Innovation and Development of Digital Finance: A Review on Digital Transformation in Banking & Financial Sector of Sri Lanka

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**Abstract**

During last few decades, Sri Lanka is shifting from agrarian economy to service economy. In service sector dominant role played by the Banking and Financial Industry (BFI). Owing to this shift, BFI Industry has experienced a constant evolution by transforming entire BFI industry landscape with new era of convergence service delivery. This evolution is considered by extended connectivity and increased speed of information processing by introducing new business models and opportunities in BFI. As one of the developing country, BFI sector in Sri Lanka is looking for an exceptional level of divergence between technology and finance. However to date, there is not much published studies in Sri Lanka explain about the nature of digital transformation in BFI industry in Sri Lanka. This study proposed to develop digital transformation framework of BFI Industry in Sri Lanka based on the diffusion of innovation (DOI) theory, technology-organization-environment (TOE) framework and actor-network theory (ANT) to conduct the multi-level analysis of the development of Sri Lanka‘s BFI industry digital transformation. It attempts to create and reveal process of building and execution of disruptive technology, variety of heterogeneous actors involved in the newly emerging converging industry. This research represent stepping stone in exploring interaction between FinTech and yet unfolding other technology around this context. It also discusses policy implication for Sri Lanka BFI industry, focusing on the expansion of state in fostering the exponential growth of BFI industry within and outside Sri Lanka.

**Keywords**: *ANT, Digital Finance, Digital Transformation, DOI, Disruptive Technology, Exponential Growth,* *FinTech, TOE*

# Introduction

Innovative solutions and technological concepts provide new business model in finance (Gomber, Koch, & Siering, 2017). This result in the emerging ecosystem for growth and disruptive innovation changing the directions of many industries, enable transformation (Omarini, 2017). Digital transformation takes place in every industries and society: banking, financial, manufacturing, medicine, healthcare, telecommunication retail etc. leads to creativity and innovation of an emerging disruptive digital technologies with entirely new business model transformed the competitive landscape (Naser & Alqahtani, 2016). Digital transformation of Banking and Financial industry (BFI) profound significant change the pattern of how new business model and mechanism for innovation and create value in BFI (Naser & Alqahtani, 2016). This would change the business to adopt to innovative business model and position customer at the center of the business process to stay in the market with competitive arena for BFI value chain as well as introducing new comers (Omarini, 2017). The disruptive technology shaping the BFI as an “enabler” than deliver the service or product (Nwankpa & Roumani, 2016). The researcher aim to define the digital transformation in BFI and further elaborate what FinTech companies are going to be the disruptors as a technology developers and how FinTechs deploy the digital technology to cause the disruption.

Financial industry developed into banking, wealth management and insurance industry with the liabilities of trust and confident. Delivery of BFI has experienced major change, from human led interaction to machine led interaction, in order to leverage the potential to improve response time, accuracy, as well as credit scoring and fraud management. This is feasible by introducing artificial intelligence (AI), machine learning, blockchain, IOT, big data and social media in to financial services. Digital Transformation is the key driver of creating a more connected world by changing the people lives and radically improve the business growth (World Economic Forum, 2016). Socio-economic among increased populations and globalization are the key factors for the change of global proportion properly choose for digitization while increasing effectiveness (Ministry of Social Equality, 2017). Customer experience, competition, regulatory directives are major driving factors for digital transformation, sustainable growth and higher profits (Scardovi, 2017). Insurance industry can be transformed by offering on-demand insurance coverage using a mobile app, also improve the customer experience by offering IoT sensors and drown to collect information from remote locations by lowering the cost of business process. Researcher examine the ICT usage and development in BFI industry, on the other hand the intensive application of advanced technologies leads to a digital transition in BFI industry in other part of the world.

##  Purpose of the study

There has been little empirical research done on digital transformation about all disruptive and vast changing process that are ongoing on various industries. Researcher will discuss about three mainstream factors influence on digital transformation in BFSI sector in Sri Lankan contest. Research on adaptation of technology in view of BFSI sector readiness to attract the digital technology, innovation and creativity (Sandström, Magnusson, & Jörnmark, 2009) as second dimension and digital business strategy (Nwankpa & Roumani, 2016) as another dimension. Researcher in this article hope to show the gap in key challenges on adaptation with technology to build the trust on digitization, benefits of moving to cloud and recommendation for regulatory frameworks alteration to streamline the flow of information as well as flow of physical goods (Sarah, 2018). The analysis resulted distinctive dimension of digital adaptation in to organization level transformation is timely and highly relevant (Heidi Gautschi, 2016).Researchers will pay more attention to theorizing actual process of formulation of a theory; and in this way, improves theory. The pragmatic procedure (Tian et al., 2016) in the business of “theorizing” then is to intertwine the data being collected with my institutional logic perspective in the form of a dialectic process of iteration between the data and theory.

##  Methodology

Researcher will conduct interviews, hold conservations, make physical observations and review available documents in three longitudinal, qualitative case studies for turning them into cases. Case can contribute to a theory that reveals ideals we should pursue and the obligations we should accept in implementation of the systems and recommendations. In order to pursue this research in that direction, my research will: (1) Purposively select five case studies representing (a) a public-sector bank, (b) a public sector regulatory agency (Central Bank of Sri Lanka), (c) private sector bank, (d) private sector insurance company, and ( e) private sector financial company, (2) Conduct in-depth conversations with relevant actors (up to about 5 from each organization) who can express their views on the issues of digital transformation, (3) Undertake documentary reviews concerning the policies, implementations and practices of digital transformation strategies in respective case organizations; and (4) Participate in applicable thoughts on ideals researcher should pursue and responsibilities about overcoming the essential issues within the organization.

# Literature Review

Digital transformation is the unique divergence of data, advanced analytics, and innovation as a cycle, or process, that enables organizations through better, more informed decision-making to create value for themselves and society (Skilton & Hovsepian, 2017). In Sri Lanka digital transformation has been underway from 1980 when the commencement of personal computer introduced to offices and home (Gunawardene, 2017). Digitization is automation of manual process by converting analog streams of information, papers to digital data to deal with automated workflow and processes. Digitalization is leveraging digitized data and process the way social and economic life are restructured around communication and media infrastructure. Digital transformation is opportunities created by digitization in organizational patterns, cultural barriers and transform existing business model, socio-economic cultures, legal and policy measures. In addressing digital transformation issues at banking and financial industry, digital technology offers disruptive financial value chain and deploy to cause the disruption while keep the customer at the center of the development process. Impact of internet on digital transformation in developing country like Sri Lanka exaggerated and success can be based on the usage of internet from grassroots level (Wickramasinghe & Ahmad, 2014).

## Technology adaptation in financial industry

According to TAM, customer adaptation process beyond perception of convenience and perception of technology usefulness as well as convenience on adaptation intention (Lai, 2017). Evolution of FinTech started with telex network, and to digitization of financial services such as ATM e-banking and technological development enabled startup and IT firms provides financial services categorized as FinTech 3 (Arner, Barberis, & Buckley, 2017). RegTech evolution is based on internal risk management system followed by technology to enhance regulatory compliance and streamline its component process, as a result transformed in to know your customer (KYC) into know your data (KYD) which resulted in data centric mindset (Arner & Janos and Buckley, 2017). Digital transformation needs to be anchored in a sound human rights framework. This is because as digital tools and web services become more pervasive in our lives, they can either enhance or inhibit the free flow of information and freedom of expression.

In this article, researcher analyze how Sri Lanka’s Digital Transformation policy attend to construct ‘go global’ as a factor in reforming the delivery of BFI sector readiness to attract the global economy with recommendation of the implication for information design, accessibility, and affordability. In emerging SME sector. Digital technologies can make a significant cost savings by technology adaptation, accelerate development using technology platform (Denig, 2017). Trends of digital transformation constitutes of four phases are technology, business, organization and society (Klewes, Popp, & Rost-Hein, 2017). Each of this phases is investigated for its relevance for the successful transformation in this chapter.

Digital transformation of BFI sector path and operational execution to be defined based on the existing organizational and societal frameworks in order to realize the value of digitization, analyze the behaviors of objects and forecast about customers, organizations used to integrate Big Data across different applications, IT systems and examine the transaction data for decision making. Using deep data analysis organizations used to reduce the customer churn by analyzing data from internal data as well as social media and CRM applications. Customer engagements towards service providers can be enhanced via digitalized strategies whilst web-based life is a strategic avenue for such initiations Social Customer Relationship Management (SCRM) in Contemporary Business Era (Siriwardana & Dissanayake, 2019). The framework to be defined developments of smart factory, and revolutionized business model from technological disruption across the IOT and artificial intelligence based on business leaders challenges such as driving cultural changes, skills gap among workforce, changing customer expectations, and maximizing return on investment (Forum, 2018).

Most emerging new technology with new services to try their luck with the customer without impacting the fundamental business processes. WhatsApp, Viber and Skype are the best example for telecommunication business model innovation which can run on top of the existing telecom technology. Having considered the potential to work closely with customers and enabling them where ever they live it is a social channel or physical environment combination of Big Data analytics, robotics, artificial intelligence and internet of thing (IOT). However, only few organizations are taking the full advantages of them. Top technology companies tend to have higher technology intensity index compared to the industry average. According to Harvard Business Review study focused on financial service industry, where digital leaders outperform digital laggards in customer loyalty and ultimately in revenue growth. This holds true for small and medium enterprise as well (Roger, 2017).

Differentiation & innovation are the driving factors of technology changes in any industry resulted in brand awareness, increase process efficiencies and improve customer experience. Entrance of FinTech organization like Uber, PickMe, YouPay, PayMe and similar mobile payment are the key drivers of digital transformation in financial industry in Sri Lanka. That said, strategy has been considered by various organizations and respond to the emerging FinTech challenging traditional banking institution with convenient mobile technology. However, the way FinTech causing disruption, top banking executives fear that a quarter of traditional financial services business will be at a risk of taken away by FinTech (Arjunwadkar, 2018). FinTech development in BFI provides financial platform starting from bank account creation to track the accounts, transactions, financial planning, manage mortgages and track cash flow using single digital interface supported by an app (Naser & Alqahtani, 2016).

# Empirical Review

Information technology (IT) is regarded as essential tool universally for the productivity of an organization and competitiveness of the economy of a country. This can be only realized through wide spread usage and IT adaptation, it is important to know the key theoretical mode for individual adaptation and firm level (Rosario Oliveira Martins, Oliveira, & Fraga Martins, 2011). Further, Rosario et al. (2011) reveal two theories for adaptation model at the firm level namely: diffusion of innovation (DOI) theory and technology, organization and environment (TOE) framework. Moreover, DOI theory explain the antecedence as individual internal and external characteristics for organizational innovativeness while TOE framework analyzes technology, organizational and environmental context influence on implementation and adaptation of innovative technology (Rosario Oliveira Martins et al., 2011). Researcher expect to analyze TOE framework with other theories such as DOI, actor network theory (ANT), monetary theory and institutional theory. Individuals are possessing different level of adaptation and generally noticed that segments of adaptation segregate individuals into five categories as explained in the below graph.

# Case Review on Digital Finance

In the discipline of finance for small business, economic analysis suggest that BFI to accelerate the market penetration in middle income sector to generate more business opportunities from micro, small, medium size enterprises and startups (Andrianaivo & Tandon, 2017). Further illustrates SME sector is vital with major contribution to GPD by providing micro entrepreneurs to micro level financial support inclusive, agro insurance and pensions (The World Bank, 2016). Major obstacle for implementation above recommendation due to unregulated microfinance institution with high profit low expense and lack of competitiveness reluctant to adopt to technology for high level of operational efficiency (Peranpalan, Suthaharan & Guganeshan, 2008). The emerging SME sector to focus on behavioral changes to the low income rural users to adopt to technological and financial infrastructure as a platform to streamline the microfinance operation (The World Bank, 2016).

Registered and non-registered financial institutions have an impact on rural economy in Sri Lanka as every small entrepreneurs and individuals engage with others on a daily basis. Consequently, cost of managing the finance has significant effect on financial behavior of rural economy, living standards and cost of living. Therefore, developing the financial area in the digital format with the involvements of key players for lending space can significantly contribute to ease of doing business, convenience banking and quality financial service at lower cost. This will have significant impact on economic growth in Sri Lanka (Ministry of Social Equality, 2017).

## Argument on Sri Lankan Context

Digitization is required in all types of markets and organizations adapt with digital changes by carefully identifying the gap in shorter period can survive in the market. The organization with more innovation and globalization has shown more digitization and dictate the digital transformation. The paper examines the impact of innovation & creativity, technology adaptation and digital business strategy with digital transformation on the presents of BFI companies in Sri Lanka. The banking sector of Sri Lanka is a prominent scope as a service driven economy, and it requires needful marketing approaches (Dissanayake & Ismail, 2017). Technology has broaden the boundaries between online and offline services at rapid pace and traditional way of depositing money and making payment has transformed with the improvement of technology organization captured the new opportunities in the financial market through alternative financial products and services. There are factors influencing the success of BFI industry in Sri Lanka, including raise of private e-commerce companies, government support for innovating the traditional financial system and facilities for payment authorization via the company’s of third party web sites (Reus & LLP, 2019). Successful digital transformation in BFI industry is closely linked to the technology development as well as central bank of Sri Lanka’s policy could make suitable innovative solutions and evolution of FinTech presence in the BFI industry could play significant role in the overall growth of Sri Lanka BFI sector. Until Sri Lanka’s technology strategy has been characterized by government intervention in favor of FinTechs presence in direct transaction with customer, Sri Lanka to follow the international platform such as PayPal to depend and follow in the footsteps of developed countries for the cross border transactions.

 In this article, researcher made a review literature of IT adaptation model in organizational level, most empirical studies are derived from DOI theory, ANT theory and TOE framework. TOE framework can be used for intra-firm technology adaptation as well as potential of application IS adaptation. Extensive analysis to be taken place for this reason to use TOE framework, DIO theory and ANT theory.

## Assumption

The ultimate goal of this research to bring together and evolution of FinTech phenomenon and drive the formative elements which may assist to illuminate why FinTech delivers disruptive potential for the financial industry and goes beyond simple linear continuation of current development. To structure transformation of banking and financial industry, framework to be defined for banking, insurance and regulation at three transformative levels: internal, network and external (Alt, Beck, & Smits, 2018).

Banking model expected to change the main fundamental functions of the system is that we should expect something radically different, with companies that will come to dominate banking without being banks, at least in the traditional sense. China’s social network offers digital content and gaming through platforms such as QQ and WeChat, now they have developed an internet based system to connect customers and merchants without being based on a simple “intermediation” model, similar to the way first generation digital marketplaces. The system capitalizes on all the data, structured and unstructured, that is able to gather and mine, generating intelligence used for profiling best merchant and consumer experience as well as value propositions (Scardovi, 2017).

Smart phone usage is growing and lower cost handsets are available, the cost of data packages is still high compared to rural earning power. In time, data packages also will become more affordable and assist the adoption of digitization. Few Banks using blockchain technology in few application, however, there should be a bigger initiatives in national approach to use blockchain as a technology to educate the corporates and users and making comfortable for them to use this technology. Privacy regulation alignment to GDPR are possible way of adopt required privacy for distributed ledger (Guo & Liang, 2016). Loans for housing and land require title searches which can be very time consuming and expensive. While most loans are backed by collateral, there are cash flow based loan products. With better credit scoring, hopefully non-asset based lending can grow. An example is Credit Cards which are typically unsecured credit, and a high growth product for most banks.

A strategy similar to market skimming could be used to accelerate adoption, by initially focusing on early adopters and those segments that are more profitable, followed by other segments. Using the concept of a global digital citizen (Churches & Crockett, 2018), approaches from more developed regions can also be used in Sri Lanka rather than trying to determine a unique approach. Parallels of this approach in the past were Blue Jeans, Music, etc., that cut across national borders.

For Start-ups where the loan required is small, assistance should be provided to develop standard business case templates to make it easier for a bank to determine credit risk. Angel Investors are available to assist with developing these business cases. Also, the banking industry should be engaged to help develop these templates. Banks also have a responsibility to have staff who understand start-ups and can provide expert credit evaluation.

# Conclusion

Although the BFI industry has conventionally existed an early adopter and rigorous user of new developments in technology, competitors due to innovative business models have an incredible impact on current industry dynamics. Economic environment changes rapidly and regulatory requirements are cost intensive and challenging, incumbent suppliers of BFI are facing a significant transformation (Tripathy & Anuradha, 2018). Against this background, most companies in the business try to design customized, smart, and flexible, though cost-efficient, financial products and services and attempt to succeed new levels of customer centricity.

By reviewing the literature, it is evident that advanced technology application leads to digital adaptation and speed of transformation significantly influence the sustainability, profit and market position of the organization (Bounfour, 2016). Creativity and innovations are crucial for the survival of the organization along with technology adaptation and digital business strategy by top management and board of directors. Even though innovation on productivity is on average, less innovation companies will lose to a high innovative companies (Zorana, 2018). Also, it is revealed in the literature that innovation is an alternative to price competition and it can complement many advantage for the customer.

Sri Lankan banking sector demands considerable employee related and process related developments (Nirmali, Khathibi & Azam, 2018), and financial sector of Sri Lanka is attributed intensive competition ,say between banking and non-banking institutions (Central Bank Report, 2017; (Dissanayake & Jayampathi, 2018)). Thus, knowledge related insights are critically important to discuss the avenues of strategizing finance sector of Sri Lanka. Accordingly, researcher intended to propose a framework it aims to provide overview of digital transformation BFI and create a business model. To situate this analysis and uniqueness of this context, we will also survey and evaluate Sri Lanka’s recent information policy development against international measures. It is revealed by the current study in the field, lot of new insights will be gained throughout the research which will allow us to draw a much better proposition of the business model changes for traditional banks, financial company and insurance companies in the future to sustain in the market.

In the context of digital transformation researcher has found from literature that increasing importance of Big Data, IOT, robotics, cyber security, artificial intelligence Blockchain and crypto currency in the context of the BFI transformation (Tripathy & Anuradha, 2018). Based on review of literature, business structures will evolve based on the potential to develop value streams offered on the basis of new data processing solutions and organizational implications (Gölzer & Fritzsche, 2017). BFI need to consider practical deployment of IoT to monitoring risk to a loan thereby reducing the likelihood of engine condition of the car, crop failure on one hand, while reducing wastage on the other, a bank could track this to ensure protection of collateral. Initiatives like RFID, and NFC for public transport and toll fee payment systems must be done in conjunction with the Central Bank so the solution is robust and properly governed.

Central Bank to fast track the launch of Sandbox and become comfortable with innovation which will allow innovation to be tested and implemented much faster than at present (Tripathy & Anuradha, 2018). Also FinTechs follow a discipline around payment systems rather than looking at it only as just technology and consumer protection is a foremost consideration. There should be an initiative from state and nonstate supportive activities for entrepreneurship from a funding and knowledge perspective, setting up funding for fund Investment Company by government to invest in private venture capital funds. New tax policy to be introduced in order to promote innovations and Startup to come forward.

In our view, precise roles examine the capacities for BFI and could reveal how they will transform their business with high level of technology adaptation. The future of FinTech solutions will be focused both by innovations on the technology level and by the response of regulators to the new developments. Customers will appreciate technological solutions that affluence usage and moderate transaction costs (Tripathy et al., 2018). Beyond this, agreed the great forces at work in this field and the essential for fast, however well-organized regulatory answers, any theoretical comprehensions on the effect of regulatory processes in the BFI sector will be greatly appreciated.

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