Winter Semester:
Organizational Adoption of AI Through A Sociocultural Lens

By

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Table of Contents

Abstract

The Second Machine Age has catalyzed a surge in digitization, new ways of acquiring knowledge and higher rates of innovation; artificial intelligence is identified as the most important general purpose technology of this era, reframing traditional sources of competitive advantage and shifting the roles of people in the workforce. Organizations worldwide are facing incredible pressure to adapt and transform technologically; however, there are significant gaps with respect to organizations' interest to adopt AI and their ability to do so. National cultures vary and this variation among national cultural values may predispose organizations operating in specific nations to be more equipped to adapt to technological change, specifically to adopt AI technology. This thesis investigates whether variation across national cultures influences organizational adoption of AI. The study provides a qualitative analysis of existing literature including organizational innovation, technological adoption, and organizational culture, as well as an analytical case study, comparing a French and an American multinational telecommunications organization to evaluate the influence of national sociocultural values on organizational adoption of AI.

Acknowledgements

It was an incredibly fun process writing this thesis and engaging with a variety of people while doing so. It gave me the opportunity to connect with so many awesome, driven, and passionate people and I'm thankful for their insight, advice, and enthusiasm. There is an incredible community of people (professors, students, etc) at UM. That said, I highly recommend to my fellow students, to proactively take advantage of this network by reaching out to others, asking questions, learning about the experiences of others, and pushing yourself. Opportunities to be "stuck", challenged, and overwhelmed are great ones (and arguably the most valuable), so take chances in your undergraduate careers and give yourself credit when you do (I explain this more in the Additional Reflection section at the end of this thesis).

This year-long process of learning, researching, writing (and rewriting), taught me a tremendous amount about myself; it was very personally rewarding because I had the freedom to explore a subject that combined all of what I had learned throughout my undergraduate career, and apply it to a specific subject that I was interested and passionate about. Ask anyone who knows me, I loved every minute of it. It was the first chance that I had to connect the dots, ask questions, make research contributions, and try to answer these questions. I am incredibly excited to use what I have learned as I pursue new paths, and feel very equipped to do so.

To think that all of this started with an email, and trip to the second floor of Lorch Hall still amazes me. I'm forever grateful that your office door was open that day (because I probably would not have had the courage twice) and for your willingness to listen to a random undergraduate student's crazy idea to write an honors thesis. I had intentionally chosen to approach you because of your background, and research interests, but I quickly realized just how incredible of a professor, mentor, and educator you are (I guess the golden apple award should

have been my first clue). Thank you for agreeing to be my advisor. It was a privilege having the chance to work with you, pick your brain, hear your stories, analyze ideas with you.

The second of my advisors who I am also incredibly grateful for is Dr. Anthony Marcum. Your excitement and energy to help students is incredible. The fact that so many International Studies students opt to write honors theses is absolutely a function of your energy, encouragement, and eagerness to guide us as we commit to such an endeavor. You were always willing to read drafts, talk about our ideas, or explore new ones with us and it makes this process that much more fun. Having been in a class with you for the past year and a half, I can personally attest to the fact that you set an extremely high standard for professors, and the department (and all of us) are fortunate to have you.

Thank you to my family. You five amazing, rambunctious and incredibly intelligent people have always encouraged me and because of you, writing an honors thesis was very much the norm, and something that I was eager to accomplish. The reason why I am incredibly eager to understand people's values is because you all have instilled within me a value system that guides me in everything that I do.

Thank you to my team, friends, and many, many more. You guys are incredible and know me better than anyone. It meant so much to me to have your support throughout this process because I could not have done it alone (and would not have wanted to). To my teammates, and to the girls who I have been my family for the past four years, thank you for everything. You guys are incredible and I love you all very much.

My one piece of advice for anyone reading this is to pursue exactly and only what you love. Freedom today is embracing and harnessing our powerful identity, and making the conscious choice to live from purpose. We're a cohort of doers, collaborators and a feedback-

crazed group; good. That's exactly how we are going to effect the change that I know we will; learn, grow, fail, and keep trying. As you grow, learn, and experience the world, continue to connect your passions with your skills, with your interests and desires, and pursue a life of meaning. This is an intensely valuable, rewarding, and challenging process. It requires intentional effort, and commitment to what you do - all the time, relentlessly, fearlessly. It's an investment that means we are exercising the amazing freedom that we have been given. Deciding to write an honors thesis was the first step I made living from purpose. For me, this choice to live an intentional, and purpose-driven life has had profound personal effects: it's helped me become more self-aware, infinitely energized, and catalyzed a fundamental shift in my mental state.

Chapter 1: Artificial Intelligence in the Context of Organizational Adoption

Section I: The Purpose of this Research

The Goal

I wanted to offer insight on whether organizations operating in different nations within the same industry adopt AI at different rates or through different processes. The various methodological approaches that I used in my research do have limitations and relied on certain assumptions. For this reason, I am not able to make a definitive claim about the relative rates of organizational adoption of AI of organizations in the U.S. and France; however, my research did illuminate why such a study merits further research, as well as additional approaches that could be taken in the future to quantify organizational rate of adoption and measure the influence of the sociocultural values of employees on organizational adoption of AI. In addition, my research stemmed from a curiosity about the relationship between organizational adoption of technology (which is widely recognized as a competitive necessity) and different individual-level sociocultural values. Resulting from this intrinsic curiosity, I was eager to attempt to offer a prescriptive claim about the capacity of organizations operating in different countries to adopt a technology that is currently viewed as "the most transformative technology for organizations" (The Economist).

The Motivation

My motivating interest for my thesis was the variation of sociocultural values of individuals and its influence on organizational adoption of technology; however, as a result of methodological limitations, I my thesis investigates the variation across national cultural values

and evaluates the influence of national cultural variation on organizational adoption of AI. I identified AI as an optimal type of technology to study how variation of national cultural values influence organizational adoption of technology because organizational adoption of AI is identified as a "competitive necessity" for organizations, indicating that organizations worldwide are incentivized to adopt AI. Next, I selected France and the U.S. as two nations that would enable a comparison of the influence of varying national cultural values on organizational adoption of AI, as these nations have cultures that are historically distinct and embody separate values (Hofstede); in this way, comparatively analyzing a French firm's AI adoption process with that of an American firm enabled me to analyze whether cultural values played a role on organizational adoption of AI. I chose to analyze two firms in the telecommunications industry because this industry was identified as the industry that has adopted AI most rapidly.[1]

Why now? And Why Artificial Intelligence (AI)?

There is a commonly held perception that the second machine age[2] is "unfolding right now"; this age is identified as an "inflection point in the history of our economies and societies

[1] At the Economics of AI conference in 2017, a portion of the conference was dedicated to discussing the influence of AI on competition, and market structure. Hal Varian and Carl Shapiro presented a presentation titled *Machine Learning, Market Structure, and Competition* and cited a McKinsey report. The McKinsey & Company report indicated that the telecommunications industry was the industry that had adopted the most AI-related technologies at scale or in a core part of the business compared to organizations in other industries. The relevant table can be found on slide eleven of *Machine Learning, Market Structure, and Competition* by Carl Shapiro and Hal Varian.

[2] McAfee and Brynjolfsson characterize the Industrial Revolution as the first machine age. The authors note that the Industrial Revolution ushered in humanity's first machine age and this era was, "the first time [our world's] progress was driven primarily by technological innovation—and it was the most profound time of transformation our world has ever seen (5). "The machine age" is also a label used by some economic historians to refer to a period of rapid technological progress spanning the late nineteenth and early twentieth centuries. Others refer to this period as the Second Industrial Revolution.

because of digitization."[3] The surge in digitization has resulted in two main consequences: new ways of acquiring knowledge and higher rates of innovation. There is widespread agreement that this age is occurring and that it is an "inflection point" for human progress; observations about the implications of "second machine age" (McAfee and Brynjolfsson, 9). How exactly this transformational period will "play out remains unknown, but if this new machine age bends the curve as dramatically as Watt's steam engine, "it is a very big deal" (McAfee and Brynjolfsson, 10). The "outstanding features" of this age include: "sustained exponential improvement in many aspects of computing, extraordinarily large amounts of digitized information, and recombinant innovation" (McAfee and Brynjolfsson, 12). These three advances are propelling our society in new ways, enabling impressive breakthroughs that "convert science fiction into everyday reality" (McAfee and Brynjolfsson, Chapter 4, 34). In addition, it is widely acknowledged that there is "no end in sight" for these breakthroughs. The reasoning behind this statement is that exponential, digital and recombinant powers of the second machine age have made it possible for humanity to "create two of the most important one-time events in our history: the emergence of real, useful artificial intelligence (AI) and the connection of most of the people on the planet via a common digital network" (McAfee and Brynjolfsson). This is the first driver for my research: to investigate this transformative age more closely, specifically in the context of one of the most significant technological advances (AI), to better understand this age, this technology, and the effects of this period. That is why I am conducting my research "now" and focusing on artificial intelligence.

[3] In *Information Rules* by economists Hal Varian and Carl Shapiro, digitization is defined as "encoding information as a stream of bits" or "the work of tuning all kinds of information and media—text, sounds, photos, video, data from instruments and sensors and so on—into the ones and zeroes that are the native language of computers and their kin" (McAfee and Brynjolfsson).

1. **Why Organizational Adoption?**

In the context of organizations, this era, especially the emergence of AI, is forcing organizations to "transform or die"; an observation of the current trends relating to organizational adoption of AI indicates that this technological transition is a challenging one, particularly for large organizations (Gerbert, Justus, Hecker). The difficulty for large organizations to adopt new technology is not new, but certain organizations have been more "agile" than others, with respect to adopting AI. The second driver for my research was to further investigate why certain organizations have been more equipped to adapt and integrate AI into organizational processes and the organizational process that has enabled organizations to adopt AI.[4]

2. **How do Sociocultural Values Relate to AI Adoption**?

We are in an age of phenomenal technological change; however, perceptions and beliefs regarding what these technological advances diverge; the term "sociocultural" was the term that most effectively encapsulated people's perceptions, beliefs, and values that are shaped by cultural and social influences.[5] The "leaders of the field of digital economics" believe that "it is an inflection point in the right direction—bounty instead of scarcity, freedom instead of constraint—but one that will bring with it some difficult challenges and choices" (McAfee and

[4] AI is reframing traditional sources of competitive advantage; for this reason, organizations are facing greater pressure to reassess how they perceive their strengths and how to maintain market share; in previous years, positional advantage was dependent upon static business processes: proprietary assets, distribution networks, access to customers, and scale. However, in today's environment, organizations "need to identify what machines do better than humans and vice versa, develop complementary roles and responsibilities for each ad redesign processes accordingly" (Gerbert, Justus, Hecker).

[5] The definition of sociocultural values that is used in this research study is the following: the principles or standards of behavior, attitudes, or beliefs of individuals, and the different groups of individuals in society and their habits, traditions and beliefs. (Oxford Dictionary, Cambridge Dictionary).

Brynjolfsson, 11). This is the optimistic view. Even from the optimistic perspective, they mention that there are evident and clear challenges to "digitization"; "rapid and accelerating digitization is likely to bring economic rather than environmental disruption stemming from the fact that as computers get more powerful, companies have less need for certain workers or tasks" (McAfee and Brynjolfsson, 11). In other words, specific types of skills may become obsolete, and thus individuals with these skills may be "left behind."[6] From the standpoint of the individual, this second-machine-age era signifies a time that will require people to learn to work with machines in new ways, learn new skills, innovate in new ways, and adapt. The emergence of AI signifies a new type of relationship between man and machine.[7] The third driver for my research was to further investigate how people operating in different cultures and embodying different sociocultural values make sense of this age and AI-infused reality, where a willingness to work alongside machines in new ways is both important and necessary. In this way, I was interested in researching whether certain sociocultural values predispose people (in the context of work) to be more capable or willing to adapt to this form of technological change. I was initially interested to study this at the level of the individual, but pivoted to studying it at the level of the

[6] When referencing that individuals with certain skills might be "left behind" is a phrase used by McAfee and Brynjolfsson in their The Second Machine Age (11).

[7] There are diverging opinions regarding the advantages and disadvantages of AI on humans and our daily lives. For example, In the Most Human Human by Brian Christain, he mentions that "the story of the twenty-first century will be, in part, the story of the drawing and redrawing of these battle lines, the story of Homo sapiens trying to stake a claim on shifting ground, flanked on both sides by beast and machine, pinned between meat and math. And here's a crucial, related question: Is this retreat a good thing or bad thing? For instance, does the fact that computers are so good at mathematics in some sense take away an arena of human activity, or does it free us from having more human life?" (Christian, 12). This process of questioning, and the willingness or rejection of individuals to perceive AI as a positive or negative influence on society was the reason that I decided to investigate the influence of sociocultural values on AI adoption. There is a broad range of perceptions of AI and this thesis aimed to evaluate how differing viewpoints influence AI adoption.

firm because of a lack of necessary data (this is explained in greater detail in Chapter 4). I was able to compare organizations operating in different countries and analyze if differing national sociocultural values influenced organizational adoption of AI.

When selecting countries with differing sociocultural values, I referenced social psychologist Geert Hofstede's cultural dimensions (Hofstede, 2001) as a starting point[8], and combined additional literature to cross-check Hofstede's cultural characteristics and assess the current sociocultural values of individuals in both nations. Hofstede's cultural dimensions are the following: the uncertainty avoidance, the Power Distance, Individualism/Collectivism, Masculinity/Femininity, and Long Term Orientation/Short Term Orientation. A sixth dimension, Indulgence/Restraint, which was added by Hofstede in 2010, will not be discussed or referenced in this thesis due to a lack of research yet conducted on this topic. These dimensions are based upon the most recent and comprehensive studies of how values in the workplace are influenced by culture[9] (The Hofstede Center, n.d.a, p.1). Using these dimensions, I selected France and the

[8] Geert Hofstede(1980) is a researcher in the fields of culture and management; in the 1970s he developed a paradigm for the organization and identification of cultures; Hofstede's work has been applied in a variety of fields, most frequently in cross-cultural psychology, international management and cross-cultural communication. Hofstede was motivated to determine if universal categories of culture existed. His research initially produced four dimensions that are applicable to cultures all over the world: power distance; collectivist-individualistic; feminine-masculine; and uncertainty avoidance. Two additional dimensions were added after subsequent research long term orientation and self-restraint (2010). Hofstede identified these dimensions after accessing a large survey database about values, attitudes and sentiments of employees working at various local subsidiaries of IBM, a multinational corporation. Several researchers, universities, and organizations have employed Hofstede's dimensions in efforts to compare national cultures. Hofstede's Insights is one such organization that has applied these dimensions, and I will be referencing the scores that this organization has identified for France and the U.S. These scores were cross-referenced with other culture evaluations made by other sources (Binus University).

[9] Culture has many definitions. A common definition of the terms is the body of a shared knowledge, understanding, and practice in a society. According to the Merriam Webster (2013) dictionary, culture is "the integrated pattern of human knowledge, belief, and behavior, that

U.S. as each country received differing scores on each cultural dimension. After selecting France and the U.S., I aggregated research, information, and testimonies pertaining to sociocultural values of American and French individuals. These testimonies reinforced that there exists sociocultural value differences among individuals living in France and the U.S.[10]; however, concluding that these testimonies influenced organizational adoption was outside of the scope of this thesis, due to methodological limitations. However, connections between national sociocultural values and organizational adoption could be made. I referenced Geert Hofstede's dimensions to understand the sociocultural value differences between France and the U.S.

3. **Why A Case Study Analysis of Telecommunications Firms?**

I used an analytical case study approach because I identified this method as being an optimal way (in terms of its feasibility and attainability) that I could uncover insight about internal processes that contributed to organizational adoption of AI. To select the organizations for my case study, I extracted insight that I gathered after conducting a comprehensive literature review of organizational innovation, technological adoption, and organizational culture. Research relating to organizational innovation indicated that a comparative analysis of organizational innovation-adoption is best conducted when size, sector, and organization type (private or

depends on the capacity for learning and transmitting knowledge to succeeding generations" and "the customary beliefs, social norms, and material traits of a racial, religious, or social group; and the set of shared attitudes, values, and practices that characterized by institutions or organization."

[10] These testimonies are analyzed in greater detail in Chapter 3 of this thesis. They are statements made by French and American individuals about their cultures and beliefs. These statements are not representative of all French or all American people's values as they represent statements from a small sample size of and were accessed from specific types of articles and publications. The primary purpose of including these testimonies was to cite examples of recent statements made by French and American individuals about their sociocultural values. Second, it was to cross-check Hofstede's cultural dimensions of France and the U.S. by researching and aggregating what actual individuals said about their sociocultural values.

public) are similar. In addition, as I reviewed the most recent literature on organizational adoption of AI, I found data that was presented at an Economics of AI conference in 2017. The data used in the presentations, generated by McKinsey & Company, indicated that the telecommunications industry was the industry that had adopted the most AI-related technologies at scale or in a core part of the business compared to organizations in other industries. In this way, to contribute to the literature on organizational adoption of AI, I selected two organizations that are in the same industry (high-tech, telecommunications), size (measured by the number of employees), and type (multinational and public). The organizations that I selected were Verizon Communications (U.S.) and Orange S.A (France). Both organizations are public multinational telecommunications corporations[11] and are of comparable size (measured by number of employees).

4. **What is a Chatbot and why is a Chatbot representative of Organizational Adoption of AI?**

The literature on organizational innovation indicated that selecting organizations that are innovation-generating or innovation-adopting as well as identifying a common type of innovation permits a more accurate comparative analysis; in the context of AI organizational adoption, most organizations are both generating and adopting the technology across sectors and are generating or adopting various types of AI. After selecting two telecommunications firms for the subjects of my case study analysis, I selected chatbots as the specific type of AI technology that I would analyze for several reasons. A chatbot is a program designed to simulate conversation with human users, especially over the internet (Oxford Dictionaries). Chatbots can

[11] Both multinational corporations are publically traded organizations. Verizon communications is traded on NYSE (VZ); Orange S.A. is traded on Euronext (ORA), NYSE (ORAN), BIT (ORA) (Reuters).

recognize the content and context of customers' requests and questions. For this reason, chatbots are one of the most popular AI applications used by telecommunications companies (Tech Emergence).

After conducting research about Orange S.A. and Verizon, there was evidence that chatbots were a type of AI technology that both organizations have sought to adopt in the form of products; in this way, there was information relating to the deployment and development (admittedly still a limited amount) of these chatbots. Analyzing the process by which each organization had adopted this type of AI technology was an opportunity for me to gather information relating to organizational adoption of AI and second, to compare these adoption processes to evaluate if national sociocultural values did influence organizational receptivity or capacity to adopt this technology.

My Research Question

This thesis attempts to answer the following question: How do national sociocultural values influence the rate of adoption of AI in American versus French organizations? The study provides a qualitative analysis of existing literature including organizational innovation, technological adoption, and organizational culture, as well as an analytical case study, comparing a French and an American multinational organization to evaluate the influence of national cultural values and organizational adoption of AI.

The goal of this research was to offer insight on whether organizations operating in different nations within the same industry adopt AI at different rates and whether national sociocultural values influenced organizational adoption of AI. The limitations of my methodology prevented me from conclusively offering insight on this subject. Though a conclusion about the influence of sociocultural values on organizational adoption of AI was not

possible, resulting from the limitations of my methodological approach, my research contributes insight that is relevant for organizations today and in the future.

My thesis illuminated why a study that explored the influence of national cultural values on organizational adoption of technology warrants investigation. My research provided insight for future research on the following subjects: organizational adoption of technology, organizational adoption of AI, organizational and generation of AI. The primary contribution of this thesis was the optimal approach that I identified to comparatively quantify the rate of organizational adoption of AI. This approach is defined and thoroughly explained in the Chapter 4 of the thesis.

Section II: Introduction to Artificial Intelligence

Technology is a valuable resource to an organization and thus has critical implications to its competitiveness and long-term profitability. Artificial Intelligence (AI) is forecasted to be the most transformative technology of the future and its disruptive potential is "already here" (Ransnotham, Kiron, Gerbert, Reeves). In a short time, AI has become mainstream and is rapidly permeating and transforming entire sectors of economies worldwide; 2016 was the year that, "AI came into its own for mainstream businesses" (Hardy). Organizations in agriculture, manufacturing, aviation, and "every other sector of the economy," are adopting AI (Hardy); they recognize the benefits and acknowledge that AI initiatives are imperative as real-world gains exist. In addition to reframing specific sources of competitive advantage, AI helps increase the rate and quality of decision making. For specific tasks, the number of inputs and the speed of processing for machines can be millions of times higher than they are for humans. Amidst this opportunity to increase productivity, profitability and businesses processes, organizations must adapt to remain competitive (Brynjolfsson and McAfee).

The capacity for organizations to adapt to technological change by adopting technology has been a competitive necessity for organizations ever since the first industrial revolution (Brynjolfsson and McAfee). One specific technology that has emerged is artificial intelligence. Theories of AI have existed since 1950 (Miller); AI itself, however, gained wider functional applicability only in the past few decades, resulting from advances such as improved algorithms and training methods, greater computing power, and the availability of large amounts of data in the cloud enabled (Miller). Artificial intelligence has a variety of applications. Most of the advances in artificial intelligence in business contexts have been focused on specific applications (Brynjolfsson and McAfee). This narrow artificial intelligence includes natural language processing, intelligent agents, computer vision, machine learning, expert systems, autonomous cars, chatbots and voice recognition and are used to preform specific tasks such as recommending songs on Pandora (Vazirani, Morvan, Hintermann, Daugherty).

A second type of artificial intelligence is referred to as human-level or general AI, which pertains to artificial intelligence that "successfully demonstrates all capabilities of a person," according to Oren Etzioni (Baggaley); this type of AI is still in early stages. This distinction is important, as my thesis, and the case study analyses that I will conduct where I quantify the rate of organizational adoption of AI will pertain only to the "narrow forms" of artificial intelligence that were identified above (robotics and autonomous vehicles, computer vision, language, virtual agents, and machine learning, which includes deep learning and underpins many recent advances in the other AI technologies). Human-level AI will not be included in my analysis.

Section III: An Overview of the Global Trends of Organizational Adoption of AI

Variation Among AI Adopters Across Industries

Industry seems to be a factor in an organizations ability to adopt AI, but not a significant factor. Insight summarized by MIT'S Sloan Management Review and Boston Consulting Group, concluded that the, "differences in adoption [are] striking, particularly within the same industry" (Ransnotham, Kiron, Gerbert, Reeves). Even in industries with extensive histories of integrating new technologies and managing data, barriers to AI adoption can be difficult to overcome (Ransnotham, Kiron, Gerbert, Reeves). The differences with respect to organizational adoption of AI are "less about technological limitations and much more about business"; in this way, the two main barriers to AI adoption (identified in this study) are the following: competing investment priorities and unclear business cases for AI. McKinsey Global Institutes similarly concludes that "sector-by-sector adoption of AI is highly uneven" (Bughin, Trench, Henke, Dahlstrom, Chui, Ramaswamy, Hazan). This pattern in the adoption of technology is representative of a common adoption curve and reflects Rogers's innovation adoption curve[12]. Such variation across industry, "implies that, at least in the near future, AI deployment is likely to accelerate at the digital frontier, expanding the gap between adopters and laggards across companies, industries, and geographic regions" (Bughin, Trench, Henke, Dahlstrom, Chui, Ramaswamy, Hazan). A similar industry-variation of "early adopters" was identified in *Embracing Digital Technology* (*Fitzgerald, Kruschwitz, Bonnet, Welch).*

The leading sectors, according to McKinsey's Industry Digitization Index, are those in

[12] The Rogers innovation adoption curve relates to the diffusion of innovation theory which will be discussed in greater detail in Chapter 2. This curve is a model that classifies adopters of innovations (such as technology) into specific groups (innovators, early adopters, early majority, late majority, and laggards (Rogers).

the high-tech sector such as telecommunications and financial services. These are industries with "long histories of digital investment" (Bughin, Trench, Henke, Dahlstrom, Chui, Ramaswamy, Hazan)[13]. Though these sectors are leading in developing and adopting digital tools, "even these sectors are far behind in AI adoption when compared with overall digitization" (Bughin, McCarthy, Chui). Sectors with the most developed digital capabilities correlates with a greater capacity to adopt AI. A Harvard Business Review article summarized the findings of a study of AI that surveyed 3,073 executives, and identified that "industries leading AI adoption, "such as high tech, telecom, and automotive, are also the ones that are the most digitized" (Bughin, McCarthy, Chui). In addition, when analyzing companies within the same industry, those that have invested in digital capabilities (cloud infrastructures, big data, etc.) are the organizations leading organizational adoption of AI[14]. Analyses conducted by Accenture indicate that different sectors are leading AI adoption than those identified by McKinsey Global Institute[15]. The Accenture report, *Boost Your AIQ: Transforming into an AI,* identified digital platform and IT software and services as the industries that are "pioneers in the development of AI technologies and applications." (Vazirani, Morvan, Hintermann, Daugherty).

A Gap Between Organizational Expectation and Adoption of AI

[13] A McKinsey Global Institute report titled *AI: The Next Digital* Frontier, identified that organizations that have been better equipped to adopt AI are those with a digital foundation; in this way, for an organization to successfully adopt AI, it "cannot delay their digital journeys" and "must address many elements of a digital and analytics transformation: identify the business case, set up the right data ecosystem, build or buy appropriate AI tools adapt work ow processes, capabilities, and culture (Bughin, Trench, Henke, Dahlstrom, Chui, Ramaswamy, Hazan).

[14] A Harvard Business Review article concluded that the "odds of generating profit from using AI are 50% higher for companies that have strong experience in digitization" (Bughin, McCarthy, Chui).

[15] Accenture's report *Boost Your AIQ: Transforming into an AI* Business (Vazirani, Morvan, Hintermann, Daugherty) and McKinsey Global Institute's report (*AI: The Next Digital* Frontier) were published in 2017.

In Reshaping Business with Artificial Intelligence, the results obtained from an annual survey[16] *conducted by MIT's Sloan Management Review* and The Boston Consulting Group, concluded that only nineteen percent of the organizations that they surveyed qualified as "early adopters of AI" (Ransnotham, Kiron, Gerbert, Reeves). These results indicated that there "is a disparity between expectation and action" as it relates to organizational adoption of AI (Ransnotham, Kiron, Gerbert, Reeves). Although approximately eighty-percent of executives agree that AI is a strategic opportunity for their organization, only approximately twenty-five percent of organizations incorporated AI *in their business* offerings or processes (Ransnotham, Kiron, Gerbert, Reeves). In addition, the report indicated that ten percent of organizations have extensively incorporated AI in their offerings or processes. Accenture's AIQ Report identified a similar "organizational AI adoption gap" with regards the testimonies of executives of organizations that mentioned that AI was an organizational priority and their organization's successful adoption of AI. Though investment in AI is "heating up," the figures gathered from a variety of sources indicates that corporate adoption of AI technology is "lagging" (Chui, Bughin, McCarthy) which demonstrates that organizational adoption of AI is still in its infancy.

Firm Size: A Contributing Factor for Organizational Adoption of AI

The reports conducted by various organizations indicate that firm size does seem to influence organizational adoption of AI. When analyzing firms that have adopted AI, a similar digital divide exists: large firms have much higher rates of adoption and awareness (Vazirani, Morvan, Hintermann, Daugherty). Across sectors, larger firms (which Accenture denotes as

[16] MIT Sloan Management Review and The Boston Consulting Group conducts an inaugural survey of approximately three thousand business executives, managers, and analysts from organizations around the world. This specific survey was an intentional effort to "understand the challenges and opportunities associated with the use of artificial intelligence" (Ransnotham, Kiron, Gerbert, Reeves).

those with more than 500 employees) are at least 10 percent more likely than smaller firms to have adopted at least one AI technology at scale or in a core part of their business. In sectors with lower rates of AI uptake, the adoption rate of bigger companies was as much as 300 percent that of smaller companies (Vazirani, Morvan, Hintermann, Daugherty).

Larger firms typically have access to more and better-structured data, and are more likely to have employees with the technical skills needed to understand the business case for AI investment and to successfully engage suppliers. These larger firms also have an advantage in comparison to smaller firms because the kind of fixed-cost investment required for AI generates higher returns when applied to a larger base of costs and revenue (*MIT Sloan Management Review* and Deloitte). As new technologies appear, startups can act with an agility that is beyond the reach of large organizations. Indeed, agility is more important than company size in determining success. The challenges big companies have in harnessing technology, data and talent are, if anything, even greater at startups. As the scale of the technology giants continues to grow exponentially, startups need an even higher artificial intelligence quotient (AIQ) for collaboration to compensate for the high costs of innovation.

Section IV: A Comparative Analysis of Organizational Adoption of AI

AI is a form of innovation[17] that organizations across sectors and countries identify as a valuable investment to remain competitive; the two processes of organizational innovation is via generation (creating the technology internally) or adoption (using a technology developed

[17] Technology is an element or component of innovation. Some innovations are technology based; others are not. Technological innovation is only a type of organizational innovation. (Damanpour)

outside of the organization). Distinguishing these two processes of organizational innovation, permits a critical analysis of AI in France and the U.S.

An analysis of AI-related data (investment, number of AI startups, AI patents, etc.) indicates that with respect to AI generation and adoption, the U.S. is leading France.[18] Yves Demazeau, a Director of Research at the National Center for Scientific Research (CNRS), stated at the 2016 AI conference that France is still comparatively lagging other countries, including the U.S. in AI innovation. Since the definition of "innovation" includes generation and adoption, it can be concluded that the U.S. is leading France in AI generation (creating new forms of AI) and adoption (using externally-developed AI). Though multiple sources validate that the U.S. is leading France in "the race to dominate AI," it is more difficult to identify and quantify organizational adoption as this data is less accessible[19]. Since there is limited company-specific data relating to AI adoption of organizations in France and the U.S., I will first give a brief overview of the AI ecosystem in France and the U.S. to set the stage for my research study, as well as summarize the current state of AI organizational adoption in France and the U.S. The data that I will analyze is the following: startup investment and AI organizational adoption data. I will not be addressing data or metrics that pertain to generation (creating) of AI, as interpreting this type of this data is beyond the scope of my research study. For this reason, data pertaining to AI patents, intellectual property, and AI startups, will not be addressed.

AI Organizational Adoption Ecosystems in France and the U.S.

[18] This French 'AI gap' may be shrinking, as the Economist estimates that Paris is quickly becoming a global leader of AI innovation (The Economist).

[19] Certain Management Consulting companies have quantified "early adopters" of AI, or have gathered data to quantify company-specific AI generation and adoption strategies such as McKinsey Global Institute; the organizations included in these reports are only American companies.

When comparing the AI ecosystem (measured by AI research, patents, and AI-related projects at universities, AI startups, policy initiatives addressing AI, multi-stakeholder partnerships collaborating on AI usage, and large companies leveraging AI) in France and in the U.S., there are noticeable differences; the U.S. is leading France in each category (Wu). Among the large organizations, technology and digital platform companies such as Google, Amazon, Facebook and Apple are spearheading AI innovations and attracting entrepreneurship (Accenture). In addition, with respect to AI research, the U.S. is leading France. Microsoft, IBM, and Google are the leading companies in AI research (MIT Technology Review). According to the Economist article, U.S. companies, specifically Google, leads in the race to dominate artificial intelligence. Measured by talent, computing power and data, Google appears to be in the lead in AI (The Economist).

American organizations also lead France with respect to AI startup investment[20], which includes startup financing deals and dollars invested by venture capitalists. In the period of 2010 and 2016, the United States' AI startup ecosystem dominated in these categories compared to France (Krause). In 2016, global investment in AI increased by 60% compared to previous years; more than five billion dollars was invested in the sector. The majority (approximately sixty-two percent of the AI startup[21] "deals") were for American startups, whereas French startups

[20] Startup investment pertains to organizational adoption of AI, as it is an indicator of active efforts to expand use cases of AI. Merger and acquisitions of AI startups and large companies is also an indicator of adoption. Acquiring a startup, a strategic decision to integrate externally developed AI into internal business processes.

[21] AI startups refer to small organizations that utilize AI technology. These startups are applying AI in a variety of industries including education, healthcare, security, advertising, tourism, or finance.

accounted for only three percent (French Accelerator). In addition, organizations in the AI sector have received higher valuations compared to those in France (approximately 2.4 times higher).

A large fraction of organizations globally are in the process of implementing AI, or have integrated the technology. A comparison of these organizations indicates that the U.S. is where thirty eight percent of the "early adopter" organizations are located (38%); whereas Western European nations only account for nine percent of "early adopters" (Krause). Certain organizations are both generating and adopting AI, and the majority of these organizations are American. For example, Alphabet (formerly known as Google) spent between twenty and thirty billion dollars on AI in 2016. Ninety percent of this was spent on R&D and deployment, and ten percent was spent on AI acquisitions (Columbus). The "future projections" that forecast the economic impact of AI by 2035 on select G20 countries reinforce that France is lagging with respect to organizational adoption of AI. The report indicated that the economic growth rate of the U.S. will increase from 3.5 to 4.6; comparatively, France's growth rate is estimated to increase from 1.7 to 2.9 (Accenture).

Identified Barriers to AI Innovation

Certain factors have been identified as inhibiting France's capacity to generate and adopt AI, whereas U.S. may be a more conducive environment for AI innovation and AI organizational adoption. The factors that have been identified range from economic, political, and social barriers. The following are the most commonly identified factors: public image of AI, weakness of means, relations with industry and insufficient support from authorities (Genot, Gibb,

Oubuih), uncompetitive data privacy policies, underdeveloped digital infrastructure,[22] uncompetitive tax regimes, and structural economic problems. There are AI-facilitative factors in France that encourage AI innovation which includes human capital (in the form of skilled engineers and AI-proficient individuals), and a well-established science and tech infrastructure. However, data privacy regulations are perceived as "the crux of the sector's future competitiveness" (Genot, Gibb, Oubuih). In the U.S., however, permissive data policies persist, rather than protective ones that are favorable for AI innovation.

In conclusion, the U.S. is leading France with respect to AI innovation (generation and adoption), as the majority of organizations that are "leading the race for AI" are American (The Economist). Companies in this category such as Alphabet, Microsoft, IBM, and Amazon are both generating and adopting AI, as they are investing in AI R&D to generate new AI technology as well as adopting AI developed externally in the form of acquiring AI startups. Since "adoption" is used to characterize organizations that are both generating and adopting AI, it is difficult to identify or compare organizational adoption-specific in the U.S. compared with France. My research study separates generation from adoption and evaluates data specifically relating to organizations adopting (using) AI.

[22] One reason for the U.S. leading France in AI innovation could be a result of France's underdeveloped digital capabilities relative to the U.S. (2015, Banfi, Bressand, Hazan, Labaye)[22] ; France's ranking on OECD's network readiness index demonstrates that it is behind the U.S. with respect to its technological infrastructure.) The Organization for Economic Cooperation and Development (OECD) generates a Network Readiness Index, which ranks countries by assessing the factors, policies, and institutions that enable a nation to fully leverage information and communication technologies (ICTs) for increased competitiveness and well-being. In comparing the relative rankings of countries in this index from the inception of the index in 2001 to its most recent compilation in 2106, the U.S. had a ranking of #1 in 2001 and dropped to #7 in 2016. France has sustained a relatively constant ranking (it has dropped from #24 to #26) from 2001 to 2016. (OECD)

Chapter 2: Literature Review

My research objective is to quantify and subsequently compare the "rate of adoption" of AI among French and U.S. organizations of comparable sizes, sectors, and type (private or public). This research question overlaps with concepts that pertain to a variety of disciplines including sociology, economics, psychology, and business; in this way, the literature review encompasses multiple fields of research including, organizational innovation, firm-level technological adoption, and organizational culture. This multi-component literature review enables me to comprehensively review the existing literature that pertains to my research study. It is divided into three sections; Section I reviews organizational innovation research, providing a high-level overview of my topic; Section II is a review of a specific stream of research within organizational innovation research. It reviews studies relating to organizational adoption of technology, specifically organizational adoption AI. Section III specifies my contribution to the literature.

Section I: Organizational Innovation

The capacity to continuously adapt, transform, and integrate new processes enables an organization to maintain its competitiveness in today's world. The topic of organizational adoption has inspired voluminous studies intended to study and explain why one organization is better equipped to adopt innovation, compared to a second organization (Gordon, Kimberly, and MacEchron, 1975). As a result of the volume of research across disciplines that has been conducted on this subject,[23] the results at the empirical level often are noncomparable and

[23] A comprehensive literature review conducted by Kelly and Franzberg (1978) indicated that more than 4,000 items in their analysis of research of technological innovation.

occasionally contradictory (Kimberly and Evanisko, 1981).[24]

Research on innovation has been conducted in many fields of study including science and engineering, humanities and art, and social sciences; in addition, these studies have employed various levels of analysis to study innovation, including individual, group, organization, industry, and economy (Baldridge and Burnham, 1975; Damapour and Schneider, 2006; Kimberly and Evanisko, 1981; Sears and Baba, 2011). An innovation can either be a new product, a new service, a new technology, or a new administrative practice (Hage, 1999) and organizational innovation refers to the study of innovation in organizations, both private and public organizations (Damanpour). Organizational innovation research investigates the external and internal conditions that are conducive to innovation, the strategies that organizations employ to manage the innovation process, and the influence of innovation on an organization (Damanpour).

This literature review will discuss the specific insights of organizational innovation research that pertains to organizational adoption of technology[25]; the non-technical concepts are beyond the scope of this study and will not be covered in detail. The concept of innovation is broad and includes multiples types of innovations: technology is only one type of innovation that organizations generate or adopt. I will summarize the antecedents of organizational innovation of technology that have been identified, as this directly applies to my research.

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[24] A tremendous amount of research has been conducted and several attempts to summarize the research demonstrated that "much remains to be learned about the conditions for and consequences of innovation" (Brewer, 1980; Kelly & Kranzberg, 1978; Kimberly, 1981; Nelson & Winter, 1977; Rogers & Shoemaker, 1971; Utterback, 1974; Zaltman, Duncan, & Holbek, 1973).

Organizational Innovation The two processes that facilitate organizational innovation is adoption and generation (Damanpour). Adoption and generation are separate concepts and distinct processes; organizations can adopt and generate innovation (as evident by Alphabet, Amazon, and various other organizations identified in Chapter one). Innovation generation or innovation adoption differ with respect to their environmental contexts, organizational conditions, and antecedents (Porter, 1985). Innovations span a variety of forms and therefore the perceived importance of specific types of innovation influences the way in which an organization adopts innovation (Porter, 1985), and results in dissimilar organizational innovation patterns. There exist multiple theoretical perspectives and approaches to understand organizational innovation (rational, institutional, political, cultural, learning, interpretive, interactional), and each is accompanied by constraints stemming from disciplinary discourse or methodological disposition. (Crossan & Apaydin, 2010; Damanpour & Gopalakrishnan, 1998; Sturdy, 2004; Van de Ven & Rogers, 1988). Each perspective offers different explanations of the motivation for and consequences of the generation and adoption of innovation in organizations (Damanpour).

The Process of Innovation Generation and Adoption: Organizations generate and adopt innovations to improve the efficiency of the organization, maintain competitiveness, or achieve short-term and long-term goals (Damanpour). Generation and adoption are distinct processes as it pertains to organizational innovation (Damanpour & Gopalakrishnan, 1998).[26] Generation is a process of introducing a new product, service, process, or practice to the market.

1. At the level of innovation, the process includes three sequential phases: generation, diffusion, and adoption. Diffusion is a process in which an innovation is communicated through certain channels among the members of a social system (Rogers, 1995). Diffusion connects generation to adoption, is studied at the level of population, and is not viewed as an organizational process. Hence, it is not discussed in this article.

Generation includes organizational activities that pertain to creating new ideas, testing ideas, and deploying these new products to the market and to consumers (Roberts, 1988). Adoption is the process of using a product, service, or practice that was not developed by the adopting organization (Angle and Van de Ven, 1989). The adoption process includes recognizing a problem, searching for solutions, deciding on a course of action to address the identified problem, implementation of the solution, sustained implementation, and eventually termination (Angle and Van de Ven, 1989; Hage and Aiken, 1970; Tornatzky and Fleischer, 1990).

The generation process is unsystematic, chaotic and disorderly, as it more closely resembles a random process of chance; the adoption process is more methodical and orderly, and is typically a "progression of phases" (Cheng and Van de Ven, 1996; Damanpour and Wischnevsky, 2006). The generation process is slower in comparison to the adoption process as a result of its chaotic nature. The characteristics, antecedents, and stages of adoption and generation are different; in this way, distinguishing adoption from generation is important in order to accurately analyze how organizations the factors that motivate innovation, and how innovating occurs.

Antecedents of Organizational Innovation: Understanding organizational conditions that induce innovation is a highly attractive endeavor to researchers and business managers alike (Damapour); for this reason, the majority of research that pertains to organizational innovation focuses on identifying its antecedents. The specific conditions under which organizations can innovate remains broad; for this reason, antecedents are the commonly used term when referring to factors that relate to an organization's innovativeness. Antecedent refers to an element or characteristic that that existed before an occurrence; it does not indicate a causal relationship between the observed characteristic and an outcome. An antecedent is distinct

from a determinant. The current research that has been conducted has been limited to observing and identifying factors that precede innovation and making inferences based on research about these antecedents; however, conclusive evidence indicating that a factor is conducive or is a determinant of organizational innovation has not been obtained.

The antecedents of organizational innovation that were determined in multiple reviews of preexisting studies, relate to three categories: environmental (external, contextual), organizational (structure, culture), and managerial (leadership, human capital) (Damanpour). I will provide a broad overview of three categories of antecedents, as a myriad number of variables have been associated with each dimension, and qualitative and quantitative reviews to identify salient antecedents have been conducted (Damanpour). The complexity of both innovation and performance constructs combined with myriad indicators for their measurement has prevented rigorous evidence on conditions and the extent to which the generation or adoption of innovation contributes to organizational performance (Damanpour).

Environmental Antecedents: Environmental Antecedents: Environmental conditions influence organizations motivation to engage in innovation (Damanpour). Different sets of environmental-related factors have been identified in various research studies on organizational innovation; the identification of different factors demonstrates the importance of academic discipline that the study is affiliated with, the process that is being studied (generation versus adoption, and the innovation type (technological or nontechnological) when studying and predicting organizational innovation.

Several systematic reviews have been conducted on organizational innovation; these studies have aggregated the environmental antecedents that are conducive to organizational innovation. (Crossan and Apaydin, 2010) combined studies from 1981-2008 and identified

organization, technology, market, and innovation types as environmental antecedents. (Damanpour and Aravind, 2006) reviewed publications spanning 1983-2003, concluding that competition, concertation, technological opportunity, appropriability conditions, and growth of demand as contextual antecedents of innovation. The studies differed with respect to field of study (economic or management), innovation process, and innovation type (technological or nontechnological). (Damanpour and Aravind, 2006) was a review of economic journals, and included technological innovations, and studied generation of innovations. In contrast, (Crossan and Apaydin) reviewed articles published in management journals, analyzing both technological and nontechnological forms of innovation, and studied adoption of innovation (Crossan, and Apaydin, 2010). The dissimilar variables that each review identified is a result of these differences.

Several studies on innovation adoption have demonstrated that context, with regards to the type of organization does influence the adoption process; in this way, environmental variables differ depending on the type of organization (public or private); "the typical environmental variables in public organizations are urbanization, deprivation, ethnicity, political orientation, and community affluence (Boyne, 2002; Damanpour & Schneider, 2009; Walker, 2008), in business organizations they are market competition, industry structure, governmental regulation, technological intensity, supplier power, and customer demand (Cohen & Levin, 1989; Roberts & Amit, 2003; Schilling, 2013).

Organizational Antecedents: Internal organizational conditions indicate an organizations intention or ability to innovate. Innovation in an organization requires financial and human resources, an innovating-conducive culture, processes, systems, policies, and a management structure. The varying organizational factors identified in both meta-analyses and

systematic review indicates that field of study, process, and innovation type influence the variables (Damanpour and Aravind, 2012) (Crossan and Apaydin 2010). The seven factors that were consistent when comparing publications from 1971-1988 and 1990-2009 were the following professionalism, specialization, technical knowledge resources, functional differentiation, management attitude toward change, organizational culture, learning, strategy, and internal and external communication (Damanpour and Aravind, 2012). In reviews published in management journals, additional factors were added. Keupp, Palmie, & Gassmann (2012) grouped organizational antecedents into intended/emergent initiatives (R&D investment, technology sourcing, competitive strategy), internal organization (size, culture, structural integration), managerial/ownership issues (human resources, ownership, process management), and resources (prior performance, knowledge and capabilities, slack) (p. 374) (Damanpour and Aravind, 2012).Of these factors, organizational culture and organizational size have received significant research attention.[27]

[27]Since the 1980s, several studies have been conducted to examine if certain dimensions of sociocultural values could explain certain types of organizational culture (Damanpour). Hofstede (1980) concluded that national culture was different across countries and these sociocultural value differences influence organizational culture and employee behavior in organizations. The influence and relationship between organizational and national culture was first identified in the early 1980s and the idea of organizational culture remains central to the way many managers think and feel about their organizational experiences and continues to draw scholarly attention (Alvesson, 2011). Managers became aware of the social characteristics of organizations in some ways resemble the cultural characteristics of societies (Smircich & Calas, 1986). Subsequent research explored the relationship between the national and organizational cultures, investigating how they might be similar or different, as well as how organizational culture might moderate or negate the effect of national culture. The conclusions drawn from these studies indicated that organizational culture, is "an internal attribute of the organization that is socially constructed, historically determined, holistic, and difficult to change" (Hofstede, Neuijen, Ohayv & Sanders 1990).

Organizational culture and national culture are distinct cultures (Hofstede). The reason for this distinction, is that employees enter organizations after their national cultural values, attitudes, and fundamental beliefs are well developed, whereas organizational practices are learned through workplace socialization (Hofstede et al., 1990); in this way, entry to and transmittal of organizational culture occur in different ways and at different times from national culture. According to various studies, behavioral norms is indicated as a fundamental element of organizational culture.[28] Moreover, individuals are only partly involved with an organizational culture as compared to totally immersed in their national culture. Therefore, the influence of organizational norms must be considered in concert with societal culture in understanding the causes of behavior in organizations. If a society's culture is resistant to change than and that this resistance is typically too strong for a work organization to overcome (Sage Publications).[29]

Organizational culture has received significant research attention; organizational size is a unique organizational factor, however as it is the "most widely research antecedent of innovation across disciplinary fields" (Damanpour). Two arguments prevail concerning organizational size. First, small organizations are able to more quickly adapt, make decisions, and thus better equipped to innovate (Damanpour, 2010; Nord and Tucker, 1987; Stevenson and Jarillo, 1990). Second, large organizations are more competent innovators because of their influx of capital, financial resources, cross-fertilization of ideas, greater technical knowledge, and can benefit from economies of scale. (Damanpour, 2010; Hitt, Hoskisson, and Ireland, 1990; Nord and

[28] Norms are what guide and influence how people behave; whereas, culture tells them the inhere meaning of the situation (D'Andrade, 1989).
[29] This conclusion does not mean that national or societal cultures are only static; there are studies indicating that culture do change overtime through processes such as acculturation (Kara and Peterson, 2012).

Tucker, 1987). The results from several analyses indicate that larger firms introduce a greater volume of innovations compared to smaller firms; however, this study notes that more recent analyses on size-innovation relationship may support a different theory (Chandy and Tellis, 2000, p. 8).

Managerial Antecedents Leaders and executives at organizations influence an organization's capacity to innovate, as they are uniquely able to predict, strategize, and interpret environmental characteristics as well as market opportunities, initiating new action, changing business processes, and motivating employees. (Bantel and Jackson, 1989; Damanpour and Schneider, 2006; Elenkov, Judge, and Wright, 2005, West and Anderson, 1996). The managerial characteristics of leaders that have been identified include: demographic (age, gender, education, experience), personality (agreeableness, authoritarianism, openness to experience) and behavioral (inspirational motivation, championing innovation, contingent rewards). Other factors that have been identified include: transformational leadership, change-oriented behavior, favorable attitude and disposition toward change, and skills and ability to create a climate supportive of innovation as key managerial characteristics (Crossan and Apaydin, 2010; de Vries et al., 2016; Ekvall and Arvonen, 1991). Managers who embody these attitudes are able to more effectively influence an innovation-conducive environment (encouraging teamwork, unity among co-workers, optimal allocation of resources, etc) (Damanpour and Schneider, 2006; Madjar, Oldham, and Pratt, 2002; Mumford, 2000). An additional key factor that pertains to leadership is the ability of organizations to select "good ideas" which is identified as being more important than leaders that simply encourage the generation of ideas (Grant, 2016).

In conclusion managerial factors, environmental factors, and organizational factors all play an important role in enabling an organization to innovate, specifically with regards to adopting technology.

Conclusion: The various factors that have been identified indicate that several components of organizations must be considered when attempting to research organizational innovation and particularly when attempting to conduct a comparative study. Since innovation antecedents did differ depending on innovation type and process, selecting organizations that are innovation-generating or innovation-adopting as well as identifying a common type of innovation will permit a more accurate analysis.[30] Second, the differences between antecedent-innovation relationship with organizations of different sizes, type (public or private) and industry (financial services, high-tech, low-tech) is important when selecting organizations for future organizational innovation research.

Section II: Organizational Adoption of AI

Though significant empirical research on organizational adoption has been conducted, there exists significant opportunities to conclusively identify the conditions or factors of innovation (Brewer, 1980; Kelly and Kranzberg, 1978; Kimberly, 1981; Nelson and Winter, 1977; Rogers and Shoemaker, 1971; Utterback, 1974; Zaltman, Duncan, and Holbek, 1973). Three primary categories of organizational innovation antecedents were identified above. As a result of the volume of research across disciplines that has been conducted on this subject, the results at the empirical level often are noncomparable and occasionally contradictory (Kimberly and Evanisko, 1981).

[30] An acknowledgement of the disciplinary biases of the field of study of research is equally important for future researchers.

These basic, but significant issues in previous work, helped me frame my honors thesis research, as well as decide to narrow the remaining portion of this literature review to AI-specific organizational adoption research.

Of interest in this thesis is organizational adoption of artificial intelligence. A significant amount of reports, articles, and publications on this specific subject has originated from management consulting companies. In addition, a new stream of economics research has emerged, that is devoted to the subject of artificial intelligence (Economics of AI).[31] Reviewing these streams of research provides a comprehensive, though certainly not an exhaustive representation of the current research regarding organizational adoption of AI.

Applying a varying and multi-methodological approach[32], management consulting companies have defined organizational adoption of AI as a type of "transformation" (Accenture,

[31] Organizational adoption of AI was discussed in the conference and the observations about this subject is consistent with the literature that was previously reviewed in other chapters of this thesis (the other AI-related subjects will not be discussed as they are beyond the scope of this study). The information presented about AI organizational adoption (firms adopting AI that was developed outside of the firm) was treated an aggregate concept with organizational generation (firms creating new forms of AI). In addition, the articles and presentations evaluated firm adoption of AI in the context of competition. Machine Learning, Market Structure & Competition (Shapiro, Varian) identified important AI inputs that are scarce (data infrastructure, software, hardware, expertise, and firm-specific labeled data). Incumbents, large established organizations, were identified as possibly having a competitive advantage of AI relative to other firms with less access to data. A second advantage of incumbents was that they can "learn how to improve algorithms and business processes" (Shaprio and Varian). The "key enablers of AI adoption" that were identified were: leadership, technical ability, and data access.

[32] The reports pertaining to AI organizational adoption published by management consulting organizations, in partnership with academic institutions, professors, students, and research facilities indicate that there are identifiable characteristics of organizations that have been able to adopt AI. The characteristics are identified using data gathered from surveys of companies internationally. The specific strategies employed by these companies is not revealed in the reports, nor are the identities of the companies identified as "early adopters." Multiple metrics and indicators exist to measure "AI pioneers" and rate of adoption of AI of organizations across sectors, sizes, and nations. The surveys, interviews, and data that were used to conclude that AI

BCG, McKinsey & Company, Deloitte). As these companies have analyzed the "AI transformations,"[33] of firms, and the strategies that these AI-adopting organizations have used to "intelligently transform," antecedents have been identified. The antecedents observed by these companies are mostly consistent with the antecedents identified in organizational innovation adoption literature: environmental (external, contextual), organizational (structure, culture), and managerial (leadership, human capital) (Damanpour).[34]

One difference is that nested antecedents have been observed; organizational digital strategies *(MIT Sloan Management Review* and Deloitte)[35] have been identified as a primary

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organizational adoption is lagging in certain countries, and that firm size and industry do influence the ability of an organization to adopt AI were concluded based on research included insights from individuals in 112 countries and 21 industries, from organizations of various sizes (MIT Sloan school of Management and Deloitte). Accenture's study included several in-depth interviews with more than 45 leading AI experts, corporate executives, entrepreneurs, research institutions, academics and policy representatives from 10 G20 countries (Australia, Canada, China, France, Germany, India, Japan, South Korea, United Kingdom and the United States). Similarly, BCG Henderson's and McKinsey & Company's reports included organizations of varying sizes, industry, and nationality.

[33] In the literature, firm-level technological adoption is dependent upon an "organizational transformation" (Brynjolfsson, Erik and McAfee, Andrew); in the case of an organization adopting digital technologies (McKinsey & Company). In this way, the definition of "adoption" has evolved from Carr's earlier definition; it is defined today as choice of a firm to take specific action to optimally enable a form of innovation (such as technology) to be utilized by a firm either for internal or external purposes. This definition of adoption will be used for the rest of this thesis.

[34] In addition to AI organizational adoption research, Management Consultant companies have also explored organizational adoption of digital technologies. Digital adoption refers to a process by which a firm adopts digital technologies which include social media, mobile, analytics, embedded devices, or artificial intelligence (McKinsey & Company, AI the Next Digital Frontier); "intelligent" transformations, however, refers only to firms adopting AI technology (McKinsey & Company).

[35] *MIT Sloan Management Review* and Deloitte's 2015 global study of digital business titled, "Strategy, not Technology, Drives Digital Transformation*"* found that businesses that have been able to integrate digital technologies, such as social, mobile, analytics and cloud, in the service of transforming how their businesses operate are able to develop and implement a well-defined digital strategy. The report underlines that a "clear digital strategy" enables organizations to "digitally reimagine [their] business" (*MIT Sloan Management Review* and Deloitte) and optimally benefit from new technologies.

antecedent to organizational adoption of AI, and an antecedent of a successful digital strategy is organizational culture. A second difference is that an organization's leadership influences organizational culture.

In addition to these differences there are also limitations of these studies. A basic limitation relying on organizational adoption of AI research is that adoption refers to both adoption and generation; in this way, concluding antecedents of organizational adoption of AI from these studies is an inaccurate analysis of the research.[36] A second limitation, relating to the reports of management consultancies such as Accenture, McKinsey & Company, BCG, and Deloitte relates to the accessibility of the data and testimonies from which the conclusions are derived.

The articles published by management consultant companies indicate the hardest factor or primary antecedent in organizational transformations (digital or AI) is an organization's culture (Bilefield, McKinsey & Company) and the execution of this a technological strategy relies on the organization's culture, which is influenced by the organization's leadership (Accenture).[37] The specific values that are embodied by this type of AI-adoption conducive

[36] With regards to firm adoption of artificial intelligence, trends of adoption were identified as being heterogeneous in both timing of adoption and ability to use AI effectively across industries (Shaprio, Varian). Since adoption and generation are used as similar concepts in this presentation, these findings begin to extend beyond the scope of my research as organizational generation of AI is not the focus of my research. For this reason, the conclusions concerning AI heterogeneous adoption patterns, "key enablers", and the advantages (in terms of AI-adoption inputs) of incumbents (large firms) will only be loosely applied to my research; it was, however, still necessary to review the publications and material in the field of AI economics as it relates to my study.

[37] The extent to which the leaders of the organization, "foster a culture able to change and invent the new" (*MIT Sloan Management Review* and Deloitte) and this culture is dependent upon the establishment of certain cultural norms within an organization. McKinsey notes that, "digital transformation is being driven from the top, personally mandated by the CEO" (Siebel). There is data testifying to the influence of an organization's culture on its ability to adopt technology; however,

organizational culture varies depending on the organization, institution, or author (Accenture; McKinsey; BCG Henderson Institute). McKinsey identifies "risk-taking, collaboration, and innovation" (McKinsey) as key indicators; whereas, Accenture in its "Boost You AIQ Transforming into an AI Business", 2017 report, notes that a culture that prioritizes technology, data, and people is optimal. The specific characteristics of a AI-adoption conducive culture differs across reports, yet there is widespread consensus in the literature that organizational culture is a pivotal component of AI adoption.

The reports pertaining to AI organizational adoption published by organizations, academic institutions, and research facilities indicate that there are identifiable characteristics of organizations that have been able to adopt AI. The characteristics are identified using data gathered from surveys of companies internationally. The specific strategies employed by these companies is not revealed in the reports, nor are the identities of the companies identified as "early adopters." An analysis of the various metrics that the reports have identified indicate though that similar characteristics have been observed of companies who have adopted AI.

In the report "Reshaping Business with Artificial Intelligence," contributors affiliated with MIT Sloan school of Management and Deloitte, cite the following seven indicators of "AI pioneer" organizations: recognition of business use cases for AI, acquiring AI talent, senior executives leading AI initiatives, understanding of data and AI algorithms (robust data and analytics infrastructures), availability of data, developing internal skills through training, and established data privacy rules. Pioneer organizations rate their companies higher in several

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whether culture drives technology adoption or whether technology changes the culture is still an open question (McKinsey). Certain organizations or individuals perceive that, "culture leads the adoption of technology. Our ability to innovate depends on the impatience of our culture" (McKinsey); whereas the alternative view perceives technology as a means by which a firm can influence its culture.

general management and leadership areas: vision and leadership, openness and ability to change, long-term thinking, close alignment between business and technology strategy, and effective collaboration (Ransbotham, David Kiron, Philipp Gerbert, and Martin Reeves)

McKinsey Global Institute (MGI) similarly recognizes the characteristics identified by Ransbotham. In addition, in Artificial Intelligence: the next digital Frontier, MGI contributors identified size of the organization as an important component. The McKinsey report noted that the "early adopters" (organizations that McKinsey authors referred to as "leaders") were the "Tech giants or digital natives" namely Amazon, Apple, Baidu, and Google (McKinsey). These organizations are investing billions of dollars in the various technologies known collectively as artificial intelligence; in addition, "tech giants" are most able to seize these AI as the necessary inputs are in place (powerful computer hardware, increasingly sophisticated algorithmic models, and a vast and fast-growing inventory of data). The report concludes that these tech giants are leaders in AI internal investment, and acquiring AI startups.

In *Boost Your AIQ* (Artificial Intelligence Quotient), Accenture's identifies three characteristics that distinguish organizations with the greatest AIQ. These organizations are "collaborative innovators" and use a combination of AI technologies, are using AI to transform their core business, are developing AI in-house (own AI-critical resources) and collaborate to share AI resources. Accenture differs from previous studies at is identifies specific strategies for organizations depending on their relative ages (i.e. their date of creation) and size; in this way, the strategies identified for incumbent organizations differ from those for new, or smaller "startup" organizations.

Section III: A Contribution to the Literature

Section I of this literature review summarized the three primary antecedents of organizational innovation (environmental, managerial, and organizational), the various types of innovations (technological, non-technological), the two distinct adoption innovation processes (generation and adoption) and indicated that a comparative analysis of organizational innovation-adoption is best conducted when size, sector, and organization type (private or public) are similar; Section II reviewed recent literature pertaining to organizational adoption of AI, and the antecedents observed by these specific management consultant companies that were reviewed are mostly consistent with the antecedents identified in organizational innovation adoption literature; however, a hierarchical antecedent relationship was identified as well as organizational characteristics of these antecedents. An intelligent or AI organizational transformation was the highest-level antecedent; this organizational transformation is preceded by a digital strategy, which is proceeded by organizational culture. Specific characteristics of the type of organizational culture that facilitates a successful digital strategy were identified, and these values can be influenced by an organization's leadership.

My research will expand the body of knowledge beyond the work completed thus far in the literature. A review of the literature indicated that national sociocultural values do influence organizational culture, and organizational culture is an antecedent of organizational adoption of innovation and adoption of AI. Further, according to recent literature, organizational culture is the hardest factor in organizational transformations (Bilefield, McKinsey & Company). Since national sociocultural values do differ and these differences influence the beliefs, attitudes, and behavior of people living in these countries, I aim to study the variation across national sociocultural values and its influence on organizational adoption of AI.

My goal is to offer insight on whether organizations operating in different nations within the same industry and size, adopt AI at different rates and whether national sociocultural values influenced organizational adoption of AI. To conduct this analysis, I identified two nations with distinct sociocultural values: France and the U.S. (Hofstede, 2001). I will quantify and subsequently compare the rate of organizational adoption of AI between French and U.S. organizations of comparable sizes, sectors, and type (private or public). The specific case-study approach that is used to measure AI adoption is explained in greater detail in the methodology section. This type of analysis will enable me to measure the relative "rates of adoption" of two firms in France and the U.S., and subsequently analyze if national culture variation influence organizational adoption of AI.

Chapter 3: The Influence of National Sociocultural Values on Organizational Adoption of Technology

Section I: Chapter Overview

According to Geert Hofstede's cultural dimensions, France and the U.S. have distinct sociocultural values; in this chapter, I summarize the national-level sociocultural values[38] of France and the U.S. and analyze the influence of sociocultural values on organizational adoption of technology. I reference social psychologist Geert Hofstede's cultural dimensions (Hofstede, 2001) as a starting point, and combined additional literature, as well as testimonies, to cross-check Hofstede's cultural characteristics to assess the current national sociocultural values of France and the U.S.[39] both nations. Two forms of "culture" are evaluated in this chapter (organizational culture and national-level sociocultural values); both forms of culture are relevant to my research as both types of culture are distinct and exist within an organization, and influence organizational adoption of technology, specifically artificial intelligence (AI).[40] In

[38] I mention "primary" as the sociocultural values of France and the U.S. at a national level were identified by reviewing and subsequently combining the similar national-level values of these two countries from various academic sources. The sociocultural values that I identify for France and the U.S. represent my efforts to condense and summarize Hofstede's cultural dimensions (Hofstede 2001) as well additional sources. Second, I analyzed testimonies of French and American individuals to and assess the current sociocultural values of individuals in both nations. The sociocultural values that are examined do not represent an exhaustive list of all of the sociocultural characteristics of French and American individuals or of the national level sociocultural values of France of the U.S.

[39] This method of gathering testimonies is not an exhaustive assessment of French and American sociocultural values. Rather, these statements and testimonies are not representative of all French or all American people as they represent statements from a small sample size of individuals and were accessed from specific types of articles and publications. The primary purpose of including these testimonies was to cite examples of recent statements made by French and American individuals about their sociocultural values. Second, it was to cross-check Hofstede's cultural dimensions of France and the U.S. by researching and aggregating what actual individuals said about their sociocultural values.

[40] The national sociocultural values of France and the U.S. that are identified in the following sections were values that I identified after evaluating previous studies, data, articles, and testimonies. The values there are identified are generalizations based on the information that I

Section I of the literature review, previous research studies that evaluated the relationship between national values and organizational culture indicated that national values do influence organizational culture.[41] This conclusion pertains to recent studies of organizational adoption AI because organizational culture is consistently acknowledged in current publications as an important driver of organizational adoption of AI. This relationship will be discussed in section two of this chapter.

Section II: A Comparative Analysis of French and American National Sociocultural Values

There is significant national-level data that indicates that people living in different nations operate with different values systems (Hofstede). Hofstede's cultural dimensions model provide a systematic framework for assessing the differences between nations and cultures. There are six dimensions of this model; however, in this thesis I will only refer to five of Hofstede's cultural dimensions. Hofstede's cultural dimensions are the following: the uncertainty avoidance, the Power Distance, Individualism/Collectivism, Masculinity/Femininity, and Long Term Orientation/Short Term Orientation. A sixth dimension, Indulgence/Restraint, which was added by Hofstede in 2010, will not be discussed or referenced in this thesis due to a lack of research yet conducted on this topic.

> *Power Distance Index*: this dimension is defined as "the extent to which the less powerful members of organizations and institutions likely to submit to authority and accept and expect that power is distributed unequally" (Hofstede, 1994).

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could access and I acknowledge that they are my own generalizations. I was careful to minimize overgeneralizing or transposing my own biases when summarizing French and American national sociocultural values. To avoid these issues, I was careful to cross-check the information that I gathered with multiple references to more accurately determine these values.

[41] (Sabri, 2004) proposes that national culture influenced employee behavior within an organization, which subsequently influenced organizational culture.

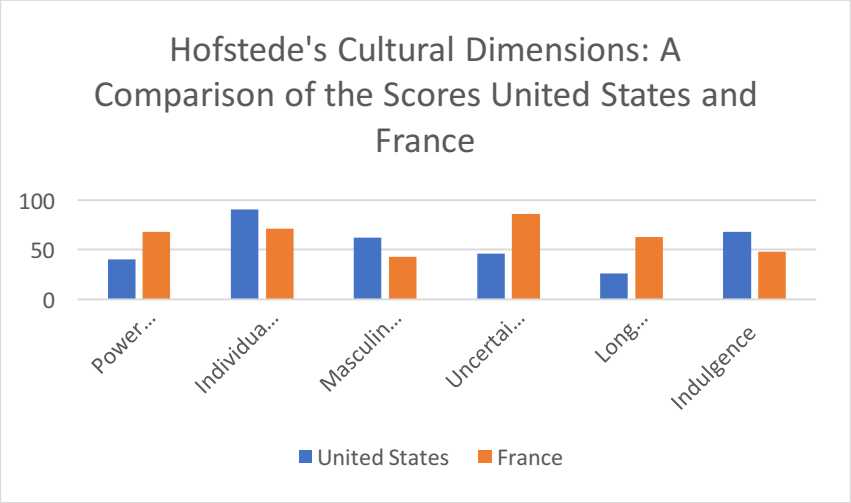
Individualism/Collectivism: refers to a society comprised of people who perceive that the needs of individuals are more important relative to the needs of a group or organization. Societies that are characterized as individualistic value personal goals, whereas collectivist societies prioritize and value the goals of the group (Hofstede Insights).

Masculinity/Femininity: refers to the extent to which values characterized as masculine such as competitiveness, and acquiring wealth are prioritized over feminine values such as quality of life and relationship building (Hofstede Insights).

Uncertainty Avoidance: measures the general tendency of individuals in a society to accept or tolerate ambiguity or whether a society prefers rules, laws, and order (Hofstede Insights).

Long-Term Orientation/Short Term Orientation: refers to a society's attitude towards traditional values; long-term oriented cultures are more focused on the future, whereas short-term oriented cultures focus on the present and live on their daily routine by following their traditions (Hofstede Insights).

When comparing the scores of France and the U.S., according to Hofstede's five cultural dimensions, there are national-level sociocultural value differences. The U.S. scored higher in the individualism category, lower the power distance category, lower in the uncertainty avoidance category, and higher in the masculinity/femininity category. France's scores were the following: Power Distance (68); Individualism/Collectivism (71); Uncertainty Avoidance (86) Long Term Orientation (39); Masculinity/Femininity (43) (Hofstede, 1980). The U.S. scores were the following: Power Distance (40); Individualism/Collectivism (91); Uncertainty Avoidance (46); Masculinity/Femininity (62) Long Term Orientation (26). (Hofstede, 1980)



National Sociocultural Values in France

In this section I will evaluate France's national level cultural values in the context of Hofstede's cultural dimensions. I combined Hofstede's cultural analysis of France with recent testimonies of French individuals. I am assuming that these testimonies are representative of the average French individual. For the purposes of my analysis, I will assume that national-level sociocultural values of France prior to certain attitude and government-regulation shifts (discussed in the following section) are representative of the average French employee working in France. The cultural change that appears to be occurring in France seems to have been catalyzed by Macron's governmental efforts starting in 2014; if such a national "rebranding effort" (New York Times) originated in 2014, it is unlikely that the culture biases of the majority of French people have changed (to a large degree) in the span of four years.[42]

> *Uncertainty Avoidance:* Hofstede's cultural dimension "uncertainty avoidance" indicates that "structure, laws, and a propensity to save and invest" is representative of French cultural values France scored an 86 in uncertainty avoidance, indicating that France is identified as a society that prefers structure, in the form of laws, rules, and regulations

[42] (Chakraborty, Thompson, Yehoue) concluded that cultural bias can be overcome by economic shocks, or institutional changes; however, these biases are overcome over a prolonged period of time, rather than a time period of four years (2014-2018).

(Hofstede Insights). A high score in this category demonstrates that French individuals prefer structure, and are less comfortable in unstructured situations or with ambiguity (Hofstede, 1994). A perceived discomfort with ambiguity or situations involving risks correlates with the tendency of French individuals to respect the status quo. French individuals appear to prefer job security, and stability, thereby minimizing ambiguity; situations or professions that involve greater risk-taking or possibly failure, may be less appealing to a French individual. In *Why France is Taking a Lesson in Culture From Silicon Valley*, "Failure is often stigmatized in French society—so much that the government started a campaign to persuade people that its O.K. to take risks" (Alderman, Morenne, Peltier). In addition, more than three quarters of French workers, "hold so-called jobs for life and unions protest when businesses demand workplace flexibility" (Alderman, Morenne, Peltier).

Long Term Orientation vs Short Term Orientation: France received a low score of thirty-nine on this dimension, indicating that France is a "long term oriented" society; in this way, it is a pragmatic culture, and one that prefers to maintain traditions and "views societal change with suspicion" (Hofstede Insights).

Masculinity/Femininity: France received a forty-three on this cultural dimension, indicating that it is a society that more closely embodies feminine characteristics such as cooperation, modesty, caring for the weak, and quality of life rather than masculine ones (achievement, heroism, assertiveness, or receiving material rewards) (Hofstede Insights). In addition, this score signifies that French society is consensus-oriented one. Specific types of professions seem to contradict with these values. France's culture has historically been "at odds with an entrepreneurial drive" (Alderman, Morenne, Peltier). Brigitte Granville, a professor of economics at Queen Mary University of London, who was raised in France mentioned that, "When you grow up in France, none of the heroes you learn about are entrepreneurs," and "when someone gets rich in France, people immediately ask, 'What did he do to make this money? He must be a nasty person'" (Segal).

Individualism/Collectivism: France's high score in this category, called individualism, is defined as a preference for "closely knit social frameworks in which individuals are expected to take care of only themselves and their immediate families" (Hofstede Insights). Given this mentality to uphold a financially stable lifestyle, it explains the negative perception of entrepreneurship and entrepreneurs. Frédéris Mazzela, the co-founder France's successful startup BlaBlaCar, mentions that in France, "entrepreneurs used to be seen as people with nothing left to lose" (Alderman, Morenne, Peltier).

Power Distance: France's higher score in this dimension indicates that French society is accepting of expects that power is distributed unequally. Individuals in societies exhibiting a large degree of Power Distance "accept a hierarchical order in which everyone has a place and which needs no further justification" (Hofstede Insights). The New York Times indicated that, "France has long been known for its open hostility to corporations and its suspicion of personal wealth" (Segal). This suspicion to wealth may

have influenced cultural bias, parenting strategies, and subsequently the careers pursued by offspring of such parents (to work rather than entrepreneurship).

The following section will review the influence that France's institutions may have had the nation's sociocultural values.

Institutional influences on National French Sociocultural Values:

Historically, France has embodied a welfare state[43]; this type of social-benefit-oriented economy may have dissuaded individuals in France from pursuing entrepreneurship as a result of cultural transmission from their parents (who were likely workers and passed on their occupational choice, creating future workers) (Chakraborty, Thompson, Yehoue). France's social welfare state is pertinent to this analysis in so far as this form of government influences the values, beliefs and attitudes of individuals living in France.

There are definite benefits to a social welfare state; however, as it pertains to perceptions of risk taking, entrepreneurship, capitalism, and technological adoption, a welfare-state political system has had a significant influence. Origins of an anti-capitalist[44] and anti-entrepreneurial[45] attitudes are usually traced back to the French Revolution, which, "elevated equality to a kind of

[43] According to the Merriam Webster dictionary, welfare state refers to a social system based where the nation's political institutions assume primary responsibility for the individual and social welfare of its citizens.

[44] According to Oxford Dictionaries, anti-capitalist is defined as being opposed to capitalism. Capitalism is defined as **"**an economic system characterized by private or corporate ownership of capital goods, by investments that are determined by private decision, and by prices, production, and the distribution of goods that are determined mainly by competition in a free market."

[45] Anti-entrepreneurial in this study refers to being opposed to entrepreneurship. According to Cambridge Dictionary, entrepreneurial and entrepreneurship are terms used to describe an individual who starts their own business; this decision to build a new organization involves an innovative ability to recognize new business opportunities and the willingness to take risks (Cambridge Dictionary).

religion" (Segal). François Hollande announced during his presidential campaign in 2012 that "My enemy is the world of finance," he was summing up a sentiment that was representative of the average French citizen (Segal).

An Evolving National Culture in France

The cultural shift that is occurring in France (specifically with regards to evolving entrepreneurial and capitalist notions) relates to my research of organizational technological adoption because France's reform policies and evident efforts to attract investment and business is impacting its culture. French growth, particularly in the deep tech sector is booming, and according to individuals involved in the entrepreneurial ecosystem in France, "there has been a huge shift in mindset" (The Economist, The Rise of Deep Tech is Boosting Paris's startup scene). Graduates are particularly keen on startups in the "deep tech" sector—involving, among other things, artificial intelligence (AI), machine learning and big data" (The Economist). If previously held cultural values are progressively dissipating or being overcome (possibly as a result of economic or political changes) then this shift may enable France to close the technological adoption gap.

Though recent cultural changes may be occurring in France, the dominant characteristics of France's national culture (risk-averse, anti-entrepreneurial, anti-capitalist) prior to these cultural shifts are likely representative of the average France citizen (discussed in Section III). The next section identifies three primary national sociocultural values of the U.S.

National Sociocultural Values of the U.S.

When comparing the scores of France and the U.S., according to Hofstede's five cultural dimensions, there are national-level sociocultural value differences. The U.S. scored higher in the individualism category, lower the power distance category, lower in the uncertainty avoidance category, and higher in the masculinity/femininity category. France's scores were the following: Power Distance (68); Individualism/Collectivism (71); Uncertainty Avoidance (86) Long Term Orientation (39); Masculinity/Femininity (43)(Hofstede, 1980).. The U.S. scores were the following: Power Distance (40); Individualism/Collectivism (91); Uncertainty Avoidance (46); Masculinity/Femininity (62) Long Term Orientation (26). (Hofstede, 1980)

Uncertainty Avoidance: The U.S. scores lower on uncertainty avoidance than France, receiving a score of forty-six. Societies that score lower in this category "maintain a more relaxed attitude in which practice counts more than principles" (Hofstede Insights); whereas countries exhibiting strong uncertainty avoidance prefer to maintain rigid codes of belief and behavior, and "are intolerant of unorthodox behavior and ideas" (Hofstede Insights). Americans are optimistic about the future, change and progress and are "less concerned with history and traditions than people from other societies" (UMSL). For this reason, Americans are very accepting of new ideas, innovative products and a "willingness to try something new or different," whether it pertains to technology, business practices or food (Andrews). Positive beliefs about change are common in the U.S. and this manifests into a willingness to adapt, ideate, innovate and to pursue entrepreneurial[46] pursuits (Andrews).

Long Term Orientation vs Short Term Orientation: The U.S. scores lower on the long-term orientation category relative to France's score. Americans are "prone to analyze new information to check whether it is true," indicating that Americans are practical, and exhibit a "can-do mentality" (Hofstede Insights). Americans perceive organization, and productivity as extremely important and for this reason are less willing to engage in activities that do not have a "visible, beneficial outcome" (UMSL).

Masculinity/Femininity: The U.S. scores a high score of sixty-two in this dimension, suggesting that it is a society that prefers achievement, heroism, assertiveness, and material rewards for success. American society at large is more competitive. Achieving success is extremely important, which results in a competitive and desire to be "the best or the winner" (UMSL). In addition, those who achieve success (in the form of career pursuits) are viewed as highly respected individuals in American society.

[46]The definition of entrepreneurial, according to Cambridge Dictionary, was given above when I defined anti-entrepreneurial.

Individualism/Collectivism: The U.S. scores high on this dimension, indicating that it is a society, similar to France, that prefers a "tight-knit framework in society" in which individuals are expected to be accountable for their relatives and loyal to them; for this reason, the propensity of Americans to view time as a resource may be a manifestation of this dimension. Americans are very intentional about using their time in the most efficient way possible.[47] Since Americans view change and the future as a positive. Using one's time in pursuit of success, results, or future oriented activities are viewed as "constructive" and respectable. Americans perceive organization, and productivity as extremely important and for this reason are less willing to engage in activities that do not have a "visible, beneficial outcome" (UMSL).

Power Distance: Unlike France, the U.S. receives a low score on power distance; in this way, Americans are less willing to accept "inequalities among people." In societies with low power distance, "people strive to equalize the distribution of power and demand justification for inequalities of power" (Hofstede Insights). Americans have a strong work ethic, believe that work is the basis of recognition (power), are driven to achieve results to earn recognition, and are highly competitive. Americans believe that people should "strive to be the best they can be," and that they "live to work"; in this way, working hard to achieve professional success is important to obtain monetary rewards or other forms of public recognition and to improve one's socioeconomic status.

Section III: An Analysis of the Relationship between National Sociocultural Values and Technology Adoption

The previous sections identified the differing national-level sociocultural values that exist in France compared with the U.S.; these sociocultural values influence behavior, shape belief systems, and impact attitudes of people (such as employees in organizations) (Sage Publications)[48]. This section of the chapter delves more deeply into how national culture shape

[47] A quotation that demonstrates the American view of "time" is "time is money" is the following: "You only get so much time in this life, so you'd better use it wisely." (UMSL)

[48] Sage publications in *Describing Culture,* aggregates research that has explored the contributing factors to cultural variation and persistence of variation. These factors include: climate, topography, indigenous economy; proximity and topography; economic systems and technology; political boundaries (Smith and Peterson, 1994) (Kluckhohn, C., & Strodtbeck, K. 1961) (Adler 1997). Hofstede argues that nations are political entities and vary in their forms of government, legal system, educational systems, labor and employment relations systems; therefore, nations are unique social systems and therefore can have different cultures. (Hofstede 1983)

the behavior, beliefs and attitudes of individuals which does influence an individual's willingness to adopt technology.

In *Culture in Development*, (Chakraborty, Thompson, Yehoue), culture is proven to influence willingness of people to pursue entrepreneurship. The report explores how anti-capitalist cultural bias, influences the values that parents instill in their children (such as risk aversion), adversely affects the supply or number of individuals pursuing entrepreneurship and risk-taking (Chakraborty, Thompson, Yehoue). An anti-entrepreneurial bias effects the innovation and risk taking in a society, which results in too little entrepreneurship. This impact of stagnant entrepreneurship is that this may make "entrepreneurs unwilling to adopt productive technologies and adversely affect economic growth" (Chakraborty, Thompson, Yehoue).

In section I, France low uncertainty avoidance score indicated that French individuals on average, prefer structure, and rules rather than ambiguity; in this way, situations or professions that involve greater risk-taking or possibly failure, may be less appealing to a French individual. The U.S., however, received a higher uncertainty avoidance score and is identified as a culture that emphasizes individual success, results, and "winning"; Americans may view "taking risks" as a necessary, and justifiable pursuit to achieve success (they are more driven to achieve and thus risk-taking might be a necessary and value-added endeavor). In addition, beliefs (such as an aversion to entrepreneurship or perception of risk), attitudes and behaviors shaped by national cultures are slow to change (Chakraborty, Thompson, Yehoue); which may explain why France is "lagging" in comparison to the U.S. with respect to innovation of AI and organizational adoption of AI. (Hofstede, 2001) noted that national cultural difference have been relatively

stable over time; while at the, "surface-level" there is some change with respect to the cultural habits and behaviors, "at a deeper level cultural differences persist" (Ghemawat, Reiche).[49]

Culture effects an individual's perception of risk and willingness to take risks; this culturally-influenced belief system, at the individual-level, is slower to change compared to political and economic institutions (Roland 2004). Transmission of culture by parents is thought to occur from two primary processes: the Beckerian approach, which focuses on within-family transmission (environment is a key influence on the development of skills and attitudes of children) or oblique (a child acquires the human capital through observation and imitation of a randomly matched working adult) (Bisin and Verdier). In both cases, the entrepreneurial culture breeds future entrepreneurs as both attitude towards risk and business expertise relative to labor productivity than a cultural lineage of wage workers. Though cultures and ancestral lineage of profession influences a child's decision to become an entrepreneur, cultural biases (such as anti-entrepreneurial perceptions) can be overcome large enough productivity shock (Chakraborty, Thompson, Yehoue). The cultural bias itself does not change, but the changing environment makes the bias easier to overcome. Roland's (2004) model of cultural transmission indicates that the behavioral change that follows from the productivity shock occurs purely from economic change and rationality. In other words, culture at the individual level does not change—it is the same as before—but cultural behavior towards offspring does. In other words, the cultural bias of the parent does not change, but the changing environment makes the bias easier to overcome; in

[49] (Ghemawat, Reiche) noted that data for the World Value Survey, which is a study of sixty-five countries, indicated that a "remarkable resilience of distinctive cultural values even after taking into account the far-reaching cultural changes cause by modernization and economic development."

this way, the child may hold different beliefs that his or her mother regarding entrepreneurship and risk taking.

French and American sociocultural values do differ (discussed in Section I) and these differences influence the beliefs, attitudes, and behavior of people living in these countries; individuals in France are more risk averse and less entrepreneurially driven relative to the average American individual. These national sociocultural value differences may explain why AI innovation in the U.S. is greater than France (The Economist). If Americans are more commonly "risk takers" and entrepreneurial, these attitudes and beliefs may result in a greater willingness to adopt technology such as AI[50] relative to individuals in France.[51]

As it relates to this study, national cultural values do influence organizational culture, and organizational culture is a driving factor for organizational adoption of AI. An article published by Harvard Business Review compiled various definitions of organizational culture and these definitions consistently identified that organizational culture, "overlaps with other cultural values—especially the broader culture of the societies in which it operates" (Watkins). The next section will review the recent literature regarding the relationship of organizational culture and AI organizational adoption.

Section IV: Influence of National Sociocultural Values on Organizational Culture

[50] However, (Chakraborty, Thompson, Yehoue) note that cultural biases (beliefs) can be overcome by a large enough productivity shock (i.e. regulation change, or economic growth).
[51] This statement is an inference made by the author, based on the literature and multiple resources cited in the text. The relationship between national level values and individual willingness to adopt technology will not be explored in greater detail as the focus of this study pertains to organization-level analysis.

One core component of organizations adopting AI, specifically for large companies, is their organizational culture. In *Reshaping Business with Artificial intelligence*, Sam Ransbotham, David Kiron, Philipp Gerbert, and Martin Reeves note that, "the culture change required to implement AI will be daunting, according to several executives with whom [the authors] spoke." In addition, a McKinsey report mentioned that, "[for organizations] to get the most out of AI in the long run, an organizational culture open to the collaboration of humans and machines is required;" in this way, an open, collaborative environment will facilitate employee trust, and simultaneously allow people, "to adjust to [the] paradigm shift [of adopting AI into the organization]" (McKinsey). Due to the interplay of training and inference in AI, and the relationship between a machine's inner workings and the results it produces, creating an organizational culture that enables collaboration, communication, and risk-taking will help employees more quickly adopt to different working conditions that integrate AI (Accenture). In order for employees to be optimally equipped to adapt to AI, "the creation of an AI-ready culture should be a priority early on" (McKinsey). Francis Hintermann, the global managing director of Accenture Research noted that "…creating AI innovations requires incumbents to open up their technology, data, and talent to work with specialist startups and entrepreneurs. That requires them to transform their innovation strategies and organizational cultures."

To establish an organizational culture that is "AI-ready" Harvard Business Review notes that, "as with all cultural and organizational changes, leadership is critical" (Bughin, McCarthy, Chui). Strong leadership support goes hand in hand with stronger AI adoption. Respondents from firms that have successfully deployed an AI technology at scale tend to report executive support that is nearly twice as high as those from companies that have not adopted any AI technology (Bughin, McCarthy, Chui).

The importance of establishing of an "AI-ready" organizational culture is supported in the literature; however, the specific organizational cultural values or norms are loosely defined. Cultural values such as risk-taking (McKinsey), bold[52] (HBR), collaborative (Accenture), and inventive(Accenture) are identified; these values are somewhat ambiguous though as "risk taking" could be embodied in many ways. The organizational cultures of organizations could be equally representative of risk taking in the context of the nation where the organization operates. For this reason, examining—in a direct sense—the interaction between national level cultural values and organizational cultural values requires data pertaining to the employee values and how these values are influenced when an organization's culture shifts because of organizational adoption of AI. This data was not publically accessible. Therefore, this study will attempt to infer the influence of national level cultural values on organizational cultural values by quantifying the "rate of organizational adoption" of AI in France and the U.S.

The insight provided by management consulting organizations pertaining to the importance of organizational culture on organizational AI-adoption coupled with existing literature on the relationship of national-level cultural values and organizational culture supports my hypothesis that organizational adoption of AI of French organizations will be slower (in a relative sense) then an American organization of the same size, sector, and type.[53] My hypothesis and the methodology that I used to test my hypothesis is explained in the following chapter.

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[52] Harvard Business Review's "A Survey of 3,000 Executives Reveals How Businesses Succeed with AI" noted that being "bold" would enable organizations to adopt AI. Being "bold referred to adopting a strategy that radically adapts its portfolio of businesses and developing new business models to build a growth path. (Bughin, McCarthy, Chui).

[53] The level of homogeneity in employees' perceptions and beliefs determines the "strength" of the organizational culture (the degree to which the dominant characteristics will be embodied by the organization); strong organizational cultures have high levels of homogeneity (Schneider, Salvaggio, & Subirats, 2002; Erez & Gati 2004). National cultures of high individualism, low

Chapter 4: Hypothesis and Methodology

Section I: Chapter Overview

The methodology chapter will introduce how I propose to quantify, in an analytical sense, the rate of adoption (absorption) of AI in French versus U.S. organizations. I will articulate my hypothesis, identify and define the variables that I will be using to measure "relative rates of AI adoption" and introduce the organizations that I will be analyzing in my case study. The previous chapters provided the foundation for my hypothesis; after acknowledging my hypothesis I will summarize how the information, insight, and literature reviews can be aggregated to justify and legitimize my hypothesis.

Research Question: How do national sociocultural values influence the rate of adoption (absorption) of AI in American versus French organizations?

Research Objective: to quantify and subsequently compare the rate of organizational adoption of AI between French and U.S. organizations of comparable sizes, sectors, and type (private or public).

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uncertainty-avoidance and low power distance will adapt to organizational change more than their counterparts. When referencing Hofstede's cultural dimensions, the U.S. scored higher in the individualism category, lower the power distance category, lower in the uncertainty avoidance category, and higher in the masculinity/femininity category.

Section II: My Hypothesis and its Underlying Logic

Hypothesis: French high-tech multinational corporations will adopt AI technology at a slower rate than American high-tech multinational corporations.

Table 1: *Justification for My Hypothesis*

	Relationship between Sociocultural Values and AI Adoption Confirmed by the Literature	
1)	National Values Differ in France and the U.S.	
2)	National Level Sociocultural Values influence Organizational Culture	
3)	Organizational Culture influences Organizational Adoption of AI	
4)	Multinational Organizations are influenced by its Country of Origin (Nation where it was founded)	
	France	U.S.
	Power Distance (68)	Power Distance (40)
	Individualism/Collectivism (71)	Individualism/Collectivism (91)
	Uncertainty Avoidance (86)	Uncertainty Avoidance (46)
	Masculinity/Femininity (43)	Masculinity/Femininity (62)
	Long Term Orientation/Short Term Orientation (39)	Long Term Orientation/Short Term Orientation (26)

1. **French vs American National- Level Sociocultural Values**:
    I. *National-Level Sociocultural Values in France:* National sociocultural values of France and the U.S. do differ. The previous chapter compared Hofstede's cultural dimension scores for France and the U.S., which reinforced that there exists sociocultural difference between the two nations. The following section will review the origins of France's dominant national cultural values.
2. **Direct Relationship between National Sociocultural Values and Organizational Culture**
    I. *National-level sociocultural values do influence organizational culture of organizations:* The national-level sociocultural values identified for France and the U.S. indicate that there exist sociocultural differences between the two

countries. In organizational management literature, firms are much more likely to adopt organizational cultures that align with the cultural values of the individuals or nation.[54] The dominant characteristics of organizational culture's that are optimally conducive to AI adoption include: risk-taking, adaptability, entrepreneurism, and collaboration.[55] These values are more similar to American national-level cultural values; therefore, there will likely be a greater degree of homogeneity with regards to the beliefs and perceptions of American employees regarding risk taking, entrepreneurship, and adaptability to change, which will foster a greater capacity (relative to French firms) to adopt an organizational culture that is conducive to AI adoption.

II. *Implications of Sociocultural Values on Management Strategies of Firms*: The different cultural characteristics of France and the U.S. that are identified by Hofstede are relevant as these cultural values influence organizational management strategies of firms (Noorderhaven, Harzing); therefore, it is inferred that French and American firms will differ in their management strategies. France and the U.S. differ with respect to values that relate to power distance and uncertainty avoidance, with France scoring higher on both

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[54] National cultures of high individualism, low uncertainty-avoidance and low power distance will adapt to a global work environment more readily than their counterparts (the U.S scores higher in power distance and individualism then France). Global work environment is defined as the cultural values that are imposed by multinational organizations (Free markets, individualism, innovation, and change) (Schneider, Salvaggio, & Subirats, 2002; Erez & Gati 2004).

[55] In Chapter 3, Section IV of this thesis, I summarized the organizational cultural values that have been embodied by AI adopting organizations. These organizational cultural values are the following: risk-taking (McKinsey), bold[55] (HBR), collaborative (Accenture), and inventive(Accenture).

dimensions. In the context of a firm, a large power distance, results in a centralized approach to management (Wong/Birnbaum-More (1994)). In addition, strong uncertainty avoidance is associated with strict control (Offermann/Hellmann 1997). In this way, the tendency of a French organization to exert stronger (relative to U.S. firms) influence on management-related issues within the firm is likely (Noorderhaven, Harzing). This is important as management strategies influence the organizational culture of a firm.

3. Direct Relationship between Organizational Culture and Organizational Adoption of AI

I. *Organizational culture is important component of organizations adopting AI.* Establishing or creating an organizational culture that is risk-taking, highly adaptive, and change-oriented better equips organizations to adopt AI (Bughin, McCarthy, Chui) (Accenture) (HBR). In *Reshaping Business with Artificial Intelligence*, Sam Ransbotham, David Kiron, Philipp Gerbert, and Martin Reeves note that, "the culture change required to implement AI will be daunting, according to several executives with whom [the authors] spoke." In addition, a McKinsey report mentioned that, "[for organizations] to get the most out of AI in the long run, an organizational culture open to the collaboration of humans and machines is required.[56]

[56] AI Adoption versus AI Generation: The majority of research concerning AI organizational adoption combines generation (creation) and adoption (using externally developed AI) as an aggregate concept; in this way, the insight, analyses, and adoption the U.S. are conducive to organizational adoption (defined as the use of AI that is developed externally). I am interested in exploring this subtle yet important difference because generation versus adoption (simply integrating AI processes that were developed by other entities) is an organizational process that seems to require a different degree of organizational "adaptation and risk-taking." Though

4. A Multinational Organization Does Embody the Cultural Values of its Nation of Origin

I. MNCs "Bear the Imprint of their National Origins" (HBR): In *The Myth of the Global Corporation*, Paul Doremus concludes that multinational corporations do "bear the imprint of their national origins"; in other words, even though multinational corporations operate in a variety of locations globally, "every company carries the baggage of its home environment as it expands internationally" (Doremus). As it relates to my analysis, Doremus's research is important as comparing the "relative rates of adoption" of two MNCs (one with France as its "home country" and one the U.S. as its "home country") still permits a legitimate comparison of the influence of national sociocultural values on organizational adoption of AI. The authors noted that the "enormous differences" among different multinational companies was a result of the "unique political and economic characteristics of their home countries" (Doremus). In addition, with regards to corporate behavior, the authors provide convincing evidence that indicate that "nationality is destiny" (HBR).

French cultural values may be less conducive to generation (innovating new forms of AI) as it requires a greater willingness to change, adoption (using existing AI applications) still seems to be an organizational venture that requires risk-taking. With the understanding that certain "AI early adopter" trends (with respect to industry and organization size) has been identified my case study approach will compare MNCs in the same sector (with origins in either France or the U.S.) to evaluate if organizational adoption of AI technology by these MNCs differs to the extent that the trends in the literature indicate.

The first goal of this thesis was to measure the rate of organizational adoption of AI by an American and French firm in the telecommunications industry. The second goal was to analyze whether national-level sociocultural values influence organizational adoption of AI.

Section III: "The Ideal World" Methodology to Evaluate Organizational Adoption of AI

In an ideal world, the optimal approach to comparatively quantify the "rate of organizational adoption of AI" would involve the following: aggregating a "portfolio" of all the forms of AI technology that each firm is utilizing internally and externally (in its products or services); distinguishing which forms of AI included in this "portfolio" were adopted (developed externally) or generated (developed internally) and by whom; and identifying all of the use cases or instances where the forms of AI that were adopted by the firm are being used. This data would provide the foundation for the ideal comparative case study approach, as it would be evident what forms of AI have been adopted within the organization and how the organization is utilizing the technology.

The second component of this ideal method would involve accessing data pertaining to how the firm has integrated the externally-developed AI technology. For example, following an acquisition, what was the process and series of events within the firm (such as efforts made by the firm's leadership team, employee sentiments, underlying business strategy articulated by the organization for integrating this externally-developed AI) that facilitated the firm to adopt this form of AI into its processes or products. An understanding of how each firm adopted externally-developed forms of AI, will provide insight regarding the period (with respect to years) that was required to successfully adopt this technology; in this way, a conclusion of the "rate of organizational adoption of AI" will be possible. (For example, post-acquisition how long did it

take for the firm to adopt one form of AI technology of the acquired firm?) After identifying each firm's "rate of organizational adoption of AI" a comparative analysis of these "rates" will be feasible.

Identifying which forms of AI have been adopted by a firm, as well as the process, within the firm, that occurred to enable the firm to integrate this technology into its internal or external processes is the necessary information to answer accomplish the first goal of this thesis. The second goal of this thesis, would be optimally accomplished by gathering employee-specific data while each firm is in the process of adopting externally-developed forms of AI. One possible approach to collect this data would be in the form of an employee survey[57]. The structure of the questions included in the survey would likely differ depending on the focus of one's study. In addition, the frequency of the surveys (how many rounds of surveys would be sent to the employees) would differ depending on the aim of the research. For my research, as quantifying the rate of organizational adoption of AI and the influence of sociocultural values on organizational adoption of AI are my primary goals, the questions as well as the frequency of surveys would relate to these goals. The questions that I would include in the survey would ask

[57]Before developing this survey, the organization would have to allow this type of survey to be sent to its employees. Surveys would be an optimal approach to accurately quantify the influence of individual-level sociocultural values because the survey responses would provide actual testimony from employees working at the organization. In addition, through the course of my research I realized that there were several levels of nested cultures within an organization, and an even more levels of culture within multinational organizations. Therefore, making a direct claim about the influence of individual-level sociocultural values on the capacity of an organization to adoption AI was an illegitimate claim. In this way, after reviewing the literature pertaining to levels of culture within an organization, and multinational organizations, I recognized that to offer insight that does not "overstate its findings" I want to acknowledge that the conclusions made from research are data-driven observation, however, there are many other factors and variables that influence organizational adoption of AI that intentionally chose to assume away for the purposes of my analysis.

the employees about his or her perceptions of the organization attempting to adopt externally-developed forms of AI. The frequency of the surveys would enable me to quantify and evaluate whether employee sentiments evolve as the organization adopts the technology. I would send a survey prior to an acquisition, as well as post-integration of the AI technology of the acquired firm.

This ideal methodology was not possible for me to accomplish for my thesis, as the necessary data and information was not accessible, nor was it possible to send employee surveys to obtain direct and credible information about employee sentiments or perceptions about the decision to adopt AI technology. However, identifying this approach was the result of the research that I did conduct, and the insight that I did gather in efforts to answer my research question. In other words, the value of my research was both the insight that I did uncover, as well as the identifying an optimal research methodology that could be employed in future studies that investigate the influence of sociocultural values and organizational adoption of AI.

My Methodology

Since this ideal methodology is outside of the scope of this research and is not able to be conducted, I will explore organizational adoption in a series of analyses to offer insight to the primary question motivating this research. The analyses that I conducted approximate (as closely as was feasible for me) the relative "rates of organizational adoption of AI" of French and American firms. My first analysis was to aggregate information accessible from internet sources about the AI-related investment by each Orange S.A. and Verizon. The weakness of this approach is that a comparison of AI investment is not perfectly indicative of the AI technology that has been effectively absorbed by the firms. The second analysis was my analytical case

study approach and my third analysis was an event study. In the following section, I will explain my choice for using each type of analysis and the strengths and weaknesses for the purposes of my research, as well as the practical constraints in my contest.

Why an Analytical Case Study Approach?

I used an analytical case study approach because I identified this method as being an optimal way (in terms of its feasibility and attainability) that I could uncover insight about the path and organizational decisions that resulted in adoption of a type of AI. The purpose of this method was to uncover insight about how organizations adopt AI technology, and evaluate if the adoption strategies of a French multinational organization and an American multinational organization were different, and if so, in what ways. In addition, I was interested to uncover sentiments of the members of the organizations regarding AI adoption, and their reasoning for these sentiments. My intention was to combine all the information I could uncover pertaining to organizational strategy, employee sentiments into an organizational adoption of AI narrative for both companies. This was my aim and my rationale for believing that uncovering this type of insight would be possible (before I completed my research) was a result of the large volume of AI-related organizational adoption articles, as well as data relating to organizational adoption studies completed by management consultant organizations.

As I continued to learn more about organizational innovation and its two processes (adoption and generation) I realized that adoption referred strictly to the absorption of an organization of externally developed forms of AI; whereas, generation related to the efforts by an organization to create new and original forms of AI technology. This distinction had not been apparent in the initial phases of my research; therefore, when I was assessing whether an analytical case study approach would be feasible and one where data and information would be

available, I had believed that it would be because of the data that I had been able to access in the beginning phases of my research. However, once I continued to conduct my research and more carefully parse through the existing literature that related to my research, I recognized the difference between adoption and generation, as well as I recognized that combining articles, data, or information that related to organizational generation versus adoption of AI, to make a conclusion about the relative rates of adoption of a French organization and an American one would be an incorrect and illegitimate claim. The claim would have been deduced resulting from an inaccurate portrayal of data that related to two different innovation processes. In other words, the amount of data and information that I had originally intended to use as the backbone for my case study, was not representative of the actual amount of data that was relevant for my research or legitimate for my research. Once I began to parse through the data and accessible information relating to organizational adoption of AI, the amount of data, articles and information that I could obtain as an undergraduate student unaffiliated with these organizations was reduced considerably. In other words, the method that I had initially identified as a feasible approach (given the availability of data relating to organizational adoption/generation of AI) to quantify relative rates of organizational adoption of AI did not permit the type of analysis that I had originally perceived that I would be able to conduct. My primary aim was to offer research that accurately offered insight on organizational adoption; therefore, continuing to combine data that related to organizational generation and adoption of AI would not permit a credible study on organizational adoption. I was still motivated to understand the variation across national cultures in receptivity to organizational change, therefore I confined my research to strictly data pertaining to organizational adoption.

Gathering data that pertains specifically to organizational adoption of AI proved to be challenging, as the most accessible type of information relates to the organization's AI generation efforts.[58] Accessing information about internal (intra-organization) efforts to adopt AI was even more difficult (if Google is a researcher's primary fact-finding tool) as internal organizational processes are less transparently communicated or explained via articles published online. Secondly, when I could retrieve articles that mentioned AI technology that was developed by a firm that Verizon or Orange S.A. had acquired, information relating to how the acquiring organization planned or had integrated (adopted) a specific forms of AI technology that it had acquired was not openly shared in these articles. For these reasons, my case study is a narrative on how and why (according to the articles that were accessible from Google) Orange S.A. and Verizon adopted AI chatbots. Chatbots are a type of AI technology that both organizations have sought to adopt in the form of products; in this way, there is information relating to the deployment and development (admittedly still a limited amount) of these chatbots. Analyzing the process by which each organization had adopted this type of AI technology is an opportunity for me to gather information relating to organizational adoption of AI and second, to compare these processes to evaluate if sociocultural values did influence organizational receptivity or capacity to adopt this technology.[59]

[58] According to an article published by Forbes, titled How Verizon is Building a Big Data and AI Culture, Verizon is building "a data-driven culture that leverages Big Data and AI capabilities." Verizon has several analytics and AI groups that are incorporated into its businesses (Forbes).
[59] My case study analysis will focus on chatbots that were adopted by Orange S.A. or Verizon. In the case of Verizon, in May of 2017, it deployed a chatbot that was developed by its internal team (Verizon FIOS). This is an example of organizational generation of AI and therefore will not be included in my analysis. The chatbot that I will focus on will be the chatbot developed by Yahoo! that Verizon acquired in 2017 (Android Authority).

Section IV: An Explanation of My Actual Methodology

Analytical Case Study Approach: I selected a qualitative case study approach for this research. The choice of the research method employed to conduct research ought to be grounded strongly on what is sought to be known; for this reason, the qualitative approach was the best method for this examination as it was consistent with my goals for this study. Qualitative seeks understand the underling qualities of entities and processes and their implicit meanings (Denzin and Lincoln, 2000)[60] and qualitative research enables exploration of a wide array of dimensions of the social world.[61] Qualitative researchers stress the social constructed nature of reality, the intimate relationship between the researcher and what is studied and the situational constraints that shape inquiry. Qualitative research see answers to questions that stress how social experience is created and given meaning. In contrast, quantitative studies emphasize the measurement and analysis of causal relationships between variables, nor process. (Denzin and Lincoln, 2003) Quantitative research question usually resemble an interrogative sentence that asks a question about the relation that exists between two or more variables. Its purpose is to identify the variables being investigated and to specify the type of relationship, descriptive,

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[60] Denzin and Lincoln suggest the following: "Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena, in terms of the meanings people bring to them. Qualitative research involves the studied use and collection of a variety of empirical materials... that describe routine and problematic moments and meanings in individuals' lives."

[61] "Through qualitative research we can explore a wide array of dimensions of the social world, including the texture and weave of everyday life, the understandings, experiences and imaginings of our research participants, the ways that social processes, institutions, discourses or relationships work and the significance of the meanings that they generate"

predictive, or causal, being investigated. As it relates to the process of qualitative research, there is "not a clear cut sequence of procedures following a neat pattern, but a messy interaction between the conceptual and empirical world, deduction and induction at the same time (Bryman and Burgess, 1994).

A case study is a common framework for conducting qualitative research (Stake, 2000). The purpose of using the case study is to get in-depth details as much as possible about an event, person or process; it is a research method that consists of investigation, collection of data over time, and detailed framing of the phenomena within specific contexts (Hartley, 2004). This method enable me to ask a "how" and "why" question regarding a specific event (Yin, 2003). There exist various types of case study approaches, and I selected a multiple case study approach. (Yin, 2014 found that a multiple case study approach is around two or more cases with similar issues. This method allows a researcher to select multiple cases from several different sites. Selection completed in this manner displays a range of perspectives on the issue. There are some advantages and disadvantages to various case studies. Multiple case studies allow for interviewing and documenting real life situations. Unlike single case studies, Yin (2014) found that multiple case studies are more robust in data analysis and as a result are more credible. Baxter and Jack (2008) explained that the case study method allows the exploration of the issue from different angles.

When employing the case study methodology, researchers are encouraged to bind the case. The issue of binding the case, or explaining how the selected group, area or situation is legitimate is helpful with regards to putting parameters on the case. These parameters enable the type of focus needed to bring to light the issues that are at play within the case. (Baxter and Jack

2008) suggest three approaches to binding a case: time and place, time and activity, and by definition and context. The parameters that I used to bind my case studies are time and activity. I assessed organizational adoption of AI by evaluating one acquisition made by each organization, analyzing the same type of AI. Additionally, the size, sector, and type of organization were variables that were kept constant.

In case study analyses, data collection is crucial as the choice of data collection determines the richness and depth of the insight that will be concluded from the case study. In case study, six major sources identified by researchers are the following: direct observation; interview; documents; archival records; physical artifacts and participant observation. One or all of the sources could be used depending on the relevance and nature of the case. (Yin, 1994; Stake, 1995; Leedy & Ormrod, 2005). I used direct observation by analyzing web sources to conduct my case study analysis.

Limitations of Case Studies: Case study research does have limitations. According to (Stake 2005), the interest and persistence of a researcher to uncover insight; in this way, "the ability to bring out the rich human attribute of the case study method is also strongly contingent on the researcher's skill and thirst to do so." I was persistent in the pursuit of acquiring access to different policies, procedures, and other material related to the investigation. I was successful in collecting the information, and this helped to increase the validity of the study, however there were limitations with regards to the data that I was able to access.

A second possible limitation was the limited scope of the case study design. Yin (2014) argued that case studies had a limited range in application to other organizations. With only two

organizations participating, there is a limitation to the transferability of the results to other organizations.

A possible third limitation of my research was my own personal bias. For example, I am American and my sociocultural beliefs motivated this study. For this reason, I had to be careful not to transpose my personal experiences when analyzing the data. To avoid this issue, I tried to reference web sources published in France and in the U.S., in efforts to more accurately understand how each organization had adopted AI.

Selecting Organizations for my Analytical Case Study: Chapter two summarized the three primary antecedents of organizational innovation (environmental, managerial, and organizational), the various types of innovations (technological, non-technological), the two distinct adoption innovation processes (generation and adoption) and indicated that a comparative analysis of organizational innovation-adoption is best conducted when size, sector, and organization type (private or public) are similar. To contribute to the literature on organizational adoption of AI, I selected two organizations that are in the same industry (high-tech, telecommunications), size (measured by the number of employees), and type (multinational and public).[62] The organizations that I selected were Verizon Communications (U.S.) and Orange S.A (France). Both organizations are public multinational telecommunications corporations[63] and are of comparable size (measured by number of employees). This information is combined in Table 1.

[62] The specific characteristics of the organizations that I intentionally kept constant are identified in Table 1.
[63] Both multinational corporations are publically traded organizations. Verizon communications is traded on NYSE (VZ); Orange S.A. is traded on Euronext (ORA), NYSE (ORAN), BIT (ORA) (Reuters).

Table 1: Variables that Remain Constant			France: Orange S.A	U.S. Verizon Communications
1.	Industry/sector	Telecommunications	Telecommunications	Telecommunications
2.	Innovation process	Adoption	Adoption	Adoption
3.	Innovation type	Technology (Task-specific Artificial Intelligence)	Task-specific Artificial Intelligence	Task-specific Artificial Intelligence
4.	Company size	Number of Employees	155,202	162,000
5.	Company type	Public	Public	Public
6.	Company form	Multinational	Multinational	Multinational

Measuring Organizational Adoption: Qualitatively Quantifying "Relative Rate of Adoption": The existing literature on organizational innovation indicated that several characteristics of organizations must be considered when conducting research on organizational innovation to accurately conclude new insight on the subject (See chapter 2, Section I); for this reason, I carefully selected two organizations that were of comparable size, type, and industry. I selected two organizations in the high-tech sector, specifically the telecommunications industry, as organizations in this high-tech sector have been the most able to adopt AI compared to organizations in other industries.[64] In addition, the literature on organizational innovation indicated that selecting organizations that are innovation-generating or innovation-adopting as well as identifying a common type of innovation permits a more accurate analysis; in the context of AI organizational adoption, most organizations are both generating and adopting the technology across sectors and are generating or adopting various types of AI. Though the organizations that I selected as my case study subjects are both generating and adopting AI technology, I focus solely on the efforts that both organizations have taken to adopt AI. Since I am interested in comparatively analyzing organizational adoption (as opposed to organizational generation) of these firms, I identified specific metrics that pertained to AI adoption (see Table 2

[64] As I reviewed the most recent literature on organizational adoption of AI, I found data that was presented at an Economics of AI conference in 2017. The data used in the presentations and were generated by McKinsey and indicated that the telecommunications industry was the industry that had adopted the most AI-related technologies at scale or in a core part of the business compared to organizations in other industries. The relevant table can be found on slide eleven of *Market Structure and Competition* by Carl Shapiro and Hal Varian.

in this chapter or Appendix A). I selected these metrics because adoption, in this research study, is the use of externally developed technology, therefore organizational activity that related to using new technology included: mergers, acquisitions, or investment in AI startups. This data was gathered from a variety of sources including: Crunchbase, CB Insights, Reuters, and the official websites of Verizon Wireless Communications and Orange S.A.

The metrics were used to quantify organizational AI adoption to "set the stage" for the qualitative case study analysis that I will conduct. These metrics provided a way in which I could introduce Orange S.A. and Verizon Communications in the context of AI adoption. The conclusion drawn from this number-based analysis will serve as the introduction of Chapter 4. Following this introduction, which provides a AI-related technological background of both organizations, is a detailed qualitative analysis of one specific merger for each organization. The analysis and subsequent comparison of how each organization embodies (in a relative sense) the AI technology that they acquired from these mergers will enable me to offer insight and observations about the capacity of either organizations to adopt AI. The primary reason that the AI-related data in Table 2 serves only as the foundation for my analytical case study is that I cannot assume that an innovation has been adopted simply because the potential adopting organization was exposed (via a merger, acquisition, or investment) to that innovation. Rather, there are many instances where organizations have attempted to adopt innovation, (such as externally-developed technology), but their adoption efforts were unsuccessful and the organization was unable to absorb the innovation or technology.[65] The sources that I referenced

[65] The GM and Toyota joint venture in 1980 testifies to the difficulty of separate firms to successfully adopt innovation of another organization. The merger between Toyota and GM was an optimal outcome, as GM benefitted from Toyota's car-manufacturing strategy and Toyota, facing import restrictions from U.S. Congress, needed to establish a manufacturing branch in the

to find relevant information and data about Verizon Wireless Communications and Orange S.A. were from a variety of academic journals, articles published by Verizon Wireless Communications and Orange S.A., business magazines, international newspapers, and online publishing websites.

Section V: Conclusion

My objective of my analytical case study is to create a narrative of one U.S. (Verizon Wireless Communications) and one French (Orange S.A.) multinational firm in the telecommunications industry, to investigate how each organization has attempted to adopt AI. I will focus my analysis on an acquisition initiated by each organization in efforts to adopt AI to conduct this investigation. Instances when these organizations have merged, acquired, or pivoted (intentionally chosen a new direction for their business) will shed light on a broader question that is motivating this research: Do patterns of organizational AI adoption differ across large multinational firms operating in different countries? This question is a high-level one that is beyond the scope of my research study; however, the research question that this thesis aims to answer originated from this general question.

U.S. The two firms launched their joint auto plant at a specific GM plant that was experiencing the greatest financial difficulty (Shook). The plant (renamed NUMMI) became tremendously successful and the primary reason was because the Toyota production and management systems had been effectively instituted at the U.S. plant. This positive joint venture incentivized GM to continue to "teach" the NUMMI business model to its other U.S. plants. GM's efforts to institute NUMMI at other GM locations failed, however, despite the noticeable successful and efficiency gains that had occurred at the NUMMI plant. One of the major inhibiting factors that prevented adoption of technology and management strategies across the firms was a strong "lack of receptiveness to change" (Langfitt). People at other American GM plants did not believe that their branches would close and therefore were not "convinced that they did not need to change" (Langfitt).

The question that I aim to answer is the following: How do national sociocultural values influence the rate of adoption of AI in American versus French organizations? The analysis of adoption patterns of comparable multinational firms (one French and one American) will enable insight to be concluded that relates to this question. In Section I of this chapter my hypothesis as well as specific information legitimizing the hypothesis was summarized. This guided my methodology for my research which takes the form of an analytical case study approach.

I believe that providing insight or to my research question is an attainable aim because of the connections that I have drawn regarding various types of research and existing literature (AI adoption, organizational innovation, and technological adoption) and the specific case study approach that I am will be using.

Chapter 5: Analytical Case Study

This chapter will include two distinct comparative analyses of organizational adoption of AI; the first analysis (Section I) is a quantitative analysis, and the second is a qualitative analysis (Section 2). The first analysis addresses three specific metrics to quantify organizational adoption of AI by Verizon and Orange S.A. This analysis provides a foundation for my qualitative case study analysis (See Appendix A, Table 2 for relevant table that compiles the data presented in this chapter).

Section I: Analysis of A Comparison of Organizational Investment in AI

To conduct my quantitative case study, I researched Verizon and Orange S.A.'s venture capital arms[66] and identified the number of AI-oriented startups that were included in the portfolios of the corporate venture capital arms of both organizations (See Appendix A, Table 2 for the relevant table). Orange Digital Ventures, Orange S.A.'s venture capital arm, was founded

[66] Venture capital funds capitalized and run by major corporations are becoming more popular, and are commonly referred to as "venture capital arms" or "corporate venture arms." In addition to Orange S.A. and Verizon, companies such as Google, Qualcomm, Comcast, Dell, Microsoft, Nokia, and Intel all have professional active venture arms. This is an important development for entrepreneurs and startups, as these corporate venture arms can invest significant capital and provide substantial assistance to a startup.

in 2015 and currently has fourteen startups[67] in its investment portfolio. Of the fourteen startups that Orange Digital Ventures has invested in, four startups use AI technology (Followanalytics, Monzo, Secbi, Wevr). In comparison, Verizon's venture capital arm, Verizon Ventures was founded in 2000 and has fifty-two startups in its portfolio. Twelve of the fifty-two portfolio startups use AI technology (8i, Otibus, Renovo, Sparkcognition, Urgent.ly, Vidrovr, Verdigris, Clip Call, Sfara, AdTheorent, Consert, Videosurf). In other words, AI-related startups occupy twenty-eight percent of the portfolio of Orange Ventures, and only twenty-three percent of Verizon Venture's portfolio. A conclusion about the relative rate of organizational adoption based a comparison of the ratios of AI-related startups in these corporate venture capital arms is not indicative of AI adoption;[68] however, it does provide useful information that testifies to the action both organizations have taken to invest in AI companies.

Section II: Analysis of Retrospective Case-Study Narrative of AI Organizational Adoption

The second analysis will take the form of a case study. This section is divided into two separate cases studies and each case study is a narrative on why and how (according to the articles that were accessible from Google) Orange S.A. and Verizon adopted AI chatbots[69]. In addition, I will briefly describe the company's history, as well as explain how it has grown and

[67] According to Oxford Dictionaries a startup refers to a company or business enterprise that is newly established (Oxford Dictionaries).
[68] The companies included in these venture capital arm portfolios represent companies that Verizon Venture or Orange Digital Ventures have invested in; however, investment by these firms is neither representative of organizational adoption of AI by Verizon nor Orange S.A.
[69] According to Oxford Dictionaries, a chatbot is a program designed to simulate conversation with human users, especially over the internet (Oxford Dictionaries). Chatbots are fueled by AI and are a "viable customer service channel" (Hyken). Chatbots can recognize the content and context of customers' requests and questions. For this reason, chatbots are one of the most popular AI applications used by telecommunications companies (Tech Emergence) (Oxford Dictionaries).

expanded, to provide additional background information about the company. An understanding of the historical context of both firms will provide useful context for my case study analysis[70]

Verizon acquired chatbots that were generated by Yahoo[71], whereas Orange S.A. integrated externally-developed AI technology to adopt a chatbot into its external product. In addition to analyzing the process by which chatbots were integrated by Orange S.A. and Verizon, I will also identify and evaluate an acquisition made by Orange S.A. and Verizon. Analyzing the process by which each organization adopted this type of AI technology is an opportunity for me to gather additional information relating to organizational adoption of AI and second, to compare each organization's processes to evaluate if there is data indicating that sociocultural values do influence organizational receptivity to adopt AI.

My case study analysis will focus on chatbots that were adopted by Orange S.A. or Verizon. In the case of Verizon, in May of 2017, it deployed a chatbot that was developed by its internal team (Verizon FIOS). This is an example of organizational generation of AI and therefore will not be the focus of this case study. The chatbot that I will focus on is the chatbot, known as "Captain"[72], that was developed by Yahoo in 2017 and analyze how Verizon, since acquiring Yahoo in 2017 (Android Authority), has integrated this AI technology into its product.

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[70]Organizational adoption of innovation (such as technology) is influenced by external and internal factors. However, after assessing the current literature relating to organizational adoption of AI, I was not able to find evidence that indicated that there is a correlation or causal relationship between organizational adoption of AI and the historical background of a firm. For this reason, I only briefly summarize the events that resulted in the formation of Verizon and Orange S.A.

[71] Yahoo Inc or Yahoo! is a global internet provider web, founded in 1994, that was acquired by Verizon Communications in 2017. Yahoo! Provides users with online information, utilities, and access to other web sites. (Encyclopedia Britannica).

[72] Yahoo developed several other Chatbots prior to releasing "Captain". In 2016, Yahoo launched its first three chatbots. They were launched on Kik Messenger and were intended for two of Yahoo's most popular apps, Yahoo News Digest and Yahoo Weather (Olson).

A Case Study of Verizon Communications

Verizon Communications is an American multinational telecommunications corporation, founded in 2000 as a result of a merger between GTE Corp and Atlantic Corp. The company has evolved since it was formed in 2000. It is a global technology company, provides communications, information and entertainment products and services to consumers, businesses and government agencies. It has two primary segments of business which include wireline and wireless (Reuters). The Wireless segment offers communications products and services, including wireless voice and data services and equipment sales, to consumer, business and government customers across the United States (Reuters).

The mergers that formed Verizon involved companies "with roots that can be traced to the beginnings of the telephone business in the late 19th century" (Verizon). Throughout most of the 20th century, U.S. government regulation largely shaped the evolution of the telecommunications industry. A law enacted in 1996 (The Telecommunications Act) marked a large shift initiated by the U.S. government to promote "market-based policies" and create a new competitive marketplace. Verizon was formed shortly after industry-specific shifts occurred, catalyzed by U.S. public policy efforts. The merger between Bell Atlantic and GTE that created Verizon is among the largest mergers in U.S. history (Verizon). GTE and Bell Atlantic are both organizations that had grown through years of mergers, acquisitions and divestitures; in this way, each firm had proven track records in successfully integrating business operations. Since Verizon was created, the company has made several acquisitions to build its portfolio of communication services. In 2015, Verizon acquired AOL Inc. This acquisition symbolized the "next chapter in the company's history," (Verizon) as it publically broadcasted Verizon's intentions to become a

global media technology company for creators, advertisers and consumers on a mobile-first network platform.[73]

In June 2017 Verizon completed its acquisition of Yahoo and promptly "amalgamated it with its existing AOL business under a new subsidiary, Oath" (Shaikh). As it relates to adoption of AI, Verizon's President of Media and Telematics noted that the acquisition was an important step towards growing Verizon's digital media company. In addition, Verizon intends to combine "assets across Verizon and Oath, from VR to AI, 5G to IoT, from content partnerships to originals, which will create exciting new ways to captivate audiences across the globe" (Shaikh). Oath is the umbrella company of the Verizon's digital content subdivisions, that integrates digital and mobile advertising with approximately fifty media and technology brands (Shaikh). The subsidiary's portfolio includes HuffPost, Yahoo Sports, AOL.com, MAKERS, Tumblr, Flickr, BUILD Studios, Yahoo Finance, Yahoo Mail, as well as others (Shaikh). To most closely analyze how Verizon has adopted AI technology into its processes, I am focusing my analysis on Verizon's subsidiary Oath, and evaluating whether Oath has been able to integrate Yahoo's AI-technology into its processes.

Verizon's Acquisition of Yahoo and Subsequent Formation of Oath

Ronan Dunne, at the Oppenheimer 20th Annual Technology, Internet and Communications Conference in Boston in 2017, publically admitted that Verizon Wireless has

[73] For additional historical background on Verizon Wireless, several articles and reports are posted on the company's website (www.Verizon.com).

"outlined a vision which will see the US operator broaden its traditional offering by leveraging artificial intelligence (AI) and transition into an information company (Mobile World Live). Dunne mentioned that Verizon is undergoing a transformation to be able to "offer superior connectivity and build experiences on top of that" (Mobile World Live) because he noted that "people don't really buy technology, they buy the possibilities that technology gives them" (Mobile World Live).

In 2017, Dunne mentioned that Verizon was proactively building on its infrastructure by broadening its offerings to provide more personalized solutions to its consumers. One example of this effort is Verizon's acquisition of Yahoo, as the primary intention behind the acquisition was to enable Verizon to improve its "media and content offerings" (Mobile World Live).[74] Verizon had shown interest in acquiring Yahoo! for several months before initiating an acquisition deal and had been investing heavily in digital advertising and media over the last several years; Verizon "believes that Yahoo's infrastructure and substantial revenue in those markets could help it expand rapidly in that market" (Reisinger). Verizon acquired AOL in 2015 for similar reasons (Reisinger).

Tim Armstrong, the appointed CEO of Oath mentioned that the goal of Oath is to "build the future of brands using a powerful technology, trusted content and differentiated data" (Williams). According to Armstrong, Verizon has "dominated consumer brands in news, sports, finance, tech, and entertainment and lifestyle coupled with [its] market-leading advertising technology platforms" (Shaikh). After the Yahoo merger, Verizon officially owned Yahoo's internet assets which includes its deep portfolio of ad tech assets and digital properties. The "ad tech assets" that were explicitly mentioned that would be acquired by Oath were the following:

Yahoo's web services (mail, news, sports content and financial tools), mobile applications and advertising technology for video and handheld devices (Womack) (Knutson and Seetharaman).

Following the completion of the acquisition, the terms specified that the sale did include Yahoo's cash, its shares in various companies, and several of Yahoo's patents. The patents that were not included in the terms of the acquisition were those in the Excalibur portfolio (Lunden). However, according to TechCrunch, Verizon was provided with an indefinite license to use the estimated four thousand patents that comprise the Excalibur Portfolio (Lunden).

The specific terms of Verizon's acquisition agreement with Yahoo are particularly relevant as Yahoo, prior to being acquired by Verizon, developed and released a chatbot, known as Captain in 2017 (Statt). Captain was "designed to use some lightweight artificial intelligence to help family members manage each other's busy schedules" (Statt). Captain is a type of task management service (Yeung), that enables users to streamline schedules and tasks by sending reminders to the user (Statt). The chatbot was initially SMS-based, and users communicated with Captain via text message; the chatbot was later launched on Facebook Messenger, and was one of the first third-party programs to integrate with Messenger's chat extensions (Yeung). Following the acquisition of Yahoo, there is no mention of Captain or of a decision by Verizon to integrate the chatbot into its portfolio of AI products.[75]

A Case Study of Orange S.A.

Orange S.A. is a French multinational telecommunications corporation that was founded in 1988. It is one of the world's leading telecommunications operators, with revenue of 40 billion

[75] Though Captain was not explicitly utilized by Verizon, Verizon released its own chatbot in May 2017, which was referred to its Fios chatbot. It is most likely that these chatbots were developed separately as the functionality of Verizon's Fios chatbot was primarily focused on entertainment content (Android Authority) on Facebook Messenger.

euros. Most of Orange's employees reside in France (97,000) and approximately 59,000 employees work in offices worldwide (Reuters). The company is present in 28 countries, and has a customer base of 263 million customers[76] (Orange).

In 1988, Orange. S.A. (France Télécom) was a division of the Ministry of Posts and Telecommunications. In 1990, France Télécom became an operator of public law, and then it was privatized by Presiden Lionel Jospin in 1998. The French government owned a twenty-seven percent stake in the company and the French government, specifically the Conseil of Ministers appointed Michel Bon as the CEO of France Telecom Group. In 2000, France Telecom bought Orange from a British multinational communications company, Vodafone, and acquired stakes in several other international firms. Following these acquisitions, France Télécom became the fourth largest telecommunications operator in the world. Orange's mobile telephone operations were merged with the mobile operations of France Télécom, forming the new group Orange SA. In 2001, Orange SA was listed on the Euronext Paris stock exchange, and later that year was listed on the CAC 40.[77] In 2002, the company's stock price suffered and received a debt adjustment by the French state, since it was still a majority stakeholder. Beginning in 2006, the company initiated a rebranding effort, and Orange Business Services became the brand for all of the company's business service offerings worldwide. As of 2015, the major shareholders of Orange include: the French government (15.08%), and the public float (84.92%).

[76] For additional historical background on Orange S.A., several articles and reports are posted on the company's official website (www.Orange.com).

[77] The CAC 40 is a French stock market index. The index represents a market capitalization-weighted measured of the 40 most significant values among the 100 highest market caps on the Euronext Paris (EuroNext).

In 2016, CEO of Orange S.A., Stephane Richard, stated that Orange S.A. would be expanding into a new market (Agnew). Mr. Richard explained that the company's expansion was motivated by the stagnant growth in the French telecommunications industry and several failed consolidation efforts by Orange S.A. to merge with other players in the industry. Mr. Richard, announced that Orange S.A. will "bank on another industry to boost earnings: financial services" (Agnew).

To initiate this organizational pivot, Orange S.A. acquired a sixty-five percent share in Groupama Banque[78] in April 2016. According to Stephane Richard, buying a majority stake in Groupama Banque signified "a major step forward in [Orange's] ambition to diversify into mobile financial services" (Thomson). Following this acquisition, Orange and Groupama Banque signed an agreement to develop a mobile banking service (Groupama). The resources of the two companies were combined to launch Orange Bank in 2017. This banking service was specifically designed for mobile usage in France. Orange Bank is marketed under both the Orange brand and Groupama brand, using each organization's respective distribution networks (Groupama).

Orange S.A.'s acquisition of Groupama Banque signified the first step to Orange S.A. adopting AI. The acquisition of Groupama Banque allowed Orange S.A. to enter the mobile finance market, and launch its mobile banking service Orange Bank. Orange S.A. was able to take advantage of Groupama's banking expertise, and integrate it with Orange S.A.'s existing assets to develop an innovative, mobile banking service, "that aims to bring mobile banking into

[78] Groupama Banque is a mutual insurance company in France. It is a leading player in the French insurance industry, ranked as the nation's top provider of individual health insurance, and insurance for farmers and local authorities. The company is active in 11 countries and operates in insurance, services, as well as financial and banking businesses. Following the acquisition by Orange S.A., Groupama Banque will continue to own the remaining thirty-five percent of the company (Groupama).

a new dimension" (Groupama)(Davies). Orange S.A. mobile banking service is innovative as it is specifically "designed for the mobile world" (Davies).

The CEO of Orange Bank, André Coisne, was committed to integrating AI into Orange S.A.'s mobile banking service.[79] Orange S.A. integrated AI technology in the form of a chatbot into its mobile banking services to ensure that the inquiries of its users are immediately addressed (Davies). Orange S.A. adopted AI technology in this case, as Orange S.A. partnered with IBM to provide an AI-powered Watson[80]-based virtual assistant.[81] The chatbot is powered by IBM's Watson's technology; it answers questions, detects emotion, and analyzes the specific user inquiry using Watson's sentiment analysis APIs. In addition, the chatbot acts as a financial advisor; it can forecast a user's future expenditures based on previous spending habits, using machine learning APIs (Davies).

After analyzing Orange S.A.'s process for adopting its customer support chatbot for its mobile banking services, it is evident that Orange S.A. proactively attempted to adopt AI. However, based on the information that was accessible on the internet, the primary motivating factor behind Orange S.A.'s acquisition of Groupama Banque was entering the mobile banking industry; however, testimony from the Orange S.A.'s leadership team, supporting investment in

[79] André Coisne mentioned that « Orange Banque est un système qui s'appuiera surtout sur le système d'intelligence artificielle IBM Watson » (Ercolani). Orange bank will use IBM's AI capabilities.

[80] Watson is IBM's version of artificial intelligence. It was created in 2014 and IBM invested in Watson with the intention of enabling companies to apply AI techniques more easily. IBM's Watson has been utilized for a variety of purposes, and across industries (Lohr).

[81] Since this chatbot was developed using IBM's AI technology, I am concluding that it is most accurately categorized an example of organizational adoption of AI. This conclusion is based on information gathered from several web sources. Watson designed the AI technology, and Orange is using this technology to for its own banking services. (« Watson désigne en effet un programme d'intelligence artificielle conçu par l'Américain IBM, dont Orange va notamment se servir pour le lancement de sa banque mobile, Orange Bank »)(Europe 1)

AI, as well as the Watson-based chatbot that Orange S.A. released in 2017 and integrated into its mobile banking services indicate that a motivating factor for Orange S.A.'s acquisition of Groupama might have been to adopt AI technology (Dillet). If Orange S.A.'s leadership team identified that mobile banking industry was a feasible industry to enter, as well as a viable industry to take advantage of AI (in the form of a chatbot), Groupama's acquisition may have been the first step of Orange S.A.'s adoption of AI technology.

This case study analysis did indicate that Orange S.A.'s leadership team is commitment to integrating AI into its processes, and particularly into its mobile banking service. The CEO of Orange S.A., Stephane Richard, admitted that the future is AI (l'avenir c'est L'IA) (Cuny). Richard's testimony indicated that he was optimistic and eager to integrate AI into Orange Bank's products. He mentioned that AI will permit better customer experiences as AI permits customers to have access to 24/7 customer service[82](Pontiroli and Rochegonde).

In addition, Orange S.A. has continued to integrate AI into its processes. Orange S.A. announced its virtual assistant, named Djingo, in 2017. I characterized Djingo as an example of organizational generation of AI, therefore I did not include it in my case study analysis. The virtual assistant was developed by Orange in collaboration with Deutsche Telekom and will allow Orange customers to control Orange TV, manage connected objects, or make a phone call

[82] This testimony by Stephane Richard was translated from an article published in Stratégie. Richard's response in French is the following : « Notre conviction est que l'IA ne va pas apporter la réponse à tout et supplanter complètement l'homme, mais elle va changer pas mal de choses dans la relation client. Il faut se demander ce qu'attendent les gens. D'abord, un service 24 h sur 24, 7 jours sur 7 et 365 jours par an. Quand vous avez besoin d'aller dans une agence mais qu'elle est fermée le dimanche et le lundi, ou que vous faites une opération le samedi et qu'il faut attendre le mardi pour avoir une trace… tout cela est complètement dépassé. Cela insupporte les gens. Sans parler des dates de valeur, etc. La disponibilité du service client est quelque chose de majeur. Et la seule façon d'assurer cette disponibilité, c'est l'IA. Un robot ne dort jamais ! » (Pontiroli and Rochegonde).

or send a text message. It incorporates AI and therefore can "provide increasingly relevant answers to user inquiries and requests".

Section III: Conclusions from the Case Studies

The analytical case studies of Verizon and Orange S.A. indicated that both multinational telecommunications corporations are integrating AI, specifically chatbots;[83] however, quantifying the rate of adoption of AI[84] of Verizon or Orange S.A. was not possible because of the limitations of my methodology. Information gathered from various internet sources proved that both companies are adopting or generating chatbots into their products. According to several web sources, Verizon and Orange S.A. are generating chabots (Verizon's Fios chatbot, and Orange S.A.'s Djingo).[85] The information aggregated from online sources did not permit me to accurately distinguish whether the chatbots were adopted or generated, preventing a conclusion to be drawn about the rate of AI adoption of either organization; in this way, it is difficult to infer if variation in national sociocultural values in France or in the U.S. (identified in Chapter 4) are influencing the ability of Verizon or Orange S.A. to adopt AI technology. However, I am able to approximate the rate of adoption of each firm, as well as compare the testimonies of the CEO's of Verizon and Orange S.A., analyzing if differences in sociocultural values are evident from their testimonies.

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[83] I acknowledge that Verizon and Orange S.A. are using and generating additional types of AI technology, in addition to the chatbot. For the purposes of this thesis, I have focused only on analyzing chatbots.

[84] It is assumed in this thesis that AI technology refers to only to chatbots.

[85] This inference is based on information gathered from various web sources accessible via Google; however, I am not able to definitively state that Verizon or Orange S.A. are generating AI technology. According to various web sources, both organizations are developing chatbots and if these chatbots are being developed internally (within the organization), then they are examples of organizational generation of AI.

A conclusion about the rate of organizational adoption of AI was unable to be made, given the limitations of my methodology; however, my qualitative case study did permit me to make observational claims about how and why Verizon and Orange S.A. adopted AI technology. In the case of Verizon, I analyzed the acquisition of Yahoo and evaluated the terms of the acquisition, and the articles published following the merger to examine whether Yahoo's chatbot, Captain, had been adopted by Verizon. According to several internet sources that were accessible via Google searches,[86] Captain was not mentioned, nor was there information indicating that the AI technology of this chatbot had been used by Verizon for other products. In this way, it appears that Verizon was not able to adopt the AI chatbot technology that it acquired from Yahoo.[87] Adopting chatbot technology may not have been Verizon's primary motivation for acquiring Yahoo; however, for the purposes of my analysis, Verizon's inability to adopt this technology after acquiring Yahoo is pertinent to my analysis. Unlike Verizon, Orange S.A. acquired Groupama Banque in 2016 and adopted an AI-powered Watson-based chatbot in 2017 for its mobile banking services. Orange S.A. did successfully adopt AI technology, in the form of a chatbot. This example contrasts with Verizon and Yahoo's chatbot, Captain, because Orange S.A. did not absorb its customer service chatbot as a result of its merger with Groupama

[86] The internet sources that I referenced to evaluate how and why Verizon and Orange S.A. adopted AI chatbots were the following online resources: Market Watch, Forbes, Orange S.A.com official website, Verizon.com, Financial Times, Groupama.com, europe1.fr, androidauthority.com, eweek, martechseries.com, theverge.com, livemint.com, Wall Street Journal, venturebeat.com, and mobileworldlive.com. I acknowledge that certain sources among this list of references are not categorized as scholarly sources; for this reason, I intentionally attempted to verify the information I found from the websites included in this list, with articles and information accessible on Verizon and Orange S.A.'s official company website.

[87] Though certain terms pertaining to the acquisition agreement between Verizon and Yahoo were accessible from various web sources, it is not possible for me to conclude with complete certainty that Yahoo's Captain or the chatbot's AI technology was either included or not included in the agreement.

Banque;[88] instead Orange S.A. adopted this technology from a third organization (IBM). Verizon and Orange S.A. employed different approaches to adopt AI technology. Verizon was unable to adopt Yahoo's AI chatbot technology, whereas Orange S.A. sought a new market and adopted AI chatbot technology after entering the mobile banking services market.

It is possible to approximate the rate of organizational adoption, given the information that I was able to access; Verizon acquired Yahoo in June, 2017 after several months of showing interest in acquiring the company. Two months before closing the deal for Yahoo, Verizon announced that it would place Yahoo and AOL under the Oath umbrella; immediately following the Yahoo acquisition, Oath was launched (Spangler) (Goel). According various web sources, it is not able to be determined if Oath was able to adopt the chatbot technology that it acquired from Yahoo.

In comparison, Orange S.A. acquired a majority stake in Groupama Banque[89] in April 2016. The acquisition signified a strategic partnership between the two companies. Groupama Banque was renamed Orange Bank on January 16, 2017 (Groupama). Following the partnership, Orange Bank officially launched in May 2017; in addition to the launch of Orange Bank, the IBM AI Watson-based chatbot assistant was introduced. With regards to the rate of adoption, Verizon's Oath was unable to adopt the chatbot technology of Yahoo; Orange S.A.'s was able to

[88] Groupama Banque did not have an AI chatbot at the time that Orange S.A. bought a sixty-five percent stake in the company in 2016 (Groupama). For this reason, it was not possible to analyze how Orange S.A. adopted AI technology from Groupama Banque.

[89] Groupama Banque is a mutual insurance company in France. It is a leading player in the French insurance industry, ranked as the nation's top provider of individual health insurance, and insurance for farmers and local authorities. The company is active in 11 countries and operates in insurance, services, as well as financial and banking businesses. Following the acquisition by Orange S.A., Groupama Banque will continue to own the remaining thirty-five percent of the company (Groupama).

adopt IBM's AI technology following its acquisition and subsequent strategic partnership with Groupama Banque.

The influence of national sociocultural values on the capacity of Verizon and Orange S.A.'s willingness to adopt AI technology is difficult to determine from the information that was accessible via web sources; in this way, I am not able to reject nor accept my hypothesis that was articulated in chapter four. It was possible, however, to offer observations regarding the testimonies of individuals who hold leadership positions at Verizon or Orange S.A. and analyze if sociocultural value differences contribute to differing viewpoints. The testimonies of Ronan Dunne (Executive Vice President of Verizon), Stephane Richard (CEO of Orange S.A.) and André Coisne (CEO of Orange Bank) indicate that these individuals share similar views regarding the importance of integrating AI technology into their business (Verizon.com).[90] A positive perception and acknowledgment of the importance of being open to technological change, willing to use and generate AI, and seek to offer products or services that are beneficial to users and differentiated from other products was similarly articulated by individuals working at both companies[91] (Ha).

[90] Testimonies from Verizon's CEO, Lowell C. McAdam, or Tim Armstrong (CEO of Oath) were not able to be found using Google.

[91] Tim Armstrong mentioned that, "the skill set of differentiation is going to be one of the most important skill sets in the future of corporations because of how pervasive technology is" (Ha). Richard mentioned that "Innovating means choosing; choosing when to disrupt," said CEO Stephane Richard, at Show Hello, the company's annual innovation showcase. "We must ask ourselves two questions. Firstly, will this innovation be useful to the person; this question is about purpose. The second question is about whether people can actually use it. This is about access. This approach to innovation is called Human Insight" (Davies). Ronan Dunne's testimony about the importance of AI is included earlier in this chapter, in the Verizon case study.

Chapter 6 Conclusions

Section I: Conclusions of Research

My motivating interest for my thesis was the variation across national cultures and its influence on organizational adoption of technology. The goal of this research was to offer insight on whether organizations operating in different nations within the same industry adopt AI at different rates and whether national sociocultural values influenced organizational adoption of AI. The limitations of my methodology prevented me from conclusively offering insight on this subject; for this reason, making a definitive claim about the relative rates of organizational adoption of AI of organizations in the U.S. and France would be an unsupported one. Research uncovers gaps, and though a conclusion about organizational adoption of AI was not feasible with my chosen methodological approach, my research contributes to future research.

My thesis illuminated why such a study warranted investigation and how this research applies to future studies on the following subjects: organizational adoption of technology, organizational adoption of AI, organizational and generation of AI. In addition, this research contributes to the following higher-level concepts: organizational change, technological change, and economic growth.

Though I was not able to make a definitive claim about the relative rates of organizational adoption of AI of organizations in the U.S. and France, my hypothesis stemmed from conclusions that I was able to make, supported by data and previous literature. The main

conclusion of this thesis is that national cultural values may predispose nations (and the organizations operating in those nations) to be more equipped to adapt to technological change, and therefore able to integrate AI. This conclusion was derived from the information I gathered from the literature and cited as the support for my hypothesis.[92] A second conclusion was that there was evidence that suggested that certain economic pressures,[93] do cause individual-level cultural values to evolve or shift. These two conclusions supported by data, research, and previous studies is why I believe that the further research that focuses on studying the influence of cultural values on organizational adoption of technology is warranted

My research contributes insight that is relevant for organizations today and in the future. Businesses today are facing incredible pressure to adapt and transform as a period of "tectonic change in the business world has begun, brought on by technological progress" (Brnjolfsson and McAfee). For over 250 years, technological innovations have been recognized as the primary drivers of economic growth. Technologies known as general-purpose technologies[94] have been recognized as the most important, as these technologies "catalyzed waves of complementary

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[92] In Chapter 4, I summarized how the information, insight, and literature reviews could be aggregated to justify and legitimize my hypothesis. I identified four main conclusions to do so. These conclusions are the following: 1) National Values differ in France and the U.S., 2) National level Sociocultural Values Influence Organizational Culture, 3) Organizational Culture influences Organizational adoption of AI, 4) Multinational Organizations are influenced by its country of origin.

[93] (Chakraborty, Thompson, Yehoue) concluded that cultural bias can be overcome by economic shocks, or institutional changes; however, these biases are overcome over a prolonged period, rather than period of four years (2014-2018). This study is by no means an exhaustive study on factors that influence individual-level cultural change; however, it did indicate that cultural values do change over time.

[94] According to Erik Brnjolfsson and Andrew McAfee, in *The Business of Artificial Intelligence*, general-purpose technologies in previous eras were the following technologies: steam engine, electricity, and internal combustion engine. These technologies are important drivers of technological innovations.

innovations and opportunities" (Brnjolfsson and McAfee). Artificial intelligence is widely recognized as the most important general-purpose technology of our era (Brnjolfsson and McAfee). As it relates to businesses, AI is estimated to have a significant impact. AI is already integrated into thousands of organizations worldwide; however, "most big opportunities have not yet been tapped" (Brnjolfsson and McAfee). Artificial intelligence, specifically machine learning, is driving changes at three levels of organizations: tasks and occupations, business processes, and business models. The effects of AI will be magnified in the coming decade as "virtually every industry" transforms its core processes and business models to take advantage of AI. The bottleneck now is in management, implementation, and business imagination (Brnjolfsson and McAfee).

The fact that a "bottleneck" exists indicates that organizational adoption and generation of AI is challenging for organizations worldwide. However, this bottleneck is not representative of the amount of organizations attempting to adopt AI; a study conducted by *MIT's Sloan Management Review* and The Boston Consulting Group, indicated that there are significant gaps with respect to organizations interest to adopt AI and their ability to do so (Ransotham, Kiron, Gerbert, Reeves). This research suggests that a large percentage of organizations acknowledge that adopting AI is a competitive advantage. In this way, future research that can identify the origins of the main challenges that organizations face in this process of adopting AI will be important. This information will better inform and subsequently more effectively equip organizations with strategies to integrate AI into their business processes.

A Need for a Common Definition of Adoption

To optimize the information and insight that will be obtained by future researchers regarding organizational adoption of AI, I believe that an important first step is to establish and define a single definition of the following terms: AI adopting organizations, AI adoption and AI generation. As I have mentioned in early chapters of this thesis, significant and valuable research has been conducted by management consulting firms, academic researchers, and other research organizations on organizational adoption of AI; however, in these studies, the term "adoption" is used to reference two types organizational innovation processes: adoption and generation. For example, terms such as "pioneer AI adopters" or "AI adopting organizations" have been used, and when assessing the insight gathered from research that combines adoption and generation, it is difficult to conclude the specific strategy that the organization utilized to incorporate AI into its business processes. To gain a deeper understanding of how organizations have integrated AI into their processes and minimize confusion, distinguishing between businesses that have utilized adoption (used externally developed AI technology) or generation (developed the AI technology internally) is crucial. Most importantly, since the organizations that are characterized as "leading the race for AI" (The Economist) such as Google, Amazon, and various others, distinguishing between the innovation processes that these organizations have used would be beneficial, as it would enable more specific insight to be gathered.

Section II: Opportunities for Future Research

Future studies will largely be dependent upon the answers that researchers wish to obtain about organizational adoption of AI and the problems that they wish to solve with their research. The research that I conducted for this thesis reinforced to me that there are incredibly interesting

questions (that remain unanswered) that relate to organizational adoption of AI, as well as what future research on this subject, in my opinion, warrants priority.

As I mentioned, the answer or identified problem should drive the research; in this way, there are three types of future research paths that I have identified and would encourage. One overarching question that I believe is important to organizations today, given the current gaps in organizational adoption across industries and nations, is the following: What is the most viable strategy to integrate technology into organizational processes? The three future avenues of research that I have identified are separate methodological approaches that would aim to expand on this relationship in the context of organizational adoption of AI. They are explained in descending order, according to priority.

1. **Analyzing Organizational Generation of AI by Evaluating Organizational Efforts to Integrate Machine Learning into HR Analytics**

My motivating higher-level question seeks to identify a viable strategy to integrate AI into organizational processes; to answer to this question, one possible area of research would focus on organizational generation of a specific type of AI, such as machine learning,[95] and evaluate how machine learning has been generated in a specific department within an organization (human resources). Focusing on organizational generation of machine learning in HR-related processes would narrow one's scope of research. More importantly, it would enable insight to be extracted about whether developing machine learning applications intended to

[95] Machine Learning is the type of AI that is recognized as being the most important general-purpose technology of the current era (Brnjolfsson and McAfee). Machine learning is defined as the field of computer science that provides "computer systems with the ability to "learn" (i.e. progressively improve performance on a specific task) with data, without being explicitly programmed (Wikipedia). It pertains to how does a system learns using data (CEB Insights).

optimally support, encourage, and address an organization's employees is a characteristic of "AI leaders." Focusing on generation as opposed to adoption of machine learning would enable researchers to have greater access to data and information. In addition, organizational investment in AI, specifically machine learning is estimated to double over the next three years; it is estimated that sixty-four percent of organizations will have adopted machine learning by 2020[96].

Through the course of my research for my thesis, "early AI adopters" were identified as organizations that are heavily investing in analytics expertise (CIO)[97]; in this way, selecting a specific method of analytics and evaluating organizations that have integrated machine learning into a type of analytics will narrow one's research focus, as well as pinpoint a function within an organization that is intended to address people within an organization.

Investigating organizations that are implementing people analytics efforts is an intentional effort to further evaluate how organizations are adopting strategies to address their employees. As I concluded in my thesis, national cultural values do differ, organizational culture influences AI adoption, and organizational cultural values can influence individual values. HR Analytics or People Analytics refers to a type of analytics that is aimed to aid managers and employees make decisions about their workforce. It applies statistics, technology and data. Organizations utilize HR analytics to optimize management practices, forecasting attrition, and

[96] The International Data Corporation(IDC) forecasts that spending on AI and machine learning will grow from $8 billion in 2016 to $47 billion in 2020.

[97] It is estimated that "AI leaders" have been able to "digitally transform" and digital transformation is a cornerstone of machine learning adoption. 72% of CIOs have responsibility for digital transformation initiatives that drive machine learning adoption. The survey found that the greater the level of digital transformation success, the more likely machine learning-based programs and strategies would succeed. IDC predicts that 40% of digital transformation initiatives will be supported by machine learning and artificial intelligence by 2019 (CIO). In addition, it is forecasted that a majority executives are planning to use machine learning in their organizations today (CIO).

employee training by analyzing trends in talent data. Though HR has been slower to integrate AI in comparison to marketing and sales, a greater number of organizations are beginning to integrate machine learning and leveraging these types of algorithms to predict attrition, and to identify ways to guide and manage employees (TechCrunch). The primary goals of people analytics are the following: to help organizations to make smarter, more strategic and more informed talent decisions; in this way, organizations can find better applicants, make smarter hiring decisions, and increase employee performance and retention(TechCrunch).

There is a reason that "everyone is into HR analytics right now" (CEB); in a world of "tectonic" technological change, organizations are prioritizing investment in strategies relating to talent acquisition, talent management, and talent retention.[98] Talent is becoming the most important resource because there is scarcity of people who have the specific skills needed in today's world.[99] For this reason, exploring and evaluating organizations that are implementing machine learning for HR analytics would provide interesting insight on how organizations are navigating employee management, given different cultural values of people. In addition, the purpose of using machine learning in HR analytics is to integrate a software system that "learns" over time about its employees. This type of system may facilitate organizations to identify and address employees based on their cultural values, motivations, and personalities. Where I had

[98] *Power to the New People Analytics*, by Bruce Fecheyr-Lippens, Bill Schaninger, and Karen Tanner, indicated that "the latest data nd analytics buzz comes from the field of HR analytics, where the application of new techniques and new thinking to talent management is becoming more mainstream."

[99] According to from an interview conducted by CEB, Guru Sethupathy mentions that "there is a scarcity of people who can do, deal with new technologies, learn the skills, upgrade their skills, and change" (CEB). He mentions that companies are vying to attract a small group of individuals who "sit at the intersection of having business knowledge, analytical knowledge, and then the growth mindset" (CEB).

previously assumed that cultural values were fixed and might predispose certain individuals, and thereby organizations to being more able to integrate AI, the combination of people analytics and machine learning, might facilitate organizational adaptability regardless of an organizations country of origin, and the national cultural values associated with that nation.

Research Question: Is orienting investment towards machine learning for HR analytics a viable strategy for organizations to integrate technology into organizational processes?

2. A Case Study Evaluating Organizations Characterized as "AI Leaders"

Since "early AI adopters" include organizations that are generating and adopting AI technology, one area for future research would be to evaluate more specifically the ratio of AI generation versus adoption. Google, Amazon, and various others, are characterized as "leading the race for AI" (The Economist); distinguishing between the innovation processes that these organizations have used would be beneficial, as it would enable more specific insight to be gathered. For example, evaluating the budget that Google has allocated for AI, and then distinguishing between its AI adoption costs (acquiring startups, strategic partnerships, etc.) and its AI generation costs (R&D investment, research grants, etc.) would afford insight regarding how Google has attained its status as an AI leader. In addition, more specificity with regards to Google's (or any organization's) AI adoption and generation expenditures will enable more detailed analyses about the factors influencing organizational adoption or generation of AI. It is difficult to learn or establish "best practices" if information about the strategies that AI leaders have utilized reference a term that includes adoption and generation, as these strategies are distinct and require different organizational approaches. Once a common definition exists, insight can be more specifically evaluated.

Research Question: Is a viable strategy for organizations to integrate technology into organizational processes to generate and adopt technology at a specific ratio?

3. Optimally Evaluating Organizational Adoption of AI

One of the primary contributions of this thesis was the optimal approach that I identified to comparatively quantify the rate of organizational adoption of AI. This approach is defined and thoroughly explained in the Chapter 4 of the thesis. In my opinion, executing this alternative methodological approach is a lower priority, relative to the two other areas of research that were explained above. I believe this because my goal is to provide insight to the overarching question that motivated this thesis in the first place. In addition, I believe that the first opportunity of future research (explained above) incorporates components of the ideal approach that I identified in Chapter 4, and extends it too; in this way, the first approach is the approach to continue to offer insight on the overarching question.

The purpose of research is assessing the current state of a field, identify where gaps exist, and contribute to filing these gaps, or provide insight about them. Igor Perisic mentions that, "research is conducted for the benefit of by others is intended to be continued, and leveraged by others" (Microsoft Research); in this way, I was eager to contribute to the field, and to point my fellow researchers in the direction that, in my opinion, is of greatest priority.

APPENDIX A: DIAGRAMS TO ACCOMPANY THESIS CHAPTERS

Figures to Accompany Chapter Two

	Relationship between Sociocultural Values and AI Adoption Confirmed by the Literature	
1)	National Values Differ in France and the U.S.	
2)	National Level Sociocultural Values influence Organizational Culture	
3)	Organizational Culture influences Organizational Adoption of AI	
4)	Multinational Organizations are influenced by its Country of Origin (Nation where it was founded)	
	France	U.S.
	Power Distance (68)	Power Distance (40)
	Individualism/Collectivism (71)	Individualism/Collectivism (91)
	Uncertainty Avoidance (86)	Uncertainty Avoidance (46)
	Masculinity/Femininity (43)	Masculinity/Femininity (62)
	Long Term Orientation/Short Term Orientation (39)	Long Term Orientation/Short Term Orientation (26)

Table 1: Variables that Remain Constant			France: Orange S.A	U.S. Verizon Communications
1.	Industry/sector	Telecommunications	Telecommunications	Telecommunications
2.	Innovation process	Adoption	Adoption	Adoption
3.	Innovation type	Technology (Task-specific Artificial Intelligence)	Task-specific Artificial Intelligence	Task-specific Artificial Intelligence
4.	Company size	Number of Employees	155,202	162,000
5.	Company type	Public	Public	Public
6.	Company form	Multinational	Multinational	Multinational

Figures to Accompany Chapter Three

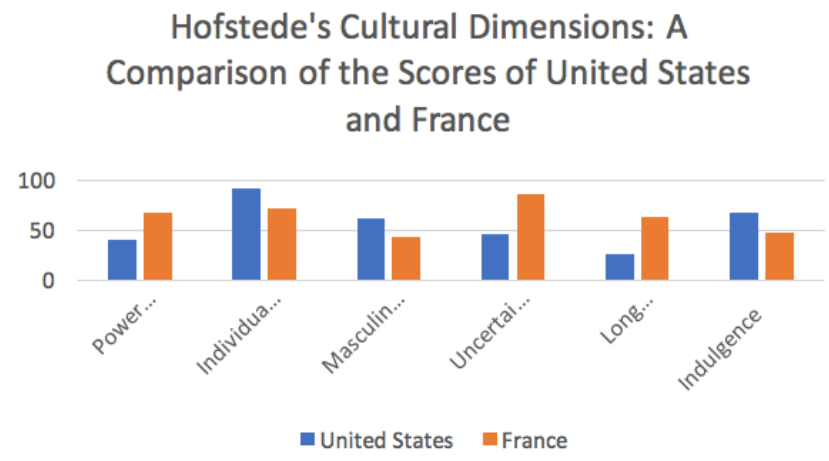

Table 2: Figure to Accompany Chapter Five

Table 2: Variables Used to Measure AI Adoption State			
Variables for Quantifying Organizational AI Adoption		France: Orange S.A	U.S. Verizon Communications
1	Number of Subsidiaries	3	19
2	Subsidiary Names	Orange Marine, Orange Business Services, Dailymotion	Oath Inc., Verizon Business Markets, Verizon Delaware, Verizon Enterprise Solutions, Verizon FIOS, Verizon Maryland, Verizon New England, Verizon New Jersey, Verizon New York, Verizon North, Verizon Pennsylvania, Verizon South, Verizon Telematics, Verizon Ventures, Verizon Virginia, Verizon Washington D.C., Verizon Wireless, XO Communications, VHMP
3	Name of Venture Capital Arm	Orange Digital Ventures (2015)	Verizon Ventures (2000)
4	Number of AI Companies in Venture Capital Arm Portfolio	4 (of 14)	12 (of 52)
5	Names of AI Companies in Venture Capital Arm Portfolio	Followanalytics, Monzo, Secbi, Wevr	8i, Otibus, Renovo, Sparkcognition, Urgent.ly, Vidrovr, Verdigris, Clip Call, Sfara, AdTheorent, Consert, Videosurf
6	Mergers and Acquisitions by MNC (2015-2017)	Business & Decision (2017), Sun Communications (2016), Groupama Banque (2016), Tigo (2016), LEXSI (2016), Cellcom Telecommunications (2016), Jazztel (2014), Dailymotion (2013), Unanimis (2009).	Niddel Corp. (2018), Yahoo! (2017),Straight Path Communications (2017), Skyward (2017), XO Communications (2017), Fleetmatics (2016), Vessel (2016), AOL (2015),
8	Appeal of Merger	Groupama has expertise in banking relations and this industry expertise enabled Orange S.A. to enter banking industry.	Yahoo has a suite of advertising technology, collection of mobile ad-serving and targeting services, a lot of content, and built-in audience
9	Key New Market Pivot	Financial Services	digital media, digital advertising, online services and software.
10	Primary Reasons for the Pivot:	Competitive telecommuncations industry, Orange S.A.'s failed effort to consolidate, and appealing possibility of entering financial services market.	Proactive attempt to optimize the monetization of demand for mobile solutions.
11	Broad Organizational Goal	Build market share and become a "primary bank" for consumers partly by combining the best of the physical and digital worlds.	Target ads to existing subscriber-base to increase share of the digital advertising market. Bolster its advertising technology (by aquiring Yahoo); build market share in search engine and advertising markets. AOL acquisition (programmic and video advertising platform) and Yahoo deal enables Verizon to augment its technology (more tech assets).
12	Goal of Business/Subsidiary	Orange Bank's primary service is to offer customers a mobile banking solution.	Oath intended to be online-advertising empire for Verizon and increase Verizon's media and content offerings.
13	Timeline	Launch a banking service specifically designed for mobile usage in France at the beginning of (2017)	Launch a subsidiary (Oath) that will merge AOL/Yahoo to form Verizon's digital media company (2017)
14	AI Product/Service	AI-powered Watson-based voice assistant or chatbot	Yahoo's Chatbot

APPENDIX B: ADDITIONAL REFLECTION

Origin of the Motivation for this Thesis

Insight articulated by Robert Pirsig catalyzed my examination of the interconnectedness of technology and values. This exploration led me down an incredible path or being stuck and unstuck (also coined by Mr. Pirsig).

"The way to solve the conflict between human values and technological needs is not to run away from technology. That's impossible. The way to resolve the conflict is to break down the barriers of dualistic thoughts that prevent a real understanding of what technology is—not an exploitation of nature, but a fusion of nature and the human spirit into a new kind of creation that transcends both. When transcendence occurs in such events as the first airplane flight across the ocean or the first footstep on the moon, a kind of public recognition of the transcendent nature of technology occurs. But this transcendence should also occur at the individual level, on a personal basis, in one's own life, in a less dramatic way."

What is "being stuck" and "stuckness"?

The difference between a good mechanic and a bad one, like the difference between a good mathematician and a bad one, is precisely this ability to select the good facts from the bad ones on the basis of quality. He has to care! This is an ability about which formal traditional scientific method has nothing to say. It's long past time to take a closer look at this qualitative preselection of facts which has seemed so scrupulously ignored by those who make so much of these facts after they are "observed." I think that it will be found that a formal acknowledgment of the role of Quality in the scientific process doesn't destroy the empirical vision at all. It expands it, strengthens it and brings it far closer to actual scientific practice.

I think the basic fault that underlies the problem of stuckness is traditional rationality's insistence upon "objectivity," a doctrine that there is a divided reality of subject and object. For true science to take place these must be rigidly separate from each other. "You are the mechanic. There is the motorcycle. You are forever apart from one another. You do this to it. You do that to it. These will be the results."

This eternally dualistic subject-object way of approaching the motorcycle sounds right to us because we're used to it. But it's not right. It's always been an artificial interpretation superimposed on reality. It's never been reality itself. When this duality is completely accepted a certain nondivided relationship between the mechanic and motorcycle, a craftsmanlike feeling for the work, is destroyed. When traditional rationality divides the world into subjects and objects it shuts out Quality, and when you're really stuck it's Quality, not any subjects or objects, that tells you where you ought to go.

By returning our attention to Quality it is hoped that we can get technological work out of the noncaring subject-object dualism and back into craftsmanlike self-involved reality again, which will reveal to us the facts we need when we are stuck.
Let's consider a reevaluation of the situation in which we assume that the stuckness now

occurring, the zero of consciousness, isn't the worst of all possible situations, but the best possible situation you could be in. After all, it's exactly this stuckness that Zen Buddhists go to so much trouble to induce; through koans, deep breathing, sitting still and the like. Your mind is empty, you have a "hollow-flexible" attitude of "beginner's mind." You're right at the front end of the train of knowledge, at the track of reality itself. Consider, for a change, that this is a moment to be not feared but cultivated. If your mind is truly, profoundly stuck, then you may be much better off than when it was loaded with ideas.

The solution to the problem often at first seems unimportant or undesirable, but the state of stuckness allows it, in time, to assume it's true importance. It seemed small because your previous rigid evaluation which led to the stuckness made it small.

But now consider the fact that no matter how hard you try to hang on to it, this stuckness is bound to disappear. Your mind will naturally and freely move toward a solution. Unless you are a real master at staying stuck you can't prevent this. The fear of stuckness is needless because the longer you stay stuck the more you see the Quality...reality that gets you unstuck every time. What's really been getting you stuck is the running from the stuckness through the cars of your train of knowledge looking for a solution that is out in front of the train.

Stuckness shouldn't be avoided. It's the psychic predecessor of all real understanding. An egoless acceptance of stuckness is a key to an understanding of all Quality, in mechanical work as in other endeavors. It's this understanding of Quality as revealed by stuckness which so often makes self-taught mechanics so superior to institute-trained men who have learned how to handle everything except a new situation.

Normally screws are so cheap and small and simple you think of them as unimportant. But now, as your Quality awareness becomes stronger, you realize that this one, individual, particular screw is neither cheap nor small nor unimportant. Right now this screw is worth exactly the selling price of the whole motorcycle, because the motorcycle is actually valueless until you get the screw out. With this reevaluation of the screw comes a willingness to expand your knowledge of it.

-Robert M. Pirsig, *Zen and the Art of Motorcycle Maintenance: An Inquiry Into Values*

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