The causal factors that affect the organizational performance of large-size companies in Thailand through HR analytics

Sukawat Penpokai[1*], Sujira Vuthisopon[2], Amnuay Saengnoree[3]

[1,2,3]*Mongkut's Institute of Technology Ladkrabang, Thailand.*

*Corresponding author: Sukawat Penpokai (Email: spenpokai@gmail.com)

ABSTRACT

Purpose: The purpose of this study is to investigate the impact of the causal factors, namely Organizational Culture (OC), Technology Adoption (TEA), and HR Competencies (HRC) on Organizational Performance (ORP), with a focus on the moderating effect of HR analytics (HRA).

Design/Methodology/Approach: Data were collected using the purposive sampling method from 498 top management in the human resources department working for large-size organizations in Thailand. Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) are applied as statistical techniques to validate and test the proposed hypotheses of the conceptual framework.

Findings: Results give strong supporting evidence to accept all the proposed hypotheses that the studied factors are contributing to each other and creating an impact on organizational performance.

Conclusion: It is confirmed that ORC, TEA, and HRC have positively impacts on HRA and ORP. In addition, it is also confirmed that HRA acts as a moderating factor to facilitate the impact of ORC, TEA, and HRC on ORP.

Research Limitations/ Implications: The scope of this study only focuses on large-size organizations that operate in Thailand.

Practical Implications: This study provides guidelines for an organization to improve factors that can have a positive impact on their performances.

Contribution to Literature: This study serves as one of the pioneering contributions to the field of HRA and its implications for ORP.

Keywords: *HR analytics, HR competencies, Large-size organization, Organizational culture, Organizational performance, Technology adoption.*

1. INTRODUCTION

In the event of an economic downturn, C-Suite executives are attempting to re-enter the game by investing in strategic alliances, utilizing technology, and accelerating reskilling; on the other hand, several cost-cutting initiatives are also being implemented concurrently. In addition, hiring the right talent, improving employee productivity, handling employee burnout from remote work, losing talent after pandemic recovery, and managing a cross-border workforce are perceived to be the most specific concerns around human resources management practices (Mercer, 2022). To measure how well organizations are doing, Kaplan and Norton (1992) propose the balanced scorecard (BSC) to measure the holistic performance of an organization through a combination of financial and non-financial metrics. Thus, it is agreed by various researchers (Ho, Ahmad, & Ramayah, 2016; Lo, Azlan, Ramayah, & Wang, 2015; Simon et al., 2015) that organizational performance should not solely focus on financial metrics but should also diversify non-financial metrics to meet key stakeholders' requirements.

Organizational culture plays an important role in facilitating the achievement of the visions and missions of an organization. It is noted as having a large impact on organizational success through factors including innovation, productivity, and financial performance in several studies. (Aboramadan, Albashiti, Alharazin, & Zaidoune, 2020; Kwarteng & Aveh, 2018; Pawirosumarto, Sarjana, Gunawan, & Gale, 2017; Pujiono, Setiawan, & Wijayanti, 2020). The enabling infrastructure, such as technologies, is also proposed to have an association with organizational

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performance. Usman, Mulia, Chairy, and Widowati (2022) pointed out that, according to Davis (1989) TAM, technology adoption occurs not only when technologies are friendly but useful such as helping to improve the job performance. Mature firms with more mature information systems are proven to have better firm performance (Rao, Guo, & Chen, 2015), as they are likely to have better information quality, reliability, and integration (Ji-fan Ren, Fosso Wamba, Akter, Dubey, & Childe, 2017).

Many of the previous studies, including those by Gupta, Drave, Dwivedi, Baabdullah, and Ismagilova (2020) and Singh and Singh (2019), support the idea that technologies play an important role in process improvement and help an organization to have better cost and productivity. The executives expected the transformation of HR competencies to close the gaps in developing and implementing organizational strategies and make HR a strategic partner (Lawler, 2003). Interestingly, Deloitte (2021) found that the half-life of skills only lasts for 2 to 5.5 years. The same alignment found in the survey from PMAT (2021) indicates that organizations choose to focus their priorities on developing and building the future skills of their employees. As a result, HR analytics has become increasingly interesting to top executives and HR management, as it is believed to improve HR effectiveness and business performance (Chartered Institute of Personnel and Development (CIPD), 2020). The HR department still has a lot to learn about how to do HR analysis successfully, identify the needs of the organization, and acquire the essential skills. The transformational analytics revolution is still in its early stages, and the majority of organizations are likely still in phase one. (Society for Human Resource Management, 2016). Thus, many researchers (Kremer, 2018; Marler & Boudreau, 2017; Peeters, Paauwe, & Van De Voorde, 2020; Sharma & Sharma, 2017) put calls to action for an empirical study on the adoption of HR analytics and its implication for organizational performance.

2. BACKGROUND OF THE STUDY

2.1. Organizational Performance (ORP)

ORP has been given many definitions according to the different knowledge, understanding, and experiences of different researchers and authors. Obeidat (2016) describes ORP as a way that organizations benefit from tangible and intangible resources to achieve their objectives, and the success of organizations is largely depend on their performance, which relates to their abilities that effectively implement strategies to achieve organizational goals. (Masa'deh, Obeidat, & Tarhini, 2016) propose ORP as the ability of the organization to access and manage multiple different organizational resources to achieve its objectives and goals.

ORP is defined as the actual results or outputs that can be measured in relation to the organization's goals and objectives (Almatrooshi, Singh, & Farouk, 2016).

Many researchers and practitioners define organizational performance as the ability to measure the outcomes of business management that affect the organization's success. In the past, financial performance metrics like revenue, profitability, and return on assets were thought to be the only gauges of an organization's performance. However, it was later realized that certain non-financial indicators are more valuable in indicating an organization's success, and should be monitored in a balanced manner with integration to financials (Kaplan & Norton, 1992, 1996, 2004). Consequently, the approach of measuring both financial metrics and non-financial metrics as a measure of total organizational performance is employed by many researchers (Ho et al., 2016; Simon et al., 2015). Organizational performance can also refer to the measurement of a firm's position in its market and its ability to meet its key stakeholders' requirements (Lo, Macky, & Pio, 2015).

2.2. Organizational Culture (ORC)

ORC has its roots in traditional organization development theories introduced in the early 1900s by various world-famous scholars such as Fayol (1916); Taylor (1947) and Herzberg, Mausner, and Snyderman (1959). National and organizational cultures are identical in the sense that countries or regions are formed by three types of things: identities, values, and institutions with historical roots, and the organization is a common social practice with the same system, but most members did not grow up in it Hofstede (1991). Culture and leadership are two sides of the same coin in that leaders first create cultures when they form groups and organizations. Once it is up and running, a dynamic process for creating the evolution of cultures will determine who will or will not be a leader (Schein, 1992). Culture defines the core values, assumptions, interpretations, and approaches that characterize an organization and is useful for identifying organizational approaches such as organizational design, stages of life cycle development, organizational quality, theories of effectiveness, leadership roles, roles of human resource managers, and management skills (Cameron & Quinn, 1999).

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In general, ORC is used to describe activities performed by members of an organization with commonly shared values and behaviors (Aboramadan et al., 2020). Many of the previous studies conducted to confirm its relevance to other organizational practices such as organizational change management and knowledge management (Al-Abdullat & Dababneh, 2018; Bhuiyan, Baird, & Munir, 2020; Pujiono et al., 2020; Stojanović-Aleksić, Erić Nielsen, & Bošković, 2019).

2.3. Technology Adoption (TEA)

TEA is classified into two major aspects: individuals and organizations. If the intention or usage of technology is at the individual level, it is considered adoption at the individual level (Davis, 1989; Fishbein & Ajzen, 1975). On the other hand, if technology is successfully implemented by the organization, it is considered adoption at the organizational level (Rogers, 1995; Tornatzky & Fleischer, 1990). Either way, the mass adoption of technology is termed "The Diffusion of Technology" or Diffusion of Innovation (DOI). Technology-Organization-Environment (TOE) defers from DOI in a sense that it considers an external environment context which help to better understand the mechanism in technology adoption process (Lai, Sun, & Ren, 2018; Verma & Bhattacharyya, 2017). The Theory of Reasoned Action (TRA) of Fishbein and Ajzen serves as the foundation for most conceptual frameworks in the field of technology adoption.

TRA introduces relationships among belief, attitude, and subjective norms to affect intention and behavior (Usman et al., 2022). Davis's Technology Acceptance Model (TAM) is adapted from TRA that focuses on employees' adoption of newly introduced technology in organizations. It believes that usefulness and ease of use have always been important factors in introducing technology into organizations to determine the actual behavior when using it Rafi, JianMing, and Ahmad (2020) and Schöpfel, Azeroual, and Saake (2020). It is universally practiced and reliable, but the model ignores consumers and only focuses on employees (Nagdev, Rajesh, & Misra, 2021). In general, the word "TEA" refers to many organisational levels of factors that influence changes or technology adoption. (Lai et al., 2018; Rafi et al., 2020).

2.4. HR Competencies (HRC)

A career path from beginning an HR career to becoming an HR executive is guided by the HR competence model, which specifies a certain set of behaviours for HR professionals. (Society for Human Resource Management, 2012). To perform the tasks, all HR professionals must have enabling competencies. Not only certain positions or career levels, sectors, geographies, or organisation sizes, but all levels of the HR profession are important for all competences (Human Resources Professionals Association (HRPA), 2014). The standard known as "CIPD's Profession Map" is introduced as a benchmark to build HR capability in a wide range of organizations (Chartered Institute of Personnel and Development (CIPD), 2015). Srikanth (2020) sees the HRC as representative of HR effectiveness. To provide business results, HR professionals need to have an understanding of business, the ability to manage change, and functional competence.

To maintain a competitive advantage, HR professionals must acquire the necessary skills to design and implement HR practices that are aligned with business strategy. Prikshat, Biswas, Nankervis, and Hoque (2018) propose that HRC is affected by continuous changes in the complexity and dynamics of the HRM function. A combination of economic and geo-political factors and explorations of the transference of western HRM models have a strong influence on the required competencies of HR professionals. As a result, HR characteristics are linked to firm performance. Yong and Yusoff (2016) define HRC as the ability to bring about change in organizations through effective HR performance and add value to a business by focusing on the processes that lead from changing business conditions to achieving long-term competitive advantage. Lo et al. (2015) agree that HR practitioners' competencies include both strategic and functional aspects.

2.5. HR Analytics (HRA)

HR Analytics (HRA), also known as People Analytics, Workforce Analytics, Talent Analytics, and some other terminologies, share the same implication: the use of HR data in the analysis process. HRA evolves as part of HR innovation, which is mainly influenced by two factors: the merging of new technology (such as big data) and the need to satisfy key stakeholders. Its value plays an important role in improving evidence-based decision making, which leads to contributions in overall business performance (Chartered Institute of Personnel and Development

(CIPD), 2018a, 2018b, 2020; Jain & Jain, 2020). Many organizations already have data analysis roles, and interest in HRA is growing, but there are still many questions about what constitutes best practice (Green, 2017).

HRA is being used by numerous organisations for a number of purposes. The different characteristics (such as size, ownership, industry, operating regions, and stage of business) of an organization impact the implementation of HRA. Several models have been introduced as guidelines for assessing an organization's HRA capability. Bersin (2014) proposes four levels namely (1) Operational Reporting, (2) Advanced Reporting, (3) Advanced Analytics, and (4) Predictive Analytics.

Kaur and Fink (2017) propose three levels consist of (1) Infrastructure and Reporting, (2) Advanced Analytics, and (3) Organizational Research. Chartered Institute of Personnel and Development (CIPD) (2020) propose similarly to Bersin (2014) and Kaur and Fink (2017) that HRA consists of the following levels: (1a) Descriptive Analytics (1b) Descriptive analytics using multidimensional data (2) Predictive Analytics and (3) Prescriptive Analytics.

3. REVIEW OF LITERATURE

3.1. Relationship between ORC, HRA, and ORP

According to Aboramadan et al. (2020), the relationship between ORC and HRA in a banking firm is a socialization process. The organization's structure, policy system, procedures, and management orientation form the values, beliefs, and assumptions that drive employees to accept innovation as part of an organization's philosophy. Different values of culture act as means to foster technological innovation (such as HRA) in an organization. Mishra, Luo, Hazen, Hassini, and Foropon (2019) argue that it is essential for all stakeholders in an organisation to recognise the value of leveraging cutting-edge information technologies and capabilities, such as HRA. The strong collaboration and alignment within the organization play an important role in facilitating the success of new capabilities. Innovative capabilities such as new technology allow an organization to better design products and services for the market.

A technology-oriented company is proactive in acquiring and implementing cutting-edge technology to outperform competitors' products and services (Obeidat, 2016). Applying new technology such as HRA allows an organization to survive in a highly competitive market. Specifically, the application of HRA in talent acquisition provides crucial benefits for HR managers to better tap the right talents (Pillai & Sivathanu, 2020).

ORC is perceived as one organization's competitive advantage over another. The performance of the company will be enhanced by the presence of a strong culture that is characterised by cooperation, openness, autonomy, dedication, employee engagement, flexibility, innovation, and responsibility, among other qualities. (Aboramadan et al., 2020). Rao et al. (2015) point out that an organization creates collaboration through experience sharing, idea exchange, and discussion. It reflects the formation of organizational values and culture that allow an organization to have standardized and aligned working processes that create consistency for all members. Internal information sharing is crucial for increasing team performance, and reaching out to partners and other external parties may significantly boost corporate success.

Kwarteng and Aveh (2018) propose that organizational culture affects corporate performance in four dimensions. Involvement: high levels of involvement and participation create a sense of ownership and responsibility and increase the quality of decision-making. Consistency: Members of an organization shared common values and beliefs through consistent and well-integrated communication. Adaptability (as agreed by Bouamama, Basly, and Zian (2021)): a reacting of changes internally and externally, re-constructs employees' behaviors and working processes that support an organization's ability to adapt. Mission: having a clear vision and direction contributes to both short- and long-term commitment and leads to effective performance. Lo, Wang, Wah, and Ramayah (2016) infer that the strong commitment of the company's executives to strategy implementation is an underlying success factor. By clearly articulating its goal and vision to every member of the organization, it plays a significant part in guiding its strategic path.

The alignment of vision commences a corporate culture that leads to continuous improvement, promotes better quality, and minimizes reluctance towards changes. In addition, the performance of a firm results from organizational collaboration made by top management.

Thus, based on the following literature review, the authors propose the following hypotheses:

H1: ORC has significant positive impact to HRA

H2: ORC has significant positive impact to ORP

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3.2. Relationship between TEA, HRA, and ORP

Mishra et al. (2019) point out that the flexibility of the information infrastructure facilitates the successful implementation of innovative information technologies. As a result, a flexible IT infrastructure enables a company to improve its technological capabilities to respond to an uncertain environment. Implementing new technology, such as HR Analytics, necessitates information processing capabilities that are adaptable enough to combine data from disparate sources. HRA applications are associated with technology integration and standardization. Technologies implemented in an organization should allow integration of information systems among different hardware and software applications (Pillai & Sivathanu, 2020).

As proposed by Fosso Wamba, Akter, and De Bourmont (2019), information quality and technology quality define the quality of HRA. An organization with robust technology can establish a good-quality information ecosystem that supports analytical activities. For instance, a company may produce more complete information by combining data from multiple sources that allow it to construct better insights. Technological infrastructure plays an important role in developing tools and capabilities related to HRA that enable firms to create actionable business intelligence from a multitude of data sources (Singh & Singh, 2019).

Information system maturity influences firm performance (Rao et al., 2015). It has been discovered that mature firms benefit from a more sophisticated IS. It enables the firms to integrate and share information among their business network, such as suppliers and customers, resulting in better business performance. Ji-fan Ren et al. (2017) suggest that system quality is the foundation of an analytics platform because it enables the platform to adjust to different demands in dynamic environments and forecast business value. Could-base technology helps an organization optimize business operations by providing more flexibility to the system (Gupta et al., 2020). Singh and Singh (2019) argue that technology infrastructure enables businesses to innovate and perform better financially by assisting them in efficiently managing all supply chain connections.

Thus, based on the following literature review, the authors propose the following hypotheses:

H3: TEA has significant positive impact to HRA

H4: TEA has significant positive impact to ORP

3.3. Relationship between HRC, HRA, and ORP

The success of HRA is largely dependent on the quality of the talent involved (Fosso Wamba et al., 2019). The talents must be well-versed in technology management as well as business. Mishra et al. (2019) supports the idea that HR competencies are one of the most widely studied factors to explore the linkage of an organization's competitive advantage. An organization must have enough resources and capabilities to promote the diffusion of new technologies. In addition, the availability of skilled professionals with the ability to carry out business analytics reflects the willingness of an organization to diffuse new technology such as big data analytics. An organization requires the right resources and skillsets for effective implementation of HR-specific technology like HRA. It is necessary that HR professionals have good knowledge of both technology and HR practices (Pillai & Sivathanu, 2020). Human capital has a positive and direct effect on organizational performance, such as employee turnover (L'Écuyer, Raymond, Fabi, & Uwizeyemungu, 2019).

HR functional performance provides for the development of human capital to satisfy an organization's purpose and strategic goals. Gupta et al. (2020) suggest that human factors facilitate incremental organizational capability through achieving superior operational performance. An organization with well-equipped human capital and proper managerial skills can produce impressive financial performance. Prikshat et al. (2018) propose that the competencies of HR professionals are important for the organization in a developing Asian economy. HR professionals help an organization overcome workforce challenges while creating positive impacts on customer loyalty and financial performance. In other words, HRM strategies and practices have a relationship with firm performance. According to Surabhi Verma, Singh, and Bhattacharyya (2021), integral HR services have an impact on an organization. The effectiveness of HR experts' interactions with managers and staff lowers overall attrition rates and raise employee satisfaction inside the company. In addition, it also helps an organization's innovation competency.

Thus, based on the following literature review, the authors propose the following hypotheses:

H5: HRC has significant positive impact to HRA

H6: HRC has significant positive impact to ORP

3.4. Relationship between HRA and ORP

Many of the previous studies examined the impact of technological capabilities on organizational performance through improvements in the efficiency and effectiveness of business management. Mishra et al. (2019) suggests that HRA helps an organization improve its business value and influence organizational performance. Technological innovation such as HRA is a key driver of organizational performance that allows an organization to reduce inefficiency through better human resources management (Obeidat, 2016). According to Fosso Wamba et al. (2019), adoption of analytical capabilities creates a competitive advantage for various functional units within an organization. Creating business values from HRA leads to building stronger internal capabilities, which link to business outcomes. HR functions in small organizations traditionally apply HRA through the integration of internal and external data to draw descriptive charts. A larger conglomerate with higher capability can apply predictive methods to optimize their business processes and increase their innovation competency. Surabhi Verma et al. (2021) suggest that HRA is an organizational strategy that facilitates alignment between employees and the organization. HRA improves real-time decision-making in HR systems and processes, resulting in more efficient HR cost management. According to Singh and Singh (2019) and Jeble et al. (2018), Big Data Analytics Capabilities such as HRA combines data from various sources to produce insightful business decisions. HRA capacity combines tangible and intangible organisational resources to produce a competitive advantage that boosts business objectives and company performance.

Thus, based on the following literature review, the authors propose the following hypotheses:

H7: HRA has significant positive impact on ORP.

All hypotheses are developed as the conceptual framework in this study as displayed in Figure 1.

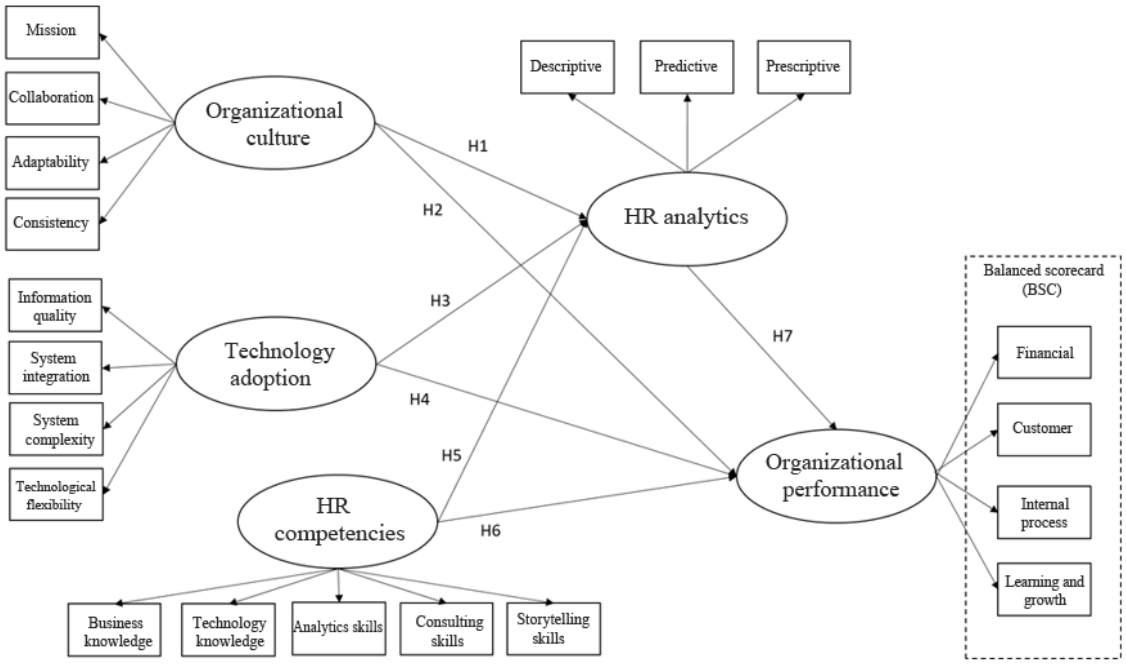

Figure 1. Proposed conceptual framework.

4. RESEARCH METHODOLOGY

4.1. Population and Sampling

Given the maturity and stage of the business, this study is limited to large organizations (Revenue Department, 2021). To define the unit of analysis, top managements in the human resources department are proposed as the representative to collect the data from. Only the top three highest levels, specifically CHRO, Head of HR, EVP (N-1), HR Director, VP (N-2), and HR Manager, AVP (N-3), are considered to be at these levels. The reason behind selection of top-3 level is because the authors wanted to ensure the quality of inputs which assumed to be limited to only higher level of the management. The targeted large-size organizations are purposively selected from the

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membership list of the Personnel Management Association of Thailand (PMAT). Altogether, the authors selected 498 companies representing various industries to proceed with the data collection process.

4.2. Research Tool

The questionnaire developed in this study is based on literature reviews conducted by various researchers. Each construct went through the thorough research in theory and concept, for example, the balanced scorecard by Kaplan and Norton (1992); Kaplan and Norton (1996) and Kaplan and Norton (2004), the technology acceptance model by Davis (1989), the organizational culture and leadership by Schein (1992), the HR competencies by Society for Human Resource Management (2012) and Society for Human Resource Management (2016), and the HR analytics framework by Chartered Institute of Personnel and Development (CIPD) (2015); Chartered Institute of Personnel and Development (CIPD) (2018a); Chartered Institute of Personnel and Development (CIPD) (2018b) and Chartered Institute of Personnel and Development (CIPD) (2020). In addition, the authors conducted a detailed study of previous research in similar fields to identify relationships among the variables and their implications in terms of measurements. The questionnaire consists of three sections: 1) personal information; 2) organizational information; and 3) relationships among factors impacting HR Analytics and the Organizational Performance. The first section aims to collect demographic data of the respondents including five questions: gender, age, education, position title, and years of working experience with the firm. The second section collects an organizational profile from the respondents, which includes five questions: annual revenue, employee numbers, type of organization, parental type, and ownership type. The third section is developed on a 5-point Likert scale to collect the inputs of the studied variables, which include 1) Organizational Culture, 2) Technology Adoption, 3) HR Competencies, 4) HR Analytics, and 5) Organizational Performance.

Table 1. Demographical data of the respondents**.**

Characteristics	**Numbers**	**Percentage**
1. Gender		
Male	158	40%
Female	242	60%
2. Age		
31-40	141	35%
41-50	159	40%
51-60	100	25%
3. Highest education		
Bachelor's degree	104	26%
Master's degree	280	70%
Doctor's degree	16	4%
4. Position title		
N-1 i.e., CPO, CHRO, Head of HR, EVP of HR	90	23%
N-2 i.e., HR Director, VP of HR	102	25%
N-3 i.e., HR Manager, AVP of HR	208	52%
5. Years of service with current organization		
Less than 1 year	38	10%
1-2 Years	43	11%
3-5 Years	92	23%
6-10 Years	103	26%
11-15 Years	51	13%
16-20 Years	30	8%
More than 20 years	43	11%
6 Total years of working experiences		
6-10 Years	39	10%
11-15 Years	83	21%
16-20 Years	92	23%
More than 20 years	186	46%

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4.3. Data Collection

With the support of PMAT, the digitized questionnaire in Google Form was sent to the emails of the selected samples and received a 100% response rate. However, after data cleansing is performed, only 400 out of 498 (80.3%) samples are of acceptable quality, thus, falling within the valid sample size as suggested by Hair, Black, Babin, Anderson, and Tatham (2006).

To describe the character of the samples, Table 1 indicates demographical data of the respondents, and Table 2 represents the organizational profile of the respondents.

Table 2. Organizational profile of the respondents.

Characteristics	Numbers	Percentage
1. Annual revenue in year 2021		
501 – 2,000 Million Baht	196	49%
2,001 – 5,000 Million Baht	67	17%
5,001 – 10,000 Million Baht	33	8%
10,001 – 20,000 Million Baht	35	9%
20,001 – 50,000 Million Baht	31	8%
More than 50,000 Million Baht	38	10%
2. Size of employees		
Less than or equal to 200 people	68	17%
201 – 500 people	84	21%
501 – 1,000 people	68	17%
1,001 – 2,000 people	53	13%
2,001 – 5,000 people	66	17%
More than 5,000 people	61	15%
3. Type of business		
Agriculture, forestry and fishing	2	1%
Mining and quarrying	2	1%
Manufacturing	103	26%
Electricity, gas, steam and air conditioning supply	9	2%
Construction	13	3%
Wholesale and retail trade	83	21%
Transportation and storage	27	7%
Accommodation and food service activities	10	3%
Information and communication	15	4%
Financial and insurance activities	43	11%
Real estate activities	15	4%
Professional, scientific, and technical activities	26	7%
Administrative and support service activities	22	6%
Education	5	1%
Human health and social work activities	19	5%
Arts, entertainment and recreation	6	2%
4. Parentship of the organization		
Thai	263	66%
Foreign	137	34%
5. Type of ownership		
Privately-owned	277	69%
Public Company Limited	123	31%

4.4. Data Analysis

The statistical analysis was done using SPSS 23.0. Confirmatory Factor Analysis (CFA) was deployed to validate the relationship among the 20 variables. Structured equation modelling (SEM) is examined using LISREL 8.8 to assess the study's hypotheses.

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5. RESULTS OF ANALYSIS

First, all 20 variables are evaluated using Person's Correlation to determine the model's overall fitness, with the results displayed in Table 3. None of these values are greater than 0.8, thus, passing an acceptable threshold of the similarity and being suitable for further developmental structural equation model (Profillidis & Botzoris, 2019).

Table 4 displays the results of the fitness analysis of the adjusted structural equation model. The value of factor loading for the observed variables ranges from 0.912 to 0.524; the highest is 0.912 (Consulting Skills, under the latent variable of HRC) and the lowest is 0.524 (Financial, under the latent variable of ORP. In addition, overall values of both factor loading and coefficient of determination (R^2) are within acceptable criteria. Table 5 represents the values of the direct, indirect, and total effect, the value of the total effect of the adjusted model. The strongest relationship (highest value of total effect) among all latent variables of the adjusted structural equation model is the effect of ORC -> ORP (0.488) whereas the weakest is the effect of HRA -> ORP (0.132), thus, all the values of total effect are significant at level 0.01.

For direct effect, the highest is ORC -> ORP (0.463), whereas the lowest is HRA -> ORP (0.132). For indirect effect, the highest is HRC -> ORP (0.052) and the lowest is ORC -> ORP (0.025), thus, significant at level 0.05. Both the HRA (0.471) and ORP (0.872) as the dependent variables fulfil the acceptable requirements (> 0.3) for the value of R2 in the modified structural equation model.

Figure 2 visualizes the summary of final structural equation model of the conceptual framework. The model gives results of goodness-of-fits values as χ^2= 62.52, df = 84, χ^2/df = 0.744, P-value = 0.962, RMSEA = 0.000, GFI = 0.985, AGFI = 0.961.

According to Dash and Paul (2021), all values of the fitness indices indicated in Table 6 are satisfied. Thus, all hypotheses of the final structural equation model are supported by the value of the path coefficient (ß), which is statistically significant at 0.01 as presented in Table 7.

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Table 3. Person's Correlation of the observed variables in of the structural equation model.

Variable	MIS	COL	ADA	CON	INQ	STI	STC	TNF	BUK	ITK	ANA	COS	STS	DES	PRD	PRS	FIN	CUS	INT	LAG
MIS	1	0.626**	0.499**	0.653**	0.500**	0.462**	0.365**	0.396**	0.474**	0.479**	0.430**	0.485**	0.399**	0.364**	0.366**	0.380**	0.426**	0.470**	0.584**	0.537**
COL	0.626**	1	0.636**	0.628**	0.456**	0.453**	0.407**	0.464**	0.426**	0.463**	0.324**	0.459**	0.457**	0.389**	0.388**	0.394**	0.367**	0.441**	0.547**	0.459**
ADA	0.499**	0.636**	1	0.554**	0.396**	0.454**	0.289**	0.471**	0.425**	0.443**	0.367**	0.473**	0.436**	0.382**	0.360**	0.357**	0.413**	0.528**	0.482**	0.440**
CON	0.653**	0.628**	0.554**	1	0.496**	0.451**	0.440**	0.426**	0.495**	0.466**	0.422**	0.525**	0.464**	0.403**	0.402**	0.410**	0.357**	0.442**	0.526**	0.552**
INQ	0.500**	0.456**	0.396**	0.496**	1	0.718**	0.663**	0.615**	0.357**	0.459**	0.398**	0.400**	0.385**	0.445**	0.362**	0.422**	0.339**	0.410**	0.553**	0.449**
STI	0.462**	0.453**	0.454**	0.451**	0.718**	1	0.700**	0.698**	0.452**	0.469**	0.420**	0.470**	0.483**	0.436**	0.406**	0.425**	0.336**	0.388**	0.547**	0.459**
STC	0.365**	0.407**	0.289**	0.440**	0.663**	0.700**	1	0.648**	0.367**	0.438**	0.350**	0.420**	0.442**	0.435**	0.369**	0.394**	0.286**	0.379**	0.490**	0.484**
TNF	0.396**	0.464**	0.471**	0.426**	0.615**	0.698**	0.648**	1	0.391**	0.472**	0.364**	0.439**	0.376**	0.410**	0.347**	0.347**	0.349**	0.444**	0.561**	0.466**
BUK	0.474**	0.426**	0.425**	0.495**	0.357**	0.452**	0.367**	0.391**	1	0.729**	0.681**	0.751**	0.714**	0.383**	0.408**	0.415**	0.374**	0.344**	0.477**	0.577**
ITK	0.479**	0.463**	0.443**	0.466**	0.459**	0.469**	0.438**	0.472**	0.729**	1	0.667**	0.684**	0.616**	0.463**	0.412**	0.452**	0.392**	0.485**	0.546**	0.570**
ANA	0.430**	0.324**	0.367**	0.422**	0.398**	0.420**	0.350**	0.364**	0.681**	0.667**	1	0.727**	0.589**	0.477**	0.478**	0.519**	0.413**	0.464**	0.482**	0.520**
COS	0.485**	0.459**	0.473**	0.525**	0.400**	0.470**	0.420**	0.439**	0.751**	0.684**	0.727**	1	0.744**	0.512**	0.505**	0.527**	0.383**	0.460**	0.530**	0.589**
STS	0.399**	0.457**	0.436**	0.464**	0.385**	0.483**	0.442**	0.376**	0.714**	0.616**	0.589**	0.744**	1	0.510**	0.506**	0.520**	0.337**	0.401**	0.476**	0.550**
DES	0.364**	0.389**	0.382**	0.403**	0.445**	0.436**	0.435**	0.410**	0.383**	0.463**	0.477**	0.512**	0.510**	1	0.682**	0.620**	0.356**	0.405**	0.501**	0.448**
PRD	0.366**	0.388**	0.360**	0.402**	0.362**	0.406**	0.369**	0.347**	0.408**	0.412**	0.478**	0.505**	0.506**	0.682**	1	0.709**	0.279**	0.321**	0.464**	0.435**
PRS	0.380**	0.394**	0.357**	0.410**	0.422**	0.425**	0.394**	0.347**	0.415**	0.452**	0.519**	0.527**	0.520**	0.620**	0.709**	1	0.255**	0.304**	0.424**	0.484**
FIN	0.426**	0.367**	0.413**	0.357**	0.339**	0.336**	0.286**	0.349**	0.374**	0.392**	0.413**	0.383**	0.337**	0.356**	0.279**	0.255**	1	0.514**	0.584**	0.424**
CUS	0.470**	0.441**	0.528**	0.442**	0.410**	0.388**	0.379**	0.444**	0.344**	0.485**	0.464**	0.460**	0.401**	0.405**	0.321**	0.304**	0.514**	1	0.688**	0.447**
INT	0.584**	0.547**	0.482**	0.526**	0.553**	0.547**	0.490**	0.561**	0.477**	0.546**	0.482**	0.530**	0.476**	0.501**	0.464**	0.424**	0.584**	0.688**	1	0.591**
LAG	0.537**	0.459**	0.440**	0.552**	0.449**	0.459**	0.484**	0.466**	0.577**	0.570**	0.520**	0.589**	0.550**	0.448**	0.435**	0.484**	0.424**	0.447**	0.591**	1

Note: Table 3 indicates that none of the values are greater than 0.8, thus, pass acceptable threshold of similarity and suitable for initial structural equation model development.

** = $p < 0.05$.

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Table 4. Results of structural equation model fitness analysis (Adjusted).

Latent variables	Observed variables	Factor loading	SE	T-value	R^2
ORC	MIS	0.805**	0.034	18.601	0.647
	COL	0.780**	0.031	17.693	0.609
	ADA	0.768**	0.042	13.799	0.589
	CON	0.814**	0.030	18.839	0.662
ITA	INQ	0.811**	0.031	19.003	0.657
	STI	0.879**	0.032	21.573	0.772
	STC	0.808**	0.031	19.123	0.653
	TNF	0.797**	0.036	18.471	0.635
HRC	BUK	0.839**	0.032	19.925	0.704
	ITK	0.878**	0.031	20.524	0.770
	ANA	0.794**	0.037	18.279	0.630
	COS	0.912**	0.034	21.893	0.832
	STS	0.851**	0.031	19.470	0.725
HRA	DES	0.852**	<-->	<-->	0.726
	PRD	0.806**	0.048	14.860	0.650
	PRS	0.869**	0.044	16.912	0.756
ORP	FIN	0.524**	<-->	<-->	0.274
	CUS	0.627**	0.043	10.424	0.393
	INT	0.755**	0.044	11.731	0.569
	LAG	0.796**	0.057	10.278	0.634

Note: <--> = Constrain parameter.
** = Factor loading is statistically significant at 0.01 (2.576 > t-value).
Organizational culture (OC), Technology adoption (TEA), HR Competencies (HRC), HR analytics (HRA), Organizational performance (ORP), Mission (MIS), Collaboration (COL), Adaptability (ADA), Consistency (CON), Information quality (INQ), System integration (STI), System complexity (STC), Technological flexibility (TNF), Business knowledge (BUK), Technology knowledge (ITK), Analytics skills (ANA), Consulting skills (COS), Storytelling Skills (STS), Descriptive (DES), Predictive (PRD), Prescriptive (PRS), Financial (FIN), Customer (CUS), Internal process (INT), Learning and growth (LAG).

Table 5. Direct effect, indirect effect, and total effect of final structural equation model for the proposed conceptual framework.

Latent variable/ R^2	HRA			ORP		
	DE	IE	TE	DE	IE	TE
ORC	0.189**	-	0.189**	0.463**	0.025*	0.488**
(t-value)	(2.959)		(2.959)	(6.032)	(2.024)	(6.292)
TEA	0.202**	-	0.202**	0.197**	0.027*	0.224**
(t-value)	(3.377)		(3.377)	(3.235)	(2.038)	(3.671)
HRC	0.391**	-	0.391**	0.292**	0.052*	0.344**
(t-value)	(6.376)		(6.376)	(4.847)	(2.395)	(5.584)
HRA	-	-	-	0.132**	-	0.132**
(t-value)	-	-	-	(2.587)	-	(2.587)
R^2	0.471			0.872		

Note: DE = Direct effect, IE = Indirect effect and TE = Total effect.
* Significant at => 1.960 and =< 2.575 (Level = 0.05), ** Significant at > 2.575 (Level = 0.01).

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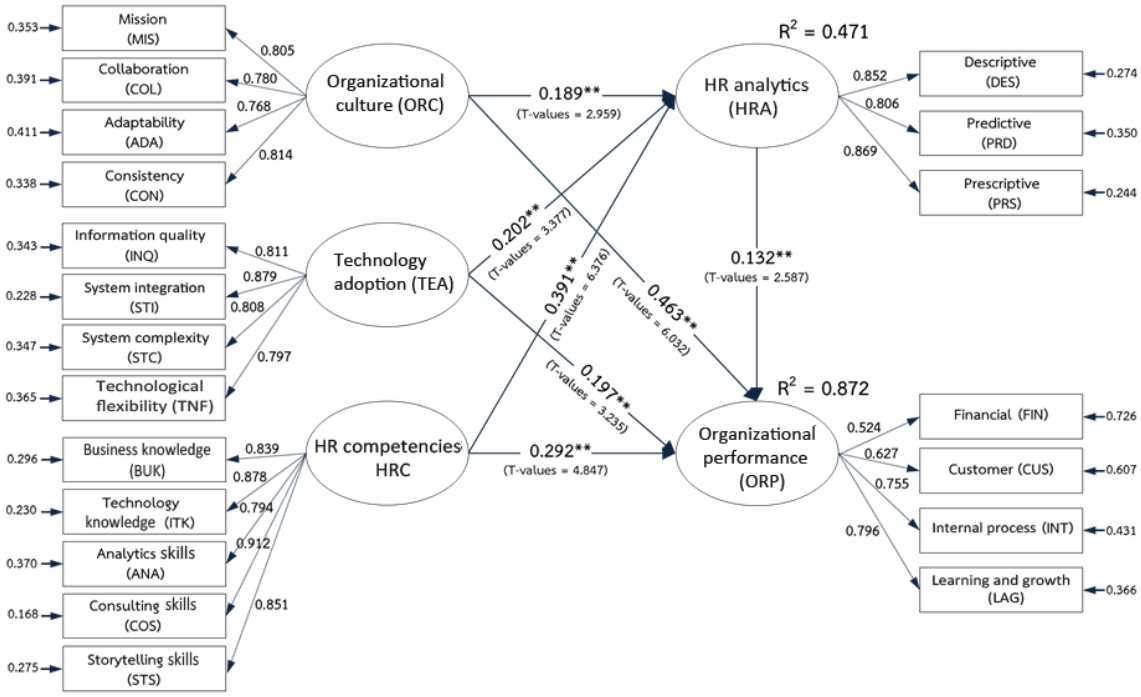

Figure 2. Final structural equation model of the study.

Note: ** shows statistically significant at 0.01.

Table 6. Summary goodness-of-fit statistics of the final model.

Goodness-of-fit statistics	Criteria	Results
Chi-square (P-value)	>0.05	0.962
CMIN/df	<3.00	0.744
Goodness-of-fit Index (GFI)	>0.90	0.985
Adjusted goodness-of-fit Index (AGFI)	>0.90	0.961
Standardized Root mean square residual (SRMSR)	<0.05	0.017
Root mean square error of approximation (RMSEA)	<0.08	0.000
Normed Fit Index (NFI)	>0.90	0.996
Non-normed fit index (NNFI)	>0.90	1.000
Comparative Fit Index (CFI)	>0.95	1.000

Table 7. Results of hypotheses testing of the final structural equation model.

Hypothesis	Path coefficient (ß)	T-value	Results
H1: ORC -> HRA	0.189**	2.959	Supported
H2: ORC -> ORP	0.463**	6.032	Supported
H3: TEA -> HRA	0.202**	3.377	Supported
H4: TEA -> ORP	0.197**	3.235	Supported
H5: HRC -> HRA	0.391**	6.373	Supported
H6: HRC -> ORP	0.292**	4.847	Supported
H7: HRA -> ORP	0.132**	2.587	Supported

Note: ** = ß is statistically significant at 0.01 (2.576 =< t-value).

6.DISCUSSION

The results from statistical analysis confirmed that all the proposed seven hypothesis in this study are supported. For ORC, the relationship to HRA is highly significant with path co-efficient value of 0.189 which aligns to the previous studies (Aboramadan et al., 2020; Mishra et al., 2019; Obeidat, 2016; Pillai & Sivathanu, 2020). Also, the relationship

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to ORP that confirmed to have a positive significant impact with path co-efficient value of 0.463 and in line with the previous studies (Bouamama et al., 2021; Kwarteng & Aveh, 2018; Lo et al., 2016; Rao et al., 2015). For TEA, the relationship to HRA is highly significant with path co-efficient value of 0.202 which aligns to the previous studies (Fosso Wamba et al., 2019; Mishra et al., 2019; Pillai & Sivathanu, 2020; Singh & Singh, 2019). For HRC, the relationship to HRA is highly significant with path co-efficient value of 0.391 which aligns to the previous studies (Fosso Wamba et al., 2019; Mishra et al., 2019; Pillai & Sivathanu, 2020). In accordance with other research, the link to ORP was also verified to have a strong beneficial influence, with a path co-efficient value of 0.197. (Gupta et al., 2020; L'Écuyer et al., 2019; Prikshat et al., 2018; Surabhi Verma et al., 2021). Last but not least, the route co-efficient value of 0.132 for the link between HRA (as a mediating variable) and ORP supports the findings of other investigations. (Jeble et al., 2018; Mishra et al., 2019; Obeidat, 2016; Singh & Singh, 2019; Surabhi Verma et al., 2021).

In summary, the results of this study confirmed the proposed assumptions. The independent variables namely Organizational Culture, Technology Adoption, HR Competencies are positively impact to Organizational Performance. In addition, they also influence the existence of HR Analytics which mediates the impact of Organizational Performance as well.

7. CONCLUSION

This study serves as a guideline to organizations, especially the large size to develop the roadmap to improve their organizational performance. Throughout the process of analysis observed variables of each construct, organizations can utilize the study as a tool to do self-assessment. Thus, organizations can identify the gap for improvement around Organizational Culture, Technology Adoption, and HR Competencies. Furthermore, the study allows organizations to be able to evaluate the maturity level of HR Analytics that is currently being practiced in the organization. As confirmed in this study that Organizational Culture, Technology Adoption, and HR Competencies have direct positive impact to Organizational Performance. Therefore, organizations should put their emphasis on improving these three elements which will allow them to elevate the overall performance. Additionally, as this study's findings suggest, an organization should build its HR Analytics skills to improve organizational performance.

8. IMPLICATIONS

The results of this study lead to some future research implications. First, changing of independent variables, the authors choose Organizational Culture, Technology Adoption, and HR Competences as the three independent factors in this study based on literature review process. There are virtually infinitely many variables that might be substituted for or added to the suggested conceptual framework. Hereby with this study, the authors suggest considering knowledge management as an option. Shahzad, Bajwa, Siddiqi, Ahmid, and Raza Sultani (2016) proposed that knowledge management has significant positive impact to Organizational Performance and Davenport, Harris, and Shapiro (2010) see the important of knowledge management to help forming data into analytics insights. Second, changing of dependent variable, Organizational Performance is measured through the Balanced Scorecard (BSC) in this study. Although BSC is considered the most complete indicator of an organization's success, other indicators may be used to support the hypothesised link in this study. For example, Almatrooshi et al. (2016) suggests that effectiveness of an organization can be measured through employee performance. Third, replication of this study into qualitative research such as in-depth interview with senior management in the field of HR or other functions to gain more detail information and to valid the results in this study.

However, this study comes with some limitations. First, the situation of COVID-19 in Thailand during this study is still under recover since the dependent variable in this study is organisational performance, the businesses of the sampling organizations may have been harmed by COVID-19 and have not yet fully recovered. Even though, most of the performance factors under Organizational Performance are captured as trends but they may not fully reflect the normal condition of an organization. On the other hand, the upside of this study that was conducted during COVID-19 can also reflect the readiness of an organization is facing unforeseeable challenges. Second, given that this study intends to focus only on large-size organizations, the result may not be the best representative of the whole Thailand's context. Further research may be required with small and medium organisations, which account for more than 99% of the registered organisations, to better represent the background of the nation (Revenue Department, 2021). Third, regarding the third aspect, the study's scope is limited to companies with local and foreign parentships that conduct business in Thailand. Differences such as policies, laws and regulations, cultures may gear the results

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of the study to some other directions. Thus, replications of this study into other geographical regions may help to reconfirm the results of the study.

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All authors contributed equally to the conception and design of the study.

REFERENCES

Aboramadan, M., Albashiti, B., Alharazin, H., & Zaidoune, S. (2020). Organizational culture, innovation and performance: A study from a non-western context. *Journal of Management Development, 39*(4), 437-451. https://doi.org/10.1108/jmd-06-2019-0253

Al-Abdullat, B. M., & Dababneh, A. (2018). The mediating effect of job satisfaction on the relationship between organizational culture and knowledge management in Jordanian banking sector. *Benchmarking: An International Journal, 25*(2), 517-544. https://doi.org/10.1108/bij-06-2016-0081

Almatrooshi, B., Singh, S. K., & Farouk, S. (2016). Determinants of organizational performance: A proposed framework. *International Journal of Productivity and Performance Management, 65*(6), 844-859. https://doi.org/10.1108/ijppm-02-2016-0038

Bersin. (2014). *Bersin by deloitte frameworks and maturity models [White paper]. Deloitte*. Retrieved from https://pdf4pro.com/cdn/learning-amp-development-bersin-by-deloitte-frameworks-and-5bb6bf.pdf

Bhuiyan, F., Baird, K., & Munir, R. (2020). The association between organisational culture, CSR practices and organisational performance in an emerging economy. *Meditari Accountancy Research, 28*(6), 977-1011. https://doi.org/10.1108/medar-09-2019-0574

Bouamama, M., Basly, S., & Zian, H. (2021). How do contingency factors influence the content of balanced scorecards? An empirical study of French intermediate-sized enterprises. *Journal of Accounting & Organizational Change, 17*(3), 373-393. https://doi.org/10.1108/jaoc-04-2020-0048

Cameron, K., & Quinn, R. (1999). *Diagnosing and changing organizational culture*. Massachusetts: Addison-Wesley.

Chartered Institute of Personnel and Development (CIPD). (2015). *The CIPD profession map: Our professional standards [White paper]*. Retrieved from https://www.academia.edu/22315691/The_CIPD_Profession_Map_Our_Professional_Standards

Chartered Institute of Personnel and Development (CIPD). (2018a). *People analytics: Driving business performance with people data. Global research report [White paper]*. Retrieved from https://www.cipd.org/globalassets/media/zzzz-interim-document-depository/uk/people-analytics-us-focus_2018_tcm18-47588.pdf

Chartered Institute of Personnel and Development (CIPD). (2018b). *Getting started with people analytics: A practitioners' guide. Guide [White paper]*. Retrieved from https://www.cipd.org/ie/knowledge/guides/analytics-practitioner-guide/

Chartered Institute of Personnel and Development (CIPD). (2020). *People analytics factsheet [White paper]*. Retrieved from https://www.cipd.org/uk/knowledge/factsheets/analytics-factsheet/

Dash, G., & Paul, J. (2021). CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. *Technological Forecasting and Social Change, 173*, 121092. https://doi.org/10.1016/j.techfore.2021.121092

Davenport, T. H., Harris, J., & Shapiro, J. (2010). Competing on talent analytics. *Harvard Business Review, 88*(10), 52-58.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. https://doi.org/10.2307/249008

Deloitte. (2021). *Reimagining human resources - the future of enterprise demands a new future of HR*. Retrieved from https://www2.deloitte.com/sg/en/pages/human-capital/articles/gx-future-of-hr.html

Fayol, H. (1916). Administration industrielle et generale. In (5th ed., Vol. 19, pp. 1916). Dunod, Paris: Bulletin from Societe de l'Industrie Minerale.

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

Fosso Wamba, S., Akter, S., & De Bourmont, M. (2019). Quality dominant logic in big data analytics and firm performance. *Business Process Management Journal, 25*(3), 512-532. https://doi.org/10.1108/bpmj-08-2017-0218

Green, D. (2017). The best practices to excel at people analytics. *Journal of Organizational Effectiveness: People and Performance, 4*(2), 137-144. https://doi.org/10.1108/joepp-03-2017-0027

Gupta, S., Drave, V. A., Dwivedi, Y. K., Baabdullah, A. M., & Ismagilova, E. (2020). Achieving superior organizational performance via big data predictive analytics: A dynamic capability view. *Industrial Marketing Management, 90*, 581- 592. https://doi.org/10.1016/j.indmarman.2019.11.009

Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River: Pearson Prentice Hall.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work* (2nd ed.). New York: John Wiley.

Ho, T. C., Ahmad, N. H., & Ramayah, T. (2016). Competitive capabilities and business performance among manufacturing SMEs: Evidence from an emerging economy, Malaysia. *Journal of Asia- Pacific Business, 17*(1) , 37- 58. https://doi.org/10.1080/10599231.2016.1129263

Hofstede, G. (1991). *Cultures and organizations: Software of the mind*. London: McGraw-Hill.

Human Resources Professionals Association (HRPA). (2014). *Human resources professional competency framework [White paper]*. Retrieved from https://studylib.net/doc/8399153/human-resources-professional-competency-framework

Jain, P., & Jain, P. (2020). Understanding the concept of HR analytics. *International Journal on Emerging Technologies, 11*(2), 644-652.

Jeble, S., Dubey, R., Childe, S. J., Papadopoulos, T., Roubaud, D., & Prakash, A. (2018). Impact of big data and predictive analytics capability on supply chain sustainability. *The International Journal of Logistics Management, 29*(2) , 513- 538. https://doi.org/10.1108/ijlm-05-2017-0134

Ji-fan Ren, S., Fosso Wamba, S., Akter, S., Dubey, R., & Childe, S. J. (2017). Modelling quality dynamics, business value and firm performance in a big data analytics environment. *International Journal of Production Research, 55*(17), 5011-5026. https://doi.org/10.1080/00207543.2016.1154209

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard – measures that drive performance. *Harvard Business Review, 83*(1), 71-79.

Kaplan, R. S., & Norton, D. P. (1996). Strategic learning & the balanced scorecard. *Strategy & Leadership, 24*(5), 18-24.

Kaplan, R. S., & Norton, D. P. (2004). The strategy map: Guide to aligning intangible assets. *Strategy & Leadership, 32*(5), 10-17. https://doi.org/10.1108/10878570410699825

Kaur, J., & Fink, A. A. (2017). *Trends and practices in talent analytics. Society for Human Resource Management (SHRM)-Society for Industrial-Organizational Psychology (SIOP)*. Retrieved from Science of HR White Paper Series No. 20.

Kremer, K. (2018). HR analytics and its moderating factors. *Management Science - Budapest Management Review, 49*(11), 62-68.

Kwarteng, A., & Aveh, F. (2018). Empirical examination of organizational culture on accounting information system and corporate performance: Evidence from a developing country perspective. *Meditari Accountancy Research, 26*(4) , 675- 698. https://doi.org/10.1108/medar-01-2018-0264

L'Écuyer, F., Raymond, L., Fabi, B., & Uwizeyemungu, S. (2019). Strategic alignment of IT and human resources management in manufacturing SMEs: Empirical test of a mediation model. *Employee Relations, 41*(5), 830-850.

Lai, Y., Sun, H., & Ren, J. (2018). Understanding the determinants of big data analytics (BDA) adoption in logistics and supply chain management: An empirical investigation. *International Journal of Logistics Management, 29*(2), 676-703.

Lawler, E. E. (2003). *Treat people right*. San Francisco: Jossey-Bass.

Lo, K., Macky, K., & Pio, E. (2015). The HR competency requirements for strategic and functional HR practitioners. *The International Journal of Human Resource Management, 26*(18) , 2308- 2328. https://doi.org/10.1080/09585192.2015.1021827

Lo, M. C., Azlan, M. A., Ramayah, T., & Wang, Y. C. (2015). Examining the effects of leadership, market orientation and leader member exchange (LMX) on organisational performance. *Engineering Economics, 26*(4) , 409- 421. https://doi.org/10.5755/j01.ee.26.4.7656

Lo, M. C., Wang, Y. C., Wah, C. J., & Ramayah, T. (2016). The critical success factors for organizational performance of SMEs in Malaysia: A partial least squares approach. *Review of Business Management, 18*(61) , 370- 391. https://doi.org/10.7819/rbgn.v18i61.3058

Marler, J. H., & Boudreau, J. W. (2017). An evidence-based review of HR analytics. *The International Journal of Human Resource Management, 28*(1), 3-26. https://doi.org/10.1080/09585192.2016.1244699

Masa'deh, R., Obeidat, B. Y., & Tarhini, A. (2016). A Jordanian empirical study of the associations among transformational leadership, transactional leadership, knowledge sharing, job performance, and firm performance: A structural equation modelling approach. *Journal of Management Development, 35*(5), 681-705.

Mercer. (2022) . *Rise of the relatable organization [White paper] . Global Talent Trends Study*. Retrieved from https://www.observatoriorh.com/wp-content/uploads/2022/04/Global-Talent-Trends-2022-Report.pdf

Mishra, D., Luo, Z., Hazen, B., Hassini, E., & Foropon, C. (2019). Organizational capabilities that enable big data and predictive analytics diffusion and organizational performance: A resource-based perspective. *Management Decision, 57*(8), 1734-1755. https://doi.org/10.1108/md-03-2018-0324

Nagdev, K., Rajesh, A., & Misra, R. (2021). The mediating impact of demonetisation on customer acceptance for IT-enabled banking services. *International Journal of Emerging Markets, 16*(1), 51-74. https://doi.org/10.1108/ijoem-05-2018-0263

Obeidat, B. Y. (2016). The effect of strategic orientation on organizational performance: The mediating role of innovation. *International Journal of Communications, Network and System Sciences, 9*(11) , 478- 505. https://doi.org/10.4236/ijcns.2016.911039

Pawirosumarto, S., Sarjana, P. K., Gunawan, R., & Gale, C. S. (2017). The effect of work environment, leadership style, and organizational culture towards job satisfaction and Its implication towards employee performance in Parador Hotels and Resorts, Indonesia. *International Journal of Law and Management, 59*(6) , 1337- 1358. https://doi.org/10.1108/ijlma-10-2016-0085

Peeters, T., Paauwe, J., & Van De Voorde, K. (2020). People analytics effectiveness: Developing a framework. *Journal of Organizational Effectiveness: People and Performance, 7*(2), 203-219. https://doi.org/10.1108/joepp-04-2020-0071

Pillai, R., & Sivathanu, B. (2020). Adoption of artificial intelligence (AI) for talent acquisition in IT/ ITeS organizations. *Benchmarking: An International Journal, 27*(9), 2599-2629. https://doi.org/10.1108/bij-04-2020-0186

PMAT. (2021). *Hot topic survey*. Retrieved from http://www.pmat.or.th

Prikshat, V., Biswas, K., Nankervis, A., & Hoque, M. R. (2018). Bangladesh HR professionals' competencies: Impact on firm performance and moderating effects of organisation life cycle. *Evidence- Based HRM, 6*(2) , 203- 220. https://doi.org/10.1108/ebhrm-12-2017-0064

Profillidis, V. A., & Botzoris, G. N. (2019). Chapter 5 - Statistical methods for transport demand modeling. *Modeling of Transport Demand*, 163–224.

Pujiono, B., Setiawan, M., & Wijayanti, R. (2020). The effect of transglobal leadership and organizational culture on job performance-inter-employee trust as moderating variable. *International Journal of Public Leadership, 16*(3), 319-335. https://doi.org/10.1108/ijpl-11-2019-0071

Rafi, M., JianMing, Z., & Ahmad, K. (2020). Digital resources integration under the knowledge management model: An analysis based on the structural equation model. *Information Discovery and Delivery, 48*(4) , 237- 253. https://doi.org/10.1108/idd-12-2019-0087

Rao, Y., Guo, K. H., & Chen, Y. (2015). Information systems maturity, knowledge sharing, and firm performance. *International Journal of Accounting & Information Management, 23*(2), 106-127. https://doi.org/10.1108/ijaim-11-2013-0060

Revenue Department. (2021) . *About SMEs, revenue department*. Retrieved from https://www.rd.go.th/fileadmin/user_upload/lorkhor/newsbanner/2022/CIT_SME.pdf

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.

Schein, E. H. (1992). *Organizational culture and leadership* (2nd ed.). San Francisco: Jossey-Bass.

Schöpfel, J., Azeroual, O., & Saake, G. (2020). Implementation and user acceptance of research information systems: An empirical survey of German universities and research organisations. *Data Technologies and Applications, 54*(1) , 1- 15. https://doi.org/10.1108/dta-01-2019-0009

Shahzad, K., Bajwa, S. U., Siddiqi, A. F. I., Ahmid, F., & Raza Sultani, A. (2016). Integrating knowledge management (KM) strategies and processes to enhance organizational creativity and performance: An empirical investigation. *Journal of Modelling in Management, 11*(1), 154-179. https://doi.org/10.1108/jm2-07-2014-0061

Sharma, A., & Sharma, T. (2017). HR analytics and performance appraisal system: A conceptual framework for employee performance improvement. *Management Research Review, 40*(6), 684-697. https://doi.org/10.1108/mrr-04-2016-0084

Simon, A., Bartle, C., Stockport, G., Smith, B., Klobas, J. E., & Sohal, A. (2015). Business leaders' views on the importance of strategic and dynamic capabilities for successful financial and non-financial business performance. *International Journal of Productivity and Performance Management, 64*(7), 908-931. https://doi.org/10.1108/ijppm-05-2014-0078

Singh, N. P., & Singh, S. (2019). Building supply chain risk resilience: Role of big data analytics in supply chain disruption mitigation. *Benchmarking: An International Journal, 26*(7), 2318-2342. https://doi.org/10.1108/bij-10-2018-0346

Society for Human Resource Management. (2012) . *SHRM competency model [White paper]* . Retrieved from https://docplayer.net/4762217-Shrm-competency-model-2012-society-for-human-resource-management.html

Society for Human Resource Management. (2016). *Use of workforce analytics for competitive advantage. The Economist Intelligence [White paper]*. Retrieved from https://www.shrm.org/foundation/ourwork/initiatives/preparing-for-future-hr-trends/Documents/Workforce%20Analytics%20Report.pdf

Srikanth, P. (2020). The relative contribution of personality, cognitive ability and the density of work experience in predicting human resource competencies. *Personnel Review, 49*(8), 1573-1590. https://doi.org/10.1108/pr-09-2018-0329

Stojanović-Aleksić, V., Erić Nielsen, J., & Bošković, A. (2019). Organizational prerequisites for knowledge creation and sharing: Empirical evidence from Serbia. *Journal of Knowledge Management, 23*(8), 1543-1565. https://doi.org/10.1108/jkm-05-2018-0286

Taylor, F. W. (1947). *The principles of scientific management*. New York: Norton, W.W.

Tornatzky, L. G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington: Lexington Books.

Usman, H., Mulia, D., Chairy, C., & Widowati, N. (2022). Integrating trust, religiosity and image into technology acceptance model: The case of the Islamic philanthropy in Indonesia. *Journal of Islamic Marketing, 13*(2) , 381- 409. https://doi.org/10.1108/jima-01-2020-0020

Verma, S., & Bhattacharyya, S. S. (2017). Perceived strategic value-based adoption of big data analytics in emerging economy: A qualitative approach for Indian firms. *Journal of Enterprise Information Management, 30*(3) , 354- 382. https://doi.org/10.1108/jeim-10-2015-0099

Verma, S., Singh, V., & Bhattacharyya, S. S. (2021). Do big data-driven HR practices improve HR service quality and innovation competency of SMEs. *International Journal of Organizational Analysis, 29*(4), 950-973. https://doi.org/10.1108/ijoa-04-2020-2128

Yong, J. Y., & Yusoff, Y. M. (2016). Studying the influence of strategic human resource competencies on the adoption of green human resource management practices. *Industrial and Commercial Training, 48*(8) , 416- 422. https://doi.org/10.1108/ict-03-2016-0017