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## The Mediating Role of Information System Ambidexterity on The Relationship Between Information Governance, Innovation, Information Technology Capabilities and HRIS Effectiveness

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### Abstract

Current pandemic has brought human resources to the forefront of business equation and the aiding technology is HRIS. However, it is a common concern for academicians and managers to reach an agreement as to why such important technological implementations, despite heavy investments, do not realize their full potential as evidenced in the contemporary marketplaces. Accordingly, this study aims at proposing a conceptual framework to investigate the influencing factors like information governance, IT capabilities of staff, innovation of senior executives, IS ambidexterity and effectiveness of human resource information systems in a developing country context like Pakistan. Banking industry provides a valuable context as it is one of the largest investors and early adopters in the field of information technology, however, the evidence suggests that the outcomes of these investments always daunt the stakeholders. In this study, we intend to explore the factors that determine the success and effectiveness of human resource information system in the banking sector of Pakistan. The antecedents that influence the HRIS effectiveness have been considered with the combination of prominent research theories like Resource based view and dynamic capabilities theory which have been employed as theoretical basis for this research.

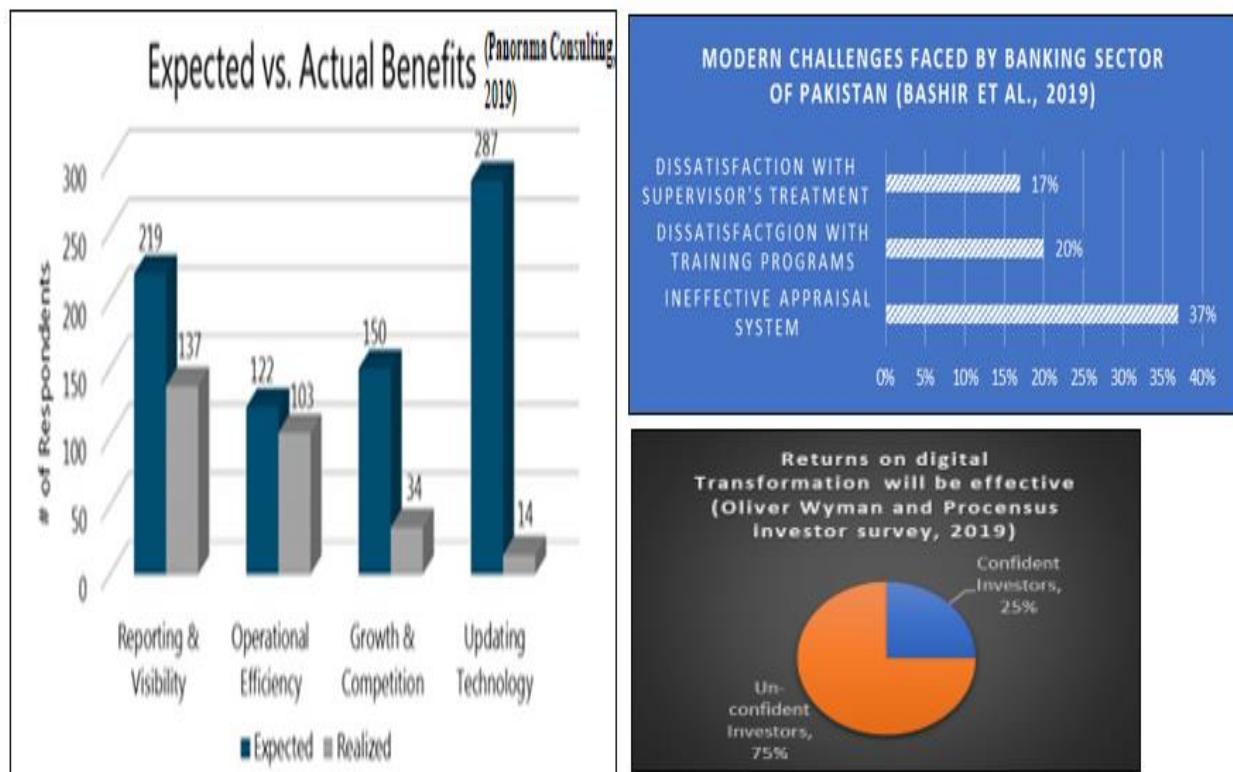
**Keywords:** Human Resource Information System Effectiveness, HRIS, Information Governance, Innovation of Senior Executives, IT Capabilities of Staff, IS Ambidexterity, Banking Sector of Pakistan

## Introduction

Human resource management has been elevated because of the current pandemic to the top of the business priority list, alongside aiding technology, undoubtedly the HRIS (Meister, 2020). However, it remains a point of concern for academics and practitioners to validate their investments in HRIS, to be productive as desired (Elragal & Hassanien, 2019). Despite huge investments in HRIS, the return on investment is less than expected as it was observed that 41% of the organizations which implemented digital transformation, experienced even less than 50% of their expected benefits (Panorama Consulting Group, 2010). Similarly, another important factor highlighted by a market research firm Oliver Wyman is that top executives are concerned to “track-down” the benefits of investments as a global bank’s CFO is reported to have said: “I know 50 percent of my digital transformation spend is wasted – I just don’t know which 50 percent” (Wyman, 2020). Figure 1.1 infographic shows some relevant trends for less than expected benefits from HRIS and digital transformations. As evident in the Figure 1.1, actual benefits have been found far less than the expected benefits as 75% of investors are not confident if their investment in transformations will be successful (Oliver Wyman, 2020). Similarly, there is not even a single metric amongst reporting and visibility, operational efficiency, growth and completion, and updating technology, which shows that obtained benefits were more than or even equal to the expectations (Panorama Consulting Solutions, 2019). Digging down the trend to Pakistan banking sector, it is observed that only 25% of the respondents believed that HRIS has contributed to effective decision making (Sadiq et al., 2012), and indirectly, has created more dissatisfied employees due to its ineffectiveness and underperformance in creating transparency (Bashir et al., 2019).

**Figure 1**

*Infographic representing statistics on less than expected returns of ISs.*



Discussing the banking sector of Pakistan, in the Session Chairman's Address at the Seminar on "Corporate Governance" arranged by the Institute of Business Administration (IBA) Pakistan (2005), Mr. Ishrat Hussain (Governor State Bank of Pakistan -SBP) highlighted that the speedy transformations fetched by global integration, deregulation and high-tech developments are snowballing the perils in banking systems whereby the historic performance of the banking system in adoption, diffusion and transformational role of technology had been mixed so far but better efforts were required for staying competitive in future, creating an argument for further exploration on the subject.

In wake of the current COVID-19 pandemic, HR role has become more important since remote work is the new norm, and the aiding technology is HRIS (Meister, 2020). Nonetheless, it has been observed and pointed out by lead executives of SBP, the regulatory body for banking sector of Pakistan, that the performance of implemented technologies is less than expected due to poor implementations which makes the governance of these institutions questionable by stakeholders (Anwar, 2011). However, it is dismaying to note that HRIS is not being used for its full potential and there are multiple performance and implementation issues that question the effectiveness of HRIS by making actual benefits less than the expected (Panorama Consulting Solutions, 2019; Sadiq et al., 2012). Although scholars have studied HRIS adoption in various contexts (Quaosar, 2018), yet there is scantiness of studies that have addressed HRIS effectiveness in answering the call to provide a comprehensive IS success measure through validating the IS success models (AmmarHussein, 2015; Delone & McLean, 2003; 2016; Ifinedo et al., 2010). However, other prominent scholars like Al-Shibly (2011) have observed HRIS success in the form of Net Benefits of D&MISSM, even though empirical research related to these observations is very less. In addition, it is argued that future research

is needed regarding effectiveness of HRIS due to scantiness of research in this field (Al-Harazneh & Sila, 2021; Al-Shibly, 2011). Correspondingly, banking industry is an early adopter of innovations with heavy investments (Gupta & Collins, 1997), and therefore, after the emergence of ERP solutions, technology advancements, and regulatory requirements as the drivers for innovation adoption, the industry is deemed to be mature in these software creating an argument to study the effectiveness of HRIS at post-implementation level, whereby limited studies have done so (Ifinedo et al., 2010; Ruivo et al., 2014). In addition, most of the past research have focused HRIS as a simple software (Alhalboosi, 2021; Al-Shibly, 2011), whereas, banks in the technology intensive competition are more inclined to go for integrated solutions with state of the art technologies and technology vendors like Oracle and SAP, to build stakeholders confidence and meet regulatory requirements with standardization, highlighting the missing part in past researches which is an ERP perspective of HRIS whereby it is reported that large organizations especially in financial sectors are more prevalent to use ERP solutions in Pakistan (Gill et al., 2018; Hendrickson, 2003; Oracle | Integrated Cloud Applications and Platform Services, 2020). Present study is an attempt to cover these gaps and contribute to the academic knowledge with its empirical findings in establishing the most important factors that have contributed to or otherwise in making HRIS a success or are responsible for its underperformance.

### Literature Review and Research Propositions

Human capital is one of the key resources in deciding the success of the organizations (Pasban & Nojedeh, 2016). This has been further emphasized by Pasban and Nojedeh (2016) that those organizations that have been able to harness the human resources better than others have had the best chances to compete and survive. Adding to the argument, one of the fundamental tools that has proven its worth in increasing the efficiency and efficacy of almost every area, in past and even today, is the technology (Wright & Dyer, 2000). In present day's highly competitive environment, an organization's human resources are viewed as potential strategic assets in order to attain long-term competitiveness edge over peers and in the contemporary world of environmental corporate responsibility (Bombiak, 2019; Quaosar, 2018).

HRIS has accumulated various HRM activities and processes with information resources to ensure rise to another domain (DeSanctis, 1986). As defined by DeSanctis (1986), HRIS is a system designed to support the activities of HRM planning, management, decision-making and control. Detailing further, HRIS also supports various implications and processes such as efficiency assessment, career preparation, succession planning, forecasts of training, pensions and benefits management, payroll, placement or hiring etc. Other researchers have also defined HRIS according to variable observations but with more or less similar inherent meanings attached to the concept such as "A Human Resource Information System is a systematic procedure for collecting, storing, maintaining, retrieving, and validating data needed by an organization about its human resources, personnel activities, and organization unit characteristics" (Kovach & Cathcart, 1999).

Despite the benefits, technology investments including but not limited to information systems, are considered very expensive decision that require careful considerations and very prudent approaches of the decision makers since any miscalculation can potentially threaten the very existence of certain organizations (Elragal & Hassanien, 2019). Similarly, Elragal and Hassanien (2019) have observed that mainstream research on the subject has indicated that organization-wide information systems, also referred to as ERPs, are criticized for not

returning the expected benefits as promised. Linking to the previous argument, in the course of the last era, massive investment has gone into the information systems to administer human resources, but due to the absence of a clear vision, plan, and strategy, the outcomes of these endeavors have not been very noticeable (Kumar et al., 2013). High costs of installation and expensive agreements for maintenance are amongst the challenges in the successful execution of HRIS (Quaosar, 2018).

It has been further emphasized that some researchers have observed the advantages of HRIS in the public sector of Pakistan but there is no substantial study regarding HRIS in the corporate sector (Khan et al., 2017). Therefore, the present study can provide an insight for researchers by contributing to knowledge of HRIS effectiveness. The concept of HRIS in this study is considered as a specialized information system managing the HRM activities throughout the organization and capturing/providing the needed information for necessary decision making to the concerned personnel as desired.

### **HRIS Effectiveness**

One of the seminal work in the exploring HRIS effectiveness is that of Reddick (2009), whereby observing the public sector organizations in Texas, he observed that the stages of HRIS adoption could be divided into three categories. The very first and the foremost phase is the operational influence of IT on the HR function, such as automating routine processes, decreasing administrative hassles, lowering costs, and increasing productivity. The relational impact phase is concerned with giving remote access to HR data and services to personnel, cutting response times, and enhancing service standards. The third one is the redefining of the extent and responsibility of the HR to engage more on strategic concerns that forms part of the transformational phase.

Various scholars, such as Al-Dmour et al (2015); Reddick (2009); Lepak & Snell (1998); Kettley and Reilly (2003); Beadles et al (2005), have introduced different dimensions of HRIS effectiveness based on their research in various contexts; however, this study focuses on the Net Benefits measure of D&MISSM (2003) for potential effectiveness of HRIS in terms of operational, relational, and transformational facets.

### **Information Governance**

Information governance is a relatively less researched concept and holds its basic roots in the information technology governance which is a widely used determinant for observing the success of information technologies adoption and implementations in various organizations (Mikalef et al., 2018). It has been identified by Mikalef et al (2018) that although the construct is very important when considering the success of IT, however, there is considerably less research on the governance of information construct associated with such substantial investments in IT systems.

Information governance characterized as a “subset of IT governance and is defined as a collection of capabilities or practices for the creation, capture, valuation, storage, usage, control, access, archival, and deletion of information over its life cycle” (Tallon et al., 2013). They have further observed that most of the literature regarding information technology governance is focused on the physical IT artifacts whereas a very important part of nonphysical IT artifacts that actually relates to the information governance is comparatively less observed.

Mikalef et al (2018) have observed a positive and significant relationship of information governance with an organization's dynamic capabilities and operational capabilities when

doing an empirical study on CIOs and IT managers in Norwegian firms. Similarly, in a study of 175 IT managers and CIOs, Big Data Analytics Capability and Radical Innovative Capability are found to be significantly and positively predicted by information governance thus allowing for an argument that information governance is a significant predictor of an organization's dynamic capabilities, as also proposed in current research. The current study uses Mikalef et al (2018, 2020) dimensions of information governance to investigate the impact of this integral variable in influencing the effectiveness of human resource information systems in Pakistan's banking sector.

### **IT Capabilities of Staff**

IT capabilities of staff has been adequately considered to be a prominent and effective determinant of information system effectiveness as claimed by past scholars (Ghobakhloo & Tang, 2015; Teo et al., 2007; Thong, 2001). This is argued that employees with proper IS expertise can serve more productively to the IS implementation by participating not only in decision-making, but also in practically all of the implementation phases that lead to the information system's long-term success (Thong, 2001). In a different and more specified perspective, Teo et al (2007) have explained staff's IT skills as HRIS expertise that refers to the knowledge of and professional skill of employees in and related to the HRIS domain particularly, whereby, HRIS workers must be diverse and have a solid understanding of all HR roles along with the technical knowledge. Same authors have argued that the availability of qualified HRIS practitioners is a critical component in the long-term sustainability and sustained development of an organization's HRIS. This has been identified that the inability of users to understand the components and functionality of a system is a major key barrier in HRIS implementation (Teo et al., 2007). However, Lin (2006) has taken a perspective of employees across the organization to have IT knowledge, as they are participating in the success of interorganizational systems, and observed that IT capabilities are the technological understanding and competence which the employees possess.

Lin (2006) has stated that the IT capability of employees refers to the degree to which the employees of a company have technical expertise and technological understanding. Similarly, it is observed as "the extent to which users of IS (both staffs and managers) in an organization are knowledgeable and experienced about IS" (Ghobakhloo & Tang, 2015).

Puspitarini et al (2018) have also identified IT capabilities of staff as an important determining factor of HRIS effectiveness in public sector of Indonesia, however, the private and corporate were not studied in their research. Similarly, Gabriel et al (2020) have observed IT capabilities of staff as an important determinant of human capital information system based on past research. In addition, IT capabilities of staff is identified to be a positive and significant predictor of HRIS adoption (Alam et al., 2016). Also, Thong (2001) has found Users' IS knowledge to have a positive and significant relation in determining IS implementation success. However, it is identified by Thong et al (1996), in their study of information system implementation in small businesses of Singapore, that the theories impacting small business are very different as compared to large organizations thus creating an argument for furthering research in large organizations. IT expertise of staff is an important factor in the implementation of emerging technologies, and it has been observed to be an important determinant linked to adoption in a positive way (Premkumar & Roberts, 1999). However, despite the importance of this factor, it appears that little research has been done on the effect of expertise of the staff on IT implementation success allowing the gap to explore the concept further in different contexts (Akkermans & van Helden, 2002).

### Innovativeness of Senior Executives

Innovativeness of senior executives is an important construct and can be elaborated as; if they are early in implementing an invention, people are described as "innovative" (Agarwal & Prasad, 1998). They also observed that more widely based models of IT implementation that incorporate concepts of technology adoption decisions could benefit from innovativeness of senior management in the domain of information technology, thus implying the importance of the role of innovativeness of senior executives (Agarwal & Prasad, 1998).

Many scholars have identified the concept; however, the following are some of the conceptions based on previous research, like Agarwal and Prasad (1998) have defined it as, "the willingness of an individual to try out any new information technology".

Thong (1999) observed that the characteristics of senior executives and leadership, such as focusing on innovations, are likely to influence the adoption of IT. Since senior executives are the ones who allocate the organizational resources, it is therefore identified by Thong (1999) that the power to pursue innovation strategies in the short and long run also, rests with them. Similarly, same author asserts that innovativeness of senior executives will lead to new solutions that will help in better implementation of new technologies. As an argument, it is stated that one of the risky undertakings for a financial institution is the implementation of IS, which requires a large investment, and only a successful enterprise with an ambitious CEO would be able to take the risk (Thong, 1999).

The concept of innovativeness with regards to senior executives of organizations has been empirically explored by numerous scholars in the past as an important determinant for various technological adoptions. Alam et al (2016) have observed innovativeness of senior executives as a significant and positive predictor of human resource information system adoption in the hospital industry in Bangladesh, however, they have proposed to carry out future research on HRIS in expanded industrial context in developing countries where the studies on HRIS have been claimed to be scarce. Similarly, Al-Qirim (2007) found it to have a positive and significant relationship in e-commerce adoption in the context of small businesses in New Zealand. In addition, Rahayu and Day (2015) have observed various dimensions of innovativeness of senior executives to be positive and significant predictor of e-commerce adoption in the context of SMEs in Indonesia. Therefore, this study employs the innovativeness of senior executives variable as an antecedent to HRIS effectiveness in the corporate banking sector of Pakistan at post-implementation stage.

### Is Ambidexterity

Duncan (1976) is known to be the first to coin the term "organisational ambidexterity" (Raisch & Birkinshaw, 2008), and has argued that for long-term sustainability, businesses should consider dual structures for initiating and for implementation of innovation. As defined by Tai et al (2019) IS ambidexterity is an acquired capability that refers to IT departments' ability to conduct exploitative and explorative IT tasks at the same time.

Other scholars have also identified the concept in related terms, like IT ambidexterity is defined as, "IT Ambidexterity is a firm's ability to simultaneously pursue exploration and exploitation in their management of IT resources and practice" (Werder & Heckmann, 2019). Similarly, ambidexterity, as identified by Tarafdar and Gordon (2007), is an "IS competency" that maintains a balance between a business's strategic objectives and operational efficiency. In addition, this has also been found by Raisch and Birkinshaw (2008) that various studies that consider ambidexterity as an important factor contributing to the success of organizations

use different labels and terminologies mentioning the same underlying concepts related to ambidexterity.

Ambidexterity, or the ability to perform two apparently opposing tasks at the same time, such as exploitation and exploration, aids organisations in overcoming the related obstacles and, as a result, has risen in popularity with potential fields in information systems (IS) studies (Werder & Heckmann, 2019).

Despite the importance of IS Ambidexterity established by past scholars, Helbin and Looy (2021) have observed the lack of research relating to multifaceted concept of ambidexterity focusing primarily on business process management ambidexterity. However, it is revealed that research in the subject topic has increased over the last three years citing the interest of scholars on this relatively unexplored research area (Helbin & Looy, 2021). They have also observed that on the basis of geography, US, European, Australian and Chinese scholars have more contribution to the topic whereas for the rest of the world including but not limited to South Asia, the ambidexterity concept is less explored which is also evidenced from following geographical distribution illustrated by subject researchers.

The systematic literature review carried out by Helbein and Looy (2021), in their recent study, shows lack of research related to ambidexterity in the south Asian region and other countries across the globe as compared to US, Europe, Australia and China, therefore, providing a research gap for the scholars to explore the ambidexterity concept further in other regions. The growth of digital platforms is seen as a crucial enabler in the scope of digitization, and the concept of ambidexterity would provide good potential direction for future study (Helbin & Looy, 2021).

Many ambidexterity studies relate exploitation and exploration variables to a specific impact or productivity variable in the context of an organization providing an argument that IS ambidexterity can be studied in its specific impact to human resource information system which is also an enabler of overall organizational productivity when found effective (Chang et al., 2019).

### **Is Ambidexterity as a Mediator in Relation to HRIS Effectiveness and its Antecedents**

This has been identified by Tai et al (2019) that various IS assets enhance IS ambidexterity and also the relationship between IS assets and IT department's ordinary capabilities of supporting operations and strategic decision support is mediated by IS ambidexterity. Tai et al (2019) have observed IS ambidexterity as the IT department's dynamic managerial capability that comprises both IS exploitation and IS exploration being achieved simultaneously. Furthering their research with the support of past literature, Tai et al (2019) have observed that top management role is very important in ambidextrous organizations as they serve as a "glue" that keeps the integration of organization as a foremost factor. Also, when management has a shared vision, it becomes more conducive for them to resolve various competing demands that are common challenge in ambidextrous organizations. This has also been observed that when organizations are growing, they may face two options; one to implement their existing technology resources to their maximum potential thus exhibiting exploitation and second to search for new technological solutions by replacing even the existing enterprise system with the new ERP following the exploration (Tai et al., 2019). In addition, it is observed in past literature that exploratory activities for finding new technological solutions like ERPs may be costly and difficult to implement but in the long run these are beneficial for the organizations in continuously changing and challenging turbulent environments (Tai et al., 2019).

Chang et al (2019) have suggested for future research to incorporate factors like governance and infrastructure to have a more detailed understanding of the ambidexterity concept. They have also observed that maintaining an ambidextrous IT climate will be crucial in resolving organisational success risks and challenges. Organizational ambidexterity along with organizational agility has been observed to be a *mediator* in relationship between a firm's Big Data Analytics capabilities which include infrastructure flexibility, management capabilities, personnel expertise, and its performance (Rialti et al., 2019). It has been further suggested for future research by Rialti et al. (2019) to explore other variables as antecedents that predict the mediating role of ambidexterity with firm performance and related measures.

Song and Lim (2015) emphasised the need of investigating mediating effects in the field of Human Resource Development, claiming that studies on the subject of mediation analysis in this field have shown insufficient results.

### **Underpinning Theories**

This study employs RBV as the main underpinning theory along with dynamic capabilities theory as supporting theory.

The resource-based view (RBV), proposed by Wernerfelt in 1984 (Wernerfelt, 1984), is a major theory that has been used to evaluate the problems and research issues related to performance. Many other prominent researchers like Penrose (1996); Barney (1991); Barney & Wright (1998); Wright et al (2001) have contributed to extend the concept of resource-based view theory. RBV's core point is that a company's success is dictated by the resources it holds (Wright et al., 2001). When RBV is used to investigate the effects of information technology (IT), IT is regarded as an organisational resource that can strengthen organisational capabilities and, as a result, contribute to improved performance (Liang & You, 2009).

The resource-based view distinguishes between information technology and information systems, that becomes interesting as observed by Wade and Hulland (2004), whereby, the former is asset-oriented, while the latter is made up of a combination of assets and skills that are based on the effective use of information technology. Complying to these arguments, Wade and Hulland (2004) have suggested that applying the RBV to the context of information systems has the ability to identify and understand the key drivers. Further, on the basis of their review of past literature, they have observed that important factors like technical skills, innovativeness, governance architectures, have been considered as various forms of IS resources in numerous diversified contexts (Wade & Hulland, 2004). Similarly, Ruivo et al (2014) used the RBV theory to analyze enterprise system success at the post-implementation stage predicting the success of enterprise systems.

Liang and You (2009) have observed the RBV's central point as; "a firm's success is dictated by the resources it has and it administers", therefore, when RBV is used to examine the impact of information technology (IT), information systems are generally observed and viewed as an organisational resource that can improve organisational capacities and, as a result, contribute to improved success. While the use of RBV in evaluating the contribution of IT to firm success makes a lot of sense and a variety of papers have been written about it, the results are still inconclusive (Liang & You, 2009).

The current study uses RBV theory as the underpinning theory to apply the resource characterization model based on numerous arguments obtained from the literature.

### **Dynamic Capabilities**

Organizations gain a competitive advantage from their important, unusual, exclusive, and hard to imitate resources, but in changing environments, this may not be enough, necessitating the development of dynamic capabilities for long-term competitive advantage (Barney, 1991; Teece et al., 1997). Explaining the concept of dynamic capabilities, Teece et al. (1997) have identified that the concept of dynamic capabilities as, "The firm's ability to incorporate, develop, and reconfigure internal and external competences to meet rapidly changing environments". In addition, innovation is also considered one of the dynamic capabilities in the extant literature (Markova, 2012). Integration of exploration and exploitation in the field of learning (i.e., ambidextrous learning) on a high level is also described as a dynamic capability by (O'Reilly and Tushman, 2008). For this study we have employed the concept of IS Ambidexterity as a dynamic capability leading to sustained competitive advantage through improving the effectiveness of human resource information system. This is in accordance with the argument by Tai et al (2019) that IS ambidexterity is a dynamic capability which enables the adjustment to internal changing environment through exploitation and external environment through exploration in order to ensure the dynamism for sustaining the competitive advantage.

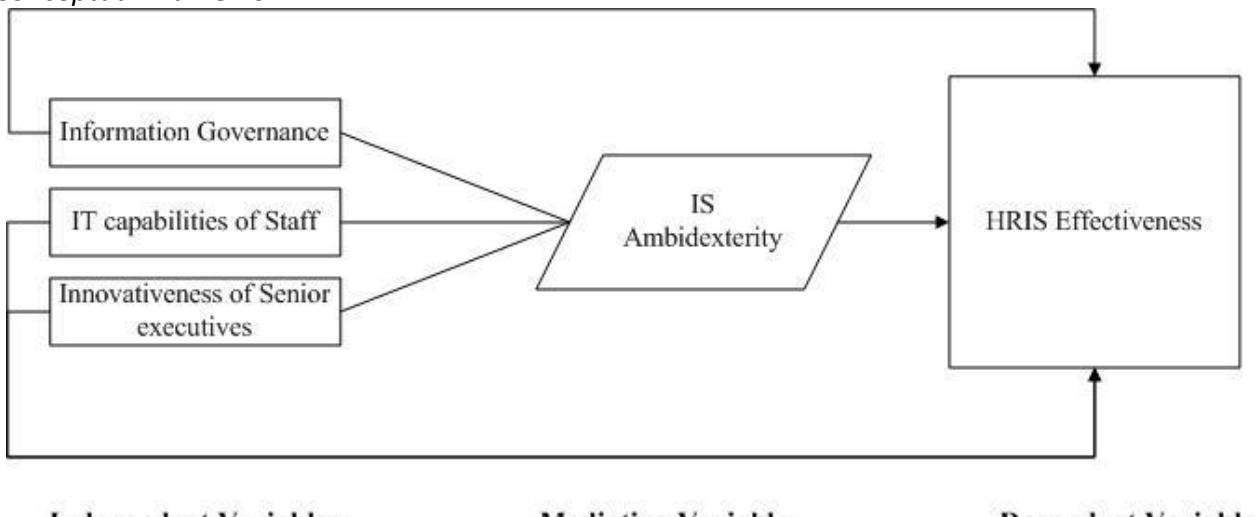
While resources may have a direct impact on firm success, recent research suggests that the impact of useful resources can require other variables, such as resource complementarity, which contends that the combination of different complementary resources may generate synergy, that can lead to improved effectiveness (Liang & You, 2009; Wade & Hulland, 2004). Correspondingly, organizational capabilities are the most common mediators in the contemporary research studies among those possible factors leading to the argument that IS ambidexterity, being a dynamic capability can possibly be a potential mediator in relation of HRIS effectiveness and its determinants (Bharadwaj, 2000; Liang & You, 2009; Tai et al., 2018).

The resource configurations that top managers create through their support and innovativeness using dynamic capabilities, and not the capabilities themselves, furnish long-term competitive advantage (Shanahan et al., 2016). For this study we suggest that sensing, seizing and reconfiguring capabilities as identified by Teece et al (1997) are applicable to the exploitation and exploration concepts of IS ambidexterity that create an effective HRIS leading to competitive gains for the organization (Markova, 2012; Tai et al., 2019). Since the concept of dynamic capabilities (Teece et al., 1997) has yet to be empirically investigated, the case of HRIS can provide a useful context (Markova, 2012).

### **Conceptual Framework**

Based on the literature review and past studies, following conceptual framework is proposed for this study.

**Figure 2**  
*Conceptual Framework*



**Independent Variables**      **Mediating Variable**      **Dependent Variable**

The current study developed the above theoretical framework to examine the influence of information governance, IT capabilities of staff and Innovativeness of senior executives on HRIS effectiveness and the mediating role of IS Ambidexterity based on the literature review discussed above and suggestions by scholars according to the context and analysis level (Troshani et al., 2011).

### Hypothesis Development

Information governance is an important determinant in observing information system effectiveness (Mikalef et al., 2020). Mikalef et al (2018) have observed a positive significant relation of information governance with organization's dynamic and operational capabilities. Similarly, Héroux & Fortin (2018) have also found information governance to be a positive and significant determinant of innovation. The following hypothesis is proposed based on the evidence given in the above-mentioned literature.

**H1:** Information Governance has a positive significant relation with HRIS effectiveness.

Staff IT capabilities have been a key factor in assessing overall system effectiveness (Aydiner et al., 2019). Staff IT skills, according to Feeny and Willcocks (1998), are a critical IS capability. Skills and specificity are two distinct characteristics of an employee's IS capabilities (Ravichandran & Lertwongsatien, 2005). These characteristics of personnel IS capabilities allow them to interact quickly and easily, as well as combine their expertise with that of the business staff to ensure fast troubleshooting when complications arise (Aydiner et al., 2019). As a result of their knowledge of various system cognitive abilities, IS personnel can operate in a number of different environments (Feeny & Willcocks, 1998). Masum et al (2015) have discovered that IT expertise has a positive impact on E-HRM adoption in Bangladesh. Teo et al (2007) have identified that employees' knowledge and technical competence have a significant relation with HRIS adoption. Similarly, Alam et al (2016) discovered a positive and significant relationship between staff IT capabilities and HRIS adoption. Finally, the following hypothesis is proposed based on the evidence presented in the above-mentioned literature.

**H2:** IT capabilities of staff has a positive significant relation with HRIS effectiveness.

The ability of senior management to think creatively has been a key factor in assessing the efficacy of information systems (Feeny & Willocks, 1998). According to Thong et al (1995), the innovativeness of senior management has a positive and important relationship with IT

adoption. Masum et al (2015) noticed that HR managers' attitudes have a positive impact on E-HRM adoption in Bangladesh. Al-Qirim (2007) revealed that in New Zealand small businesses, CEO innovation and technology adoption have a positive and significant relationship. Similarly, Alam et al (2016) identified a positive and significant relationship between senior management innovation and HRIS adoption. Finally, the following hypothesis is proposed based on the evidence presented in the above-mentioned literature.

**H3:** Innovativeness of senior management has a positive significant relation with HRIS effectiveness.

IS ambidexterity is a dimension of ambidexterity concept which refers to the IS departments ability to be exploitative and explorative simultaneously (Tai et al., 2019). Tarafdar and Gordon (2007) have found ambidexterity to be an important determinant of innovation. Tai et al (2019) have identified that IS ambidexterity is significantly related to IS alignment in operational support aspect. Similarly, Rialti et al (2019) have found a positive significant relationship between ambidexterity and agility. Syed et al (2020) have noted, in their study of British high-tech firms that IT ambidexterity capability has a positive and significant impact on IT success. Therefore, based on previous research and available literature, the following hypothesis is presented.

**H4:** IS Ambidexterity has a positive significant relation with HRIS effectiveness.

Magnusson et al (2020) have identified that formalized IT governance can be detrimental to innovations affecting the ambidexterity of the organization and warns that organizations should be more flexible in their governance of information technologies in order to foster the ambidexterity which is an emerging concept. They have also called for future research on ambidexterity to be carried out in public and also in private sectors for better understanding. Based on the literature, following hypothesis is presented:

**H5:** Information Governance has a positive significant relation with IS Ambidexterity.

According to Tushman et al (2002), human resource competence is a fundamental antecedent of ambidexterity, which demonstrates the capacity of internal human resources to fulfil innovating roles. This has also been identified by Junni et al (2015) that HR flexibility is an important antecedent of ambidexterity (Úbeda-García et al., 2018). In addition, Junni et al. (2015) have found the lack of studies related to HR and employee characteristics and ambidexterity implying for the gap in literature. In this context, the following hypothesis is proposed:

**H6:** IT capabilities of staff has a positive significant relation with IS Ambidexterity.

Leadership characteristics is a fundamental antecedent of ambidexterity, according to Adler et al (1999), who also recommend more study to better explain the phenomenon. Brion and Mothe (2017) have also identified creativity as determining factor of ambidexterity and have observed that it has a positive and significant relation with ambidexterity. Similarly, Junni et al (2015) have found the lack of studies related to senior management characteristics and ambidexterity implying for the gap in literature. The following hypothesis is suggested in this context:

**H7:** Innovativeness of senior management has a positive significant relation with IS Ambidexterity.

According to research, there is a scarcity of studies on how digital innovation is governed and managed (Magnusson et al., 2020). This has been observed that IS ambidexterity mediates the relation between IS assets, new technology skills, understanding business situations, and operational support is mediated by IS ambidexterity (Tai et al., 2019). In addition, Tai et al (2019) have also observed the mediating role of IS ambidexterity in context of strategic

decision support which is contextualized as the ability to acquire strategic decisions with the help of effectively implemented information systems, however, the results were not significant leading to the call for further research in the mediating role of IS ambidexterity due to mixed results. As observed by Tai et al (2019), that different IS assets impact the information system effectiveness through the mediating role of IS ambidexterity, we observe that according to RBV perspective of the firms, information governance, IT capabilities of staff and innovativeness of senior executives contribute as organizations' assets and propose that propose that IS ambidexterity mediates the relation between mentioned IS assets that serve as determining factors of IS effectiveness and IS ambidexterity, and the information system effectiveness. In this context, based on the evidence from prior literature, following hypothesis (H8-H10) relating to mediating role of IS Ambidexterity are posited:

**H8:** IS Ambidexterity mediates the relationship between Information Governance and HRIS effectiveness.

**H9:** IS Ambidexterity mediates the relationship between IT capabilities of staff and HRIS effectiveness.

**H10:** IS Ambidexterity mediates the relationship between Innovativeness of senior management and HRIS effectiveness.

As O'Reilly and Tushman (2013) stated, the best lens through which to evaluate ambidexterity is through the perspective of dynamic capabilities, there is a need to investigate IS ambidexterity as a dynamic capability, which is what this study is addressing.

## Methodology

This paper used a conceptual model methodological approach to propose a novel framework that can integrate three important variables, namely information governance, IT capabilities of staff, and innovation of senior executives, to influence IS ambidexterity (a mediating variable) and predict HRIS effectiveness in Pakistan's banking sector. The researchers used the insights of industry professionals, conducted a related review of the literature, and examined the actual issues in the Pakistani banking sector to come up with this proposed conceptual framework. Consequently, the suggested conceptual framework is supported by RBV and dynamic capabilities theories.

The data should be taken primarily from senior top executives of banks' branches who form the appropriate target respondents for present study framework, because of their knowledgeability as required by their job positions, active involvement in operation, strategy, policy formulation and implementations. The hybrid structure of banks and their large size also inspire to have bank branch managers (individuals) as the suitable unit of analysis.

Numerous researchers, including Al-Dmour et al (2015); Reddick (2009); Lepak & Snell (1998); Beadles et al (2005), had also presented important perspectives of HRIS effectiveness based on their research in multiple settings; however, it is recommended to explore the D&MISSM (2003)'s Net Benefits measure for potential HRIS effectiveness in terms of operational, relational, and transformational attributes.

Since, the current study horizons the positivist paradigm and deductive approach to theory development (theory falsification or verification, testing of hypothesis, generalizing from general to specific) in answering the research questions regarding HRIS effectiveness and its determinants, the most suitable approach for data collection and analysis would be quantitative approach (Kilani & Kobziev, 2016), using the survey method through structured questionnaires for collecting primary and cross-sectional one-shot data collection (Saunders et al., 2007, 2019; Sekaran & Bougie, 2016).

### Discussion, Conclusion, and Implications

This study has acknowledged the significance of HRIS effectiveness in the banking sector of Pakistan and its direct and indirect influencing factors like information governance, IT capabilities of staff, innovation of senior executives and IS ambidexterity, an emerging research concept. Accordingly, ten research propositions have been formulated and recommended to empirically examine in the banking organizations, considering the facts discussed in the introduction of the study. The importance of banking sector in the overall economy of the country is evident, being the major contributor (Shair et al., 2019), from the fact that it accounts for almost 95% of the financial sector of Pakistan (Husain, 2006).

Studies related to HRIS in developing countries are scarce (Quaosar, 2018), which allows current study to add a valuable contribution to the existing academic knowledge in the challenging times of COVID-19 pandemic. The pandemic has transformed most of the HR to the new normal where remote work is facilitated by the use of technology, highlighting the importance of a robust, scalable and modern information system like HRIS, to be in place for handling the new normal challenges smoothly (Meister, 2020). The facts and the pace of digital transformations make it a topic of interest to study the contribution of HRIS in organizations, especially those who are early adopters of technology like banks. This can lead to industry standards and best practices if HRIS is studied for its effective implementation and relevant recommendations are sought accordingly. Managers and decision makers are interested to observe the effectiveness of their decisions in HRIS investments, which are costly decisions, and also the factors that contribute positively or negatively towards their success. This study proposes a framework of important influencing factors that can be empirically tested to provide the evidence to decision makers and also add to academic knowledge, regarding factors that contribute to HRIS effectiveness in making it a useful contributor to organizations' overall success.

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