BUSINESS ANALYTICS IN EMERGING MARKET FIRMS: EXPLORATORY INSIGHTS FROM TECH FIRMS IN THAILAND

[1]OLIMPIA C. RACELA, [2]AMONRAT THOUMRUNGROJE

[1,2]Busines Administration Division, Mahidol University International College, Thailand
E-mail: [1]olimpia.rac@mahidol.edu, [2]amonrat.tho@mahidol.edu

Abstract - This study aims to investigate the data analytics environment and the role of data analytics in technology companies in Thailand. Specifically, it seeks to understand how varying degrees of data analytics impact firm performance and to identify necessary adaptations for firms to maintain competitiveness in the current technological landscape. Qualitative methods were employed, utilizing in-depth interviews with representatives from three technology companies operating in Thailand. Data collected through interviews were analyzed using reasoning techniques to identify common themes and patterns. Rigorous controls were implemented for time and place to ensure data equivalence across the sample. The findings reveal that all three tech companies attributed significant benefits to data analytics, particularly in generating business insights to enhance customer experience, leading to improved firm performance, increased market share, and greater operational efficiency. Despite challenges in implementation due to a scarcity of expertise, firms prioritize technological advancements in data analytics. The research underscores the vital role of data analytics and business intelligence for contemporary tech firms in Thailand. The insights derived from this study provide valuable guidance for firms seeking to leverage data analytics for competitive advantage. Moreover, it highlights the importance of investing in technological advancements in data analytics to navigate challenges and capitalize on emerging opportunities in the digital era.

Keywords - Big Data, Business Intelligence, Resource-Based View, Dynamic Capabilities

I. INTRODUCTION

The advancement of big data and data analytics can be traced back to the late 20th century, with the term "big data" first appearing in discussions surrounding the Barbados Oceanographic and Meteorological Experiment (BOMEX) of 1969 (Halevi & Moed, 2012). Initially defined as large datasets, advancements in computing technology have enabled organizations of today to leverage data analytics for real-time insights and decision-making, exceeding the capabilities of traditional business intelligence (BI) solutions.

In recent business landscapes, organizations are increasingly prioritizing data analytics as a strategic imperative to drive revenue growth, cost savings, and operational efficiency. Tech giants such as Facebook, AIG, GE Software, and American Express are at the forefront of leveraging data analytics to extract actionable insights and capitalize on emerging business opportunities (Buluswar et al., 2016). Despite the availability of ample data, many organizations underutilize their datasets, often due to a lack of dedicated data analysts or awareness of the potential value of data analyses (Chen, Chiang & Storey, 2012).

Thailand is an emerging market where the amount of market data availability is rapidly growing, from data from mobile phones, smart tickets, CCTVs, social media, among many other devices and channels. Data will come from cloud sources, on-premise data centers, cell towers, endpoints, and IoT devices, which are expected to account for over 50% of the country's total data creation (Digital Economy Promotion Agency). Recognizing the growth potential, major global companies have made significant investments to support Thailand's BI infrastructure. For instance, Microsoft planned to establish an AI Center of Excellence and developing its cloud data center region in Thailand (Leesa-Nguansuk, 2023). Huawai launched its cloud stack technology to provide secure could services to Thailand's enterprise markets (Bangkok Post, 2024)

Even simple statistical tools can yield significant benefits for companies in terms of enhancing decision-making and driving business performance. Various datasets readily available to companies, including customer demographics, procurement expenses, supplier relationships, and employee satisfaction, offer rich sources of insights and opportunities for improvement (Chen et al., 2012). This study aims to investigate how tech firms harness their data assets to enhance business performance, exploring the impact of different degrees of data analytics on key performance indicators such as sales revenue, profitability, and demand forecasting accuracy. Additionally, the study seeks to identify strategic changes necessary for firms to maintain competitiveness in the digital age.

II. LITERATURE REVIEW

The Resource-Based View (RBV) of the firm, initially articulated by Barney (1991), posits that firms gain and sustain competitive advantage through the acquisition and utilization of resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In the era of big data, this perspective has gained renewed significance as firms increasingly

recognize data as a critical strategic asset. Mikalef and Gupta (2021) extend this view by arguing that big data analytics capabilities can be seen as a unique resource that enables firms to derive actionable insights, leading to improved decision-making and innovation. These capabilities, encompassing data management, analytics, and the generation of insights, align with the VRIN criteria by offering firms distinct advantages that are difficult for competitors to replicate. The strategic management of big data, through advanced analytics and the integration of diverse data sources, provides firms with the opportunity to develop new products, personalize marketing efforts, and optimize operations, thereby achieving a competitive edge in their respective markets (Mikalef et al., 2021).

Dynamic Capabilities Theory, as developed by Teece, Pisano, and Shuen (1997), further elaborates on the RBV by focusing on the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. In the context of big data, this theory underscores the importance of a firm's agility in leveraging technological advancements for data analytics. Akter et al. (2016) highlight how dynamic capabilities, specifically in big data analytics, enable firms to sense and seize opportunities, as well as to reconfigure existing operations in line with market dynamics. This ability to adapt and innovate based on insights derived from big data analytics is crucial for sustaining competitiveness in fast-paced industries. Firms that invest in developing these dynamic capabilities are better positioned to exploit big data for strategic decision-making, thereby navigating the complexities of the digital economy more effectively (Akter et al., 2016).

Despite these insights, there remains a gap in the literature regarding the operationalization of these theories in the specific context of big data utilization within firms. While the strategic importance of big data is acknowledged, there is less clarity on the mechanisms through which big data analytics capabilities can be systematically developed and aligned with RBV and Dynamic Capabilities Theory to achieve sustained competitive advantage. Furthermore, empirical studies exploring the impact of big data analytics on firm performance often yield mixed results, suggesting the need for a deeper understanding of the contextual factors and capabilities that mediate this relationship. Additionally, the evolving nature of big data technologies and the rapid pace of digital transformation present ongoing challenges for firms attempting to harness big data effectively, highlighting the need for continuous adaptation and learning within organizations (Mikalef et al., 2021; Akter et al., 2016). This underscores a critical gap in the literature: the need for more granular research that explores how firms can operationalize big data analytics within the frameworks of RBV and Dynamic Capabilities Theory to navigate the digital age successfully.

In recent years, the term "Big Data" has gained prominence, referring to datasets whose size exceeds the processing capabilities of conventional databases and computers. Key elements of Big Data include capture, storage, management, and analysis, highlighting the need for advanced technologies and methodologies to extract meaningful insights (Manyika et al., 2011). Big data analytics, commonly known as data mining or data processing, involves the automatic extraction of information from large datasets to uncover valuable patterns or insights (Rajaraman, Leskovec, & Ullman, 2012). The sheer volume of data generated by organizations, often exceeding hundreds of terabytes, underscores the necessity of employing sophisticated statistical tools to derive actionable insights (Hair, 2007).

BI encompasses a set of strategies, processes, and technologies aimed at supporting the collection, analysis, and dissemination of business information (Dedić&Starnier, 2016). Data mining, a component of BI, involves the discovery of patterns and relationships within large datasets, spanning various formats such as numerical data, visual images, and textual information (Hair, 2007). Firm performance, a multifaceted concept, extends beyond financial metrics to encompass operational efficiency, management excellence, and competitive positioning (Chen & Quester, 2006).

Information technology (IT) plays a pivotal role in enhancing organizational processes and enabling business decentralization. Technological advancements in telecommunications have facilitated the dissemination of information and reduced the reliance on middle managers as intermediaries (Winter & Taylor, 1996). Predictive analysis, rooted in statistical techniques dating back to the 1920s, enables organizations to forecast future outcomes or behaviors, providing valuable insights for decision-making (Hair, 2007; Nyce, 2007). Tech companies are synonymous with innovation, research, and development, driving technological advancements and shaping our digital landscape (Kerstetter, 2015; Mitchell, 2011).

III. METHODOLOGY

To address the research question, this study implemented an exploratory research design involving in-depth interviews with key informants who were knowledgeable about their company's BI system and IT system. Firms were selected based on being among the early adopters to embrace and utilize 'big data', such as those companies operating in retail and e-commerce, financial institutions, and telecommunications, to name a few.

Participant Company X was a local consumer-to-consumer e-commerce website established nearly 15 years ago and was currently recognized as Thailand's leading online commerce platform. The key informant is Thai and had been at Company A for about three years as an Analytics Manager. Participant Company Y was a subsidiary of one of the world's leading online travel agencies (OTAs) and was established in Thailand over 20 years ago. The key informant is a non-Thai expat andworked at the company for about five years as a systems developer.Participant Company Z was a mobile app and website that offered promotional discounts at restaurants launched in Thailand over ten years ago. Company Zwas one of the Asia region's most popular apps for restaurant services. The key informant is a non-Thai expat who held the highest executive position in Thailand.

The in-depth interviews were conducted face-to-face with participants in various settings, e.g. meeting rooms on company sites or nearby coffee shops, ensuring a conducive environment for candid responses. The interviews were systematically structured, with questions initially presented broadly and shifting to more focused inquiries when necessary. The three key informants provided comprehensive responses to the interview questions and were given sufficient opportunity to elaborate. In some instances, key informants were asked and encouraged to elaborate and to provide as much detail as possible. Interviews were conducted in Thai or English, depending on the preference of the interviewee. The average time spent on the in-depth interview is 40 minutes. The interviewer was recorded when the interviewee agreed and approved. Subsequently, recorded voice data and typed notes were carefully transcribed and subjected to a thematic analysis using a reasoned coding approach, which allowed for the identification of recurring themes and patterns.

A series of open-ended questions were asked to elicit comprehensive insights from participants regarding data utilization within their respective organizations. The interview process also involved inquiries about the types of data maintained by the firm, the integration of data analytics into business operations, and the ensuing benefits resulting from such practices. Moreover, key informants were probed on their future investment plans in data analytics, as well as their perceptions regarding the importance of data analytics both presently and in the conceivable future.

The interview questionnaire comprised two distinct sections of questions: personal inquiries aimed at gathering demographic and professional background information, and research topic-related queries intended to delve into the specifics of data management and analytics practices within the organization. Notable among the research topic-related questions were inquiries regarding the nature and utilization of available data assets, the firm's methodof data storage and endurance, and the extent of its engagement with digital platforms for data acquisition.

Also, the key informants were prompted to explain their conceptualization of data analytics and its implementation within their company, including examples of predictive analytics and the utilization of statistical tools or solutions. Challenges encountered in dealing with data, perceptions of the significance of data analytics, and barriers to its implementation were also explored. Moreover, participants were invited to articulate the specific technological requirements relevant to their business operations, as well as their envisioned strategies for the integration and adoption of data analytics solutions, along with any associated obstacles.

IV. RESULTS AND FINDINGS

Transcripts of the key informant responses were observed by two separate research analysts who were instructed to identify patterns and commonalities within and among responses. The analyses revealed several commonalities among the three firms under examination, covering various dimensions of their data analytics infrastructure, and practices. Firstly, there was a unanimous consensus regarding the centrality of customer behavior data within their data repositories. This category encompasses an array of metrics, including web activity, consumer navigation patterns, booking behaviors, and indicators of user engagement such as click-through rates. Additionally, supplementary data streams encompassing membership details, advertising metrics, and time-based parameters such as page load times were also identified across all firms.

In terms of data storage methodologies, a collective preference for cloud-based solutions was evident, enabling pervasive access to stored data resources via internet connectivity. This centralized cloud computing framework facilitates seamless data retrieval and utilization across diverse organizational contexts, underscoring the imperative of accessibility and flexibility in contemporary data management paradigms. However, it is noteworthy that Company Y, cited the persistence of paper-based contracts within their data storage framework, highlighting a divergence from the predominant electronic storage modality.

Moreover, concerning database management strategies, a notable distinction was observed, with Company X emerging as the sole entity leveraging advanced big data technologies such as ETL (Extract, Transform, Load), Hadoop, and Apache

infrastructure. This strategic adoption underscores Company X's commitment to achieving real-time data processing capabilities, revealing a rigorous effort to harness the potential of cutting-edge data analytics methodologies for enhanced operational agility and competitive advantage.

V. DISCUSSION AND CONCLUSION

The research findings uncover meaningful insights into data utilization procedures adopted by leading tech firms in Thailand, spanning across small, medium, and large enterprises. Despite differences in firm size and resources, there is a consensus among respondents regarding the benefits derived from data analytics and business insights. Particularly, there is a unanimous intent among firms to invest and expand their analytics capabilities. Company Y, as a major player, demonstrated a higher level of data utilization, likely due to its larger size and robust resources, including a comparatively larger analytics team. However, the scarcity of specialized talent in data science and statistics with a tech background presents a significant challenge, hindering the full realization of analytics potential.

Despite the valued insights found in this study, it has several limitations. The research focuses on leading tech firms, potentially limiting the generalizability of findings to firms outside the tech industry. Additionally, the study highlights challenges related to talent acquisition in the field of data analytics, yet it does not address potential strategies to address this concern.Also, this study did not address the potential challenges encountered by smaller firms with limited resources in implementing robust data analytics strategies, highlighting a gap in understanding the scalability and adaptability of such practices across diverse organizational contexts.

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