

Technology versus Teller: An Economic Analysis of Automation Disruption in Banking Sector

By:

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Submitted to the Board of Economics
School of Natural and Social Sciences
in partial fulfillment of the requirements
for the degree of Bachelor of Arts

Purchase College
State University of New York

May 2019

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Abstract:

For decades technology in the workforce has led to greater efficiency and prosperity. I will discuss the economic disruption of automation in the workforce. Specifically, its effect on the bank teller. My microeconomic approach into this concept gives an in-depth analysis of the technological implications for tellers. Current research indicates that automation is taking our jobs making bank tellers among the first to be unemployed. I find that automation can substitute and complement a teller. Automation can be cost saving, costly, and aid in retail banking business expansion. Consumer behavior ultimately influences business decision-making strategies on teller's role. The bank teller will cease to exist due to the automation of tasks in banking.

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Section I: Introduction

The digital age has created new style of banking through innovation of mobile banking, online banking, cellphone banking and modified digital automated teller machines (ATM's). My question, one I aim to answer throughout this paper, is how is automation effecting the bank teller role? Classical economic theory states that everything has costs and benefits. Humans have unlimited wants but limited resources. Scarcity is what influences our decisions and every choice we make forgoes another choice that could be made; therefore, our choices are valuable. Ideally, we make the best decision given all the information available. There are two perspectives to be discussed, employees and employers. Automation can substitute employees as well as complement employees. Employers adapt automation if it is cost-saving but value employment of humans when automation is costly. Yet in this digital age automation is a key component in business expansion. What businesses do to invest in automation will determine their profits and growth in business. The consumers of the product or services delivered determines the demand of the bank teller because businesses seek to produce optimally and efficiently. The consumers are the bank customers. Every day there is a choice to be made when handling one's banking needs, that is to traditionally utilize the bank teller role or use the digital software to execute needs. The economics of consumer behavior determines what the employers seek to improve and deliver as a banking business. Neoclassical economics assumes humans are rational and predictable. We make rational choices. According to behavioral economics that is not the case. In the real world we are irrational and don't always make the most optimal decisions. This economic lens does not contradict neoclassical theory, it adds more depth to the complexity of economic thought. The irrational elements of decision-making for consumers offers complexity in the analysis of bank tellers versus automated teller machines. Classical economic models assume rational decisions are being made. Behavioral economics seeks to understand the discrepancies in the decision-making process. Rationally the teller role is not valuable but why are they still employed? Different types of consumers choose human services or automated services for banking needs. Peoples

preferences are determined by how the options are presented to them. Nudge theory helps the consumer make the rational choice. Banks are selling convenience and attractiveness to maintain the consumer banking relationship through electronic banking. Given the choice of standing on a teller line or using the ATM, more people prefer the ATM. Given the choice of going to a bank and choosing to use phone or online banking, fewer individuals go the branch. The banking business has suggested its customers use the electronic services and has positively reinforced those decisions by satisfying customer needs. As a business it has become cost-efficient to invest in the ATM and electronic services, therefore by placing modified ATM along the teller line or at the entrance of banks it nudges consumers to take advantage of their electronic service. I am to discuss its implications on unskilled workers. Investing in one's skill sets will make one marketable in this digital age.

Section II: Theory

Classical economic theory states that everything has cost and benefits and as humans we have unlimited wants but scarcity influences our choices. Therefore, we make the rational choice considering the opportunity costs. Assuming we are rational and seeking to maximize utility, we make the optimal choice. Automation in the work force disrupts human employment. This can be a positive or negative effect. It depends on the individual's perspective whether he is managing the business, an employee or a consumer. Automation is a form of service delivery through technology and minimal human assistance. In context of this paper automation in retail banking has progressed, since the late 1900s. Due to the digitization of banking services, traditional teller roles have evolved. The automated teller machine is among the first examples of automation. Later came banking my phone. Online banking became prevalent in the 2000s and recently mobile banking, an artificial intelligence-based system, has been introduced to the market. Retail banks focus on the market distribution of goods and services based on the demand of consumers and costs of the business. Therefore, benefits should outweigh the cost of each decision. Based on classical economic theory and the literature one can conclude that investment in technology produces efficiency and increases profit. Banks are making the

rational choice of employing automation and decreasing labor costs. A rational consumer given the choice of waiting on line for teller or using automated services, would choose the less costly option. Type of costs to forego vary, such as time, technology knowledge, and trust. Classical economic theory implies everyone is making the less costly choice but not everyone will due to the economics of decision-making. Behaviorally the rational choice isn't always implemented due to many decision factors, we are humans and make irrational choices. Although automation is efficient, as a society we cannot immediately adopt 100% automation. We have unique heuristics, and we respond differently to automation implications. One implication of teller automation is substitution of workers due to tellers being low skilled employees. Complementarities also exist and teller roles have modified to meet banking needs. Business expansion captures customers through automated financial service anywhere and anytime. Banks are revolutionizing their service deliverance through the digital world. Therefore, automation cuts costs in the long run. Cost of applying self-service technology is less than hiring more tellers (Frey, Osborne, 2017). When the cost of something reduces, we do more of it, according to the basic supply and demand model. In the short run it can be costly to employ automation. There are barriers and risks. Although electronic banking is in demand, banks must account for time and effective output, therefore it is too costly to become fully automated. Today, the most effective production at minimal cost is employing tellers and automated tellers to aid in the transition of digital financial services.

Section 2a: Automation can substitute workers

Substitution of workers occurs when the set of skills workers use are routine and require minimal skills. The job requirements of a bank teller are a high school diploma and customer service experience. Traditionally tellers are the cash handlers and front-line employees of the bank. The evolution of the automated teller machine delivers same services as tellers but much quicker, such as deposits, withdrawals, etc. These types of transactions are routine, most tellers' tasks are routine.

Substitution occurs in many industries, although tellers remained in demand with the introduction of the ATM, advances in technology and artificial intelligence now implicate the cessation of human tellers. A business could substitute an employee job with artificial intelligence if the machine can outperform or perform as well as the employee. The average growth rate for all occupations is 7 percent, according to the United States Bureau of Labor and Statistics. USBLS reports a decline of bank tellers by 8%. This decline is because routine tasks will be automated. Jobs, like tellers, that require minimal skills will be automated. Frey and Osborne's general employment analysis states, about 47 percent of total US employment is at risk, perhaps over the next decade or two (2017). Frey and Osborne's analysis of automation implication on wage and education resulted in wages and educational attainment exhibiting a strong negative relationship with an occupation's probability of computerization (2017). Therefore, higher wages and higher educational attainment will make one's occupation less susceptible to computerization. The demand of jobs entails more unique skills and intelligence. Low-skill workers will reallocate to tasks that are non-susceptible to computerization for example tasks requiring creative and social intelligence. Overall job automation is not necessarily a threat to us as of now due to timeliness and effective execution of advanced automation systems but in the decades coming the threat is expected. By then new jobs hopefully are invented and individuals have invested in their skills and complementary attributes. Brougham and Haar write a paper seeking to measure the awareness of Smart, Technology, Artificial Intelligence, Robotics, & Algorithms (STARA) in employers of various industries (2018). It gives insight on employee's perceptions about STARA in the workplace. This study finds that overall the awareness is low specifically in-service sector jobs due to STARA's prominence in the service industry's (Brougham, Haar, 2018). The idea of jobs being stolen is low. They find that older folks don't intuitively find the implications harmful pertaining to their role. Meanwhile younger age groups do see the implication of STARA and are more aware of its potential.

Section 2b: Automation can complement workers

Human tellers and automated tellers complement each other. Traditionally the ATM and teller work together, as complements. Due to task automation, tellers can perform tasks efficiently and focus on being sales people, focus on problem solving solutions and educate on product knowledge. Customers are inclined to use third party support as intermediaries although technology usage in banks is generalized as self-service technology (Isboli, Pepece, 2018). These customers make use of the platform side to get assistance with self-service technology such as atm's and mobile banking. The tellers modified role, complements use of new technology to provide an efficient service, which benefits both the consumer and producer. Therefore, automation currently serves as a complement, by allowing tellers to provide better customer service. It is economically profitable to retain and train teller with product knowledge. This allows the tellers to communicate the transition of traditional banking to mobile or online banking. Banks must consider all age groups. Non-tech-savvy individuals demand the convenience of a teller. The literature on psychology and communication suggests that individuals are eager for interaction with others and this interaction is the fundamental interpersonal motive to explain a significant amount of human behavior's demand to interact with retail employees (Lee 2017). Artificial intelligence could substitute a worker or complement a worker depending on the type of industry (Decanio, 2016). Decanio addresses the productivity of labor between human worker and a robotic worker and how likely it is to adapt and who isn't depending on the relationship the human has with technological advancements in the workforce (2016). Considering the bank telling job, it is likely that many could be displaced but those individuals with business or unique skill sets could be more likely to keep their job as the teller's role will evolve to conform to artificial intelligence (AI). Rational people see this trend in automation application at work and decide to invest in complementary skills. Investing in our skills will set us apart from the unskilled. Humans that complement AI-based labor will be in high demand. Individuals that cannot outperform or complement task automation will be replaced (Decanio, 2016). History has shown that bank tellers were crucial in relationship banking,

they continue to be a valuable input in production today. Tellers aid the transition to mobile and online banking. Invoking advanced systems will likely cause a teller to have more responsibility. Its demand is expected to decrease in the next decade but those that have more skills will adjust with bank changes.

Section 2c: Automation allows businesses to expand their services

Electronic business is expected to become one of the core strategies of future banking development (Gautam, 2012). Technological progress determines smart machine demand to improve operational efficiency. Gautam measures the effect of introducing electronic banking and finds that strong competition exists in the banking industry and electronic banking has been a way to capture business (2012). Due to the banking industry being highly competitive, they must opt for a business plan that retains clients. The prevalence of mobile, phone, and online banking is due to potential market power. The reason of embracing electronic banking is for retention and expansion of banking business which would gain more profits. There is a significant amount of profit with electronic banking (Gautam, 2012). The profit outweighs the cost of invoking electronic banking and operational efficiency improves as the costs reduce (Gautam, 2012). An industry must adapt to consumers demands. Automated service quality has become a competitive weapon because it is easy to duplicate a bank product, but not a level of service (Al-Hawari, 2011). Therefore, by understanding the outcomes of automated service quality, benefits are available to banks in terms of enhancing the level of service quality, gaining competitive advantages, expanding their market share, increasing their innovation ability, and finally improving the bank performance (Al-Hawari, 2011). Change is inevitable because demand fluctuates. Prendergast and Marr state, for bank branches to profit and conform to technological advancements, they must continuously re-evaluate the profitability and customer service levels of the human/technology mix within branches (1994). This mix will attract the customer as well as enable teller to perform effectively. Technological progress is a major determining factor in business expansion but appealing to both, the customer and tellers, will increase productivity and grow

business. Mullan, Bradley, & Loane find that mobile banking is of great value in order to maintain market share and customer relations (2017). There is competitive advantage in mobile banking adoption. If business industries invest profits in artificial intelligence implementation, they hold competitive advantage. Electronic business retains market power and is the firms optimal core strategy to succeed in its market. The prevalence of the bills of cash for transactions has decreased due to credit and debit card usage. Demonetization is a major factor because of which the usage of online banking services like ATM's, Online Banking, Mobile Banking, Tele-Banking is growing rapidly (Upadhyay, Rajani, Surani 2017).

Section 2d: Automation can be costly

The banking business like any business has an optimal goal to profit maximize. The intent of using the least amount of inputs to produce the most outputs at minimal cost. In order to profit maximize a business must weigh out all costs, variable and fixed to determine how to produce. A business cannot have everything, therefore there are tradeoffs to consider. The tradeoff here is human teller and automated banking services. Automation implementation requires thorough data records. Record-keeping of failures and successes in technology execution is crucial for developing the next best AI-based system. Ransbotham, Kiron, Gerbert, Reeves state that data collection and preparation are typically the most time-consuming activities in developing an AI-based application (2017). For an advanced method to work efficiently in any work force, trial and error must be accounted for, strong data must be gathered for the operation to work best. The banking industry has revolutionized in these past decades. Their investment is meeting demands but every industry is unique therefore to some automation is too costly. Mullan, Bradley, & Loane write low levels of customer demand and lack of return on investment are key barriers for banks (2017). Rather than laying off workers immediately, business is focused on the success of mobile banking. It is still too costly for firms to lay off all tellers because more concrete and reliable results need to support labor productivity in online and mobile banking access.

Section 2e: Automation can be cost saving

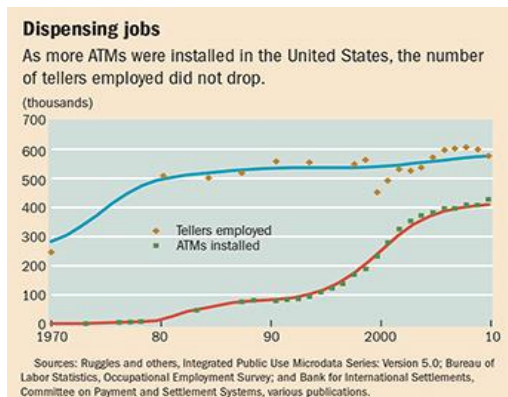
Automated teller machine innovation initially reduced cost of bank operation because more bank branches were built. Tellers per branch decrease, but they were allocated to other branch locations (Bessen, 2015). The reduced operating costs due to ATM implementation enabled banks to expand business by having more revenue to invest in ATM's and run other branches. In general, if a firm, in this case banks, implements a new device and it is deemed effective the bank has an incentive to continue investing and improve such device. This is possible due to efficiency. When efficiency exists in technological adoption it means they will be saving costs in paying teller salaries. Currently ATMs are constantly updating. Retail banks are correcting errors and expanding its functions. In the long run automation is cost saving. There is value in teller employment now but when the ATM reaches all its capabilities, teller is no longer desired, therefore costs are reduced. Minimizing cost of production through electronic banking yields significant revenue. The marginal productivity of labor measures how much output is produced. If capital is increased and kept constant the producer decides if output increased by an additional unit of labor is cost-efficient. This concept determines how many tellers per branch is optimal. Technology implementation is becoming a norm. The more it is utilized means benefits outweigh costs. According to classical theory benefits will have to be greater than costs for the firm to choose automation. Firms will operate if there are business profit earnings. Opportunity cost must be less than revenue or zero for firms to invest in automation. It is cost-saving in the long run because output will be sufficiently greater. Automation adoption means it is faster, captures more consumers, efficient, and has minimal mistakes. Proper investment must be allocated to security, performance, and adaptability.

Section 2f: Automation and consumer behavior

Consumers are in control of the demand of automation. From a retail bank executive perspective, it is evident that retail banks are revolutionizing in this digital age. Traditional banking is adapting to the demand of automation due to the creation of electronic self-service banking inventions. On average many consumers are adapting and adopting this new form of banking but not all. This is due to the type of consumer demanding service. There are older folks, working adults, young adults and teenagers. The adoption perception of the adult for benefits of the smartphone, mobile banking, would be the mobility or access to account whenever, the internet connection and application (Choudrie, Junior, Mckenna, & Richter, 2018). If users recognize the potential benefits that a smartphone provides, then they are likely to adopt and use a smartphone if continuance trust isn't affected. Trust and compatibility are the main features of Choudrie, Junior, Mckenna, & Richter's research among adults (2018). Banks sell convenience and anytime accessibility through mobile banking. They nudge you into choosing to utilize the automated services. Tellers are trained to educate consumers on their services and help this transition by presenting them to a banker, which would make the interaction more personable and offer great customer service. Both the bank and the consumer are benefiting from the interaction. Elizabeth finds, most digital natives reported a high level of current and anticipated use of mobile banking, but it isn't the case with AI based systems due to them being newer implemented services, still in early stages (2018). Mobile banking technologies offer advantages to customers that have resulted in greater usage, advanced AI banking services are more complex and go beyond the mere use of mobile banking (Elizabeth, 2018). There is a pattern in consumer response when new technology is prominent. If its popular and used within that age group than it is more likely to be accepted. Digital natives use digital devices but not advanced AI services as comfortably. The rule of thumb that influences this choice is known as the familiarity heuristic. Sticking with what you know is the decision maker therefore when given the choice of using something new and using a service you're familiar with, your decision is biased because you are choosing to utilize what you are

familiar with. Therefore, non-digital natives are likely to seek human teller service. Gupta and Arora's analysis among the "reasons against" mobile banking adoption, finds tradition barrier as the major determinant, meaning that consumers do what they know or what they are familiar with, therefore consumers go the traditional route for service (2017). Therefore, mobile banking adoption can be increased if managers attempt to minimize the effect of barriers of mobile banking adoption. The greater the change that innovation entails, the greater the resistance encountered by the consumers (Laukkanen, Sinkkonen, Kivijärvi, & Laukkanen, 2007). Businesses can take this research and develop methods to capture consumers. They must develop business plans that will promote behavior they want. Choice architecture is a key behavioral economic concept, its intent is to develop choice presentation that influence the behavior the banks want. ATM placement in all retail banks is not coincidentally at the entrance of the bank. It's a nudge to get consumers to use it, assuming it'll save you time. The nudge aspect of choice architecture is to alter consumer behavior to make the rational decision. When handling banking needs the most prevalent choice presented to us is online banking, mobile banking and telephone banking all design to give you any time-anywhere access.

Section 3: History of the market for bank tellers



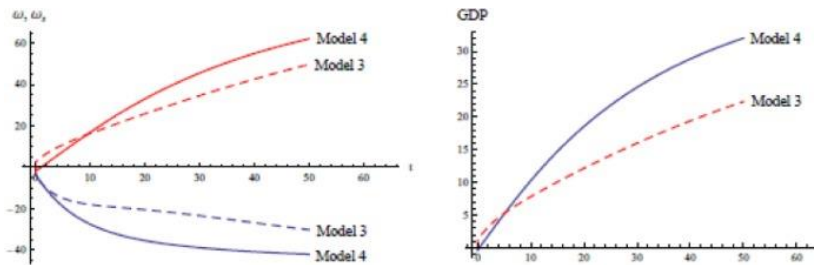
The number of bank teller jobs did not decrease as the ATMs started rolling out. ATMs increased the demand for tellers because they reduced the cost of operating a bank branch. ATMs automated some tasks, the remaining tasks that were not automated became more valuable (Besson, 2015, p.17)

The ATM was introduced in the 1970s, it wasn't trustworthy being that it was new. Bank tellers were trusted to handle cash transactions. They were known as cashiers or customer service agents. The invention of the automated teller machine was created for the same purpose, to dispense cash. The

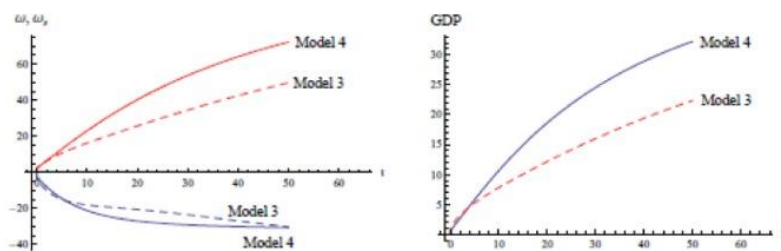
evolution of customer service is developing and integrating information technology and will continue to revolutionize customer service (Domegan 1996). Banks rapidly increased their use of automated teller machines by 1990s. As a result, demand for tellers didn't decrease overall. Bessen states, the number of tellers required to operate a branch office in the average urban market fell from 20 to 13 between 1988 and 2004 and bank branches in urban areas increased by 43 percent (2015). Automated teller machines reduced cost of bank operation, it resulted in more bank branches. Tellers per branch decreased but were allocated to new branches. There is positive correlation between ATM growth and teller growth from 2000-2010 in the figure above. Supporting Bessen's argument that profit gained from ATM implementation allowed business to expand branches and allocate tellers to other locations (2015). Therefore, we don't see a decline in teller demand during this period. They complement each other. ATM numbers in the US economy quadrupled from approximately 100,000 to 400,000 between 1995 – 2010. ATMs today are sophisticated computers that can do almost anything a human bank teller does. They are self-service technology agents. We can include phone banking, online and mobile banking in this automation development of banking services. Telephone banking became available in the 1980s and popular in the 1990s. It is a service that allows account holders to call securely and request assistance on their bank accounts. Then technology further develops, and online banking becomes a possibility in the 2000s. We enter the digital age and innovation in banking service continues to develop as mobile banking is used around 2010. United States Bureau of Labor and Statistics states bank tellers is expected to decline by 8%. When the automated teller was invented it complemented the services of the teller, both were in demand. Now there are four different types of self-service technology to access our bank accounts therefore the expected decline of 8% by 2026 is an effect of the implementation of all four self-service banking technology's.

Section 4: Empirical Evidence

Section 4a: Substitution



(a) The ratio of unskilled to skilled labor in sector 2 is 1.6



(b) The ratio of unskilled to skilled labor in sector 2 is 0.44

In both runs, high-skill labor gains more and low-skill labor loses more in Model 4 than in Model 3. Because GDP growth is higher in Model 4, the income share of low-skill labor also decreases more (Berg, Buffie, Zanna, 2018, p. 43)

Source: *International Monetary Fund 2018* by Berg, Buffie, and Zanna

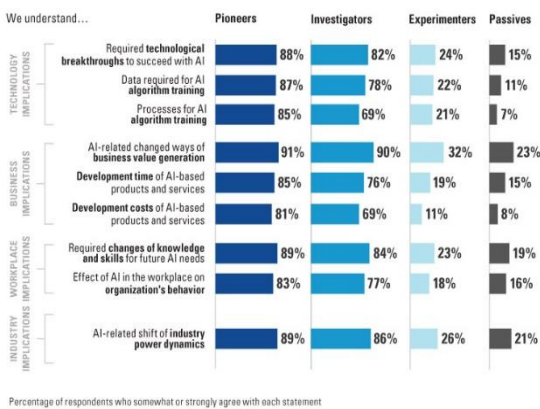
Berg, Buffie, and Zanna state that a small increase in the level of robot productivity can increase output enormously if the robots and humans are sufficiently close substitutes (2018). Figure above represents Berg, Buffie, and Zanna's results. In both runs, high-skill labor gains more and low-skill labor loses more in Model 4 than in Model 3. Because GDP growth is higher in Model 4, the income share of low-skill labor also decreases more (Berg, Buffie, Zanna, 2018, p. 43). The distributional outcome is much worse when robots substitute only for low-skill labor in Model 3 above. While skilled labor enjoys large gains, the wage for low skill labor decreases in the short/medium run (Berg, Buffie, Zanna, 2018). The skilled wage increases 56 - 157% in the long run while the wage paid to low-skill labor drops 26 - 56% and the group's share in national income decreases from 31% to 8 - 18% (Berg, Buffie, Zanna, 2018). If automation and humans are close substitutes, then output is greater for robot or smart machine use than the substitute. Skilled labor is effective when automation complements work output. Overall it is evident that output is increased through technology, but distribution of effected workers' wages will suffer the consequences. Low skilled workers will suffer

wages decrease and have smaller share of national income. Autor states automation has increased the productivity of skilled labor and contributed significantly to widening wage inequality over the past thirty years (2015). Automation disruption has its costs and benefits and results in inequality, a concept that requires a separate analysis not addressed in this paper.

Section 4b: Complement

Levels of AI understanding

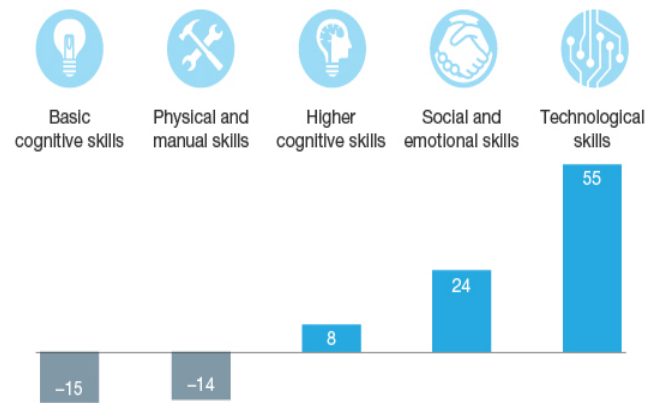
To what extent do you agree with the following statements about your organization?



Percentage of respondents who somewhat or strongly agree with each statement

Source: MIT Sloan Management Review

Change in total hours worked in Europe and the US, 2016 vs 2030 estimate, %



Source: McKinsey Global Institute Workforce Skills Model; McKinsey Global Institute analysis

In Levels of AI Understanding organizations have different levels of understanding. Compared to Passives, Pioneers are 12 times more likely to understand the process for training algorithms, 10 times more likely to understand the development costs of AI-based products and services, and 8 times more likely to understand the data that's needed for training AI algorithms (Ransbotham, Kiron, Gerbert, Reeves, 2017, p.7)

In McKinsey's model the numbers represent shift in demand. Higher cognitive skills, social and emotional skills and technological skills will increase. While, demand for basic cognitive skills and physical and manual skills decreases (Bughin, et al., 2018).

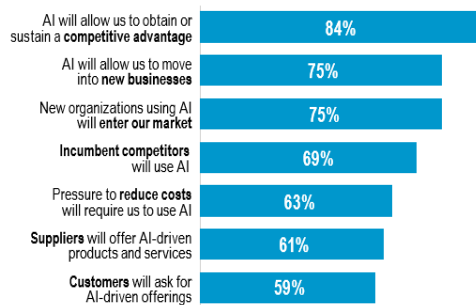
Automation of tasks does not mean an automation of jobs (Ransbotham, Kiron, Gerbert, Reeves, 2017). One should focus on unique skills or complementary assets to have an employable advantage. In figure above respondents are categorized. Pioneers use AI in workplace, Investigators, intend to use AI in workplace, Experimenters, would consider AI, Passives, don't see value in AI. 89% of pioneers agreed that changes in skill and knowledge are needed working with AI, 84% Investigators

also agreed (Ransobotham, Kiron, Gerbert, Reeves, 2017). Experimenters and Passives had a smaller percentage (23% and 19%) agree on workplace implications but this is most likely a result of them not employing or have intent to employ AI. Autor analyzes historical trends to determine that workers are more likely to benefit directly from automation if they supply tasks that are complemented by automation (2015). Initially when automated tellers were frequently used tellers remained valuable. Human tellers and automated tellers complement each other. Utilizing the ATM for more simple transactions allows tellers to focus on each customer uniquely. There is an employable advantage if employees focus on unique skills or complementary assets to adapt to a potential AI based job such as technological skills, social and high cognitive skills shown in figure 4. Those employee skills are expected to work more hours than basic cognitive skills, i.e. bank teller, and physical or manual skills.

Section 4c: Business Expansion

Reasons for adopting AI

Why is your organization interested in AI?

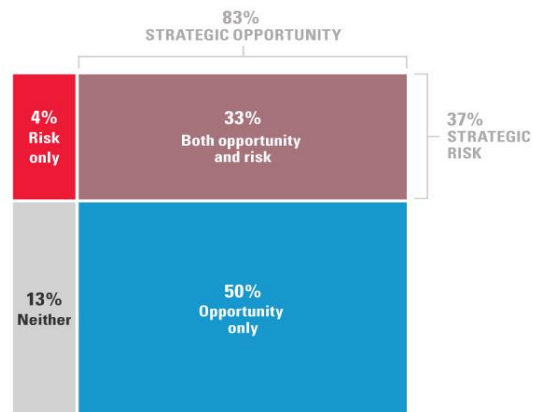


Percentage of respondents who somewhat or strongly agree with each statement

Source: MIT Sloan Management Review

AI as strategic opportunity and risk

Do you perceive AI as a strategic opportunity or risk to your organization?



Source: MIT Sloan Management Review

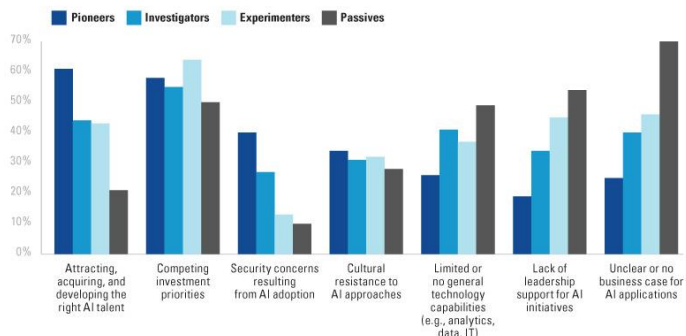
In Reasons for adopting AI the reason organizations are mostly interested in AI is its expectation to create competitive advantage.
 AI as a strategic opportunity and risk: More than 80% of the executives surveyed view AI as a strategic opportunity. 50%, consider AI to be only an opportunity. Some see risk. About 40% of managers see AI as a strategic risk as well. 13% does not view AI as either an opportunity or risk. (Ransobotham, Kiron, Gerbert, Reeves, 2017, p.4)

Ransobotham, Kiron, Gerbert, Reeves conducted a global survey of about 3000 executives, managers and analysts (2017). Figure 6 shows when asked if they perceived AI as a strategic opportunity or risk to organization 83% found AI to be a strategic opportunity. Among the various types of self-service technology exists mobile banking, which is an AI (artificial intelligence) based technology. It is ideal for banks to focus on AI-based systems because it's in high demand, specifically in the banking sector. While expectations for AI run high, executives recognize its potential risks. An executive must be optimistic and cautious of the AI implications. Rapidly adopting AI would be detrimental if mistakes occur. Therefore, value exists but a strategic business plan and patience will deliver the optimal outcome. More than 80% of the executives surveyed are eyeing the peaks and view AI as a strategic opportunity, in figure above. Ransobotham, Kiron, Gerbert, Reeves find the largest group of respondents, 50%, consider AI to be only an opportunity. Some see risks and the potential for increased competition from AI as well as benefits (2017). Almost 40% of managers see AI as a strategic risk as well. A much smaller group (13%) does not view AI as either an opportunity or risk. There are multiple reasons for adopting AI and most respondents believe that AI will benefit their organization through new business or reduced costs. In figure 5, 84% believe AI will allow their organization to obtain or sustain a competitive advantage. 75% state AI allows for business growth and that new business will enter their market with AI. Expecting other competitors to join the market is an incentive to gain competitive advantage by adopting AI efficiently and strategically.

Section 4d: Cost

Barriers to AI adoption

What are the top three barriers to AI adoption in your organization?

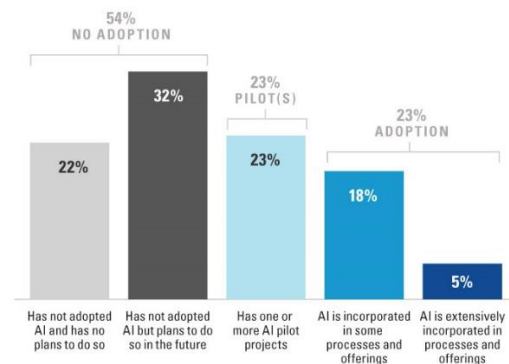


Percentage of respondents ranking the selection as one of the top three barriers

Source: MIT Sloan Management Review

Adoption level of AI

What is the level of AI adoption in your organization?



Source: MIT Sloan Management Review

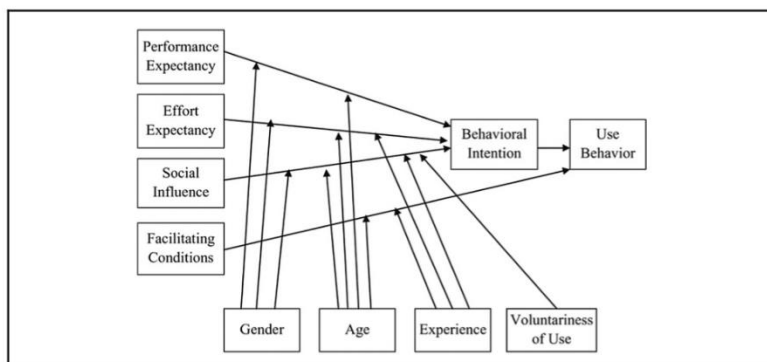
In Adoption level of AI, you can see a quarter of all organizations have adopted AI so far, despite 4 in 5 executives agreeing that AI is a strategic opportunity for their organization (Ransobotham, Kiron, Gerbert, Reeves, 2017, p. 5).

In Barriers to AI Adoption The clusters of organizations demonstrate how barriers to AI differ and affect rates of adoption, while AI talent limits Pioneers, Passives don't yet recognize a business case for AI (Ransobotham, Kiron, Gerbert, Reeves, 2017, p.6).

Depending on the business automation adoption intentions the costs vary. The banking industry understands AI and has implemented it through mobile banking. Tellers currently serve through educating customers on mobile banking services. Due to competition, banks need more concrete and reliable results to support AI implementation. In the long run it is ideal for banks to focus on AI-based systems. ATM reduce cost of bank operation. When the cost of something reduces, we do more of it. Revenue gained is allocated to where it has a higher utility, investment in smart machines. The implementation of automated machines sparked an effective way of banking and reducing costs. Not only is the ATM able to execute various routine teller tasks but it influenced investment in all types of self-service banking technology. All types reduce costs. Routine tasks jobs that require minimal skill like bank tellers help business maintain stability. Human errors or mistakes are accounted for but now with automation in the workforce mistakes are minimized and rather than being a stable firm they have

opportunity for growth. Therefore, modified ATM, online, mobile, and telephone banking are a result of cost savings from technological implementation in workforce. In both figures above we have managers, executives, analyst's perspective on costs. Pioneers are from organizations that both understand and have adopted AI, 60% of pioneers reports one major barrier of AI adoption is acquiring the right AI talent (Ransobotham, Kiron, Gerbert, Reeves, 2017). They are searching for innovators and educated people that can execute AI implementation securely. About 70% of passives are unclear about AI applications (Ransobotham, Kiron, Gerbert, Reeves, 2017). This could be a result of not gathering or recording enough data to develop automated applications. It is costly to begin the process of applying AI based systems because data is needed, recorded failures and successes over periods of time in business are essential for developing AI. Training of AI algorithms requires strong data. Training AI algorithms involves a variety of skills, including understanding how to build algorithms, how to collect and integrate the relevant data for training purposes, and how to supervise the training of the algorithm. Tech skilled people are needed. Each business needs his or her own experts and machines rather than just relying on outsourcing, which is another cost (Ransobotham, Kiron, Gerbert, Reeves, 2017).

Section 4f: Consumer Behavior



Source: *Young Consumers*

This is the UTUAT model purpose is for evaluating the probability of success of the new technology system. There are three core attributes, i.e. PE, EE and SI, which determine user behavioral intention. (Tan, Lau, 2016)

Figure above represents the unified theory of acceptance and use of technology (UTAUT) model (Tan, Lau, 2016). It is a technology acceptance model. The UTAUT's goal is to examine the user's intentions of the technology and how they chose to behave. The findings imply that service providers need to focus on performance expectancy of the technology to facilitate the uptake of mobile banking, as it is the strongest predictor of users' behavioral intention (Tan, Lau, 2016). It is found that effort expectancy has a significant effect on Performance expectancy. The consumers effort influences their intent to use mobile banking, if effort is marketed as seamless to do then consumer is more likely to use the service if it performs well. Effort expectancy must reduce for performance expectancy to increase. The popular idea of risk is what could hinder adoption, and, in this case, perceived risk is an important factor affecting user intention to use mobile banking. Banks need to invest in the upmost security features and show a pattern of trust and no breach in personal information for consumers to consider mobile banking adoption or any type of new services. Bank operators can use the findings to improve their marketing strategies and services offered to make them more attractive and competitive to students to speed up the mobile banking adoption rate (Tan, Lau, 2016). Performance expectancy is a strong predictor of millennial usage due to many tech-based systems offering or selling performance as the reason why their products are the ones to use.

Conclusion

American culture, specifically the labor force, is divided between skilled and unskilled workers. The bank teller job is an example of unskilled labor. There will be an immense displacement of workers that could lead to greater unemployment, unless skills per individual are desired in the growing automation workforce (King, Hammond, Harrington, 2017). Therefore, tellers among other types of careers are expected to decline in demand. The invention of mobile, online and modified automated teller machines operate more efficiently compared to humans therefore the traditional teller role will be extinct in the long run. Although the teller role has redefined in the past, as self-service

banking technology has been applied to everyday banking, the digital demand of service is revolutionizing traditional banking. Teller employment is declining. Currently they enable the transition of consumption to digital banking.

Automation easily replaces unskilled labor, but it cannot easily automate skilled tasks. Costs of investing in automation for unskilled tasks is deemed profitable, which is why it is a popular business move in other industries. The automation of skilled tasks will require more time and investment, but it is a possibility. The revolution in digital banking has grown rapidly. Similarly, shopping is revolutionizing as well as education. Amazon is a prime example of the transformation in the shopping industry. They hold an enormous amount of market power in our digital age. Competing shopping retailers are investing in this digital experience. This digital revolution results in a high demand of education due to the demand of skilled workers. Therefore, education must revolutionize. This could mean digital learning growth, decline in type of teachers and increase in online classes. It also proposes an evaluation of change in our current education system. As a society we need to raise innovators and thinkers to create new jobs and inventions. The implications of this case study are generalizable to other types of industries. The separation of skilled and unskilled will affect the American workforce because technology replaces unskilled workers and enhances productivity in skilled workers. Therefore, we don't need tellers because without them bank productivity increases. This paper aimed to analyze automation in the bank teller role, although it is generalizable to unskilled labor, no new data was executed to solidify the theoretical analysis.

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