FACTORS INFLUENCING THE ADOPTION OF TECHNOLOGIES IN THE INSURANCE INDUSTRY: A THANACHART INSURANCE STUDY.

AN INDEPENDENT STUDY SUBMITTED AS PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE IN BUSINESS ADMINISTRATION (MBA, GENERAL MANAGEMENT), INTERNATIONAL GRADUATE SCHOOL OF BUSINESS,

SIAM UNIVERSITY BANGKOK THAILAND.

Author:

AHAIWE IKENNA JOSHUA

Student ID: 5817190096

Supervised By:

Dr. Tanakorn Limsarun

March 2, 2019

FACTORS INFLUENCING THE ADOPTION OF TECHNOLOGIES IN THE INSURANCE INDUSTRY:

(A THANACHART INSURANCE CASE STUDY).

CERTIFICATE

TO:

AHAIWE IKENNA JOSHUA

Student ID: 5817190096

This independent study has been approved as partial Fulfillment of the Requirements for the Degree of Master's in Business Administration in General Management.

.....

(Dr. Tanakorn Limsarun)

Supervisor

Date: 10 / April / 2019

.....

(Associate Professor Dr. Jomphong Mongkhonvanit)

Acting Dean, Graduate School of Business

Date: 11 / April / 2019

Graduate School of Business: Siam University, Bangkok Thailand

ABSTRACT

Title:	Factors influencing the adoption of technologies in the Insurance Industry: A Thanachart Insurance Case Study.
Author:	Ahaiwe Ikenna Joshua
Degree :	Master of Business Administration (International Program)
Major:	General Management
Academic year:	2018
Advisor:	.....

(Dr. Tanakorn Limsarun)

22 / April / 2019

This study aim to observe factors that influence the adoption of technology in the Insurance Industry using the example of Thanachart Insurance Public Company Limited ("TNI"). As a case study, the hypotheses was comprised of five elements; namely customer behavior, management strategy, technological trends, regulatory agencies, and environmental concerns which could influence technological adoption. Direct interviews of top management officials at Thanachart Insurance plc. used a semi-structured questionnaire, and used content analysis in analyzing the data. The results from the data analysis established the preeminence and importance of management strategy/leadership styles and regulatory decisions partially supported the importance of customer behavior and technological trends; while environmental concerns ranked lowest among the factors that influenced technological adoption. Given the sample size of the population and the singular focus on a specific insurance firm, further research is required to unveil the commonality of the factors in this study across the board, using at least five insurance industries. In particular, future research might exclusively focus on the role of customer behavior in technological adoption by these firms.

The result of this study established the significant role management plays in the success or failure of a project; therefore, the suggestion to insurance firms seeking to adopt technologies primarily would be to focus on committed and transformation-driven leadership. Also, environmental concerns should take a more prominent role in the final decision on what technologies to adopt given the current climatic concerns.

Keywords: Insurance, Thanachart Insurance, technological adoption, business process.

Approved by

.....

ACKNOWLEDGMENTS

My foremost acknowledgments is to the Almighty God; also, my deepest gratitude goes to my parents Eguzoikpe and Uzoma Ahaiwe whose immense support both financial, spiritual, and material made me what I am today; my appreciation goes towards my sisters Tochi, Chizaram, Chiwendu, Odochi Ahaiwe four of whom cheered me up and stood by me through the thick and thin.

I am also thankful to the management of Siam University, particularly the MBA department, the late Dean Dr. Vijit Supinit, the current Dean Associate Professor Dr. Jomphong Mongkhonvanit, and especially the President Dr. Pornchai Mongkhonvanit; who made sure I took my exams even after the timeline elapsed.

In the spirit of Thanksgiving, I would love to recognize the efforts of Dr. Emmanuel Nweke Okafor, who pushed me to pursue this degree. Starting from the day I registered as an MBA student, Dr. Emmanuel has always believed in my academic abilities and showed this through his moral, academic, and humanitarian support. Likewise, I extend my appreciation to Benard Obiechina, my roommate for a good number of my student years. Bernard took me in when I had nothing, and still found the time to proofread my work and offer advice where necessary.

I would be remiss if I fail to acknowledge the tireless efforts of my advisor Dr. Tanakorn Limsarun, as my advisor he gave me useful tips on properly referencing my IS and pitfalls to avoid, ever willing to help he made sure to schedule time for advising despite his tight schedule.

I cannot end this acknowledgment without recognizing the efforts of Mr. Sakgul Rimmagulsup, Mr. Sakgul took it upon himself to source the interviewees of this work, in the same vein I extend my gratitude to the other interviewees particularly Mr. Theekapak Sriyukwong who carved out time to talk to me despite their hectic schedule. Thanks, and remain Blessed.

DEDICATION

I humbly dedicate this work to my parents; whose hard work and determination made everything possible.

Ahaiwe Aloysius Eguzoikpe

Ahaiwe Grace Uzoma

and to my Nephew,

Jayden Munachimso Ogbonnaya

the latest addition to my family.

Table of Contents

Chapter 1 ..... **Error! Bookmark not defined.**

INTRODUCTION ..... **Error! Bookmark not defined.**

1.1. Background of the Research ..... **Error! Bookmark not defined.**

1.2. Statement of the Problem ..... **Error! Bookmark not defined.**

1.3. Research Objectives ..... **Error! Bookmark not defined.**

1.4. Scope of the Study ..... **Error! Bookmark not defined.**

1.5. Significance of the Study ..... **Error! Bookmark not defined.**

1.6. Conceptual Framework ..... **Error! Bookmark not defined.**

1.7. Research Hypotheses ..... **Error! Bookmark not defined.**

1.8. Definition of Terms ..... **Error! Bookmark not defined.**

Chapter 2 ..... **Error! Bookmark not defined.**

LITERATURE REVIEW ..... **Error! Bookmark not defined.**

2.1. Technological Trends in the Insurance Industry ..... **Error! Bookmark not defined.**

2.2. Independent Variables ..... **Error! Bookmark not defined.**

A. Management Direction ..... **Error! Bookmark not defined.**

B. Regulatory Decisions ..... **Error! Bookmark not defined.**

C. Consumer Behavior ..... **Error! Bookmark not defined.**

D. Environmental Factors ..... **Error! Bookmark not defined.**

2.3. Dependent Variable ..... **Error! Bookmark not defined.**

Adoption of Technology in Insurance Industry ..... **Error! Bookmark not defined.**

Chapter 3 ..... **Error! Bookmark not defined.**

RESEARCH METHODOLOGY ..... **Error! Bookmark not defined.**

3.1. Research Design ..... **Error! Bookmark not defined.**

3.2. Population and Sample Size ..... **Error! Bookmark not defined.**
3.3. Interview Guideline ..... **Error! Bookmark not defined.**
3.4. Data Collection Methods ..... **Error! Bookmark not defined.**
3.5. Data Analysis Techniques ..... **Error! Bookmark not defined.**
Chapter 4 ..... **Error! Bookmark not defined.**
DATA ANALYSIS AND FINDINGS ..... **Error! Bookmark not defined.**
Research Objectives Revisited ..... **Error! Bookmark not defined.**
4.1. Management Strategy and Technological Adoption ..... **Error! Bookmark not defined.**
4.2. Customer Behavior and Technological Adoption ..... **Error! Bookmark not defined.**
4.3. Technological Trends and the Insurance Industry ..... **Error! Bookmark not defined.**
4.4. Government and the adoption of Technology ..... **Error! Bookmark not defined.**
4.5. Environmental Concerns and Technological Adoption ..... **Error! Bookmark not defined.**
4.6. Examination of the Research Hypotheses ..... **Error! Bookmark not defined.**
4.7. Data Analysis Findings Conclusion and Summary. ..... **Error! Bookmark not defined.**
4.8. Summary Findings from Respondents ..... **Error! Bookmark not defined.**
Chapter 5 ..... **Error! Bookmark not defined.**
RECOMMENDATION AND CONCLUSION ..... **Error! Bookmark not defined.**
5.1. Recommendations ..... **Error! Bookmark not defined.**
5.2. Limitations of the Study ..... **Error! Bookmark not defined.**
5.3. Conclusion ..... **Error! Bookmark not defined.**
REFERENCES ..... **Error! Bookmark not defined.**
RESEARCHER BIOGRAPHY ..... **Error! Bookmark not defined.**

Chapter 1

INTRODUCTION

1.1. Background of the Research

Businesses around the world have implemented or are seeking to enforce some form of automated business processes commonly known as a workflow in their business activities, a move away from manual or human-only process to human-machine process. The essence of implementing workflow management tool or system is for efficiency, integration of various systems which could be legacy and or newer systems, support for and of the organization processes and effectiveness (Stohr, E.A. & Zhao, J.L, 2001). A profound realization for Insurance Providers would be achieving some level of flexibility in operation and structure to respond to market changes and customer demands (Braunwarth et al. 2010). Process flow optimization leading to standardization, Information Technology (IT) flexibility, and automation is a growing trend, the banks initially led the way, and now insurance providers are playing catch up with process industrialization (US6647396B2. 2008). Besides reengineering of business processes, a sizable percentage of Insurance providers see pursuing operations optimization (Capgemini 2017), process optimization, automation, and standardization as critical activities (Capgemini 2018).

Humanity has progressed from one age to another and currently in the time period of Information Technology (IT) commonly known as the Computer Age. The IT age is one where data and innovative digital technologies drive the world; impacting virtually every business sector from Financial Services to Medical Services, even to human relationships; in a global and interconnected world, these sectors use state of the art technologies to aid consolidation (Accenture 2017). Undoubtedly in the developed countries, the fastest growing and most significant industry is the service industry (Henry, Z. 2017); this is not limited to developed nations alone, particularly developing countries are seemingly tapping into the untold benefits emanating

from this industry. The 21st century has seen increasing technological and scientific advances that have led to increased competitiveness and the conversion of the business processes [from manual to automated] of service providers such as insurance firms (Braunwarth et al. 2010).

The Insurance Industry is a subset of the Financial Sector which itself is housed under the Financial System as described by Investopedia, of all the various financial sectors: insurance sectors are the least likely to have research that looks closely onto their business processes. While there are numerous researches done on the claims process most are limited to healthcare particularly in the USA, very few pieces of research are about Asia or South East Asia. Within Asia the big players such as AXA Asia, AIA, etc. are faced with increasing competitiveness driven solely by technological development of Asia, this competitiveness has forced traditional insurance bigwigs to transform their operations and respond to a rapidly growing society where e-commerce and mobility hold sway (S. Lam, 2017). One-way insurance providers are trying to deal with digital disruption is to engage in partnerships, takeover, or internal R&D, just recently AXA Asia invested in fintech and InsurTech.

Insurance Providers are starting to realize that they are way behind, Information and Communication Technology (ICT) is a fast-growing sector, less than 10yrs ago mobile phones had basis browsing capabilities via Wireless Application Protocol (WAP), however, today they are obsolete, these and more astronomical changes has greatly impacted consumer behavior where different people want different things, and the idea of one-size fits all is no longer tenable, thus insurance providers need to seek avenues of flexibility to cater to these customers (Braunwarth et al. 2010).

According to the study done by Thai Re Group in 2016, the Insurance Industry is an expanding industry with a slow growth rate pegged at 4.5% as at 2016 and was projected to reach 6.01% in 2017, within the ASEAN community the Thai insurance industry it the 2nd largest, it comes in at 8th position when the whole of Asia is

considered, and globally it is the 27th largest. When broken down into various types of insurance, Life Insurance takes the most significant share of the pie within this group and continues to grow while other non-life insurance showed slow but steady growths at 2% (Thai Re Group, 2017). Based on information gotten from the Office of Insurance Commission (OIC), the Thai insurance sector is divided into two main categories [Life and Non-Life Insurance], there are about 66 Non-Life Insurance Firms (OICS Non-Life, 2018) and 25 Life Insurance/Assurance firms (OIC Life, 2018) as of June 2018. In Thailand the leading InsurTech firm is Frank.co.th, a startup that began 2 years ago and was recently voted as the Most Innovative Startup in 2016 by Bangkok Insurance, while InsurTech startups have the creativity and innovativeness they still require the assistance of the more prominent and more traditional firms in handling complex processes such as underwriting.

1.2. Statement of the Problem

In the 2018 annual report of PwC Financial Services, a significant concern in the insurance industry according to top management is on the impact of technology on their growth; they already understand that digitization is an important area that requires strengthening as evidenced by the results of the survey conducted by PwC on Insurance CEO's (PricewaterhouseCoopers, 2017). Claims Processing as an integral part of the insurance industry should be optimized to the point where the time-taken from process initiation and completion ought to be minimal so as to respond to a fast-changing landscape in both technology, finance and human behavior (); however, the current state of claims processing is instead all too time consuming primarily due to the amount of data required to process the claims to, number of persons involved; currently most of these processes are handled manually or slightly automated. This is an inefficient process prone to error since it is heavily tilted to the manual side (Osman. H 2018), thus increasing costs while reducing competitiveness.

In an interview with ecommerceIQ, the co-founder of Frank.co.th Harpem Doowa; an InsurTech startup firm in Thailand outlined the problems currently associated with the Thai insurance sector, part of the problem he mentioned was costs incurred from employing several insurance agents to manage customers as the processes seem hard for the customer to do by themselves; and this is attributed mainly to the resistance to change by most insurance firms, the implication means most of the processes require human sorting and approval in areas where technologies can be quickly deployed (Osman. H 2018).

However, most Insurance firms in Thailand currently conduct their business processes manually, that is: all stages require the use of paper which besides taking up space, and contributing to increased expenditure, also goes against the concept of Green Society which the Thai government claims it aims to be. Both time and money are wasted in the current paper-based processes, money in the form of employing thousands of agents (Darana.C, 2018). When Claims officers should be investigating claims they are busy sifting through paperwork for data that could be gotten by a click on the button, this not only inhibits productivity but impacts on the company's bottom-line as nobody wants to do business with an insurance firm that takes time to investigate and award claims. Should this claim delay persist, Insurance firms might find it hard to sell premiums to clients who consider time and cost an essential factor. Therefore, the need to investigate how automation can address this issue becomes even more necessary. Insurance firms will benefit substantially by adopting an automated process over the current manual process (Chitranukroh. A, 2017).

The dominance of technology in the financial sector cannot be overemphasized, more than any other sector in Thailand the financial industry is heavily influenced by the fast rate of technological adoption by the Bank

of Thailand (BOT) which then spills to sectors like the Insurance Firms (Huynh. C, 2018); the operations of insurance are often complex which is where technology comes in, to reduce complexity while retaining the compatibility with existing systems, additionally a key factor considered prior to implementing a newer technology is often data management (Wiltgen, 2016).

1.3. Research Objectives

Besides other aims, this research is directed at laying a framework for traditional insurance companies on adopting new technologies to support current business processes while exploring other technologies so as to gain and maintain a comparative advantage over other competitors in a highly competitive market.

Outlined below are some of the objectives of this research paper:

a. To identify technological trends imperative for a digital insurance age.

b. To discuss the debilitating factors that might disrupt the adoption of technologies.

c. To explore possible areas where these technologies can be implemented.

1.4. Scope of the Study

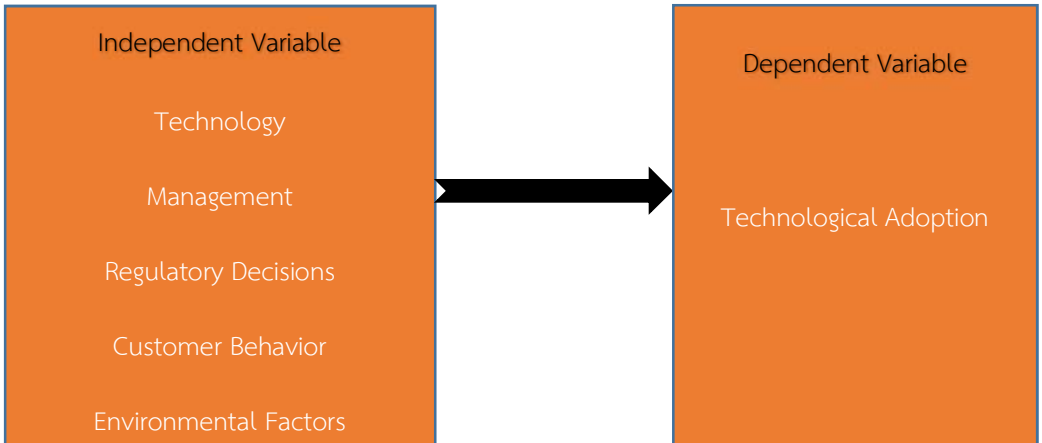
This research is designed to get information by interviewing senior executives from one of the major insurance firms headquartered in Bangkok, Thailand and begun operations in 1997. The research data will be obtained via a qualitative research method. The reason for adopting this research methodology is primarily because senior executives are in a better position to comment on and give credible and useful information on the importance of technology to their firm; also, these senior executives are often tasked with issuing orders to implement a new technology, and most importantly they are responsible for communicating these changes to their employees, managing the adoption of these technologies by the perceived end-users and providing the benefits of such systems to the firm in the long run (Wiltgen, 2016). While the period of data

collection via an interview with the principal persons at the Insurance firm will be done between the months of June and August of the year 2018.

1.5. Significance of the Study

In recent years, there has been an increase in the use of technology particularly Business Process Automation in the handling of business processes; although within the financial industry the insurance subset is the slowest at adopting newer technologies. Numerous researches have been conducted on the insurance industry, but very few focused on the rise of InsurTech and the effect of digital disruption to traditional insurance processes. This research paper aims to understand the implication of adopting newer technologies much faster for traditional insurance firms; of firm pertinence will be the goal to proffer advice that would aid traditional insurance firms in adopting technological advancements to favorable compete against insurance startups built solely on Information Technological know-how. Additionally, this research comes at a time where the analyses on this topic with regards to Asian and mainly Thai insurance companies seems to be non-existent, the finding will be useful for further studies to bridge the information gap currently existing; and possibly the research findings and recommendations could be adopted by other insurance firms to become more competitive and technologically savvy.

1.6. Conceptual Framework



1.7. Research Hypotheses

H1: Management Decisions can positively influence the adoption of technology.

H2: Regulatory Decisions can influence the adoption of technology.

H3: Environmental Factors might influence technology adoption.

H4: Certain Technological Trends can influence the type of technologies to be adopted.

H5: Customer Behavior can influence the type of technologies to be adopted.

1.8. Definition of Terms

Throughout this research paper, specific keywords and terminologies will be referenced often, to remove all forms of ambiguities and maintain a standard frame of reference; those keywords will be defined below.

- Management: there are multiple definitions of the term 'management,' however in the context of this study management will be defined based on Peter Drucker's definition in his book "The Principles of Management," he defines it as "a multipurpose organ that manages business, managers, workers, and work." This definition can further be subdivided into three groups namely as a Noun [the people, managers at all levels], as a Process [business], and Act [managing] (Akrani, 2011). Alternatively, the definition of management according to Daniel W Wheeler where management is centralized by administrators in a firm responsible for integrating the 3M's [Money, Men, and Material] into an active operating unit (Abey, 2010); can be used.

- Customer Behavior: like management there are also varying definitions of customer behavior; for the sake of this study the definition to be employed is provided by (Solomon et al, 2006),

customer behavior is described as a study of the process involved in the decisions individuals or group make when selecting, purchasing, using or disposing goods, ideas, experiences, and services for the purpose of needs or desires satisfaction. While there are various definitions of consumer behavior, most agree about the fundamentals of consumer behavior and hold to the idea that it is bound to change as customers psychological, physical, and material needs changes over time (Dudovskiy, 2013).

- Technology: the word 'technology' is probably the most used word but ironically also the word for which there is no exact definition; nevertheless the word is believed to be etymologically derived "techne" which itself is derived from a Greek word **τέχνη**. According to Merriam Webster Dictionary technology is defined as the practical application of scientific knowledge particularly in a specific area. In the words of Techpreneur and Venture Capitalist Peter Thiel "Any new and better way of doing things is technology provided it is properly understood," this definition best fits this study since the technologies considered are geared at doing business in a better, effective and more efficient manner (Thierer, 2014).

- Regulatory Decisions: Due to the overall economic impact of financial institutions to the national economy the central government takes closer interests and very often set up the regulatory bodies to oversee these institutions who in turn create regulatory decisions; in this study Regulatory Decisions also known as regulatory or government affairs is meant to refer to specific policies, decrees, and legislation made by regulatory bodies or agencies whose sole existence is for the regulating, supervising and enforcement of those policies and decrees (Quinn, 2006); in the

context of this study the appropriate regulatory body responsible for regulatory decisions in Thailand's Insurance Industry is the Office of Insurance Commission (OIC).

- Environmental Factors: generally, the factors or elements of environment encompass several disciplines and is not limited to the following: physical, demographics, political, technological, and cultural, etc. the description of environment in this study will be limited to the physical aspect of environment which includes specifically green environment, sustainable environment, and climate change and the role IT plays (Molla & Cooper, 2009). This is all the more necessary given the state of the environment and the numerous efforts aimed at conservation of the globe, based on numerous studies most firms are most concerned with reducing carbon emissions and waste management than other environmental concerns, although they devote more time and resources to social causes (Scholtens, 2011) and endeavor to innovate to the point of creating a sustainable environment (Triguero et al., 2013).

Chapter 2
LITERATURE REVIEW

2.1. Technological Trends in the Insurance Industry

A. Big Data: refers to voluminous and complex data sets which could be structured or unstructured that cannot be processed using traditional means; often these data are what is known as BLOB [Binary Large Objects] which include video, audio, and images. To take advantage of big data more sophisticated data processing applications that run on the cloud or a physical machine is required. Alternatively, Big Data can also be defined using the three v's developed Gartner distinguished VP and analyst Doug Laney In which he described it as "high-volume, high-velocity, and high-variety information assets that demands innovative, and cost-effective forms of processing information for enhanced insights and decision-making." While SAS adds two more dimensions to Doug's definition, Data Variability [the influx of data is never stable, it can be high today and low tomorrow thus the variation] and Data Complexity [in an interconnected world data can come from various sources such as smartphones, sensors, PC, and other smart devices, etc. very often these data seem disconnected but with a big data technology the correlations and linkages can be harnessed]; benefits of harnessing big data includes useful near real-time business insights, observing customer behavior

and personalizing goods or services to them, useful in threat analysis, in the insurance sector it can be used for fraud detection and, calculation Know Your Customer scores, calculation risk portfolios, and predicting preventive maintenance on assets, etc. ("What Is Big Data And Why It Matters", 2015).

B. Blockchain Technology: blockchain was developed initially to spearhead the buying and selling of Bitcoin; the basic concept of blockchain is to create multiple back-ups of a record(s) distributed across several systems which are public but at the same time preventing it from being modified, any time it is updated all copies are updated simultaneously [there is no lockout period to prevent a user from updating a record while another user is trying to update the same record as is the case with traditional Relational Database (RDBMS)]; Don & Alex Tapscott in their 2016 book [Blockchain Revolution] define blockchain as a digital ledger of some sorts that records not only financial transactions but nearly any valuable thing; given core insurance business processes that exists such as Anti-Money Laundering (AML) and Know Your Customer (KYC scores) which currently these processes are being handled manually and skewed to labor-intensive processes but with an adoption of blockchain technology processes and verification can be speed up

significantly (“What Is Blockchain Technology? A Step-by-Step Guide for Beginners”, 2016).

C. Business Process Management Systems: often shortened to BPM or BPMS in the business world, a BPMS is a software that helps to improve end to end business processes by modeling it to aid human-machine interactions and reduce human-caused errors (“Gartner IT Glossary,” 2013). Experts agree on at least five steps to a BPM activity which includes modeling, analyzing, monitoring, managing, optimizing and automation. The importance of a BPM cannot be underestimated, with an efficient BPM, costs can be saved, human-errors minimized, services improved, overall speed improvement; and tasks can be routed to the right person, and Service Level Agreement (SLA) can be adhered to strictly (Rouse & Pratt, 2018).

D. Cloud Computing: is a concept whereby computing transforms into a utility, in which computing becomes rather ubiquitous, with data stored in the cloud and computing services to interact with the data accessible on-demand anywhere and anytime just with an internet connection; a significant benefit of cloud computing to user is elimination of local storage concerns, pricing per usage, location

independent, cost savings from not purchasing software and hardware, and near all-time accessibility; however there remains concerns about data integrity, system outage (Amazon s3 availability event, 2008,"), data security (Krebs, 2009), and data ownership [since data control is effectively transferred to the cloud managing firm] (Wang, Wang, Ren, & Lou, 2010).

E. Knowledge Management Systems: with the world becoming smaller through globalization, more opportunities and markets are available for goods and services from various firms, for firms offering similar products or services this means the competition grows stronger, hence to effectively outdo competitors the utilization of resources particular knowledge of the business processes becomes all the more pertinent; this could go a long way in creating competitive advantage against other firms and a core understanding of how the firm works and areas that require improvement (Handzic et al., 2008). (Huang et al., 2011) Defines KM as a process involving the identification, harnessing, and management of knowledge both individual and collective to enhance the competitive capabilities of a firm. Also, KM can be defined as an IT innovation that is used to store and retrieve useful information [knowledge]; traditionally in the Insurance sector most processes are known only by certain individuals should anything happen to them it does not bode well

for the firm, but with the use of KMS, information can be stored, shared, collaborated upon and be used to train new employees; this ensures that knowledge remains in the firm irrespective of the loss of key persons.

F. Internet of Things: IoT is defined according to Gartner as the "Network of physical Objects that contains embedded technology to communicate or interact with their internal states of the external environment", they predict that by 2020 smart devices in the market hit 7.3 billion units and with the rate of IoT expanding at a much quicker rate over 26 billion devices will be connected within the same time period; within the insurance industry this can lead to improved security, preventive maintenance, and safety in the insurance sector, asset management, areas of adoption in insurance can be smarter homes, fire alarm, flooding, burglary, water leakage, etc. (Gartner, 2013, Bandyopadhyay & Sen, 2011). While not a new technological trend in 2018, it remains an area which is being explored currently; the basic idea behind IoT is the ubiquitous nature of interconnectedness in which we find in devices on or around us, these devices are connected to some form of network and IoT wants to make them talk to each other; while there are security and ethical questions to be asked regarding this technology there are still area where it might be useful, e.g. using a smartphone to control

electricity in the home so as to cut costs, or using a smart meter that only works when it suspects people are within a particular vicinity (Burgess, 2018). (Bandyopadhyay & Sen, 2011) in their research on IoT and the challenges in its standardization observed the significant issues affecting IoT which are human privacy and business confidentiality, in dealing with confidentiality encryption tools can be used to manage and protect data transfer, but the mitigating factor to this view is the speed of encryption when compared to the volume of data, currently encryption is a resource-intensive process thus it is slow, with a faster essential distribution plan this can significantly improve on confidentiality; the other issue being human privacy (location and data) is a lot harder to deal with particularly from a legal and ethical standpoint; for example in some European nations court documents are required to track someone but with IoT anyone can be traced even without a court document, in the wake of current issues such as Facebook-Cambridge Analytica and Russia meddling into the US Election claims are made, the question then arises on data ownership (Cadwalladr, 2018).

G. Machine Learning (ML) and Artificial Intelligence (AI): Machine learning and Artificial intelligence are considered as a subset of Artificial Neural Network (ANNs), generally it is hard to define ANNs, but it can be described as computational tools for modeling complex

real-life issues and attempting to find a solution (Basher & Hajmeer, 2000), the reason for this isn't unconnected to the fact that ANNs was modeled after the human brain (Haykin, 1999). Earlier, big data was touched upon, data is transformed into useful insight by modern statistical tools most of which are derived from artificial neural networks (ANN), machine learning thus is responsible for creating experts system that learns from big data, because of the sheer computational capability of artificial networks it becomes all the more necessary to write specific algorithms to provide the expected outcomes; however it is pertinent to realize that while predictive capacity of ANN's can explain correlation but correlation is not all causation (Obermeyer & Emanuel, 2016). Data Complexity is one of the two dimensions added by SAS to the traditional definition of big data ("What Is Big Data And Why It Matters", 2015), these complexities present a major scientific problem but with the advent and ubiquity of machine learning and artificial intelligence or general Artificial Neural Network these problems are better handled; and the possibilities of its application in the insurance industry are endless such as in risk portfolio management, credit risk classification, asset portfolio management (Bahrammirzaee et al., 2011), calculating credit scores and bankruptcy prediction (Tsai & Wu, 2008). Also, because ANN's is data dependent and learn based on historical data which may or may not be repeated leading to false predictions, a

method for preventing such possible occurrences would be to use a hybrid system that arises from the combination of the strengths of single systems into a mega system, although there is no guarantee of performance due to integration issues, despite these shortcomings ANNs have been proven to perform better than traditional statistical models (Bahrammirzaee, 2010, Bahrammirzaee et al., 2011).

2.2. Independent Variables

A. Management Direction: In an age of rapid digitization, the influence of active management cannot be underestimated, the strategic direction from the Top is essential for technological adoption which in turn drives digitization as emphasized in the book "Leading Digital" by Westerman et al. (Westerman et al. 2014). In the book, they argued that while the bottom-up approach is admirable the only way necessary for real change is from a top-down push which cut across divisions within the firms. Digital transformation is possible with a strong leadership where the leader at the top drive for change (Hee Kwon & Jae Park, 2017).

- Top Management Support: Within the senior management structure, the designated officer to oversee the adoption of technology is the Chief Information Officer, the CIO has knowledge of the existing IT infrastructure and demands, and this places the CIO as the most important person with regards to adopting new technologies. A futurist CIO is particularly keen on more modern technologies that can be deployed to strengthen competitive advantage over competitions while cutting cost and generating revenue (Jha et al. 2016). The chance of adopting technologies largely rests on the keenness of the CIO who in turn can influence other top executives on the release of funds. Adopting new technologies is not an IT

department-only issue; in many cases, it permeates the entire business and can even affect the business cycle or processes (Ben, 2016). However, the crucial aspect of IT-driven business transformation is the effective management of managerial challenges to mitigate potential business failures (Agarwal et al. 2011). In their research (Young & Jordan, 2008) assert that the most crucial factor responsible for the success of a project is management support; and they must be ready to accept any outcome of the project irrespective of the outcome.

- Effective communication with employees on the benefit: As part of adopting technologies, the role of management is to drive change across business units and divisions (Valentine, E. & Stewart, G. 2015). The firm's IT strategy must be connected to the corporate strategy, to be successful at this, the CEO and CIO will need to both understand and distribute the benefits of using IT across the organization. Effective communication with employees can be enhanced by the adoption of transformative leadership techniques by top management (Felfe, J., & Schyns, B., 2004). In communicating with employees, the benefits of the technologies to be adopted it is necessary to explain the roles each employee will play and how it will impact the bigger picture (Durou, Jaoude, & Khalife, 2016). According to a research undertaken by Capgemini that involved interviewing executives across industries on the adoption of digitization, the most recurrent issue was generational gap [younger employees who are tech-savvy and interested in the latest technologies vs. older employees who are less tech-savvy and mostly involved in legacy-manual methods of doing things]; and very often it is hard to determine the best communication strategy to deal with this divide (Bonnet & Ferraris, 2013). As part of communicating the benefit of potential technologies to the

employees, plans must be put in place to improve the IT skills of the employees this should be a commitment of top management across the organization so as to fully maximize the expected benefits and ultimately cultivate sustainable commitment (Iyengar et al., 2015, p. 616; Mao, Liu, Zhang, & Deng, 2016).

- Cost Savings and Competitive Advantage: A profound realization is that firms do not invest in IT to satisfy users or be fast; instead they mostly invest to make profits, making profits which can come from cost savings from adopting technologies is the responsibility of top management rather than the project management team which often move to another project before profits are realized from the investment (Young & Jordan, 2008). In a 2008 paper from (Marchand & Peppard, 2008) they argue that adopting new technologies in itself does not bring the most benefits rather organizational changes in doing business does, and these benefits could range from solving problems, increasing revenue, streamlining business processes improving performance, reacting to competition, and to innovation which aids in achieving a competitive advantages over competing firms through cost reductions (Lu & Ramamurthy, 2011; Mithas, Tafti, Bardhan, & Goh, 2012). However, care must be taken as technologies have become ubiquitous, and even competitors can get them or also imitate the capabilities of others; thus, continually investing in IT can increase costs and reduce competitive advantage (Chae et al., 2014).

B. Regulatory Decisions: in a research conducted by (Haller & Siedschlag, 2011) the speed at which ICT is diffused and adopted is highly dependent on the firms' characteristics and also the closeness

to early ICT adopters most of whom are often the regulatory agencies. In addition, the provision of technology infrastructures such as internet access, multiple payment platforms, and newer technologies can affect the rate of adoption of technologies. The role of regulators is of paramount importance in ensuring the attractiveness of projects to potential investors. Infrastructure cuts across various sectors of the government, across institution, and disciplines, they can serve in multi-capacity, e.g., internet access can be used by private and public consumers; also regulators often think about the impact of infrastructure over the long-term. Furthermore, regulators determine the rules of engagement and also map out plans on how those rules are adhered to which at the end of the day affects service quality. Regulator themselves are often not directly involved in market decisions; however, their primary task is to supervise the implementation of infrastructures that can effectively impact on the adoption of technologies especially when they are coming from an impartial position (Davies, Vammalle, & Jansen, 2016). In Thailand the leading regulatory agency for Insurance is the government-owned Office of Insurance Commission or OIC for short, they are responsible for issuing decrees such as supporting e-payment channels, and the use of e-channels for policy sales and issuance (Chitranukroh, 2017). According to research by (Nasri & Charfeddine, 2012) their research findings showed government support had a profound impact on technology adoption, also there must be unambiguous rules, guidelines and regulations regarding data privacy and security and most importantly to ensure the much-needed infrastructure are in place (Chong, Ooi, Lin, &Tang, 2009).

C. Consumer Behavior: In an increasingly digitized society, customer behavior is also rapidly changing with the rate of change of technology, and this means firms must endeavor to respond to such changes and meet customer preferences (Jantarajaturapath, P. 2011).

There are several theories based off different studies to explore factors influencing the adoption of technologies, some of the models include Technology Acceptance Model (TAM) offered by (Davis, 1989), Theory of Planned Behavior (TPB) by (Ajzen, 1991), and the Theory of Reasoned Action (TRA) first proposed by (Ajzen & Fishbein, 1975); in their works on factors affecting adoption of internet banking in Tunisia, building upon TAM they opined that when end users perceive the service to be useful it indirectly influences their behavior. Furthermore, if end users perceive that government/regulatory body support for technology is high, it tends to increase their likelihood of acceptance. In a similar vein, the quality of internet infrastructure can influence human behavior towards adopting technology (Nasri & Charfeddine, 2012). In an age of cyber warfare and hacking, customers are particularly concerned about privacy and security; and this largely influences their willingness to adopt the new technologies. Generation Y and Millennia's are fortunate to be born into the Information and Communication Technology (ICT) age thus many in this age groups will be computer literate unlike the older generation who are used to manual processes evidently these factors would determine who readily adopt the new technologies (Nasri & Charfeddine, 2012). Besides TAM, TBP and TRA there exists a newer model tagged Technology Task Fit (TTF) which its proponents present as the tendency of a user to adopt a technology if it is perceived to fit the task it is required for, some of its proponents cite the adoption of mobile insurance as a testament to its efficacy (Lee et al., 2007). Financial services companies would need to segregate the markets into various segments to reach appropriate groups based on task fit (Zhou, Lu, & Wang, 2010); alternatively, in improving existing services financial services firms can refer to reviews from users of early technology adopters to enhance their services and increase chances of user adoption (Wiedemann, Haunstetter, & Pousttchi,2008).

According to Zhou et al. customer adoption is mostly dependent on technology fit, perceived benefit, ease of use, and their views on technology.

D. Environmental Factors: There exist enormous pressures from stakeholders, host communities, and government for businesses to engage in business practices that protects the environment in a sustainable manner, previously researchers overlooked the role of IT but of recent there has been increasing focus on the role IT plays in green environment and climate change (Molla & Cooper, 2009). The IT infrastructure of any organization may contribute to carbon release, but when IT is managed this situation can be minimized. While much of IT adoption is focused on economics, currently the environmental impact is also considered (Ridgley 2009); this point is further buttressed by (Chen et al., 2008) in which IT managers are expected to source for technologies that are environmentally friendly and sustainable; pressure can also come from regulatory agencies on maintaining a low level of carbon emission, and incentivize green environment (Cuerva, Triguero-Cano, & Córcoles, 2013).

When accessing environmental factors in regard to influencing the adoption of technologies in the insurance industry, there seems to be no study to that effect; however, there have been studies conducted on the insurance firms and their tendency to engage in some form of Corporate Social Responsibility (CSR). One of the most notable study was by Ben Scholtens who conducted a study involving over 150 insurance firms worldwide on CSR, as part of the findings most insurance firms engaged in CSR particularly as it relates to community outreach and event sponsorship, as for the environment most are concerned with 2 significant aspects, waste management [internal and energy], carbon emissions; in general, they are more committed to social rather than environmental aspects (Scholtens, 2011). At the center of ecological sustainability is Green

Innovation whereby business processes and product are innovative to the point of increasing environmental sustainability levels (Triguero et al., 2013). One of the many benefits of being a socially responsible firm is an indirect increase in profitability, positive perception from the public, and generally favorable performance; the relationship between CSR and the adoption of technology is dual, in the sense that lack of technology can hinder CSR efforts on the other hand CSR can help IT managers decide what technologies to adopt (Olowokudejo, Aduloju, & Oke, 2011).

2.3. Dependent Variable

Adoption of Technology in Insurance Industry

Globalization trends have provided and continue to provide numerous prospects for firms to introduce new and existing products and services to a much wider markets, and this leads to increased competition pool; the key to staying in business and not going the way of Kodak is to adopt disruptive technologies and more importantly outline the expected opportunities (Anthony, 2017, McKinney, 2016). There are undoubtedly limitless potentials in the insurance sector given that it is a sector that is hardly given to change and often very rarely are first adopters of technology, ironically the banking sector which like insurance industry are both housed under the financial sector seems to be eager to adopt technologies at a much faster rate (Huynh. C, 2018). When it comes to adoption of technologies in the insurance sector, there are credible concerns from the management level down to the perceived use and benefits, in her 2016 article Karen outlines 5 factors that are necessary for technological adoption from a technological perspective, these factors

while seemingly basic are crucial issues for the insurance sector and they include Data Management [how will the new system handle the existing data, how will the data be integrated to the potential system], to answer the key questions raise by Data Management the firm has to consider Compatibility [very often the data and processes are run on legacy systems, therefore using a new system the critical question is how compatible is the new system or how can we integrate the new and old system: two possible ways exist to integrate namely via API call or Web services], once the issue of compatibility is being considered another major issue arises which is Complexity [one of the core reasons for adopting technology is to make things easier, if the opposite is the case then the chances of adoption are lower, this concept is particularly one of the reasons why firms are increasingly moving towards low-code platforms (Beckley, 2018)], very often when firms consider adopting or implementing a new technology where cost is to be considered the key determining factor might boil down to support for existing infrastructure, as Karen noted the cost-benefit analysis is done to determine the feasibility of the project, furthermore some firms also consider the reusability or potential for reengineering of the technology in other areas as a key decision factor(Wiltgen, 2016). Besides technological factors there are other factors outlined above, such as customer behavior, it is pertinent that customer wants and needs are satisfied, this position is also held by (Okonta et al., 2013) in which they referred to the known and unknown needs of the customers as "the voice of the customers; in addition (Nwakanma et al., 2013) observed that customer involvement could be crucial to adopting and implementing IT, this perhaps supports the view of (Jantarajaturapath, P. 2011) who advises that firms respond to customer preferences and this can be efficiently done by market segmentation (Zhou, Lu, & Wang, 2010); ultimately customer adoption of a technology is dependent on the perceived benefit, ease of use and their level of familiarity with same or similar technologies. Of all the factors that can influence adoption decision Management is perhaps the most important, this position is strongly held

by (Young & Jordan, 2008), also in support is (Hee Kwon & Jae Park, 2017) who assert that strong leadership is a key determinant for digital transformation; furthermore a key function of management is communication with employees on the expected benefit of the potential technologies, as argued by (Iyengar et al., 2015, p. 616; Mao, Liu, Zhang, & Deng, 2016) top management should endeavor to make plans to improve the skills of the employees to enable them use the technologies and this can be enhanced by clearly communicating the roles of each employees in the new setup (Felfe, J., & Schyns, B., 2004); besides communicating with employees the management team have to consider the financial and competitive advantage to be accrued from adopting these technologies; (Marchand and Peppard, 2018) argued that adopting technologies itself does not bring the benefits rather a change in the organization business does, this ultimately leads to increase revenue accrual, and competitive advantage that arises as a results of cost saving measures (Lu & Ramamurthy, 2011). Adopting technology is also affected by external factors such as regulatory decisions and environmental factors; unlike other factors already discussed which are internal or within the control of insurance firms; the insurance industry is part of the financial sector, the financial sector is one of the sectors that directly impacts the economy of a nation therefore the government has to pay close attention to this industry, to do this they delegate the powers to certain agencies such as central banks, stock exchange commissions, and insurance commissions to oversee, supervise and enforce policies and decrees, while most of these decrees pertains to user privacy and data access in some cases the regulatory agencies can be a driving force in the adoption of newer and improved technology or technical know-how (Chitranukroh, 2017); government regulations could also be in terms green environment and climate change concerns, independently the insurance firms can decide to give back to the community by engaging in Corporate Social Responsibility (CSR) (Scholtens, 2011); furthermore increasingly insurance in the process of adopting a technology would do well to consider green innovation as

opined by Triguero et al(2013), this is based upon the observation of (Molla & Cooper, 2009) who in their work on "Green IT Readiness" argues that IT role in green environment and climate change is increasing, their point is further underscored by Ridgley(2009) who argues that while much of IT adoption is geared towards the economics and financial aspect, there is an increasing consideration for its economic impact.

In summary, while there are multiple factors that influences the adoption of technologies in the insurance industry, based on reviews from other literatures the following factors feature prominently effective and transformational leadership (Hee Kwon & Jae Park, 2017), user or client behavior consideration (Nasri & Charfeddine, 2012), Employee communication and training (Al-Azri, Al-Salti, & Al-Karaghouli, 2010), top management support and strategic guidance (Westerman et al., 2014, Al-Azri, Al-Salti, & Al-Karaghouli, 2010), and most importantly adopting technologies that address specific wants and needs then changing the business processes if necessary to gain competitive advantage (Mithas et al., 2012); however the adopting technology is not a panacea since others can get the same technology which in turn reduces the competitive advantage over competitors hence management must run a cost-benefit analysis prior to making the final decision (Chae et al., 2015).

Chapter 3

RESEARCH METHODOLOGY

3.1. Research Design

To address the research questions, this study opted to get inputs from top management executives in the selected insurance firm heading various departments ranging from business innovation, business process redesign, to IT; the research data will be gotten via a qualitative research method. The purpose of this selection is primarily because senior executives are in a better position to comment on and give credible and useful information on the importance of technology to their firm being experts (Paré et al., 2013); also, these senior executives are often tasked with issuing orders on the adoption of a new technology, and most importantly they are responsible for communicating these changes to their employees, managing the adoption of these technologies by the perceived end-users and providing the benefits of such systems to the firm in the long run (Wiltgen, 2016) and ultimately are best equipped to answer questions regarding insurance technologies since specific pieces of information are considered sensitive due to the nature of the financial industry. The period of data collection via an interview with the principal persons at the Insurance firm was done within the 3rd and 4th quarter of 2018. Face to Face interview was selected over Delphi or other techniques because of scheduling constraints (chances of discussing with experts more than once is limited), also the quality of data is more productive, more factual information can be gotten, increased response rate, capturing of non-verbal cues (to determine the level of comfort the interviewee has with the questions being asked and responding appropriately), and capturing of emotional state (DeFranzo, 2014; Oltmann, 2016).

3.2. Population and Sample Size

This research is based on qualitative research methodology therefore the selection was limited to key experts in the named insurance firm; unlike quantitative studies the number of respondents for a qualitative often ranges from 1 to 30 (Fridlund & Hildingh, 2000), however, the actual sample size should be gotten based on wealth of experience and information with regards to the research question (Krippendorff, 2004; Patton, 2002) and as noted by Bengtsson (2016) there are no specific criteria required to arrive at the sample size required for a qualitative analysis, nor is there limitation on the volume of information to be gotten, or the number of respondents; these factors depends entirely on the researcher(s).

The total population size was 8, and the sample size set 5. The five (5) experts were chosen based on the suggestion of a top executive at the insurance firm, and they were interviewed face to face by the researcher.

3.3. Interview Guideline

The following interview questions were developed as part of the study on the adoption of technologies by insurance firms, and the interviews were conducted with five respondents.

1. Management Support
    - How does Management Strategy affect the adoption of technology?
    - What is the role of 2nd Management Support on top management decision?
    - How does the Cost-Benefit Analysis factor into the adoption of technologies?
    - How do you deal with InsurTech threats?
    - How does top management plan to convince employees to adopt technologies?
2. Customer Behavior
    - Do you think customer behavior has an effect on the adoption of technology? If yes how?
3. Technological Infrastructure Availability
    - Are there possible infrastructural barriers that can affect the adoption of technology? If yes in what ways.
4. Government or Regulators Policies
    - What role does government or regulators policies play in adopting newer technologies?
    - Are Cryptocurrencies currently being accepted as a form of payment? If no, why?
5. Environmental Concerns

- Do Environmental Concerns affect the adoption of technologies?
- What kind of Corporate Social Responsibility has your firm engaged in?

6. Technologies

- What role is Blockchain expected to play if adopted?
- From the technologies mentioned, is there any not currently being implemented by your firm? If yes, which and why?
- How can Big Data adoption aid the insurance process?
- What are the core Insurance Business Process in order of priority?
- What future does Artificial Intelligence and IoT hold for insurance?
- What are your thoughts on Robotics in the insurance industry?

3.4. Data Collection Methods

In this study, data were collected via face to face interview with the use of already prepared semi-structured questions, the experts were asked questions based on the conceptual framework, interviews are considered the premier data collection method in quantitative research (Doody & Noonan, 2013), as part of data collection methods notes were taken to supplement audio recording, however (Knox and Burkard, 2009) argued that note taking could be distracting to the interviewee. The questions were semi-structured albeit strictly focused on the conceptual framework and research questions; during the discussion, some insights were exposed to the researcher and subsequently the research was updated to reflect those newer insights which can prove beneficial for future research. The purpose for deploying the semi-structured research was primarily to allow for free flow of information and useful opinions through the use of open-ended questions, this process allows for newer concepts to be introduced while shedding significant insights on the topics since the interviewees are industry experts (Cohen & Crabtree, 2006).

3.5. Data Analysis Techniques

The data analysis techniques deployed for this research was content analysis, this was done without the use of content analysis computer packages, for researches involving qualitative analysis there are several analytical methods available to the researcher(s), as noted by Burnard (1995), these methods include but are not limited to the following ethnography, phenomenology, content analysis, hermeneutics, and grounded theory. However, of the methods available to the researcher only content analysis has an openness to it, since there are fewer rules to abide by; the beauty of the method is that the researchers are not limited when compared to other qualitative methods that have stricter rules and do not allow for the use of quantitative analytic methods which is permissible in content analysis (Long & Johnson 2000). Furthermore there exists varying definition of qualitative content analysis, however, the most preferred definition is the one by Krippendorff (2004) in which it was defined as "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use", substantially limiting the interpretation of the verbal, visual or written data to the context in which they occur (Downe-Wambolt, 1992).

Chapter 4

DATA ANALYSIS AND FINDINGS

Research Objectives Revisited

This research aims to lay down a framework for the adoption of technologies by traditional insurance firms to support existing business processes currently handled manually; as part of the statement of the problem this research pointed out some of the problems not limited to increased costs of doing business including employing thousands of staffs to handle processes that otherwise could be handled with technology, and increased use of paper leading to a more toxic environment. Staying true to the research objectives which summarily is intended to identify technological trends applicable to the insurance industry, also to discuss factors that could hamper the adoption of these technology trends and finally explore areas for the implementation of these technologies and future technologies. As part of making the findings and analysis comprehensible, the findings are subdivided into various sections each linked to the conceptual framework and research questions.

4.1. Management Strategy and Technological Adoption

One of the questions posed by the researcher was factors that affect the adoption of technology, and this was further broken down into several sub-factors such as management strategy, customer behavior, and employee readiness.

To understand those factors we posed a general question to the interviews rather than break it down into those sub-factors, we relied on them to give us a broader view, of the five(5) executives interviewed three(3) believed Management Strategy plays a more prominent role than Customer Behavior which the remaining two(2) believed; furthermore, a follow-up question was posed regarding the role of Employee in technological adoption to with all interviewees responded that while this might be an issue for some firms it would not be an issue within their firm mainly because the CEO of the firm is tech-savvy and continuously pushes for digital innovation and this attitude has a domino effect on the other staffs. When trying to understand why and how Management Strategy affects the adoption of technology an example was provided, the example given used the Thai Government and its Digital 4.0 vision as a roadmap to digitization, when the government announced the initiative, other departments took cue and begun to reform with most moving from a paper-driven process to computer-driven processes.

The results showed that once Management Strategy was set, this acts as a catalyst for technological adoption this finding tally rightfully with Agarwal et al. 2011 which assert that effective management in IT-driven business transformation is crucial to the success of a business. The implication of this study reveals that more attention should be paid to the management strategy or support for IT projects as that is a major if not the primary determinant for success or failure.

4.2. Customer Behavior and Technological Adoption

An often overlooked area in businesses today, in economics one of the earlier adages for capitalism used to be "Customer is King", that however seems not to hold true for capitalist firms who are beholden to their investors first; before their customers, unfortunately, firms are learning the hard way to put customer satisfaction first and what better way to understand customer satisfaction than first having to understand their behavior to credibly predict their wants and possibly needs. Satisfied customers are keys to market success and provide a competitive advantage (Lou & Hombourg. 2007), customers being the source of revenue to the firms, therefore, customer satisfaction ranks high on the priority listing, in a data-driven age this aspect of business is best studied through the big data analysis of behavioral trends. In a study conducted by Stock et al. 2013, the results showed that a direct study of customer behavior can be helpful, an example of direct customer behavior is customer feedback, this encourages the customers to submit their thought about a product or service, and these thoughts are further turned into actionable insights.

4.3. Technological Trends and the Insurance Industry

In the financial sector the insurance industry very often is highly resistant to change, fortunately in a fast-moving world the time to play catch-up is little and with threats from InsurTech, legacy insurance firms are very open to adopting these technologies, chief amongst them is business process management, blockchain, cloud computing and big data analytics. While the interviewees acknowledged the numerous benefits inherent in the adoption of blockchain technology, there seems to be no concrete plan to neither adopt nor implement the technology yet, one of them placed that decision squarely at the foot of customers, the idea was if customers show interest then the insurance firm would have no reason not to implement it. Another beneficial but sparsely used technology is the Knowledge Management System (KMS), while the firm admitted they have and operate a KMS; some interviewees admitted it was being underutilized. In insurance the core business processes are Claims, Underwriting and Sales, all the technologies listed above have a role to play in these processes, particularly big data analytics and blockchain.

With Artificial Intelligence and Robotics growing in leaps and bounds, it comes as no surprise to tech watchers of the almost limitless applications it can be put to, even for an industry resistant to change as the insurance industry they still see a potential use of AI, one of the areas suggested by an interviewee was in house or location scouting and survey, drones could be guided for survey over humans physically scouting the area, alternatively AI could be involved in the processing to intelligently offer advice similar to what IBM Watson (IBM Corp. 2018) currently does. On robotics, while Asians particularly the Japanese are known for their groundbreaking research in Robotics the effects, however, is not felt in South East Asia and its environs, the opinions of the interviewees was that at this point in time there appears to be no real need for implementing robotics, furthermore, it was revealed that a team dedicated to exploring new technologies for a possible future implementation.

4.4. Government and the adoption of Technology

Under Thai law, all insurance firms irrespective of their categorization [Life or Non-Life] fall under the auspices of the Office of Insurance Commission [OIC], the OIC for a better part closely follows the lead of the Bank of Thailand [BOT] with regards to adopting and implementing technologies this, therefore, means a domino effect is observed in individual insurance firms, in plain words what this means is “OIC Leads and Insurance Firms follow”.

4.5. Environmental Concerns and Technological Adoption

Given the ubiquity nature of environmental issues such as climate change, pollution, and greenhouse gas emission, these issues have generated and continue to generate lots of controversy particularly within the business sector which is bound to face the most regulation (Enkvist, P., Nauclér, T., & Rosander, J, 2007). Fortunately, the insurance sector deals primarily in the service industry, unlike those in the products industry, however, like the study referenced few lines up; all firms across industries will be impacted, interestingly as the interview went on, it became evident that environmental concerns played no significant factor in the adoption of technologies, although the insurance in this case study are heavily involved in Corporate Social Responsibility (CSR). A cursory visit to the headquarter in Bangkok several awards are showcased including awards for CSR efforts and promoting greener societies. As noted by one of the interviewees every year the firm wins an award for their Corporate Social Responsibility efforts and commitment to a cleaner society.

4.6. Examination of the Research Hypotheses

In the introductory chapter of this research paper under the research hypothesis subheading, five hypotheses were brought out, having analyzed the information providing by the interviewers this research proceeds to offer a stance on each hypothesis.

4.6.1. The first hypothesis is that Management Decisions can positively influence the adoption of technology. This claim is based on the hierarchical nature of management especially in Thailand where seniority is strictly observed, and management is centralized.

From the research analysis and findings this research indeed confirms this fact, nowhere is this effect felt than in a place with centralized management system, since the decision is a top-down, waterfall model it stands to reason that the management is primarily responsible for influencing the adoption of technology, and this decision is further communicated to the employees on the lower rung of the firm who in turn see to it that the project is successful. Also, of worthy note is the style of leadership employed by the top management as asserted by (Jonathan., M & Vissanu Z, 2012), the leadership style does indeed have a significant impact on the overall firms' effectiveness of which implementing the adoption of technologies would fall into.

A counter-hypothesis would be that in a decentralized management society the effect of top management decisions would not be felt as strongly compared to its centralized counterpart.

4.6.2. The second hypothesis claims that Regulatory Decisions can influence the adoption of technology. While the study findings do not conclusively state that regulatory decisions from regulatory bodies such as the OIC does indeed directly impact on individual insurance firms adopting any technologies, it however, strongly opines that due to the domino effect the moves by the regulator bodies indirectly push these firms to adopt these newer technologies, although when it comes to privacy and security the regulatory bodies holds sway and can set rules on what technologies are acceptable or not.

Countering this hypothesis would be the view that individual insurance firms are free to adopt whatever technologies they find beneficial to their businesses, while this claim is

technically correct, it, however, fails to take into cognizance the fact that the OIC is empowered by law to goad insurance firms into adopting specific technologies.

4.6.3. The third hypothesis states that Environmental Factors might influence technology adoption. Of all the hypotheses in this study this was the only one to be rejected outrightly, although the insurance firm in this case study engages in certain activities to promotes a greener society it does, however, believes their technologies currently or to be implemented in the future have little negative impact on the environment; therefore, it is not a significant factor in the decision to adopt newer technologies. In fairness fair, this finding is restricted to this specific study; therefore, the possibility of it not being applicable to other insurance firms exists.

As a counter to this hypothesis, it could be argued that since environmental issues is a collective effort, therefore all firms should show concern; furthermore, the solution would require firms to pay close attention to technologies and machinery to be adopted and or implemented.

4.6.4. The fourth and penultimate hypothesis claims that Certain Technological Trends can influence the type of technologies to be adopted. In a highly competitive industry as the financial sector, the importance of adopting technologies cannot be overstated, however, in an age where new technologies are introduced in droves utmost care must be taken when deciding what technologies to adopt. As this research findings show, this hypothesis goes both ways, but ultimately the final decision centers on the relevance of the technology to the core insurance business process such as underwriting and claims processing.

The counter-hypothesis would be the adoption of technology trends because it is what is in the now, this strategy is problematic in that, not all technology trends apply to the financial sector thus investing in them amounts to a colossal waste of fund that could be put into better use in other business areas.

4.6.5. The fifth and ultimate hypothesis hypothesizes that Customer Behavior can influence the type of technologies to be adopted. This factor besides management factor is the next

most important factor to be considered, an example is the ubiquitous adoption of LINE (a PC and Mobile messaging application) by majority firms in Thailand as a social medium to reach directly to customers, while these firms do not exactly need the application, they are forced to adopt it due to the behavior of their customers most of whom use the application. In similar disposition customer behavior can affect these decisions, granted the final decision mostly is dependent on top management decision and the cost-benefit analysis, if the expected benefit outweighs the cost, then the adoption of the technology is given the green light.

The counter-hypothesis posits that while customer behavior can and do actually influence the adoption of technologies it is not as important when compared to other factors, this position, however, is met with significant difficulties, namely the ignoring of customers behavior in a highly competitive industry such as insurance where Non-Life Insurance sector far outnumbers the firms in Life Insurance with a ratio of 3:1 is an indirect means of telling them to move to the competitor.

4.7. Data Analysis Findings Conclusion and Summary.

The basic underlying of this chapter was to scrutinize factors that influence the implementation of technologies in the insurance sector using Thanachart Insurance as a Case Study; furthermore, the five hypotheses were raised, and counter-hypotheses offered as a means of comparison and contrast. After the analysis, these hypotheses were answered; the findings are summarized below.

These findings conclusively proved that management decision, management styles, customer behavior, and regulatory decisions do indeed influence the adoption of technologies, while regulatory decisions do not directly influence the decision; regulatory bodies still play a crucial role; and finally, environmental concerns appear to play no significant influential factor.

The next and final chapter will offer a full summary of the findings, to be discussed in detail are the limitations to the study, and most importantly recommendations for upcoming research, this study being probably the first of its kind will act as the base for further researches.

4.8. Summary Findings from Respondents.

Summary Interview Questions	Interviewee A	Interviewee B	Interviewee C	Interviewee D	Interviewee E
Management					
How does Management Strategy affect the adoption of technology?	IT Vision	Customers Satisfaction drives their decisions.	Transformational Leadership	C-Level management affinity for IT	Customer Behavior drives the actions of top management
What is the effect of Cost-Benefit Analysis to the adoption of technologies?	Important but if the benefit is substantial, the cost is irrelevant	Benefit outweighs cost	Provided the ROI outweighs the investment it is worth it	Benefit outweighs cost	Profit over Loss
Dealing with InsurTech threats.	Partner with them	Partner with them	Learn from them	Partner with them	Collaboration
Role of the employee in the adoption of technologies	• Depends on how Top-Management communicates the benefits to them • Willingness to embrace change	• Could be a problem as most employees are old and used to manual processes • Resistant to change.	Top Management can create a communique to encourage employees to be open-minded	Employees follow the rules laid down by top management.	Management Strategy out rules employees
Customer Behavior					
Does Customer Behavior have any effect on the adoption of new technologies?	No	Yes	Not necessarily	Not to a high degree	Yes
If Yes! How?		Their behavior influences the decision of top			Customer Behavior is analyzed, and the use of specific technologies helps in planning

		management to adopt technologies.			
If No! Why?	Customer follow the firms' direction		While customer behavior can influence a specific decision, it does not at the high-level	Customer Behavior is considered only as a side factor	
Technological Infrastructure Availability					
Can the unavailability of certain technological infrastructure influence the adoption of technologies?	No	No	No	No	No
If Yes! How?					
If No! Why?	IT Team must follow tech trends if they aim to stay relevant	• If the benefit is anticipated then the infrastructure will be provided. • In some case when the infrastructure is unavailable, it can be	The firm tries to stay with the times, by using up to date infrastructure or providing support for integrating new systems to the existing system.		

		outsourced.			
Government or Regulators Policies					
What role does government or regulators policies play in adopting newer technologies?	IOC drives firms' to be innovative and adopt newer technologies	IOC is fully in support of firms' adopting newer technologies.	The firm tries as much as possible to abide by IOC regulations	The IOC provides guidelines for the insurance industry to adopt	The BOT and IOC acts as influencers for insurance firms
Environmental Concerns					
Do Environmental Concerns affect the adoption of technologies?	Yes; the firm prides itself as a Green Firm.	No; service firm does not have any direct impact on the environment	Not directly since insurance firms do not provide any product	No; service firm does not have any direct impact on the environment	Insurance is a service industry; therefore, environmental concerns rank low but not irrelevant
Corporate Social Responsibility	Involved in several CSR Projects within the kingdom of Thailand	The firm engages in CSR Projects around Thailand	Involved in several CSR Projects in Northern Thailand	Involved in several CSR Projects by giving to the monks and visiting temples	Involved in several CSR Projects within the kingdom of Thailand

Technologies					
What technologies are currently being implemented?	Business Process Management, Big Data, Knowledge Management Systems.	Business Process Management, Big Data, Knowledge Management Systems.	Knowledge Management System and Business Process Management	Big Data Analytics, Mobile Applications, Digitization, BPM	Business Process Management, Big Data Analytics, Cloud Computing.
Will Blockchain be implemented soon?	Not in the near future; the technology is relatively new and being studied.	No. Unless the need arises based on changes in customer behavior.	Not at the moment.	This depends mostly on the need.	Not at the moment, should customer behavior indicate the need for this, the firm will decide.
If Yes! In what way will it assist the existing processes?					
How can Big Data adoption aid the insurance process?	In the Claims and Underwriting processes	Sales, Claims and Underwriting Processes.	In the core processes of the insurance industry	Sales, Claims, and Underwriting Processes.	Underwriting and Claims.
What future does Artificial Intelligence and IoT hold for insurance?	• AI in studying customer behavior and complex analytics; • Not looking into IOT for now.	• AI can be used for analytics. • IOT Benefit is currently unknown.	AI will be deployed in data processing since insurance deals heavily on complex data.	Big Data Analytics and data processing	Data Analysis and regarding IOT currently there is no use for this technology yet.

What are your thoughts on Robotics in the insurance industry	Drone Aerial Survey	Drone Aerial Surveillance for Accidents.	The Insurance industry has little use for robotics at the moment	Robotics works well for other industries, very little use in the financial sector	Unmanned drones can be used for scanning and taking pictures of landmass or accident location.

Chapter 5

RECOMMENDATION AND CONCLUSION

This case study sought to understand selected factors that might affect the adoption of technology in the insurance sector, so far this study has proved that certain factors indeed play an essential role in the eventual adoption of selected technologies, also exposed was the critical role management styles plays. To buttress and shed light on the case study five hypotheses were examined alongside antithesis which could serve as a building block for future research. One of the hypotheses examined the role of management, and it was believed that the role of management would have a positive influence; the results supported this hypothesis like most of the hypotheses, although the result indicated non-support for the third hypothesis regarding Environmental Factors influencing technology adoption.

The insurance sector represents a vital arm of the financial industry, as this research earlier espoused the sector is strategically divided into Life, and Non-Life Insurance, the insurance firm in this case study is a significant play in the Non-Life insurance sphere. This study further highlights the indisputable role management plays; leadership styles and in particular transformative leadership techniques which greatly aids effective communication from employers to employees (Felfe, J., & Schyns, B., 2004). Of worthy note is the revelation that employees play little to no role in the adoption of these technologies; instead, they carry out tasks as assigned by management. In the significance of the research, it was opined that a principal aim of the study was to lay a groundwork for upcoming studies and even as a guide for legacy firms on imperatives to ensure the successful adoption of technology, the results in the study provides a positive outlook for those firms seeking to adopt it. Customer behavior no doubt is a crucial issue for businesses worldwide, it could be argued that big data as a concept was developed specifically to address this issue, e-commerce firms take advantage of customer behavior through the use of big data analytics to analyze and offer personalized products or services best believed to suit that particular customer; against the initial presupposition of this study the results indicated a deviation towards a slight disagreement on the role of customer behavior in the eventual adoption of technology, this position can be used in future researches. Despite the global focus on the environment, this study conclusively did not accept the third hypothesis on the role of environmental factors. On the other hand, the second hypothesis regulatory decision was partially supported, while the fourth hypothesis on technological trends was supported.

5.1. Recommendations

A realistic inference based on the result of this study would be for managers to adopt a transformative leadership style, the role leaders play in the success or failure of a project is crucial as Agarwal et al. 2011 inferred the effective management plays a crucial role in mitigating the failure of a project; in a similar line of thought, Iyengar et al. 2015 asserts in terms of communicating the potential benefit of technologies to employees this task rests squarely in the palms of the management.

Another crucial recommendation gotten from the result of this study is the view espoused by one of the interviewees, the suggestion was for firms to consider the cost-benefit analysis before embarking on the implementation of new technology and only when the benefit far outweighs the cost should the project be greenlighted. In a 2017 study by Ivanov and Webster on the cost-benefit analysis of technological adoption, these costs might include installation costs; upgrade costs, implementation costs, maintenance costs, procurement costs, staff training costs, specialist hiring costs, etc. Alternatively, future research could be done solely on how these costs can influence the adoption of technology by a firm.

In addition to the aforementioned recommendations, while the results from the study indicated that Employee Readiness was not considered in the adoption of technologies, this research suggests that having employees input on technological adoption might be a step in the right direction since it would appear to be a form of motivation (Walden & Hoffman, 2007), very often employees are hesitant to accepting change primarily due to fear of loss of control (Benlian & Hess, 2011), thus having them as part of the process quells such fears.

Finally, the last recommendation would be the non-financial factors that could influence the adoption of relevant technologies; these factors would serve well for future researches, and these factors include but are not limited to organizational culture, the complexity of the technology, customer readiness in using the new technology.

5.1.1. Recommendations for Top Management

Top Management should take a more strategic role in defining and laying down the ground rules for technological adoption, in a digital age must be a long-term commitment to process digitization and overall use of Information Technology tools to streamline, optimize, and maximize business processes. More importantly, these strategic policies must translate financial benefits to the stakeholders.

5.1.2. Recommendations for Middle Management

Middle management play an important role in communication channels between operational managers and top management; therefore, they must be equipped with the relevant information required for the operational managers and ensure credible feedback to top management; they also must communicate the long-term benefits to the operational management.

5.1.3. Recommendations for Operational Management

In terms of operations management, traditionally this level of management is believed to apply only to firm's production goods which would require some level of operations, within the service industry particularly the financial sector the prerogative of operations management would be the managing of the workforce, part of this task includes communicating the benefit of the technologies being adopted both economically as well as wellness such as less tasks to manage etc. In addition, given that operation managers deal directly with floor workers, this means they have direct feedback from the end user, and to ensure employees align with the strategic vision of the firm the operation management is responsible for organizing programs, suggesting better remuneration packages and encouraging a feedback culture irrespective of its negativity. Alternatively, they could allow the employees to suggest useful technologies to be adopted by the firm, and this helps in making the employees feel welcomed and needed.

5.1.4. Recommendations for the Financial Sector at Large

While this study was strictly limited to the insurance sector and a specific firm, the findings could very well apply to other industries but for the sake of brevity and the family to which the insurance sector falls in; this recommendation would be limited to the financial sector. The recommendation is that all level of management show a long-term commitment to the use of technologies to improve business processes, a decentralized structure be set up to allow for employees to gain more responsibilities and more experience in how these technologies affect them and the business at large, a culture of learning should be encouraged amongst the employees, if possible workshops be set up to transfer knowledge, these classes could be handled by the employees themselves. As an imperative for top management is to show transformational leadership skills in order to positively impact others below them in the hierarchy; and finally, always get feedback from the end users or customers before making a final decision, while this study showed that

customer inputs were not really considered; it would be highly rewarding if this factor is taking into proper consideration as the case may require.

5.2. Limitations of the Study

As is the case with most studies, this study also has its limitations, for the sake of clarity the limitations are subdivided into three distinct parts.

The principal limitation is the language barrier; this study was conducted in English while the Insurance firm in the case study is a Thai organization, although the interviews were conducted exclusively in English; the possibility of words, phrases or sentences being misunderstood exists. Thus, it is befitting for future researches to consider dual languages to accurately capture the thoughts, responses, and opinions of their respondents.

The next limitation is interview scheduling, respondents chosen for this research were high-level players most of whom held the Vice President's title hence it was hard booking an interview spot, in some cases as many as two interviews were held on the same day with different interviewees all to avoid having to reschedule forever. To avoid this scenario repeating itself, it might be necessary to form an alliance with the personal assistant or secretaries of the interviewees to make scheduling a meet a less herculean task.

The third and final limitation bothers on information provided, as part of the interview process specific questions were left unanswered by the interviewees on purpose, the reason given was that specific information were in a sense "classified" or could not be provided for privacy reasons. A future researcher could do well to find out what questions are considered private and those that are not, the purpose of this exercise is to aid in the preparation of the questionnaire to be used [Structured or Semi-Structured] which in turn means the responses would be more productive.

Summarily, this study proves that more researches in the insurance industry in Thailand are warranted, and significant focus should be on technology and customer behavior. With the government of Thailand touting and pushing for Thailand 4.0 (Languepin, 2016) and a digital economy this presents a wholesome opportunity for researchers. Alternatively, researchers can use the different hypotheses presented in this study as the antithesis as the basis of their research.

5.3. Conclusion

This paper believed to be a pioneer study in this field scrutinized the various factors influencing the adoption of technology in insurance firms; using Thanachart Insurance as a case study; as a probable pioneer study, this paper bridges a vital information gap in this field of study. It points out albeit briefly the benefits that accrue with adoption technology these benefits are not limited to cost savings, time-saving, and more streamlined processes with a high degree of accuracy. Besides those benefits, the crux of the study borders on factors such as customer behavior, management strategy, technological trends, regulatory decisions, and environmental factors, etc. and how they influence the adoption of technology, all the factors aforementioned are crucial in the final decision, however, as noted earlier some other factors were not considered within the scope of this study, all in unison are to be considered by the management team before opting for new technologies. Of utmost concern would be management strategy and customer behavior, it is possible for a mismatch between customer expectations and firms offering based on a wrong analysis of customer behavior thus the imperative inherent in grasping a good understanding of the customer; with regards to management, they play a crucial role both in shaping the future of the firm and communicating the profits of implementing such technologies; as several studies assert the management is ultimately responsible for the outcome of a project. Future research might need to study the effect of various types of costs on the adoption of technology in the financial sector, of extreme importance for future research would be a study on specific technologies and the benefits they might provide to the firms when incorporated into their existing setup.

In conclusion, this study acts as an icebreaker of sorts, the limits to the benefits of technologies to business are mostly dependent on the implementation and usage, adoption is just one part of the puzzle, adoption on its own provides no benefit to the firm, only actual implementation does. However, despite the need for more technologies either to make work more comfortable, or cut costs, or optimize processes one thing remains which is the environment, concern must be shown for the environment and technologies adopted should support a cleaner environment and efforts at giving back to the community goes a long way in connecting to the customer; and last but not the least concern for employee, with the rate at which Artificial Intelligence (AI) grows in leaps and bounds it comes as no surprise that many non-technical employees would be laid off, however, there still needs to be human factor at play, investing in these employees by empowering them with the knowledge required to use these technologies goes a long way in determining the ultimate success or failure of the project for which those technologies were adopted.

REFERENCES

Abey, F. (2010). *Definition of Management by Eminent Authors*. Retrieved from https://www.mbaknol.com/management-concepts/definition-of-management-by-eminent-authors/

Agarwal, R., Johnson, S. L., and Lucas, H. C. (2011). "Leadership in the Face of Technological Discontinuities: The Transformation of EarthColor," *Communications of the Association for Information Systems* (29:1), pp. 627-645.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11–39).

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.

Akrani, G. (2011). *What Is Management? Definitions Meaning and Features.* Retrieved from http://kalyan-city.blogspot.com/2011/04/what-is-management-definitions-meaning.html

Al-Azri, A., Al-Salti, Z., & Al-Karaghouli, W. (2010). The successful implementation of e-government transformation: A case study in Oman.

Amazon.com, "Amazon s3 availability event: (2008)," Online at http://status.aws.amazon.com/s3-20080720.html

Anthony, S. (2017). *Kodak's Downfall Wasn't About Technology*. Retrieved from https://hbr.org/2016/07/kodaks-downfall-wasnt-about-technology

Bahrammirzaee, A. (2010). A comparative survey of artificial intelligence applications in finance: Artificial neural networks, expert system and hybrid intelligent systems. Neural Computing & Applications, 19(8), 1165-1195. https://doi.org/10.1007/s00521-010-0362-z

Bahrammirzaee, A., Ghatari, A. R., Ahmadi, P., & Madani, K. (2011). Hybrid credit ranking intelligent system using expert system and artificial neural networks, 34(1), 28-46. https://doi.org/10.1007/s10489-009-0177-8

Bandyopadhyay, D., & Sen, J. (2011). Internet of Things: Applications and Challenges in Technology and Standardization, 58(1), 49-69. https://doi.org/10.1007/s11277-011-0288-5

Basheer IA, Hajmeer M (2000). *Artificial neural networks: fundamentals, computing, design, and application*. J Microbiol Methods 43:3–31

Beckley, M. (2018). *What the Rise of Low-Code Means for CIOs*. Retrieved from https://www.forbes.com/sites/forbestechcouncil/2018/06/06/what-the-rise-of-low-code-means-for-cios/#56dadac0c865

Ben, R. (2016). *5 Factors Driving Digital Transformation - Information Age*. Retrieved from https://www.information-age.com/5-factors-driving-digital-transformation-123463707/

Bengtsson, Mariette. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, 2, 8-14. https://doi:10.1016/j.npls.2016.01.001

Benlian, A., & Hess, T. (2011). Opportunities and risks of software-as-a-service: *Findings from a survey of IT executives. Decision Support Systems*, 52(1), 232–246

Bonnet, D., & Ferraris, P. (2013). Being Digital: *Engaging the Organization to Accelerate Digital Transformation*. Retrieved from https://www.capgemini.com/wp-content/uploads/2017/07/being_digital_engaging_the_organization_to_accelerate_digital_transformation.pdf

Braunwarth, K. S., Kaiser, M., & Müller, A. L. (2010). Economic evaluation and optimization of the degree of automation in insurance *processes*. *Business & Information Systems Engineering*, 2(1), 29-39. https://doi.org/10.1007/s12599-009-0088-6

Burnard, P. (1995). Interpreting text: an alternative to some current forms of textual analysis in qualitative research. *Social Sciences in Health*, 1, 236–245.

Burgess, M. (2018). *What Is The Internet Of Things? WIRED Explains*. Retrieved from http://www.wired.co.uk/article/internet-of-things-what-is-explained-iot

Business Process Management - BPM - Gartner IT Glossary. (2013). Retrieved from https://www.gartner.com/it-glossary/business-process-management-bpm

Cadwalladr, C. (2018). *Revealed: 50 Million Facebook Profiles Harvested For Cambridge Analytica In Major Data Breach*. Retrieved from https://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election

Chae, H., Koh, C. E., & Prybutok, V. R. (2014). Information technology capability and firm performance: contradictory findings and their possible causes. *MIS Quarterly*, 38, 305–326.

Chitranukroh, A. (2017). *Technological Disruptions in the Insurance Industry*. Retrieved from https://www.tilleke.com/resources/technological-disruptions-insurance-industry

Chitranukroh, A. (Nop). (2017). *Thailand: E-Insurance Regulations Issued – Effective August 2017*. Retrieved from https://www.tilleke.com/resources/thailand-e-insurance-regulations-issued-%E2%80%93-effective-august-2017

Chong, A. Y. L., Ooi, K. B., Lin, B., & Tang, S. Y. (2009). Influence of interorganizational relationships on SMEs' e-business adoption. I*nternet Research*, 19(3),

Chudasri, D. (2018). *OIC to insurers: Get ready for new rules*. Retrieved from https://www.bangkokpost.com/business/news/1441606/oic-to-insurers-get-ready-for-new-rules

Cohen D, Crabtree B (2006). *Qualitative Research Guidelines Project.* Retrieved from http://www.qualres.org/HomeSemi-3629.html

Coombs, C. R. (2015). When planned IS/IT project benefits are not realized: a study of inhibitors and facilitators to benefits realization, 33(2), 363-379. https://doi.org/10.1016/j.ijproman.2014.06.012

Cuerva, M. C., Triguero-Cano, Ángela, & Córcoles, D. (2013). Drivers of green and non-green innovation: empirical evidence in Low-Tech SMEs, 68, 104-113. https://doi.org/10.1016/j.jclepro.2013.10.049

Davies, A., Vammalle, C., & Jansen, J. (2016). *The OECD framework for the governance of infrastructure*. Retrieved from http://www.oecd.org/gov/getting-infrastructure-right.pdf

DeFranzo, S. E. (2014). *Advantages and Disadvantages of Face-to-Face Data Collection*. Retrieved from https://www.snapsurveys.com/blog/advantages-disadvantages-facetoface-data-collection/

Doody, Owen & Noonan, Maria (2013). Preparing and conducting interviews to collect data. *Nurse Researcher*, 20(5), 28-32.

Downe-Wambolt, B. (1992). Content analysis: method, applications and issues. *Health Care for Women International*, 13, 313–321.

Dudovskiy, J. (2013). *Consumer Buyer Behavior Definition - Research Methodology*. Retrieved from https://research-methodology.net/consumer-buyer-behaviour-definition/

Durou, E., Jaoude, J. A., & Khalife, R. (2016). *The changing role of people management in the digital age*. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/xe/Documents/human-capital/dme_hc_changing_role_of_people_management_in_the_digital_era.pdf

Dvir, T., Eden, D., Avolio, B. J., and Shamir, B., (2002), "Impact of transformational leadership on follower development and performance: A field experiment," *Academy of management journal*, 45(4), pp. 735-744

Enkvist, P., Nauclér, T., & Rosander, J. (2007). A cost curve for greenhouse gas reduction. *McKinsey Quarterly*, 1, 34.

Felfe, J., and Schyns, B., (2004). "Is similarity in leadership related to organizational outcomes? The case of transformational leadership," *Journal of Leadership & Organizational Studies*, 10(4), pp. 92-102.

Finance Powered by Intelligent Automation (2018). Retrieved from https://www.capgemini.com/service/business-services/transform-your-finance-operations/finance-powered-by-intelligent-automation/

Fishbein, M., & Ajzen, I. (1975). *Belief, attitudes, intention and behavior: An introduction to theory and research*. Reading MA: Addision-Wasely.

Folake Olowokudejo S.A. Aduloju S.A. Oke (2011). Corporate social responsibility and organizational effectiveness of insurance companies in Nigeria, 12(3), 156-167. https://doi.org/10.1108/15265941111136914

Gartner Says the Internet of Things Installed Base Will Grow to 26 Billion Units By 2020. (2013). Retrieved from Gartner https://www.gartner.com/newsroom/id/2636073r

HANDZIC M, LAGUMDZIJA A and CELJO A (2008) Auditing knowledge management practices: model and application. *Knowledge Management Research & Practice* 6(1), 90–99.

Haykin S (1999) *Neural networks—a comprehensive foundation*. Prentice Hall, Englewood Cliffs

Hee Kwon, E., & Jae Park, M. (2017). *Critical Factors on Firm's Digital Transformation Capacity: Empirical Evidence from Korea*. Retrieved from https://www.ripublication.com/ijaer17/ijaerv12n22_116.pdf

Henry, Z. (2017). *Meet the Biggest Money-Making Industries of 2017*. Retrieved from https://www.inc.com/zoe-henry/inc5000-2017-5-biggest-industries-revenue.html

Brian Quinn (2006) *Governance of the Regulatory Decision Making Process*. Proceedings of the 2nd Annual Conference on the Future of Financial Regulation. London School of Economics. Retrieved from https://www.gla.ac.uk/media/media_22177_en.pdf

Huang, L.-S., Quaddus, M., Rowe, A. L., & Lai, C.-P. (2011). An investigation into the factors affecting knowledge management adoption and practice in the life insurance business, 9(1), 58-72. https://doi.org/10.1057/kmrp.2011.2

Huda, M. Q., Hidayah, N. A., & Utami, M. C. (2017). Exploring the organizational factor contributing to effective IT implementation. https://doi.org/10.1109/citsm.2017.8089295

Huynh, C. (2018). *Bank of Thailand to Adopt Blockchain Technology*. Retrieved from https://btcmanager.com/bank-of-thailand-to-adopt-blockchain-technology/

IBM Corp. (2018). Retrieved from https://www.ibm.com/industries/banking-financial-markets/risk-compliance

Insurance Change Survey 2017 | Accenture. (2017). Retrieved from https://www.accenture.com/us-en/insight-financial-services-change-survey-insurance

Ivanov, S., & Webster, C. (2017). Adoption of robots, artificial intelligence and service automation by travel, tourism and hospitality companies–a cost-benefit analysis. *International Scientific Conference "Contemporary Tourism–Traditions and Innovations*.

Iyengar, K., Sweeney, J. R., & Montealegre, R. (2015). Information technology use as a learning mechanism: the impact of IT use on knowledge transfer effectiveness, absorptive capacity, and franchisee performance. *MIS Quarterly*, 39, 615–641.

Jantarajaturapath, P. (2011). Factors affecting e-commerce adoption and business success of Thai SMEs. *European Journal of Management*.

Jha, S. K., Pinsonneault, A., and Dubé, L., (2016). "The evolution of an ICT platform-enabled ecosystem for poverty alleviation: The case of eKutir," Management Information Systems Quarterly, 40(2), pp. 431-445.

Jonathan Michie & Vissanu Zumitzavan (2012).The impact of 'learning' and 'leadership' management styles on organizational outcomes: a study of tyre firms in Thailand, *Asia Pacific Business Review*, 18:4, 607-630, https://doi.org/10.1080/13602381.2012.694724.

Knox, Sarah & Burkard, Alan W. (2009). *Qualitative research interviews*. Psychotherapy Research, 19(4-5), 566-575.

Krebs, B. (2009). *Data Breaches Are More Costly Than Ever*. Retrieved from http://www.washingtonpost.com/wp-dyn/content/article/2009/02/02/AR2009020203064.html

Krippendorff, K. (2004). *Content analysis: an introduction to its methodology*. Thousand Oaks, California: Sage Publications Inc.

Lam, S. (2017). *AXA Asia embraces digital disruption with Fast-IT*. Retrieved from https://www.cw.com.hk/digital-transformation/axa-asia-embraces-digital-disruption-fast-it.

Lee, Ching-Chang & Cheng, Hsing & Cheng, Hui-Hsin. (2007). an empirical study of mobile commerce in insurance industry: Task–technology fit and individual differences. Decision Support Systems. 43. 95-110. 10.1016/j.dss.2005.05.008.

Long, T., & Johnson, M. (2000). Rigour, reliability and validity in qualitative research. *Clinical Effectiveness in Nursing*, 4(1), 30-37. https://doi.org/10.1054/cein.2000.0106.

Lu, Y., & Ramamurthy, K. (2011). Understanding the link between information technology capability and organizational agility: an empirical examination. *MIS Quarterly*, 35, 931–954.

Luo, X., & Homburg, C. (2007). *Neglected outcomes of customer satisfaction. Journal of Marketing*, 71(2), 133–149.

Mao, H., Liu, S., Zhang, J., & Deng, Z. (2016). Information technology resource, knowledge management capability, and competitive advantage: The moderating role of resource commitment, 36(6), 1062-1074. https://doi.org/10.1016/j.ijinfomgt.2016.07.001

Marchand, D.A., Peppard, J. (2008). D*esigned To Fail: Why IT Projects Underachieve and What to Do About It.* Cranfield School of Management, Cranfield.

McKinney, P. (2016). *5 Innovation Blind Spots That Killed Nokia and Kodak S11 Ep9*. Retrieved from http://killerinnovations.com/5-innovation-blind-spots-that-killed-nokia-and-kodak-s11-ep9/

Mithas, S., Tafti, A., Bardhan, I., & Goh, J. M. (2012). Information technology and firm profitability: mechanisms and empirical evidence. *MIS Quarterly*, 36, 205–224

Molla, A., & Cooper, V. (2009) Green IT Readiness: A Framework and Preliminary Proof of Concept, 16(2). https://doi.org/10.3127/ajis.v16i2.545

Nasri, W., & Charfeddine, L. (2012). Factors affecting the adoption of Internet banking in Tunisia: An integration theory of acceptance model and theory of planned behavior, 23(1), 1-14. https://doi.org/10.1016/j.hitech.2012.03.001

Nwakanma, C. I., Asiegbu, B. C., Ogbonna, C. A., & Njoku, P. P. C. (2013). Factors affecting successful implementation of information technology projects: experts' perception. *European Scientific Journal*, ESJ, 9(27).

Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the Future — Big Data, Machine Learning, and Clinical Medicine, 375(13), 1216-1219. https://doi.org/10.1056/nejmp1606181

Office of Insurance Commission Service. (2018, January 31). *Non-Life Insurance*. Retrieved from http://oiceservice.oic.or.th/company/non_life.php?action=search

Office of Insurance Commission. *Life Insurance Companies in Thailand*. Retrieved from http://www1.oic.or.th/en/search/companies3.php

Oltmann, S. (2016). Qualitative Interviews: A Methodological Discussion of the Interviewer and Respondent Contexts. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 17(2). http://dx.doi.org/10.17169/fqs-17.2.2551

Osman. H. (2018). *Challenges with Thailand's Online InsurTech Play*. Retrieved June from https://ecommerceiq.asia/thailand-insurtech-challenges/

P. (2017). *Top insurance industry issues in 2018*. Retrieved from https://www.pwc.com/us/en/industries/insurance/library/top-issues.html

Paré, J., Cameron, A., Poba-Nzaou, P., and Templier, M. (2013). "*A Systematic Assessment of Rigor in Information Systems Ranking-Type Delphi Studies*," Information & Management (50:5), pp. 207-217.

Patton, M. Q. (2002). *Qualitative, research & evaluation methods*. Thousand Oaks, California: Sage publications Inc.

Peppard, J., Ward, J., Daniel, E. (2007). Managing the realization of business benefits from IT investments. *MIS Quarterly*. Exec. 6, 1–11.

Process Optimization. (2017). Retrieved from https://www.capgemini.com/consulting/service/big-data-analytics-consulting/process-optimization/#

Ridgley, C. (2009). "The Decision Disconnect". *Australasian Journal of Information Systems*, (16:1), pp. 185-208

Rouse, M., & Pratt, M. K. (2018). *What Is Business Process Management (BPM)?* Retrieved from https://searchcio.techtarget.com/definition/business-process-management

Scholtens, B. (2011). Corporate social responsibility in the international insurance industry, 19(2), 143-156. https://doi.org/10.1002/sd.513

SOLOMON, M., et al. (2006). *Consumer Behaviour: A European Perspective*. 3rd ed. Harlow: Prentice Hall.

Stefanie A. Haller & Iulia Siedschlag (2011) Determinants of ICT adoption: evidence from firm-level data, Applied Economics, 43:26, 3775-3788, DOI: 10.1080/00036841003724411

Stock, R.M. & Bednarek, M. J. of the Acad. Mark. Sci. (2014) 42: 400. https://doi.org/10.1007/s11747-013-0355-4

Stohr, E.A. & Zhao, J.L. Information Systems Frontiers (2001) 3: 281. https://doi.org/10.1023/A:1011457324641

Thai Re Group. (2017).*The State of Insurance Market in Thailand*. Retrieved from http://www.thaire.co.th/thaire_backend/upload/ourservices/publice_20170331141039.pdf

Triguero, A., Moreno-Mondéjar, L., Davia, M.A. (2013). *Drivers of different types of eco-innovation in European SMEs*. Ecol. Econ. 92, 25e33.

Tsai C-F, Wu J-W (2008). *Using neural network ensembles for bankruptcy prediction and credit scoring*. *Expert Syst Appl* 34(4):2639–2649

US6647396B2 - Classification based content management system. (n.d.). Retrieved from https://patents.google.com/patent/US6647396B2/en

Valentine, E., and Stewart, G. (2015), *"Enterprise Business Technology Governance: Three competencies to build board digital leadership capability," In System Sciences (HICSS)*, 2015 48th Hawaii International Conference on (pp. 4513-4522). IEEE.

Walden, E., & Hoffman, J. (2007). Organizational form, incentives and the management of information technology: Opening the black box of outsourcing. *Computers & Operations Research*, 34(12), 3575–3591

Wang, C., Wang, Q., Ren, K., & Lou, W. (2010). Privacy-Preserving Public Auditing for Data Storage Security in Cloud Computing. https://doi.org/10.1109/infcom.2010.5462173

Westerman, G., Bonnet, D., and McAfee, A. (2014). "Leading digital: Turning technology into business transformation," Harvard Business Press

What Is Big Data And Why It Matters. (2015). Retrieved from https://www.sas.com/en_us/insights/big-data/what-is-big-data.html

What Is Blockchain Technology? A Step-by-Step Guide for Beginners. (2016). Retrieved from https://blockgeeks.com/guides/what-is-blockchain-technology/

Wiedemann, D. G., Haunstetter, T., & Pousttchi, K. (2008). Analyzing the Basic Elements of Mobile Viral Marketing-An Empirical Study. https://doi.org/10.1109/icmb.2008.41

Willcocks, L., Feeny, D., and Olson, N. (2006). "Implementing Core IS Capabilities: Feeny Willcocks IT Governance and Management Framework Revisited," *European Management Journal*, 24(1), pp. 28-37.

Wiltgen, K. (2016). 5 *Keys to a Successful Technology Implementation*. Retrieved from https://rsmus.com/what-we-do/services/technology/management-consulting/five-keys-to-a-successful-technology-implementation.html

Young, R., & Jordan, E. (2008). Top management support: Mantra or necessity? 26(7), 713-725. https://doi.org/10.1016/j.ijproman.2008.06.001

Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption, 26(4), 760-767. https://doi.org/10.1016/j.chb.2010.01.013

RESEARCHER BIOGRAPHY

Ahaiwe Ikenna Joshua is a Solutions Specialist in RapidFlows Enterprise Applications Development at Stream IT Consulting Ltd. He focuses primarily on presales, giving technical presentations, and designing proof of concepts; as part of his consulting activities he engages with financial services particularly the banking and insurance sector. His loves politics, writes blogs and researches on technology in fintech with special focus on web server security.