharma and learning and development, some essence of the Agile Manifesto can be further conceptualized to give life to learning and development.

CHAPTER 4

CONCLUSIONS AND FURTHER EXPLORATION

At the beginning of this capstone, I had more questions than answers with respect to whether agile approaches could be applied to learning and development initiatives. My colleagues at BNC were strong advocates for agile, saying things such as, “use agile as a selling point”, “just run a pilot program and see”, “think about using ‘the trendy agile’ in your project”. This unsolved question ignited my idea of turning this experience into a capstone study. After the study, I find that agility and learning have become more interconnected than I thought (see Figure 18).

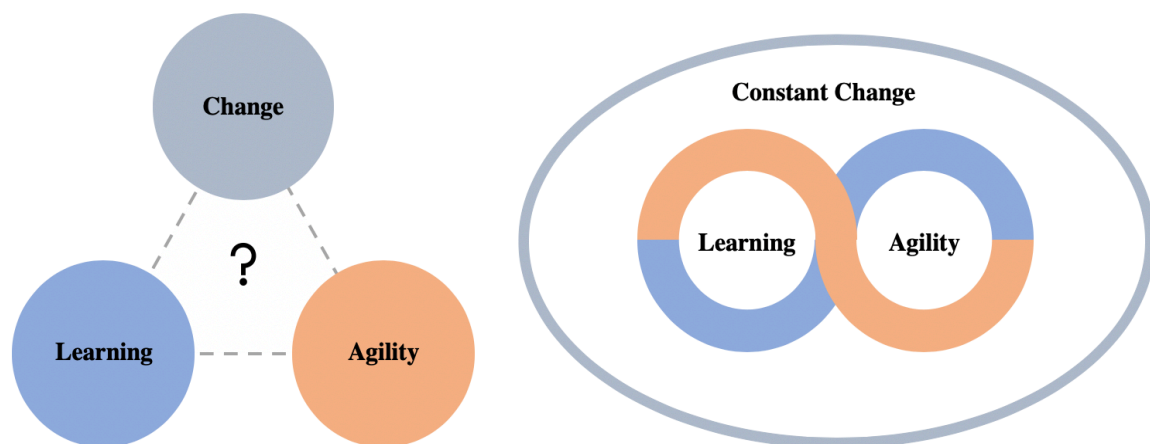


Figure 18. Comparison of the Personal Perception of Learning, Agility, and Change Before (left) and After (right) the Capstone Study (Tang, 2020)

Studies of agility and organizational learning are deeply rooted in numerous quality improvement cases in the manufacturing industry. Takeuchi and Nonaka (1986) amplify the importance of multilevel learning and

multifunctional learning when organizations pursue agility. Peter Senge (1990) further underscores the essence of organizational learning to increase adaptiveness as well as to generate creativity.

Conclusions

In my view, agility and learning closely interplay with each other in a helix (see Figure 19).

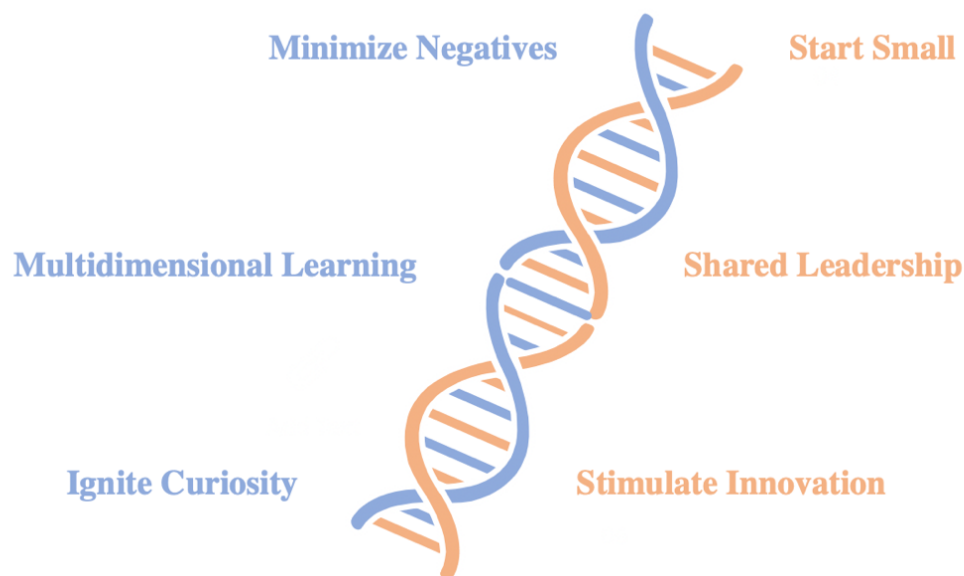


Figure 19. Value Created by the Helix of Learning (in blue) and Agility (in orange) (Tang, 2020)

Synergizing together, they can empower people in organizations to collaborate across levels and functions through three sets of values. These values can prepare organizations to tap into unknowns and uncertainty with dynamic capabilities (Teece, et al., 2016, p. 6).

Start Small & Minimize Negatives

Starting small and breaking things into increments are fundamental features of agile approaches (Takeuchi & Nonaka, 1986; Agile Manifesto, n.d.).

It aims to make sure the value is delivered each time. Asking people to take small steps engages them in a deliberate process of discovery. It allows them to go beyond the obvious and shed light on their learning.

Beginning with small steps creates a relatively safe space for people to learn. This is critical for people who are not comfortable with change. For example, pharma R&D staff tend to have habitual ways of doing things that are rigid and sequential. If small steps work out, such as the pilot program in the BNC case, it can assure people and boost their confidence in taking bigger steps. Even if these steps fail, the feeling of “losing” is easier to be managed.

With less negative feelings, the mammalian brain is in a less active state. When the mammalian brain is freed up more, the prefrontal human brain takes over for higher intellectual functions, like learning (MacLean, 1978).

Shared Leadership & Multidimensional Learning

Compared with traditional management approaches, agile stands out by assembling diverse, cross-functional, and highly inclusive teams. The team leader, often referred to as the project owner, does not tell the team who should do what or how long tasks will take. The way that the team works relies heavily on collective intelligence (Takeuchi et al., 2016). In other words, each member of the team shares responsibility, and leadership is also shared. The shared leadership strives for having small commitments from individuals, which can move change forward agilely in the group (Onderick-Harvey, 2018).

Such shared leadership requires the team leader to be a process facilitator and to learn from team members actively. It not only changes the team

dynamics but also provides fertile soil for organizational learning. In the BNC case, Dian and Elizabeth created an inclusive environment for having both high-level stakeholders and frontline scientists in the implementation process. The behavior of leaders is considered as the source of reinforcing learning behaviors (Senge, 1990; Garvin et al., 2008). In the agile environment, leaders need to foster learning behaviors across levels and functions, which is particularly important for science-driven organizations, like pharma (Fiore et al., 2019). Gradually, nurtured multidimensional learning behaviors can sustain a supportive learning environment.

Stimulate Innovation & Ignite Curiosity

Experiential learning through small steps and multidimensional learning through collaboration creates an opening for many possibilities, including innovation. Takeuchi et al uncover (2016) that “innovation is what agile is all about.” Innovation is also placed at the heart of pharma as the engine for competitive advantage. To innovate something, we need to mobilize the intellectual capacity along with existing experiences to make a difference. It is a process of staying intellectually curious.

The nature of curiosity as an emotional-motivational state is in a positive correlation with the pleasure associated with learning (Litman, 2005; Reio & Callahan, 2004). When we get genuinely curious about something, our intrinsic motivation to learn is activated. Our impulse to learn is also an impulse to be generative and to expand our ability. More importantly, generative learning plays a pivotal role in creating a learning organization (Senge, 1990).

Implications of the Helix

To some degree, the helix of learning and agility is naturally structured with both stability and flexibility. By uncovering these three sets of values, I hope to offer a new perspective for learning and organizational development practitioners and leaders to see the interconnected relationship between learning and agility. Though this capstone focuses on pharma, I believe my findings can also provide some value for other organizations, especially regulated industries where both stable backbone functions and dynamic capabilities are desired.

The ability to learn continuously and move agilely is crucial for individuals and organizations in a world of rapid change. Done well, the helix can unlock potential in building learning capabilities from both individual and organizational levels. As Bill Gates said, “success today requires the agility and drive to constantly rethink, reinvigorate, react, and reinvent.”

Further Exploration

Through the case and literature review, my initial goals of minimizing the current research gap and discovering the value of agility in learning seem reached. While I feel many questions that I held at the beginning are answered, there are still many questions to be answered on this journey that I want to explore further. These questions primarily focus on three areas.

Quantitative Value of Agility in Learning

In the BNC case, the training solution used two established systems along with some existing team resources. All add layers of difficulty in

calculating the detailed project cost. Therefore, it is assumed that the net benefits (i.e., benefits minus costs) that agility brings (Teece et al., 2016) in the BNC case are positive.

One of the benefits of agile is commonly considered as cost-saving compared with the traditional sequential approaches in the world of product development (Cohen, 2009, p. 11-13). Are there relevant quantitative studies of the return on investment of agile? Furthermore, can any of these studies be the reference for exploring the quantitative value of agility in learning?

Psychological Safety in Integration

Extensive studies of psychological safety underscore that it can create a better environment for learning. The process of fostering psychological safety is difficult and often needs efforts across the organization. While studying Edgar Schein's theory of anxiety and how it can inhibit learning, I became aware of an intriguing perspective he offered. He indicates that psychological safety can be dramatically missing when a company is downsizing or undergoing a major structural change. It is extremely difficult to create psychological safety when organizations are pushing for greater workforce productivity at the same time (Schein, 2002).

It makes me realize the unique contextual background of BNC. Throughout my 12-week experience, I felt unspoken anxiety and observed different attitudes toward integration. In this case, the most important integration guiding principle was to make sure the top priority was business continuity. When I think about it, it seems like a rationally reasonable but emotionally

demanding request for people who live in uncertainty every day. I am curious and want to learn more about psychological safety in integration. I wonder how major structural changes might effect people's learning behaviors.

Agility and Organizational Culture

Edgar Schein (1984) constructs a formal definition of organizational culture that derives from a dynamic model of learning and group dynamics. He further defines cultural elements as learned solutions to problems. In the BNC case, I walked into a working environment where “the agile way of doing things” had been increasingly advocated organization-wide and supported by team leaders. The cultural element of agility was growing across organizational levels.

Would my experience be different if the organizational culture did not have the seed of agile? Would the project be accelerated if it happened in the world of software development where agile has deep roots? I want to know more about the relationship between agile and organizational culture. What kind of impact can agile bring to organizational culture? These are questions I will continue to explore.

CHAPTER 5

PERSONAL REFLECTION

“Learning without reflection is a waste. Reflection without learning is dangerous.”

- Confucius

Working at BNC in the summer of 2019, I felt that I was on an accelerated track with numerous details, multiple stakeholders, and many deliverable dates. It gave me a closer look at solution implementation in a highly regulated industry in a dynamic environment. Although I was in a position of little authority, the knowledge I learned in the MSOD program at Penn equipped me with insights and new ways of thinking to navigate the process. Lessons from the classroom were tested and proved transferable to different organizational contexts.

I ask myself if it would be different if I worked on this project without any knowledge of organizational dynamics. It is difficult to say how many things could be different. One thing is for sure: I would not be aware of the rich layers of a seemingly simple implementation process. This experience has greatly increased my confidence to become an organizational development consultant and a professional in the healthcare industry.

Writing this capstone was a lengthy journey of learning, stops, and surprises. It felt like running a marathon, a process with dynamic rhythm and resilience. As I near the end of the journey, I am grateful for the opportunity to

write this capstone. It holds a space for me to reflect on what I experienced, to learn areas I want to explore, and to start thinking about new paths to travel.

I believe the most valuable gift that I learned from my journey at Penn is understanding the power of stopping, reflecting, and exploring. Dr. Russo once said, “the consultant, as well as the leader, is a teacher.” I also feel a great responsibility as a helping professional, to inspire others and to continuously reinvent myself.

There are more miles to go.

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