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THE IMPACT OF HUMAN RESOURCES INFORMATION SYSTEMS (HRIS) ON HUMAN RESOURCES MANAGEMENT (HRM):A REFLECTIVE INVESTIGATION

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ABSTRACT

THE IMPACT OF HUMAN RESOURCES INFORMATION SYSTEMS (HRIS) ON HUMAN RESOURCES MANAGEMENT (HRM): A REFLECTIVE INVESTIGATION

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Human resources management (HRM) have undergone a digital transformation that requires enhanced usage of human resources information systems (HRIS) compared to previous times in organizations. This study intends to explore what the current status of human resources information systems (HRIS) is and how the impact of human resources information systems (HRIS) is experienced on human resources management (HRM) in Turkey. The study employs a higher-order investigation involving a comprehensive systematic literature review and a empirical validation resulted from structural equation modelling (SEM). Drawing on TOE framework, institutional theory and knowledge based view, the main academic contribution of the study is the recognition of current factors through which the positive impact of human resources information systems (HRIS) can be experienced. Aligned with this contribution, the study is believed to offer a fresh perspective for human resources (HR) practitioners as well.

Keywords: human resources management (HRM), human resources information systems (HRIS), systematic literature review, structural equation modelling (SEM), mediating factors.

ÖZ

İNSAN KAYNAKLARI BİLGİ SİSTEMLERİNİN (İKBS) İNSAN KAYNAKLARI YÖNETİMİ (İKY) ÜZERİNE ETKİSİ: YANSITICI BİR ARAŞTIRMA

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İnsan kaynakları yönetimi (İKY), kuruluşlarda önceki zamanlara kıyasla insan kaynakları bilgi sistemlerinin (İKBS) daha fazla kullanılmasını gerektiren bir dijital dönüşümden geçmiştir. Bu çalışma, Türkiye'de insan kaynakları bilgi sistemlerinin (İKBS) mevcut durumunun ne olduğunu ve insan kaynakları bilgi sistemlerinin (İKBS) insan kaynakları yönetimine (İKY) etkisinin nasıl tecrübe edildiğini araştırmayı amaçlamaktadır. Çalışma, kapsamlı bir sistematik literatür incelemesini ve yapısal eşitlik modellemesinden (SEM) elde edilen ampirik bir doğrulamayı içeren üst düzey bir araştırma kullanır. TOE çerçevesi, kurumsallık teorisi ve bilgiye dayalı bakış açısına dayanan çalışmanın ana akademik katkısı, insan kaynakları bilgi sistemlerinin (İKBS) olumlu etkisinin deneyimlenebileceği güncel faktörlerin tanınmasıdır. Bu katkı ile uyumlu olarak, çalışmanın insan kaynakları (İK) uygulayıcıları için de yeni bir bakış açısı sunacağına inanılmaktadır.

Anahtar sözcükler: insan kaynakları yönetimi (İKY), insan kaynakları bilgi sistemleri (İKBS), sistematik literatür taraması, yapısal eşitlik modellemesi (YEM), aracılık eden faktörler.

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TEXT OF OATH

I declare and honestly confirm that my study, titled "The Impact of Human Resources Information Systems (HRIS) on Human Resources Management (HRM): A Reflective Investigation" and presented as a PhD Thesis, has been written without applying to any assistance inconsistent with scientific ethics and traditions. I declare, to the best of my knowledge and belief, that all content and ideas drawn directly or indirectly from external sources are indicated in the text and listed in the list of references.

Gamze ÜNAL

07.01.2022

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SYMBOLS AND ABBREVIATIONS

SYMBOLS:

AGFI	Adjusted Goodness-Of-Fit Index
AVE	Average Variance Extracted
CFI	Comparative Fit Index
CR	Composite Reliability
CMIN	Minimum Discrepancy
CMIN/DF	Minimum Discrepancy to Degrees of Freedom
DF	Degrees of freedom
GFI	Goodness-of-Fit Index
IFI	Incremental Fit Index
NFI	Normed Fit Index
NNFI	Non-Normed Fit Index
R^2	Square of the Coefficient of Multiple Correlation
RMR	Root Mean Square Residual
RMSEA	Root Mean-Square Error of Approximation
$\chi2$	Chi Square Value
$\chi2/df$	Chi Square To Degree Of Freedom

ABBREVIATIONS:

ACAP	Absorptive Capacity
AMOS	Analysis of Moment Structures
BI	Business Intelligence
CFA	Confirmatory Factor Analysis
CP	Competitive Pressure

CS	Cost Saving
E	Exploitation
E-HRM	Electronic Human Resources Management
ERP	Enterprise Resource Planning
ESCI	Emerging Sources Citation Index
HPWS	High Performance Work Systems
HR	Human Resources
HRIS	Human Resources Information Systems
HRM	Human Resources Management
I	Internalization
IE	Information effect
IS	Information System
IT	Information Technology
KBV	Knowledge Based View
PAC/PACAP	Potential Absorptive Capacity
RAC/RACAP	Realized Absorptive Capacity
SCIE	Science Citation Index Expanded
SEM	Structural Equation Modelling
SRMR	Standardized Root Mean Square Residual
SSCI	Social Sciences Citation Index
SI	Strategic Impact
TMS	Top Management Support
TOE	Technology-Environment-Organization
TS	Time Saving

CHAPTER 1
INTRODUCTION

1.1. Chapter Overview

This chapter presents a general introduction for the main topic of the study regarding the impact of human resources information systems (HRIS) on human resources management (HRM). This chapter outlines respectively the conceptual review of HRIS, the historical review of human resources information systems (HRIS), the historical development of human resources management (HRM) in Turkey, the main application fields of human resources information systems (HRIS), research problem, research questions, the purpose of the study as well as the significance of the study.

1.2. The Conceptual Review of Human Resources Information Systems

The usage of information systems in the field of human resources management (HRM) has been gaining popularity as a result of global technological improvement. Today's workplaces have been subject to a considerable transformation necessitating the usage of human resources information systems (HRIS) in the fulfillment of human resources (HR) practices. Current forms of sophisticated technology has increased the use of advanced systems in human resources management (HRM) to accelerate the fulfillment of regular human resources (HR) functions as well as to facilitate the development and change of human resources (HR) department within the organization. In this respect, it seems important to investigate whether human resources information systems (HRIS) can lead to an improvement for the fulfillment of human resources management (HRM) and in which aspects this improvement can be experienced.

Being a modern product of human resources management (HRM) innovation, human resources information systems (HRIS) is resulted from the interconnected set of fresh ideas that spreads predictably and consistently within distinct communities (Roger,

2003). A human resources management (HRM) innovation may be described by whether its new framework is viewed as novel and whether it is able to affect the attitudes and behaviors of employees (Marler & Boudreau, 2017). Human resources information systems (HRIS) used to be described as a systematic method for gathering, organizing, preserving, accessing, and verifying data on human resources of an organization (DeSanctis, 1986; Kavanagh et al., 1990; Kovach & Cathcart, 1999).

With the realization of its additional aspects, human resources information systems (HRIS) have begun to be characterized through a holistic approach. It not only consists of the applications required to manage human resources (HR) functions, which refers to the technological element of the system, but also includes people, policies, and procedures capable of generating human resources (HR) data that indicates the social element of the system (Hendrickson, 2003). In other words, although technological development in human resources management (HRM) is associated with technical factors, the development of ability to use that technology is related with social factors. Thus, it is necessary to pay attention to social factors, as much as technical ones (Furumo & Melcher, 2006) both of which are required by current human resources information systems (HRIS).

Organizations are supposed to make some necessary adjustments in order to keep up with or survive in inevitable transformation. As in all technological innovations, human resources information systems (HRIS) might have been accepted as a promising tool able to overcome potential challenges during this transition. It is assumed that firms that integrate successful human resource information (HRIS) systems in an effective manner are more productive and lucrative than businesses that do not. The usage of human resources information systems (HRIS) may also lead to change in the workplace, work structure, jobs and the roles (Wingrove, 2005; Fisher & Howell, 2004; Doherty & King, 2002) to not only meet the current needs but also increase the efficiency in human resources management (HRM) and across the organization. However, the use of human resources information systems (HRIS) may lead to a number of outcomes (Ziebell et al., 2019). Being of aware that what will be actualized may be different from what is expected, it is important to reflect the present situation regarding to the impact of human resources information systems (HRIS) on human resources management (HRM).

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1.3. Historical Evolution of Human Resources Information Systems

Human resources information systems (HRIS) has experienced great changes for a while through adopting various forms of information technologies to keep up with the time. Indeed, the question of what major changes has occurred throughout the time is for understanding whether human resources management (HRM) field achieve its goals. Having considered the major evolutionary changes, it can be fully understood how different forms of technology (respectively; mainframe computing, client-server computing, web-based enterprise resource planning systems, and cloud-based software) have influenced human resources management (HRM) field.

1.3.1. Mainframe Computing (1940s - Mid-1980s)

The mainframe phase began in the 1940s with the introduction of HRIS by major enterprises and lasted until the mid 1980s to automate fundamental human resource (HR) tasks such as payroll and personnel record keeping in response to government laws and reporting requirements. This phase resulted in increased HRM process efficiency through the use of technology that might minimize expenses and administrative burdens that are prevalent in most HR departments (Kavanagh et al., 2015). Despite the lack of academic theory or study analyzing the efficacy of mainframe computer systems, there is some practitioner-oriented research that concentrates on understanding how these new technologies changed HRM procedures and how they may be successfully applied. (Tomeski & Lazarus, 1973a, 1973b; Lukaszewski et al., 2016).

1.3.2. Client Server & PC-based Systems (Mid-1980s - Mid-1990s)

The remarkable changes in the HRIS field that occurred in the 1980s and 1990s are related with client-server and PC-based applications. This period was caused by the demise of the industrial relations system and the unionization of organizations in the private sector (Kochan, 1986). It is followed by a transition from a manufacturing to a service economy in which workers are considered as important success elements for firms. Organizations had to be more concerned with productivity in reaction to global competitiveness, which necessitated substantial downsizing, restructuring, and redesigning, in tandem with the rising sophistication of information technology.

Further, organizations began to compete for the talents and skills of employees (Huselid, 1995) that resulted in increased emphasis on employee self-control rather than supervisory control. As a result, the decentralized client server HRIS enabled HRM to meet many of its fundamental aims, by giving managers and HR professionals with data for HR planning and crucial employment choices.

Client-server solutions also reduced administrative overhead and enabled HR experts to transition from reactive maintenance managers to strategic partners. Despite extensive use of these new systems, there has been little study on their effectiveness, as there was in the preceding HRIS period (Lukaszewski et al., 2016).

1.3.3. ERP & Web-based Systems (Mid-1990s - 2010)

Since the mid-1990s, enterprise resource planning (ERP) or Web-based systems started to be used in HR departments to fulfill main HR functions including recruitment, training, performance management, and compensation. Having started with an explosion of software product offerings in mid 1990s, this era moved to more integrated, web-enabled enterprise resource planning systems since the early 2000s.

This new system's offerings were built on two different approaches; best of breed approach and an integrated ERP suite approach. As the best-of-breed approach refers to the implementation of separate systems for each area of HRM, an integrated ERP suite approach requires either the purchase of an integrated HR (as part of a broader organizational-wide ERP) or one single ERP that integrated multiple HR functional areas. As a result, firms could consolidate corporate data and all HRM could be accessible at any time or location using web-based software.. For example, web-based recruitment systems organizations was employed to attract potential applicants and allow them to apply for jobs online.

Additionally, e-learning systems started to be used to deliver training to employees, and increase the flexibility, convenience, and costs associated with traditional training methods (Salas et al., 2005). Researches on these systems has confirmed that web-based solutions have boosted the efficiency of HR procedures and provided access to job candidates, workers, retirees, and human resource managers, (Gueutal & Stone, 2005; Kavanagh et al., 2015).

1.3.4. Cloud-based Systems (since 2010)

HRIS capabilities and the delivery of HRIS functionality have moved to cloud-based applications in recent years. The main feature of cloud computing is being able to deliver software to clients as a service, different from previous generations of HRIS software used through being installed at the client's location and able to be customized to fit the needs. Although the standard software product offered by vendors is not customizable, organizations have a chance to configure their own software to meet their specific needs with cloud-based applications.

This system does not require to purchase and maintain hardware and software but instead provide access the software over the web though a web browser. Since much of the technical responsibilities are outsourced to the cloud vendor, the up-front capital expenses such as hardware and software purchases as well as the need for internal IT staff can be significantly reduced. Based on-premise deployment approach, organizations tend to prefer the latest version of cloud-based HR software since the launch of these systems (CedarCrestone, 2011). This tendency has prompted new software vendors to enter into the market and reach every kind of clients.

1.4. Types of Human Resources Information Systems

In the light of the evolution phases experienced in HRIS field, the following types of HRIS can be chronologically classified as:

• Desktop office software (Collison, 2005; Ashbaugh & Miranda, 2002)

• In-house systems (Ashbaugh & Miranda, 2002)

• Stand-alone applications (Ashbaugh & Miranda, 2002)

• Best-of-breed software (Shrivastava & Shaw, 2003)

• Enterprise-wide integrated software (Shrivastava& Shaw, 2003)

• Cloud-based applications (Johnson et al.,2016)

It has been known that the emergence of human resources management (HRM) is not based on an automated or computerized human resources information systems (HRIS), rather there were only papers and folders including employee files, hardcopy payroll records and time cards (Kovach & Cathcart, 1999; Kovach et al., 2002). What is interesting is that the primitive version of HRM is still in use today regardless of the size of the organizations.

Even if there is a classification for the types of HRIS that are identified with the specific eras, the evolution phases may not be experienced sequentially in every organizations HR affairs of which are still subject to manual intervention. For example, an automated payroll module may be used in an organization; however, the other HR facilities may be carried out in a primitive manner by paper and folders. Therefore, it is also important to detail the types of HRIS separately in their own nature.

The first type of HRIS started to be used when computerization begins as desktop office software. The desktop office software kind of HRIS has a huge user base due to its low cost and practicality, so it is not confined to specific businesses. As a result, corporations have begun to replace their human resource management systems, or at least part of its modules, with desktop office software. The main disadvantages of desktop office software are the lack of accessibility by all employees and the absence of data protection (Ashbaugh & Miranda, 2002; Barut, 2008).

The second type is a human resources-specific in-house system, which has the benefit of flexibility because the company's system analysis and programming abilities are available within the organization. The downside of in-house systems is that they are inflexible which means that possible demands coming from changing rules, professional standards, and organizational restructurings may not be addressed easily and cheaply after their deployment (Ashbaugh & Miranda, 2002; Barut, 2008).

Third type of is stand-alone specialized applications designed for a specific human resources sub-functions such as skills inventory, applicant tracking so forth. Because stand-alone apps are specialized, they feature increased functionality and are often less expensive than homegrown systems. They may, however, be unsuitable for integration with other HR software and enterprise-wide use due to the possibility for data input issues (Ashbaugh & Miranda, 2002; Barut, 2008).

As the fourth type of HRIS, best-of-breed software refers to human resources function-specific systems that are incorporated within the function. Compared to other types of HRIS, the best-of-breed systems provide greater flexibility (Shrivastava & Shaw, 2003). However, genuine real-time integration in the company as a whole is not achievable, so they are unable to be fully connected with enterprise-wide software. Since the same software cannot be utilized throughout the business, integration results in data input redundancy, data accessibility issues, and likely failures to integrate human resources data with other organizational data. In order to handle the integration problem, best-of-breed software benefits from customized interface programs between HRIS and other corporate software (Ashbaugh & Miranda, 2002; Barut, 2008).

Fifth type of HRIS is enterprise-wide integrated software as a component of the enterprise resource planning (ERP) system that is utilized throughout the firm.. It is stated that enterprise-wide integrated HRIS may standardize procedures and foster a shared culture inside a business (Shrivastava & Shaw, 2003), as the part of an organization-wide information system. Although these systems are less flexible than best-of-breed software, earlier forms of data redundancy and accessibility difficulties can be addressed (Ashbaugh & Miranda, 2002; Barut, 2008).

As the last type of application, cloud based applications is related with the rising usage of mobile and social technology. Because this fourth generation of technology deployment has the potential to significantly impact how businesses utilize HR technology, software providers have begun to offer cloud-based solutions that are interoperable with cloud, mobile, and social applications. Taking over the interest from the ERP applications, the focus of cloud-based apps has been on how the Web can further revolutionize HR procedures (Lukaszewski et al., 2016).

Today, organization are transitioning from functional to process-oriented structures, so HR systems are supposed to be more aligned with each other and broader business processes (Wingrove, 2005). With the aim of "integration dominates functionality" (Ashbaugh & Miranda, 2002), organizations tend to purge their information systems portfolio by eliminating unneeded and duplicate systems and shifting to an integrated solution. (Schramm, 2006). Therefore, regardless of the types covered thus far, HRIS appear to be anticipated to give alignment in all types of businesses.

1.5. Historical Development of Human Resources Management in Turkey

Human Resource Management (HRM) has experienced a tremendous change in the last century and started to be identified as a key factor for sustaining competitive advantage in prevailing industries. The development of HRM in Turkey can be associated with many factors such as Turkey's adoption of liberal economy, changing nature of market structure, decrease in government intervention and increase in privatization, economic and social changes along with increased interaction with Western institutions and the presence of multi- and international corporations, globalization, and change in workforce characteristics as well as societal values (Aycan, 2005; Tayfur, 2013).

Until 1950s, there was no separate personnel departments, so personnel-related issues consisting of transactional issues such as payroll calculations, employee tracking and legally-required practices were fulfilled by accounting and finance departments of organizations (Özden, 2004). Around 1960s, personnel departments emerged as a subdivision within accounting and finance departments (Andersen, 2000). Since 1970s, personnel departments were officially formed to perform personnel-related tasks, and the Personnel Management Association was established in 1971. Despite the rapid growth of organizations, the scope of personnel departments was still limited to compensation, tax and social security, premiums (Dereli, 2001).

With the liberalization movement in 1980s, the importance of human resources (HR) was recognized as a competitive advantage by organizations due to being subject to global competition. So, it was the late 1980s when "personnel departments" could convert into "HR departments" (Sozer, 2004), and the term "human resources management" could be adopted at the beginning of 1990s (Kuzeyli, 2000).

Having brought significant change to managing personnel-related issues, HRM started to correspond to "modern management" in organizations. By 2000s the percentage of organizations with HRM departments has increased to 65 % (Andersen, 2000); even if the large-scale downsizings occurring after economic crises in 2000s affected the fate of HRM departments and organizations in general (Aycan, 2005; Tayfur, 2013).

It is stated that HRM field has been developing as long as learning experiences from abroad; thus majority of Turkish HRM concepts and practices has been adopted from

foreign countries (Usdiken, 1996; Emre, 1998; Tayfur, 2013). In order to maintain competitive advantage, the companies operating in Turkey have been led to follow trends through benchmarking. Adopting new practices from abroad as well as growing academic interest about HRM systems have provided impetus for the progress of HRM in Turkey (Sozer, 2004; Tayfur, 2013).

Since HR managers have shifted their focus from providing transactional services to performing strategic functions; it has been required to formulate and execute human resources policies and practices, contributing to companies' strategic aims. In spite of significant improvements widespread in Turkey' business environment, there is still much for allowing further development and implementing practices compatible with Turkish culture and labor style (Tayfur, 2013). Therefore, it is believed that the remaining shortcomings in HRM field can be overcome with the help of developing unique researches on the business environment in Turkey.

1.6. Main Application Fields of Human Resources Information Systems

There have been suggestions about how HRIS applications may support organizational processes (Hendrickson, 2003; Kundu & Kadian, 2012). In line with these suggestions, a number of HRIS applications can be defined according to the basic HRM tasks (Al-Dmour et al., 2015). HR functions to be fulfilled via HRIS are outlined below.

1.6.1. Administrative Affairs

The administrative parts of HR functions can be associated with document hosting, the standardization of business processes, the update of databases as well as data integration and maintenance (Patel, 2015). It is claimed that HRIS can give a variety of solutions for administrative duties, such as the removal of paper forms, which are more slower and have a larger likelihood of error (Al-Dmour et al., 2015).

Further, an HRIS can offer the digitalization of the data including manuals, handbooks, code of conduct, policies, compliances which can be easily accessed and updated; the reduction or elimination of redundancy in the system; an improved management system in accordance with the legislation (Patel, 2015).

1.6.2. Compensation Management

Compensation management is a comprehensive process including the calculation of various detailed payment items in addition to original wage and salary. Since traditional payroll system consists of a tiresome and time-consuming tasks liable to error; with the growth of compensation technology supported by multiple business drivers, possible calculation errors can be eliminated and labor costs can be properly anticipated.

It is important to streamline and automate the compensation planning process, to track employee compensation history by gathering data on employee time and attendance, to allocate incentive pay and bonuses, to provide higher quality information to decision makers and assist in performance management (Johnson & Gueutal, 2011:20-22). Data processed by metrics and incorporated into sophisticated compensation models can help managers in their decisions on the performance of all employees (Kianto et al., 2017:13).

1.6.3. Recruitment

It is also possible to implement up-to-date-recruitment approaches in telation to HRIS such as e-recruiting, or internet recruiting tools, a corporate recruiting website, general online job boards; industry-specific job boards; and regional job boards to enhance recruiting efforts (Johnson & Gueutal, 2011:8). Since recruitment is a comprehensive process that involves identifying, attracting, screening, shortlisting, interviewing, selecting, hiring, and onboarding employees; one or some parts of this process can also be conducted by specific web based technology.

It may be possible to identify the best job candidates who have the right knowledge, skills and abilities for each job and who may best fit the organization by e-selection; as the part of e-recruitment. The reasons for the adoption of e-selection technology may include time and resources benefits, the utility of selection tests, a more diverse and stronger applicant pool, reduced cycle times and recruitment costs and increased brand identitiy (Johnson & Gueutal, 2011:9).

1.6.4. Training and development

With the advancements in web technologies in recent years, firms have started to engage in training support applications including both e-learning or e-teaching (Johnson & Gueutal, 2011:14). It is stated that Web-based HRIS software can provide self-service convenience to the employees and managers via the Internet for mutual communication (Meade, 2000; Al-Dmour et al., 2015), that consists of training materials, course interactions and course delivery.

There have been main business drivers behind the use of these systems that can be associated with cost saving, increasing flexibility and increasing control over learning. Besides to savings in materials, travels, time and place; the flexibility e-learning can help both employees and managers manage the work/life balance. An HRIS can be used to keep track of which courses have been completed and which upcoming training opportunities are able to meet organizational needs (Johnson & Gueutal, 2011).

1.6.5. Performance Appraisal

Performance appraisal via HRIS consists of automating the collection of performance data, monitoring employee work and supporting the development and delivery of performance evaluations. As performance data is collected by the HRIS, performance averages can be calculated using pre-determined metrics and measures. Since a basic template of performance feedback for each employee can be generated by HRIS, managerial time can be spent on the "value added" portions of performance management such as mentoring and coaching employees (Johnson & Gueutal, 2011:17).

When integrated with the other modules of HRIS, performance appraisal may be more useful through linking performance information to other HR data, such as individual developmental plans, compensation and bonuses, job assignments, and training opportunities (Kianto et al., 2017:13). However, rather than just benefiting computer-generated performance appraisal reports, managerial judgment and personal interaction should be also given importance to get more reliable results (Johnson & Gueutal, 2011:18).

1.6.6. Grievance Management

Grievance handling, when used as an important module in HRIS, is able to cover the full cycle of handling and recording employee grievances in a smooth way; with a method of identifying grievance, defining correctly, collecting data, analyzing and solving, prompting redressal, implementing and following up (Gorti & Simon, 2016:5). Employees are allowed to register grievances through the online mechanism of employee grievance redressal application without having to physically get in touch with people.

Having submitted their grievance without a need to personally contact any designated person, employees are able to track the complaint and view the status and outcomes. With the help of an online mechanism, grievances can be taken care of within a stipulated time period. In addition, employee attrition can be reduced, employee queries can be easily registered and handled, and can be immediately reported (Gorti & Simon, 2016:8-9). Having emphasized the importance of fairness, a positive psychological contract between employees and employers can be created by the existence of such systems within the organization (Gorti & Simon, 2016:11).

1.6.7. Knowledge Management

Knowledge management via HRIS can be systematized through effective communication channels to enhance the process of internal and external information flow within the organization. As employees can directly contact each other at the entire hierarchical structure of the firm in order to access up-to-date and relevant information, they can also share data across other departments in different branches and even internationally operating ones (Karakanian, 2000; Al-Dmour et al., 2015).

The inclusion of an HR portal has started to be considered as a vital strategic opportunity in any system upgrade (Johnson & Gueutal, 2011:4; (Al-Dmour et al., 2015:40). A web-enabled HR portal can allow an employee to access HR services anywhere and anytime, using devices ranging from laptop computers to smart phones and tablets. With the rapid expansion of access to current information, "democratization of HR data" (Johnson & Gueutal, 2011:4) can be provided throughout the organization.

1.6.8. Organizational Development

Organizational development via HRIS can be associated with the approach that investigates how required needs can be adopted and how a structural change can be made possible through information technology (Rameshbabu, 2018:8). As diversified channels for generating reliable reports, data warehouses and data mining tools can be used to support strategic decision-making.

The advanced statistical data analysis techniques can be used to discover the relationships between policies, procedures, practices, and organizational outcomes. An HR dashboard may also be used to organize high-level, real-time, visually organized data on the most important metrics for HR success. HR dashboards allow managers to evaluate data at a higher degree of precision, allowing them to immediately identify possible issue areas and achieve HR outcomes and business goals (Johnson & Gueutal, 2011:7).

1.6.9. Labor-force Planning

It is possible to envision workforce supply and demand at any future point in time through HRIS. The match between supply and demand of labor for organizations operating in a dynamic environment may be a very dynamic process which requires continuous monitoring of a number of HR-related activities and programs as well as appropriate adjustments and modifications.

Thus, information systems that promote HRM may become a vital element for efficient and active human resources planning for dynamic environments (Kadhim et al., 2012). In other words, technological changes are supposed to increase the ability of HR practitioners to monitor the workforce, produce reports easily, utilize employee skills effectively and even reduce labor costs (Al-Dmour et al., 2015). Having identified potential HR surpluses/deficits by a system, satisfactory HR levels in terms of quality and quantity of manpower can be provided to maximize the performance and wellbeing of HR department. (Boateng, 2007; Kadhim et al., 2012).

1.6.10. Career and Talent Management

Companies have been searching for opportunities to retain valued employees and optimize talent as long as they are allowed by their budget and resources. Thus, companies tend to concentrate on the control of workforce attrition, the assessment of employee turnover and the development of effective retention management plan (Allen, 2010). Having considered the cost of recruiting and cultivating highly qualified professional talent, managers want to anticipate where to direct their retention efforts within the organization.

Through data mining feature of HRIS, it is possible to develop a plan to target certain professional features such as the level of education and the kind of work experience for future hiring as well as to reduce turnover. Using turnover data of previous via statistical models, it can be forecasted which highly qualified workers are more likely to leave the organization. Employees in this category can then be targeted for retention programs and incentives (Johnson & Gueutal, 2011:8).

1.7. Research Problem

Human resources information systems (HRIS) has been a developing subject that deserves an in-depth discovery to reveal its relevance in human resources management (HRM) in Turkey. Although organizations have started implementing HRIS for the sake of HRM, there is still much to investigate the impact of HR systems used in organizations.

Due to the lack of awareness of both the need and the significance, HRIS may have not been using in the organizations at the desired level. Further, HR functions might have not been fuifilled with a strategical perspectice. However, regardless of industry, size, or location, organizations are expected to accommodate with digital transformation which requires HRM transformation sooner or later. Therefore, a comprehensive human resources information systems (HRIS) research is intended to be conducted in higher-order terms by reflecting the current state of human resources management (HRM) in Turkey.

1.8. Research Questions

This study seeks to answer the following explanatory questions:

1. Is there a positive relationship between using human resources information systems (HRIS) and the execution of human resources management (HRM)?

2. Do companies using an human resources information systems (HRIS) experience time savings in human resources management (HRM)?

- Does information technology (IT) infrastructure act as a mediator between human resources information systems (HRIS) and time saving?

- Does top management support act as a mediator between human resources information systems (HRIS) and time saving?

- Does competitive pressure act as a mediator between human resources information systems (HRIS) and time saving?

- Does internalization act as a mediator between human resources information systems (HRIS) and time saving?

- Does exploitation act as a mediator between human resources information systems (HRIS) and time saving?

3. Do companies using an human resources information systems (HRIS) experience cost savings in human resources management (HRM)?

- Does information technology (IT) infrastructure act as a mediator between human resources information systems (HRIS) and cost saving?

- Does top management support act as a mediator between human resources information systems (HRIS) and cost saving?

- Does competitive pressure act as a mediator between human resources information systems (HRIS) and cost saving?

- Does internalization act as a mediator between human resources information systems (HRIS) and cost saving?

- Does exploitation act as a mediator between human resources information systems (HRIS) and cost saving?

4. Do companies using an human resources information systems (HRIS) experience information effect in human resources management (HRM)?

- Does information technology (IT) infrastructure act as a mediator between human resources information systems (HRIS) and information effect?

- Does top management support act as a mediator between human resources information systems (HRIS) and information effect?

- Does competitive pressure act as a mediator between human resources information systems (HRIS) and information effect?

- Does internalization act as a mediator between human resources information systems (HRIS) and information effect?

- Does exploitation act as a mediator between human resources information systems (HRIS) and information effect?

5. Do companies using an human resources information systems (HRIS) experience the strategic impact and HR's role in human resources management (HRM)?

- Does information technology (IT) infrastructure act as a mediator between human resources information systems (HRIS) and the strategic impact and HR's role?

- Does top management support act as a mediator between human resources information systems (HRIS) and the strategic impact and HR's role?

- Does competitive pressure act as a mediator between human resources information systems (HRIS) and the strategic impact and HR's role?

- Does internalization act as a mediator between human resources information systems (HRIS) and the strategic impact and HR's role?

- Does exploitation act as a mediator between human resources information systems (HRIS) and the strategic impact and HR's role?

1.9. Purpose of the Study

The rationale behind this research is to explore the current situation in human resources management and to investigate the impact of human resources information systems (HRIS) on human resources management (HRM). It is initially intended to have a systematic review to clarify the impact criteria of HRIS. Further, it is also aimed to investigate whether there are mediating relationships able to facilitate the occurrence of impact factors. Additional sub-purposes explore the current role of HRM in organizations, the degree of HRIS use in organizations, the tendency for the use of different kinds of HRIS, the types of human resource functions fulfilled by HRIS, and the relationship between external factors and HRIS, in accordance with the study's overall goal.

1.10. Significance of the Study

This study is able to present both theoretical and practical contribution. Theoretically, this study intends to be investigate the impact of HRIS on HRM through a comprehensive quantitative design. It is believed that this study is able to theoretically can contribute to the existing literature with a detailed perspective on HRIS framework. The original contribution of this study can also be associated with use of ceremonial adoption and realized absorptive capacity approaches. Practically, the results of the current study can offer a set of guidelines to organizations in terms of the fulfillment of HR functions in a convenient manner. Through empirically supported suggestions, the results of this study can broaden scopes of the subject, change the current perceptions, and provide a global perspective towards HRIS. With this new perspective, organizations can be aware of the importance to reach international standards of HR functions and match the competition of world ranking companies in HRM.

CHAPTER 2
REVIEW OF LITERATURE

2.1. Chapter Overview

This chapter presents an extensive background perspective, addresses the importance of relevant literature, and discusses the context via a comprehensive systematic study over which recent research could be conducted. This chapter consist of systematic literature review and its results including respectively categorization by subject, categorization by organizational theories and categorization by methodology, and a final discussion under conclusion part.

2.2. Systematic Literature Review

In order to improve research performance, a systematic literature review is carried out on the thesis subject that is the impact of HRIS (Human Resource Information System) on Human Resources Management (HRM). As stated by Clarivate Analytics, with the WoS (Web of Science) platform, it is possible to access an unrivalled breadth of world-class research literature linked to a rigorously selected core of journals and uniquely discover new information through meticulously captured metadata and citation connections. In this sense, WoS (Web of Science) database is preferred to find out academical studies containing the term of HRIS (Human Resources Information System)as the subject. Besides to primary purpose of reaching studies directly pointing out HRIS, HRIS-related terms supporting the research model of this study are also included with the use of keywords such as time saving, cost saving, information effect, the strategic impact and HR's role, IT infrastructure, top management support, competitive pressure, internalization and exploitation.

It is aimed to use three criteria to include the studies in this systematic literature review. Firstly, only articles belonging to "high-impact-factor" journals are included in this systematic literature review. The articles taken place in the journals that belongs to respectively SSCI (Social Science Citation Index), SCIE (Science Citation Index

Expanded) or ESCI (Emerging Sources Citation Index) classification were preferred as long as possible. Additionally, the journals belonging to CPCI-S (Conference Proceedings Citation Index – Science) and CPCI-SSH (Conference Proceedings Citation Index – Social Science & Humanities). These journals are evaluated for calculating impact factor every year based on citations, published papers, reach of the papers etc. Although, quite recent articles; namely the articles published in the years between 2016 - 2020 are given priority, some articles published in the years between 1975 – 2020, which are directly related to the main subject of this study are also chosen. As empirical articles are primarily preferred, among the conceptual articles only those thought to be beneficial for the development of methodological model of this study are included. Systematic literature review is conducted through being based on the suggestions of Tranield et al. (2003), including three main steps of planning, execution and reporting. The analysis is articulated by a series of steps that allow the construction of a database containing all the characteristics of the selected papers. This provides a complete picture of the characteristics of the current literature on the subject. The entire review process includes three steps respectively; first attempt, cross examination and result.

In the first attempt, HRIS along with the keyword of each construct are investigated (such as "HRIS" & "time saving", "HRIS" & "internalization" etc.). In the cross examination step, the impact of HRIS on HRM is tried to be figured out via triple combinations (such as "HRIS" & "IT infrastructure" & "HRM", "HRIS" & "exploitation" & "HRM"). With the help of "fit for purpose" method, 50 resources belonging to WoS (Web of Science) database and 23 supportive resources searched via Google Scholars are downloaded. Final 50 articles are archived and classified, creating a special Excel sheet to study their scientific characteristics. This is made possible by carefully reading all the papers, retrieving all useful information and looking at their references to better understand the domain in which each study is grounded. The final table includes information such as type of author (single author or collaboration); theme (see below); type of paper (conceptual or empirical); design; type of research performed (quantitative, qualitative); applied methodology (case study, survey, literature review, etc.); and the unit of analysis (firms, manager, others).

The analysis of the resources covering human resource information usage in human resource management area include the characteristics of the papers, the analysis of the main definitions provided by the various authors on HRIS and the main themes studied in management literature, in order to understand the research orientation and the main observation lenses used by scholars. Therefore, the results of this systematic literature review is supposed to indicate the existing gaps in organization and management literature and identify future avenues of research in HRIS domain.

Table 2. 1. The Results of Systematic Literature Review

Keyword	Date	#
"HRIS" & "time saving" & "HRM"	2016 - 2020	4
	1975- 2015	1
"HRIS" & "cost saving" & "HRM"	2016 - 2020	2
	1975- 2015	2
"HRIS" & "information effect" & "HRM"	2016 - 2020	3
	1975- 2015	2
"HRIS" & "the strategic impact" & "HRM"	2016 - 2020	3
	1975- 2015	1
"HRIS" & "IT infrastructure" & "HRM"	2016 - 2020	4
	1975- 2015	2
"HRIS" & "top management support" & "HRM"	2016 - 2020	3
	1975- 2015	2
"HRIS" & "competitive pressure" & "HRM"	2016 - 2020	3
	1975- 2015	2
"HRIS" & "internalization" & "HRM"	2016 - 2020	5
	1975- 2015	2
"HRIS" & "exploitation" & "HRM"	2016 - 2020	4
	1975- 2015	2
	1975- 2015	0
Total # of resources		50

Table 2. 2. Table of Systematic Literature Review

No	Article	Journal	Year	Author	Keyword	Framework	Methodology
1	Human Resource System as Innovation for Organizations	Innovation & Management Review	2020	Mauro & Borges-Andrade	HRIS, Strategic HR Implementation	An investigation to identify relevant aspects to achieve advantage of the innovative potential of a HRIS	Interview & content analyses
2	University stakeholders' perceptions of the impact and benefits of, and barriers to, human resource information systems in Spanish universities	International Review of Administrative Sciences	2020	Ramirez & Tejada	HRIS, TS, CS	The importance and benefits of, and barriers to, transmitting information on HR collected in HRIS	Questionnaire - Anova, Regression
3	Cost reduction and productivity improvement through HRIS	International Journal of Innovation and Sustainable Development	2020	Begum, Bhuiyan & Alam	HRIS, CS	The use of HRIS applications generated a higher efficiency in terms of employee productivity and the reduction of HR costs	Questionanire / MANCOVA
4	Factors Influencing Practice of Human Resource Information System in Organizations: A Hybrid Approach of AHP and DEMATEL	(IJACSA) International Journal of Advanced Computer Science and Applications	2020	Masum, Abid, Arafat & Beh	HRIS, IT infrastructure, TMS, CP	The development of TOE framework and HOT fit model to identify the factors that influence the administration choice in embracing HRIS	interview, questionnaire
5	Exploring the Effect of Digital Investment on IT Innovation	Sustainability	2020	Nwankpa & Merhout	Competitive pressure	The effect of competitive pressure on digital investments.	Survey / SEM
6	HR ambidexterity and absorptive capacities: A paradox-based approach to HRM capabilities and practice adoption in MNC subsidiaries	Human Resource Management	2020	Beletskiy & Fey	Internalization, Absorptive Capacity	The relationship between the capabilities of HR departments and the level of adoption of corporate HRM practices in MNC subsidiaries	Survey / questionnaire
7	Linking e-hrm practices and organizational outcomes-empirical analysis of line managers perception	RBGN FECAP Review of Business Management	2019	Iqbal, Ahmad, Raziq & Borini	HRIS, SEM	The value creation opportunities offered by e-HRM practices	EFA / PLS-SEM

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8	Analysis of Cloud-Based Human Resource Information System Adoption Factors Prioritization in Micro, Small, and Medium Enterprises	11th International Conference on Advanced Computer Science and Information Systems	2019	Imron, Hidayanto, Fitriani, Nugroho & Inan	HRIS, TOE	Cloud based HRIS adoption	Interview & questionnaire
9	How does IT capability affect open innovation performance? The mediating effect of absorptive capacity	European Journal of Innovation Management	2019	Wu, Ding, Liu & Gao	AC, IT capability, open innovation	The exploration of the relationship between IT capability and open innovation performance	Questionnaire/ SEM
10	Strategic alignment of IT and human resources management in manufacturing SMEs - Empirical test of a mediation model	Employee Relations: The International Journal	2019	L'ecuyer, Raymond, Fabi & Uwizeyemungu	HRIS, IS, HRM,SEM	The deployment of strategic IT capabilities to improve the performance of HR function	Questionnaire / SEM
11	Strategic Human Resources Management and Business Intelligence Systems in the Purpose of Social and Economic Development	Economy and Market Communication Review	2019	Lajšić	HRIS, ERP, HRM	The strategic readiness of information capital (IT and systems) in organization	A concept model for HRM
12	Combined Influence of Absorptive Capacity and Corporate Entrepreneurship on Performance	Sustainability	2019	Jiménez-Barrionuevo, et al.	Exploitation, strategic impact	The effect of absorptive capacities on corporate entrepreneurial activities and firms' performance.	Survey / questionnaire - SEM
13	Do human resources policies and practices produce resilient public servants? Evidence of the validity of a structural model and measurement models	RBGN-Revista Brasileira De Gestao De Negocios Review of Business Management	2019	Costa, Demo & Paschoal	HRM policies and practices, SEM	The influence of hrm policies and practices on public servant resilience at work	Quantitative study – SEM
14	e-HRM in a Cloud Environment Implementation and Its Adoption: A literature Review	International Journal of Human Capital and IT Professionals	2019	Ziebell et al.	HRIS, IS, HRM	e-HRM solutions in a cloud environment as a map for changes	A systematic literature review
15	Impact of enterprise resource planning on HRM in automobile sector: Statistical analysis	Journal of Statistics and Management Systems	2018	Kushwaha, Yadaw& Prasad	HRIS, ERP, HRM	The impact of ERP on HRM in firms in terms of effectiveness	Structured questionnaire method

16	Fostering integration through HRM practices:An empirical examination of absorptive capacity and knowledge transfer in cross-border M&As	Journal of World Business	2018	Zhou, Fey & Yildiz	HRM practices, Absorptive Capacity	The post-acquisition integration of knowledge transfer, absorptive capacity and HRM practice	Quantitative research - questionnaire
17	On the shoulders of giants a meta-review of strategic HRM	International Journal of Human Resource Management	2018	Jiang & Messersmith	HRIS, IS	A meta-review of theoretical & empirical frameworks of strategic HRM	A meta-review
18	Factors influencing E-HRM implementation in government organizations: Case studies from Bangladesh	Journal of Enterprise Information Management	2018	Rahman, Mordi & Nwagbara	e-HRM implementation	The factors influencing the implementation of e-HRM in government organizations	A qualitative and multiple case study
19	Intelligent Human Resource Information System (i- HRIS): A Holistic Decision Support Framework for HR Excellence	The International Arab Journal of Information Technology	2018	Masum, Beh, Azad & Hoque	HRIS, HRM	A framework of i-HRIS applying Intelligent Decision Support System (IDSS) along with Knowledge Discovery in Database (KDD)	A special i-HRIS model
20	Value Chain Creation in Business Analytics	51st Hawaii International Conference on System Sciences	2018	Yoo & Roh	Absorptive capacity, business analytics	An investigation on whether organizational resilience, absorptive capacity, and analytical IT capabilities	Survey, SEM
21	Investigation on the precursors to and effects of HRIS use: The case of a developing country	Cogent Business & Management	2018	Quaosar, Hoque & Bao	HRIS, IT, innovation, transformation	The exploration of the precursors to and effects of HRIS use in a developing country.	Survey / questionnaire – PLS-SEM
22	Human Resource Information Management Model based on Blockchain Technology	2017 IEEE Symposium on Service-Oriented System Engineering	2017	Wang, Feng, Zhang, Lyu, Wang & You	Cost saving, information effect	The authenticity of HR information has become an important factor that affects the cost and efficiency of HRM	Qualitative - a specific model
23	Diffusion of innovation theory: Beyond decision stage	International Journal of Advanced and Applied Sciences	2017	Tariq, Pangil & Shahzad	HRIS, IT infrastructure, competitive pressure	The importance of HRIS implementation in the organization to achieve the competitive advantage	Mixed method

24	Cloud-Based Security Driven Human Resource Management System	Advances in Digital Technologies	2017	Odun-Ayo et al.	HRIS, IS	A cloud computing based securty model for HRIS	The development of a model"
25	Intellectual Capital - Enhancing HR, Absorptive Capacity, and Innovation	Human Resource Management	2017	Soo, Tian, Teo & Cordery	Absorptive Capacity, SHRM	The role of intellectual capital enhancing HR practices in the development of a firm's Absorptive Capacity	Interview & Questionnaire - SEM
26	The applications, advantages and challenges in the implementation of HRIS in Pakistani perspective	VINE Journal of Information and Knowledge Management Systems	2017	Khan, Hussainy, Khan & Khan	HRIS, IS, HRM	The reveal of applications, advantages and challanges of HRIS in different sectors	Questionnaire
27	HRIS implementation readiness in the Ethiopian health sector: a cross-sectional study	Human Resources for Health	2017	Dilu, Gebreslassie & Kebede	HRIS, IS	The investigation for the implementation of HRIS in health sector	A qualitative study / questionnaire
28	To use or not to use: Modelling end user grumbling as user resistance in pre-implementation stage of ERP system	Information Systems	2017	Mahmud, Ramayah & Kurnia	ERP Systems, IS, Adoption	The end-user grumbling behaviour that precedes the implementation of a new ERP system	Survey / questionnaire
29	E-Skills and the Adoption of Cloud Computing	Thunderbird International Business Review	2017	Hadhri, Maherzi, Youssef	Competitive pressure, cost saving	The preliminary results for the determinants of Cloud Computing (CC) adoption.	Survey / logit models
30	Knowledge-based HRM practices, intellectual capital and innovation	Journal of Business Research	2017	Kianto, Saenz & Aramburu	HRIS, HRM	The impact of knowledge-based HRM practices on a firm's intellectual capital, producing higher innovation performance	SEM based on partial least squares (PLS)
31	Information systems absorptive capacity for environmentally driven IS-enabled transformation	Information Systems Journal	2017	Cooper & Molla	IS, absorptive capacity, cost saving	The potential of IS to enable environmental sustainability necessitates an understanding of how organisations can realise this potential.	Mixed method
32	On the Untapped Value of e-HRM: A Literature Review	Communications of the Association for Information Systems	2016	Wirtky et al.	HRIS, IS, HRM	The value potential of IT in HRM and its importance in HRM transformation	Literature Review

33	Adopting Factors of Electronic Human Resource Management: Evidence from Bangladesh	ICISET 2016	2016	Masum et al.	HRIS, SEM, HRM	The factors inducing the organization decisions to adopt e-HRM	SEM based on (TOE) model
34	Critical Factors Influencing Decision to Adopt Human Resource Information System (HRIS) in Hospitals	Plos One	2016	Alam, Masum, Beh & Hong	HRIS, technology, innovation	Factors influencing management decisions to adopt HRIS	Two conceptual model
35	The Impact of HRIS on Organizational Effectiveness: A case study of textile industry in Thailand	International Journal of Asian Business and Information Management	2016	Siengthai & Udomphol	HRIS, IS, HRM	An investigation for the impact of HRIS on organizational effectiveness	Exploratory study - questionnaire
36	Promoting uncommon use of knowledge in IS departments	IT & People	2016	Wang et al.	HRIS, IS	The effects of HRM practices on uncommon use of knowledge	Survey / questionnaire
37	The Evolution of the Field of Human Resource Information Systems: Co-Evolution of Technology and HR Processes	Communications of the Association for Information Systems	2016	Johnson, LukaszewskiStone	HRM, IS,ERP	The examination on the interplay btw the evolution of technology and the HR field	Literature Review
38	An evidence-based review of HR Analytics	International Journal of HRM	2016	Marler & Boudreau	HRIS, HRM	An evidence-based review using an on HR Analytics	Published peer-reviewed literature
39	An Integrated Model of Business Intelligence Adoption in Thailand Logistics Service Firms	(ICITEE) 7th International Conference on IT and EE	2015	Chaveesuk & Horkondee	Competitive pressure,	The investigation of factors influencing BI adoption.	Questionnaire / SEM
40	Towards explaining subsidiary implementation, integration, and internalization of MNC headquarters HRM practices	International Business Review	2015	Ahlvik & Björkman	Internalization	The transfer of organizational practices from headquarters to subsidiaries of multinational corporations	Survey / questionnaire
41	The Effect of Absorptive Capacity on Innovativeness: Context and Information Systems Capability as Catalysts	British Journal of Management	2012	Cepeda-Carrion et al.	Absorptive capacity, mediation	The identification of catalysts for the relationship btw AC and company innovativeness	Questionnaire, factor analyses

42	A resource-based perspective on information technology and firm performance: A meta analysis	Industrial Management & Data Systems	2010	Liang, You, Liu	IT, firm performance	Whether IT and organizational resources have significant effect on firm performance.	Meta Analysis
43	Internalization of ISO 9000 Standards: The Antecedent Role of Functionalist and Institutionalist Drivers and Performance Implications	International Journal of Production Research	2009	Nair & Prajogo	Internalition, innovation	The internalization of practices underlying ISO 9000 standards	Survey / questionnaire
44	Open Innovation in Practice: An Analysis of Strategic Approaches to Technology Transactions	IEEE Transactions On Engineering Management	2009	Lichtenthaler	Open innovation, absorptive capacity	An investigation on the current state of open innovation in practice	Survey / questionnaire
45	Determinants of e-business diffusion: A test of the technology	Technovation	2008	Lin & Lin	TOE framework	The examination of the influence of TOE	Survey / questionnaire
46	Gaining agility through IT personnel capabilities: The mediating role of IT infrastructure capabilities	Journal of Association for Information Systems	2007	Fink & Neumann	IT infrastructure capabilities	The interrelationship between IT personnel capabilities, IT infrastructure capabilities and organizational agility.	Survey / questionnaire
47	Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management	MIS Quarterly	2007	Liang, Saraf, Hu	ERP, top management, institutional theory	How top management mediates the impact of external institutional pressures on the degree of usage of ERP systems	Survey / questionnaire
48	Adoption of an Organizational Practice by Subsidiaries of MNC: Institutional and Relational Effects	Academy of Management	2002	Kostova & Roth	Ceremonial Adoption	The adoption of an organizational practic	Survey / questionnaire
49	Competitive pressure: the effects on investments in product and process innovation	RAND Journal of Economics	2000	Boone	Competitive pressure, cost saving	The effects of competitive pressure on a firm's incentives to invest in innovations	A conceptual model
50	The Measurement of Organizational Commitment	Journal of Vocational Behavior	1979	Mowday, Steers & Porter	Organizational commitment	A measure of employee commitment to work organizations	Scale Development

2.3. Results of Systematic Literature Review

Human resources management (HRM) has started to experience a digital transformation that brought a strategic, integrated, and coherent approach to its process within organizations (Armstrong, 2014; Costa, 2019). Due to the impact of technology on human resource management (HRM) procedures and practices, a new discipline, human resources information systems (HRIS) has arisen to focus on leveraging technology to assist the human resource management (HRM) functions (Johnson et al., 2016).

The reason why many organizations have moved from the traditional personnel management understanding to the human resources information systems (HRIS) (O'Brien, 2008) is actually associated with the challenges in the external environment which accelerate the transformational influence on human resources management (HRM) functions. Organizations are recommended to increase their ingenuity and initiative in order to keep pace with knowledge-based business environment of today's "digital era". After recognizing the demands of this new era which demand that human resources management (HRM) take on a new dimension, it is felt that there is still much to discover the impact of HR systems in human resources management (HRM).

Being forced to adopt new systems, organizations can respond to external challenges through building new capabilities, the adoption of which are forced by external environment (Wirtky et al., 2016). Organizations need a critical instrument able to innovate their human resources management (HRM) practices in order to achieve competitive advantage (Masum, 2015; Masum et al., 2015), which leads to increased organizational efficiency (Kumar & Parumasur, 2013).

At first glance, human resources information systems (HRIS) can be identified as a digital mechanism to collect, store, maintain, update, analyze data and generate related reports in relation to both HR department and organization in general (Celik & Akgemci, 2015:165). Based on the current literature, human resources information systems (HRIS) tends to be defined as an umbrella term that refers to various HR systems including the design, the implementation, as well as the interactive or communication aspects of those systems. Thus, human resources information systems (HRIS) can be defined as a database system designed to assist human resources

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management (HRM) in the collection and analysis of HR data, decision-making, and reporting of HR information (Kabene et al. 2006; Dorel, 2011; & Dilu et al. 2017) in the fulfillment of all HR functions for the sake of organization.

It has been seen that firms that effectively use sophisticated HR technology solutions outperform those that continue to rely on basic HR administration, which no longer provides a competitive advantage. Human resources information systems (HRM) has become a more technologically advanced profession (Johnson & Gueutal, 2011:1) as well as increasingly complicated and data-intensive in the execution of all activities (Bingol, 2010:639). Human resources information systems (HRIS) can offer human resources management (HRM) with a central database for all HR-related units such as payroll, benefit administration, and pension (Targowski & Deshpande, 2001; Shani & Tesone, 2010). Human resources management (HRM) functions such as identifying potential employees, managing personnel data, and developing programs to improve employees' talent and abilities are all supported by human resources information systems (HRIS) (Bal, Bozkurt & Ertemsir, 2012; Targowski & Deshpande, 2001).

Aligned with the research questions of this study, it is intended to explain to the aspects that human resources information systems (HRIS) bring an added value for organizations in the actualization of human resources management (HRM). In order to answer the research questions of this study, both explanatory factors through which the impact of human resources information systems (HRIS) on human resources management (HRM) is experienced and the mediating factors acting as means in the relationship between human resources information systems (HRIS) and human resources management (HRM) are investigated. With the help of an in-depth discovery based on comprehensive systematic literature review, those factors are explained in detail in order to reveal whether they are able to explain or facilitate the impact of human resources information systems (HRIS) on human resources management (HRM).

Despite its delayed digitalization, HRM has progressed from paper-driven to technology-driven era in a very short period of time (Kumar & Parumasur, 2013). HRIS enable businesses to store and retrieve massive amounts of data through eliminating job duplication and ensuring simplified operations in a quick and efficient manner.

Time saving can be defined as one of the metrics used to assess the efficiency of any information system that can be used in HRM. It is stated that any system must be user-friendly, and easy to navigate inside, and must meet the needs of all HR functions in order to create a positive impact on time management (Kaygusuz et al., 2016). It is asserted that integrating HRM with an information technology can assist time reduction for HR operations (Reddick, 2009; Ramirez & Tejada, 2020). It is experienced that HRIS is able to remove the wasted time on administrative operations (Targowaski & Deshpande, 2001). Similarly, in the study of Suharti and Sulistyo (2018), it is observed that one widely acknowledged benefit of using an HRIS is the ability to minimize time spent on administrative affairs (Ramirez & Tejada, 2020). Thus, having allowed enhanced metrics accessibility, HRIS can lead to quicker data processing that result in administrative efficiency (Ramirez & Tejada, 2020). Data becomes more simpler to store, update, categorize, and analyze when HRM operations are computerized into HRIS, allowing for rapid development, planning, and administration of HRM (Ngai & Wat, 2006; Sergio et al., 2010; Shani & Tesone, 2010; Targowski & Deshpande, 2001).

HR personnel can also spend less time on operational activities and more time on strategic decisions, so they can serve for competitive advantage and contribute to corporate performance (Kaygusuz et al., 2016). Likewise, the integration of an HRIS application with an organization's website for online recruiting may result in time efficiency by allowing time to be better spent and work activities to be done faster (Troshani et al. 2011, Karikari, 2015; Suharti & Sulistyo, 2018).

Functionally, an HRIS can also facilitate HR productivity improvements and lower HR costs (Beadles et al., 2005; Kwame, 2019; Ramirez & Tejada, 2020) in areas including recruiting, hiring and training of employees, as well as data inputting. (Arpoh-Baah et al. 2020). Due to ongoing pressure to cut costs in organizations, HR expenditures such as staffs, benefits, services are subject to be decreased (Arpoh-Baah et al., 2020). HRIS enables businesses to better plan, manage, and control their HR expenditures without allocating too many resources and without devoting too much time and effort to them (Boateng, 2018; Arpoh-Baah et al., 2020).

In a research on the motivations for using an HRIS, cost reductions are the primary motivator for almost 80 % of participant companies surveyed (Sergio et al., 2010).

Similarly, Lori and Elaine (2002) showed that a successful e-recruiting model can decrease hiring time by two-thirds and expenses by 90 % (Kumar & Parumasur, 2013). Another research reveals that IBM can save $1.2 million on printing and mailing costs every year with the help of its paperless online HR environment, (Brown, 2013). This indicates that it is possible to save a significant amount of money through deployment and use of HRIS in organizations.

According to Johnson and Guental (2011), HRIS can help businesses through preventing expensive benefits errors. As an instrument for improved efficiency, HRIS can allow the company to save money by automating traditional labor-intensive tasks (Wiblen, Grant & Dery, 2010; Kumar & Parumasur, 2013) and can decrease labor and recruiting cost (Khera & Gulati, 2012).

The reduction in the cost of HR tasks shows that HRIS is negatively associated with the cost of HRM functions (Troshani et al. 2011). As a result, the higher the number of HRIS applications, the cheaper the cost of HRM (Begum, Bhuiyan & Alam, 2020). As long as making a regular assessment, an HRM system can even determine organizational effectiveness in terms of return on investment (ROI) (Boateng, 2018; Arpoh-Baah et al., 2020).

There are more advantages of using an HRIS, among which higher transparency, quicker response and easier access to information are prominent (Ramirez & Tejada, 2020). HR department of an organization plays a critical role in not only developing policies, but also simplifying processes (Ambler, 2006).

With the technological development, the concept of "information management" has also emerged which involves all actions such as creation, organization and efficient use of information (Cakar et al. 2010:72). The information effect of HRIS starts with effective dissemination and utilization of information (Arpoh-Baah et al., 2020). Recent studies have shown that HRIS not only saves time and money, but also enhances the quality of work that can only be achieved through more accurate and reliable information (Makkar & Sanjeev, 2014).

It is possible to assist a company in handling all HR information in general with an excellent and upgraded kind of HRIS (Troshani et al., 2011). On the one hand, user satisfaction can be achieved by ensuring information sharing as well as displaying high

degree of summary information. On the other hand, HRIS may assist employees in more readily interaction among themselves and with all units in organization, so their productivity and performance can be boosted (Kaygusuz et al., 2016).

The information effect of HRIS has served for effective decisions making in order to meet organizational goals in the short term. Through the improvement in power dynamics and communication process, the role of HR has started to be perceived as a decision support and information broker in the organization (Khan et al. 2017).

Besides to operational decision making, the emphasis has started to be experienced in strategic decision making as well (Kovach et al. 2002). Today, concentrating on operational tasks of HR is no longer the primary driver of organizational performance (Kuipers & Giurge, 2017). HR professionals deserve to be characterized not only as personnel managers but also as strategic partners being primarily involved in visionary decisions. In other words, they not only ensure compliance within the business dynamics, but they can also manage and accompany prospective changes and developments in line with the company's long term plans.

The adoption of HRIS is supposed to promote HR to the foreseen position of strategic partner (Shani & Tesone, 2010) and a new age has begun for HRM in order to manage the change within the organization (Lori & Elaine, 2002; Targowski & Deshpande, 2001; Pasqualetto, 1993; Kumar & Parumasur, 2013). Since an HRIS has the ability to turn HR into a more efficient and strategic department by transforming basic administrative tasks to strategic functions (Palframan, 2002; Kumar & Parumasur, 2013) through focusing on strategic activities, company operations, and policies (Remenyi et al., 1993; Zuboff, 1988). (Quaosar et al., 2018:5).

With the help of the implementations of HRM systems that fulfill operational HRM activities, HR professionals can focus on initiatives that provide strategic value, such as talent management, employee training and development programs (Dery et al, 2013). Therefore, HR departments needs HRIS in terms of HRM transformation in order to play a more strategic role in organizations (Johnson & Gueutal, 2011).

An HRIS can strategically increase organizational performance and transform the way of organizational management (Katou and Budhwar, 2006). According to Kumar and Parumasur (2013), a successful and well-implemented HRIS may give strategic

direction, support company strategy, and execute corporate strategy effectively. It may be deduced that HRIS can assist a company in gaining a competitive edge while also enhancing overall organizational efficiency.

Besides to explanatory factors through which the impact of HRIS on HRM are supposed to be experienced, it is also investigated whether there exist any other factors inbetween HRIS and HRM. Based on the literature review, it is supported that there may be not only a direct causal link between independent and dependent variables, but also unobservable mediators firstly affected by independent variable, that in turn affect the dependent variables. Thereby, the nature of the linkage between independent and dependent variables can be determined by means of mediating variables (Mackinnon, 2008).

This study treats the variables supposed to act inbetween HRIS and HRM as mediators, which are IT infrastructure, top management support, competitive pressure, internalization, and exploitation. It is assumed that these mediating variables can only exist or emerge in case of HRIS. Because these variables are not self-existing phenomena, they can only be realized as long as they are prompted by a revolution such as HRIS. With the help of the expalantions derived from literature review, the mediating variables of this study are clarified in detail below.

The recent breakthrough experienced in HRM field can be explained by TOE (technology-organization-environment) framework that provides guidance in the flexible fulfillment of HR functions (Masum et al. 2016; Rahman et al. 2018). According to TOE theory, the decision of adoption and implementation of any innovation system is based on three factors; technology context, organization context and environment context (Tornatzky & Fleischer, 1990).

Technology has been defined as a key enabler for the creation of innovative policies and practices (Noe, Clarke & Klein, 2014). Technological context refers to the expertise, knowledge, infrastructure and IS support (Rahman, Mordi & Nwagbara, 2018). Representing technology context, the most important aspect in adopting a new information system (IS) application is identified as having a reliable IT infrastructure (Ross et al. 1996). Research results show that IT infrastructure is the most critical

factor in HRIS usage, so it is identified as key success element in organizations (Masum et al. 2015; Masum et al. 2020).

IT infrastructure refers to a set of technological capabilities for data / information processing and transmission including hardware, software, databases, and telecommunications necessary to run the organization (Tariq, 2017). These capabilities consist of human resources with necessary technical and management knowledge and skills, as well as the procedural guidance, data communications networks and equipments of the organization, the applicational infrastructure, and the data derived as a result of information infrastructure (Rue¨l, 2011).

It has been realized that IT infrastructure serves as the foundation for the development of information systems. Several additional researches discovered that IT infrastructure has a favorable and significant impact on IT innovation adoption (Gibbs & Kraemer, 2004; Hsu et al. 2006; Zhu et al., 2006; Hadaya, 2008; Fink & Neumann, 2007; Oliveira & Martins, 2010; Al-Mobaideen et al., 2013; Tariq, 2017).

HRIS is the outcome of increasing convergence of information and communication technologies when based on a proper IT infrastructure. In other words, information and communication technologies are designed and deployed to support HR purposes and practices (Rue¨l, 2011). It is stated that the lack of supportive supervision, nonreliable internet access, inadequate infrastructure, and previous negative experiences are the challenges of implementation (Ishijima, 2015; Campbell & Settle, 2009; Dilu et al. 2017). Thus, HR and IT functions are required to collaborate within the organization. Even, many giant companies such as IBM, Ford, Dutch Telecom KPN, and Royal Dutch Airlines have their special IT functions developed to support HR functions (Rue¨l, 2011).

Findings demonstrating the intermediary effect of IT infrastructure can raise the awareness of the implications when it comes to HRIS adoption. Accordingly, the mediating effect of IS infrastructure along with HRIS competences can positively influence the relationship between the its high performance work systems (HPWS) capabilities and the performance of its HR function (L'ecuyer, 2019). It is implied that organizations most engaged in creating strategic IT skills supporting their HR performance are able to generate a sustainable competitive advantage (L'ecuyer,

2019). From another perspective, the lack of advanced IT infrastructure may inhibit the operation of e-HRM systems which has been mentioned in many studies (Johnson et al., 2016; Heikkilä et al., 2014; Banerji, 2013; Jaradat, 2013; Rahman et al. 2018).

An innovation alone may not necessarily result in organizational improvements, since it is not a single act, but rather a network of interconnected actions (Alves, Galina, & Dobelin, 2018). Similarly, a competitive advantage can only be accomplished by finding the optimal fit able to support the HR system (Kavanagh & Johnson, 2015).

There is always possibility that the different types of obstacles may be encountered in the fulfillment of organizational functions such as the lack of IT infrastructure (Rogers, 2003; Zhu, Kraemer & Xu, 2006; Malik & Khan, 2009). However, organizations can reap the benefits in HRM, as long as being supported by a proper IT infrastructure, that is indeed reshaped according to the needs of HRIS.

For instance, when an HRIS is run through an enterprise resource planning (ERP) system, it becomes possible to reduce errors, the duration of cycles, and even shorten turnaround periods through reaping the benefits of an all-in-one system (Boateng, 2018). Similarly, the utilization of online technologies for HR functions can offer HR practitioners time saving, so that they can allow time for only the topics having higher importance (Bal et al., 2012; Kumar & Parumasur, 2013). It is claimed that several hours may be saved that would otherwise be spent on non-strategic as well as mundane duties fulfilled upon both the need of employees and the request of top managers (Arpoh-Baah et al. 2020).

Besides to the reduction in the amount of time devoted on routine tasks (Thite et al. 2012), an HRIS can also accelerate HR transaction process, eliminate information inaccuracies, and regulate all HR activities. The more integration of HR professionals with information systems may result in the less time devoted for the fulfillment of HR functions (Reddick, 2009). It can be inferred that IT infrastructure can contribute to the time spent on recruiting, training, data inputting, document processing and decision making fulfilled by HRIS.

Being relieved of the stress of handling routine tasks and requests, HR practitioners can focus on organizational development (Aswanth & Brijball, 2013; Ramirez & Tejada, 2020). The data maintained in HRIS infrastructure can be utilized for both the

development planning of employees and the long term workforce and succession planning of the organization (Kossek & Block, 1999, Said et al. 2014), which can only be achieved by timely access.

Aside from time saving, an effective technology-based HRIS may also help organizations cut HR processing expenses (Enshur et al., 2002; Lengnick and Moritz, 2003) as well as administrative expenditures (Lepak & Snell, 2002; Lengnick & Moritz, 2003). According to Beadles et al. (2005), HRIS may assist in keeping HR costs low. Consistently, Masrek (2009) advocates that one of the important benefits of HRIS is the reduction in processing cost. According to the research conducted by Lederer (1984), information that is easily accessible, readily available, and accurate via HRIS also results in cost savings (Ramirez & Tejada, 2020).

The cost saving actually derives from the automation of information able to decrease the large number of HR data through creating short cuts for each HR process. Through the data storage provided by IT infrastructure, it may be possible to better plan and manage HR costs without devoting too many resources (Boateng, 2018). Due to the constant pressure to cut HR expenses, companies have been looking for the solutions including fewer HR staffs, lower benefits, and reduced HR services (Arpoh-Baah et al. 2020).

IT infrastructure can lower the cost of communication even if the range of communication is simultaneously increased (Wu et al. 2019). Specifically, the cost reductions can be experienced in the fulfillment of selecting, hiring, orienting of employees as well as data entry expenses after their recruitment process. According to many prior studies, a certain reduction could be experienced in not only HR process but in the salaries paid for additional HR staffs as well (Said et al. 2014). Without the need for additional HR staffs, cost saving on employees can also be achieved (Awazu & Desouza, 2004). Having resolved the cost-cutting dilemma, the successful decisions can be also made on remuneration and incentives, promotions, training and development, and other HR practices (Arpoh-Baah et al. 2020).

Due to the requirement to guarantee the efficiency and effectiveness of HRM in benefiting from limited and available resources to boost productivity and service quality, cost-cutting methods can be developed through regular controls (Boateng,

2018; Arpoh-Baah et al. 2020). With the help of frequent assessment of HRIS infrastructure, organizational effectiveness in terms of the return on investment (ROI) can even be provided (Boateng, 2018).

Besides to time and cost advantages, a well implemented HRIS can also leads to information effect. As explained by Beadles et al. (2005), an HRIS increases information efficiency, allowing HR professionals to focus on delivering superior data analysis (Ramirez & Tejada, 2020).

Many researches have confirmed that there is a substantial positive relationship with HRIS and information effect. An HR system can enhance its capacity to transmit the high volume of information (Kossek & Block, 1999) by means of IT infrastructure. Through easily available data, An HRIS allows for more information sharing as well as enhanced knowledge transfer and management. (Aswanth & Brijball, 2013; Ramirez & Tejada, 2020).

In their study on open innovation process, Wu et al. (2019) state that the interaction between companies in pursuit of enhanced external information needs extensive communication and coordination. Both newly obtained external knowledge and existing internal knowledge can be employed by an IT solutions able to assist organizations in simply and logically storing knowledge, simplifying employee access and facilitating their communication. It is even suggested that policymakers should take additional steps to make it easier for businesses to use IT infrastructure (Wu et al. 2019).

New technologies have been constantly being launched and developed to improve the effectiveness and efficiency of a HR department. The data-intensive nature of HRIS infrastructures render all records being kept in some sort of database. For instance, by using of a cloud infrastructure, it may become possible to create a digitalized system aligned with the goal of increasing efficiency (Odun-Ayo et al. 2017). Likewise, decision-makers can make quick and precise choices by using Business Intelligence (BI) system in many organizations (Chaveesuk & Horkondee, 2015). Importantly, HRIS can facilitate to take decisions on compensation and benefit management, training and development, selection of the best candidates and recruitment (Arpoh-Baah et al. 2020). From another perspective, the lack of an infrastructure appropriate

for HRIS usage may lead to inadequacies in competitiveness, time management, and decision-making (Teo et al. 2001). This is due to the fact that information refined by HRIS can assist companies in better decision making (Jackson et al. 2011).

HRM decision making has also moved from an operational to a strategic level with the help of the strategic deployment of the information via HRIS (Kovach et al., 2002). The necessity to establish a developing connection between HR department and organizational strategy has become more and more important. In order to accomplish strategical goals and objectives of the organization, HRIS has featured its strategic function through taking steps in the direction of human capital (Fletcher, 2005; Kavanagh & Johnson, 2015; Mauro & Borges-Andrade, 2020). Organizations turn their attention for novel innovations to create a more competitive workforce in order to fulfill their missions (Muriithi et al., 2014; Boateng, 2018; Nawaz & Gomes, 2014).

HRIS has shifted HR department to a business partner, HR professionals to a decision support and information broker, and the dynamics of HR department to a more strategic oriented manner (Khan et al. 2017). Severeal researchers have defined HRIS's main objective to be strategic because of the quality and useful information that allows professionals to focus on more strategic decisions and tasks to support company strategy (Kossek et al. 1994; Targowski & Deshpande, 2001; Lori & Elaine, 2002; Beadles et al., 2005; Sergio et al., 2010; Shani & Tesone, 2010; Successfactors, 2013; Kumar & Parumasur, 2013).

The innovative potential of a system can be utilized for the strategical benefit of organization; which refers to the strategic HRM (Kavanagh & Johnson, 2015; Mauro & Borges-Andrade, 2020). However, it is considered that an effective HRM cannot be sustainable without the assistance of information technology. In other words, there is a continuous need for a IT infrastructure in order to practice on the strategic impact of HRIS.

For instance, the online transaction processing systems should be backed up by an IT infrastructure to assess information capital in strategical HRM. This type of systems might be an ERP module, a component of a business intelligence system, or any kind of HRIS. It can be inferred that the strategic readiness of information capital; namely IT infrastructure, is accepted as the most significant indicator of performance. It can

also assess whether human resources is competent to help an organization's plan be supported and implemented (Lajšić, 2019). It may be implied that being shaped on behalf of HRIS, IT infrastructure can help the realization of strategical targets of the organization.

As the second dimension of TOE framework, organizational context explains the structure and process of an organization to use technological innovation (DePietro et al., 1990; Tornatzky & Fleischer, 1990; Cao et al. 2014). It is stated that technological systems can be either hampered or facilitated by organizational factors (Cao et al., 2014). It is specified that organizational dimension is the most frequently investigated aspect in IT adoption in organizations (Hameed et al. 2012). Among organizational dimension, the most critical factor is determined as top management support in the decision and support of the adoption of an innovation Oliveira & Martins, 2011; Alam et al., 2016; Van de Weerd et al. 2016; Imron et al. 2019).

Although organizational factors related to HRIS may change depending on the needs of different organizations, some major factors are thought to be decisive for the system regardless of the organization. Thus, organization dimension can be included as an intermediary factor to measure the nature of the linkage between HRIS and HRM.

Top management support implies managerial attitudes towards the acceptance and usage of an innovation in the organization (Chatterjee et al. 2002a; Pudjianto et al. 2011). It is possible to make necessary resources, authority or power available for the accomplishment of an IT/IS project with the consent of top-level management (Lian et al. 2014).

Many studies have confirmed the positive impact of top management on new technology adoption; such as the information system adoption in hospitals by Chang et al. (2007), the implementation of HRIS in Singapore by Teo et al. (2007), effective execution of an HRIS (Razali & Vrontis, 2010; Troshani et al., 2011) and negative impact of the lack of commitment from top managers on technology adoption by Altarawneh and Al-Shqairat (2010), Kananu and Nyakego (2016).

However, top management support may not be sufficient to alter an innovation's performance. There is a need for a method to encourage senior managers' need for change. When an invention is firstly released, spreads, or is enforced by the industry,

senior executives in an organization should consider it to see whether it may help their company gain a competitive edge. Potential results of HRIS cannot be realized by top managers until its operations are closely observed by themselves.

It is important to note that top management support is not a stand-alone effort, but rather an HRIS-focused assitance. HRIS first provides a vision, insight, and awareness to top managers by managing their view of an HR system, after which top managers may provide a positive perspective, support, and devotion to the fulfillment of HR functions via HRIS (Tsai & Tang, 2012; Chan & Chong, 2012; Chaveesuk & Horkondee, 2015).

According to Chatterjee et al. (2002a), top management may provide vision, support and recommendations to organizational departments about the advantages and challenges of new technologies (70-71). Top managers' favourable attitudes towards information technologies lead to management measures for assimilation of the systems (Liang et al. 2007). For instance, it is adviced senior management to establish an e-business environment convenient for market response as well as client satisfaction (Lin & Lin, 2008).

HRIS can also provide assistance to operational management in hiring, positioning and the compensation of employees. Today, HR processes such as labor planning, compensation programs, salary projections, budgeting, and workforce relations can be fulfilled via HRIS (Bal et al. 2012). HRIS has been employed to particularly analyze labor supply to check whether it is aligned with long-term business strategies by top management (Siengthai & Udomphol, 2016).

As already mentioned, quick response and faster access to information can be provided with the help of enhanced data control (Ikhlas & Al-Shqairat, 2010). When this control is fulfilled by also top management, the advantages obtained from HRIS can be improved. If HRIS is used by middle management in analysis and evaluation of critical issues, on time decisions can be immediately taken. Thus, the contribution of management in the use of HRIS may result in time saving in the fulfillment of HR actions.

From another perspective, the lack of commitment from top managers is accepted as a critical challenges that hinder the benefits from HRIS such as quick data entry and

control, immediate data usage with less errors, and the fulfilment of HR tasks in a streamlined manner (Ikhlas & Al-Shqairat, 2010). If top management cannot comprehend the main advantages of HRIS, and it can eventually result in failure. In other words, if HRIS cannot get considerable support from top management in terms of installation, maintenance and usage, its advantages cannot be realized (Ngai & Wat, 2006).

Therefore, the ineffective utilization of HRIS may occur due to the insufficient commitment and support from management along with the incapability of HR experts. Instead of just implementing, businesses should focus on the challanges preventing the effective use of HRIS (Khan et al., 2017). Regarding time saving, it may not be a true approach to just expect this advantage from HRIS. But rather discovering the facilitators through which time saving effect of HRIS is improved may be adviced. Being an important one of these facilitators, top management support seems to be inevitable in taking advantage of HRIS. Even if HRIS provides fast and easy access to data, these available information cannot be usefull unles they do not turn into managerial actions at the same speed. Therefore, the speed of information access is supposed to be parallel to the speed of managerial actions. According to an empirical research, top management executives should be guided to have IT-infrastructures and to hire IT-capable employees (Alam et al., 2016) in order to support HRIS as well as it effective utilization.

Similarly, another guidance for top management should be on the analysis of perceived cost of a contemporary HRIS to obtain competitive advantage (Alam et al., 2016). It may be difficult to convince top management for the need of a new system which has a risk to be perceived as an additional unnecessary cost (Ngai & Wat, 2006; Shani &Tesone, 2010). At this point, top managers may be advised to focus on the opportunity cost of HRIS. In other words, it may be analyzed that whether cost saving advantages are greater than the implementation and maintenance cost of HRIS.

When the trade off between bearing the cost of HRIS and the cost saving advantage to be obtained via HRIS is taken into consideration, it is undertaken that the investment can be compensated in a shorter amount of time (Boateng, 2007). As a result, HRIS may eliminate costly benefit errors, saving employers money that would otherwise be spent (Johnson & Guental, 2011).

Further, Ngai and Wat (2006) assert that the most significant barrier to the implementation of HRIS can be its installation and maintenance cost (Kumar & Parumasur, 2013). Supportingly, some other researches (Razali & Vrontis, 2010; Troshani et al., 2011) have identified top management support as a critical aspect in the effective implementation of an HRIS. Another study conducted on Spanish university stakeholders confirm this view by supporting that the lack of top management support as wells as insufficient financial support are the main obstacles for the adoption of HRIS (Ramirez & Tejada, 2020).

Additionally, HRIS can be used to properly assess actual business performance such as calculating ROI (the return on investments) on training or turnover costs in order to persuade top management for its effectiveness (Shani &Tesone, 2010; Kumar & Parumasur, 2013). Therefore, it may be possible to use some as evidence for HRIS's being cost driven feature rather than being a costly application.

By the contribution of HRIS, a variety of HR data has started to be presented as numerous kinds of reports to both HR department and organization in general (Beckers & Bsat, 2002). It is supposed that the use of informative reports obtained via HRIS can be affected by top management support. This can be better explained through a sample related to the use of ERP systems. It is seen that companies may show variations in terms of ERP integration despite operating in the same institutional context. According to Liang et al. (2007), the differences experienced in the utilization of the same kind of systems can be clarified through "human agency approach". It is stated that top management authorities are the main human agency responsible for converting external effects into managerial activities through using common sense. In other words, rather than truly relying on the new institutional practices, they use their beliefs and opinions to take managerial actions.

Consistently, Mitchell (2006) maintains that top management has a "boundary-spanning" function by importing external information and combining with internal information in the performance of an IT innovation. Any business advantage that can be received from an ERP usage is compared by top managers with the alternative systems used by other similar organizations. It is accepted that the impact on ERP integration is directed by the decisions of top management, even for inevitable circumstances forced by industry (Liang et al. 2007). This also applies to the

information effect of HRIS in the use of information within the organization. Even non-users of HRIS believe that the information supplied by HRIS can help top management make better strategic decisions (Siengthai, 2016).

There are also evidences for the mediating effect of top management support in the strategic impact and HR's role resulted from HRIS. The most prominent indicator is insourcing HR as a partnership within the organization despite using an high-tech system; such as any kind of HRIS, rather than separating HR activities among other business units (Jansson & Rozenbachs, 2016). While HR professionals can act as the strategic partners of top management through using human resource information system (HRIS) (Beadles et al., 2005; Khan et al., 2017), the strategic position of HR professionals as well as HR department can be increased by the mediation effect of management authorities.

Top management's commitment and decisiveness are evident in HR roles that might be regarded as having a stronger strategic engagement. Thus, it is believed that the support of top management establishes the groundwork for the strategic impact of HR's role. It is argued that the only way to associate with business management is acting as HR business partners rather than HR practitioners of an HRPBs are more closely associated with business management than with HR as an administrative department. The factors that can help or hinder HR from acting as a business partner can be associated with managerial decisiveness (Jansson & Rozenbachs, 2016).

It is also critical to grasp the main components of external environment surrounding organizations, since they do not exist alone. Organizations interact with other entities and are susceptible to a wide range of conditions that may be beyond their control, regardless of how they govern their internal operations. Environmental context defines the outside conditions such as industrial circumstances, sectoral structure and government regulations supposed to affect innovation adoptions (DePietro et al., 1990).

Competitive pressure is one of the representative of environmental context that refers to the amount of pressure a business feels from competitors within the industry (Grover, 1993; Teo, Lim et al., 2007). Since it implies a rational system and emphasize

industry rivalry and niche changes; businesses subject to these forces are expected to operate successfully and efficiently within their environments (Scott & Meyer 1991).

As with other breakthroughs; the introduction, dissemination, or acknowledgment of an innovation within an industry may be viewed as both a promise and a danger for the survival of businesses. While it appears that competitive pressure leads to the adoption of complex systems (Lumsden et al., 2013; Hadhri et al., 2017), the entry of those systems into the market can provoke competitive pressure. As organizations begin to use HRIS, they may find themselves in a new rivalry with their HRIS-using competitors.

From a wider standpoint, competitive pressure drives organizations to adopt new technological applications in order to acquire strategic advantages over competitors and to provide high-quality services (Masum, 2015; Battisti et al., 2007; Grandon & Pearson, 2004). Companies tend to see the adoption of new innovations as a way of enhancing their competitive standing (Grandon & Pearson, 2004). Competitive pressure is defined to be a powerful predictor of an organization's information systems (IS) approach (Lin, 2006; Nwankpa & Merhout, 2020). However, only adopting a new technology and confine themselves to that innovation may not be sufficient to maintain their standings. It is adviced that as long as an aggressive mindset can be developed, businesses continually look for upcoming cutting-edge technology promising better efficiency (Nwankpa & Merhout, 2020).

From a focused perspective, organizations have a chance to give direction to competition through choosing their own method, while trying to keep up with the innovation trend. Although it seems that they are exposed to continuous industrial pressure; organizations are the only mechanisms to set their stances in that rivalry. They are obliged to consider environmental elements in order to take advantage of favourable conditions and limit the impact of adversities. An organization represent an open system that "must develop and renew its human resources at least as quickly as it consumes them" (Kramar, 2014:1077). It can be inferred that competitive pressure is not a phenomenon standing outside of the organization; instead, every organization contribute their rivalry through deciding on the approach belived to increase their competitive advantage. It is for sure that every organization are subject to competitive

pressure to some extent. However, what should be underlined at this point is that competitive pressure is also affected by the method preferred by the organization.

With the use of electronic information systems, HR information and decision making have experienced a completely digital transition (Lengnick-Hall & Moritz, 2003:367). The current form of HRISs have arisen from a variety of societal and corporate trends (Lengnick-Hall & Moritz, 2003). Since HR functions began to be performed electronically, it has become possible to interact in real time. Many physical barriers previously impeding efficient engagement and seamless business operations could therefore be avoided. HR processes have been redesigned to minimize stages and shorten cycle times (Rue¨l, 2011).

Chaveesuk and Horkondee (2015) identify competitive pressure as a facilitator to make big data analysis in a precise and fast way. As competitive pressure compells organizations to install a technological system; such as business intelligence (BI) systems, the necessary data can be quickly obtained from this system and strategic decisions can be immediately taken. This is consistent with what D'Aveni (1994) refers as "hypercompetition". The application of information technologies (IT) for business operations to obtain higher speed and greater timing" is critical in the context of hypercompetition (Rue¨l, 2011). However, innovation itself is able to spark competitive pressure, which in turn can lead to innovation performance.

Companies have preferred and actively used technologies such as enterprise resource planning (ERP) systems, electronic data exchange (EDI), and data warehousing systems (Ramakrishnan et al., 2012; Holsapple & Sena, 2005; Hwang et al., 2004). The implementation of enterprise resource planning (ERP) systems have enabled the linkage of all corporate activities. Internal and external interrelationships between HRM systems and their surroundings regulate externalities and allow long-term resource reproduction (Ehnert, 2009; Mariappanadar, 2014). Databases that were previously separate might now be merged into a unified entity for transaction processing and decision making in real-time (LengnickHall & Moritz, 2003:367).

Competitive pressure is overemphasized in HRM literature, as if it were the sole sort of pressure. Businesses, on the other hand, compete not just for resources, political power, and institutional legitimacy, but also for social and economic well-being

(DiMaggio & Powell, 1983; Najeeb, 2014). Through relying on competitive pressure, enterprises can level up and put pressure on their competitors.

Economical development can be achieved through competitive pressure, since it drives enterprises to add more and more value a less cost (Spacey, 2020). Specifically, a process innovation is expected to result in a decrease in a company's cost level. It is asserted that an increased competitive pressure can motivate fairly efficient companies to undertake new innovations by allowing them to better leverage their costs (Boone, 2000).

According to the adaptation and selection effects, the average efficiency of an industry can be improved by a greater competitive pressure. As highly inefficient firms are eliminated from the sector as a result of the selection effect, relatively steady enterprises face pressure to enhance their efficiency as a result of the adaptation effect (Boone, 2000). Based on the selection and adaptation effects of competition, companies' incentives to innovate are triggered and this innovation is expexted to result in cost saving. While an innovation investment may result in cost saving in the organization, innovation itself has also ability to trigger competitive pressure, which in turn leads to cost saving across organizations.

In the study of Hadhri et al. (2017), there is positive correlation between competitive pressure and expected outcomes of cloud computing (Lumsden et al., 2013).Their findings support previous researches indicating that cost savings are the primary motivator for cloud computing usage (Marston et al., 2011; Reese, 2009; Hadhri et al., 2017). Regarding the impact of external forces on productivity growth, Nickell et al. (1996) state that as companies are confronted with a strong competitive pressure, they reduce the costs and increase the incentives as immediate as possible. Additionally, Belderbos et al. (2004) maintains that R&D collaboration produces potential value in businesses' resources as well as cost savings in their activities promoting innovation.

In relation to information effect of an innovation, an organization can utilize more responsive services, transparent information, efficient operations and user friendly applications. In their research, Lin & Lin (2008) state that companies perceive competitive pressure as a means for the dissemination of e-business due to the fear of losing competitive advantage. Similarly, some governmental organizations prefer

imitating IT implementation habits of some prosperous institutions (Pudjianto et al. 2011). Organizational knowledge can be accepted as an element of competitive pressure pushed by the industry since no business want to stay in the back (Powell & Dent-Micallef, 1997; Spender, 1996; Teece, Pisano, & Shuen, 1997). Human networking and organizational communication, facilitated by information technology (IT), have become critical components in the development of organizational processes which greatly contributes to the generation and accumulation of knowledge inside the organization (Rue¨l et al., 2011).

Competitive pressure is recognized not only as a key factor of potential outcomes of computerization (Dasgupta et al., 1999), the interorganizational systems (Grover, 1993), the dissemination of information (Ramamurthy et al., 1999), and e-business adoption affecting all organization (Ramamurthy et al., 1999; Zhu et al., 2003. For instance, e-business is accepted as a competency that offers infrastructure for managing information and allows inter-firm communication in order to enhance transactional efficiency, extend current channels, and seize new possibilities (Lin & Lin, 2008). The performance to be received from those innovative systems are supposed to be affected as well as increased by competitive pressure.

Contemporary firms requires HRM to mostly deal with knowledge management, because knowledge is defined as the primary competitive advantage for these organizations. Knowledge stands for not just the specialized professional information of employees required for their professions, but also for company processes, employee interaction and cooperation styles, and exchange and growth. As long as they are developed in accordance with knowledge management, HR policies and practices can promote organizational development (Rue¨l, 2011).

In today's competitive world, where change is identified as a must rather than a preference, not only concentrating on the tendency of organization to transform but also the change in employees' adaptive behaviors is critical for organizational performance. According to recent researches, HR's operational duties are not any more the primary motivator of organizational effectiveness. It is demonstrated that operational activities intervene to performance only when combined with a cost driven approach. Being opposed to operational tasks, the strategic impact and HR's role in this respect tends to boost organizational performance. As a result, it is extremely

important for HR managers to undertake the strategic role thorouhgly, especially in the absence of any innovation strategy, to establish strategic thinking and change habits within the organization (Kuipers & Giurge, 2017).

In the assessment of the relationship between HR's role and system performance, it is important to firstly investigate whether or to what extent HR's role is aligned with corporate strategy. It is recommended to focus not only on whether HR roles are connected to performance, but also on how much their alignment with the implemented organizational strategy truly matters for performance. If organizational strategy support the implement and use of technological systems, then HR roles is supposed to evolve with this technology. Competitive pressure, resulted from HRIS is believed to trigger the strategic impact and HR's role through facilitating the transformation process of HR. Being mostly exposed to such a pressure, HR department is supposed to establish best practices to cope with competitive HR challanges and to maximize the efficiency of organization's human capital (Tarique et al. 2006).

Due to the necessity for electronical integration of company processes, businesses may feel compelled to expand their use of e-business in order to retain and increase their competitive advantage (Lin & Lin, 2008). For instance, Dow Chemicals has changed its "a life-time employment model" to "a life-time employability model" resulted from the present needs. With this transition, company has started making commitments on the development for employees' skills rather than just providing a whole life job opportunity. Based on the belief that a worldwide strategy could only be pursued with the help of an HR system (Rue¨l et al. 2004), Dow Chemicals adopt an HRIS in order to survive and retain its competitive advantage. Similarly, e-hrm implementation in Bangladeshi public sector organizations have experienced effective management of human capital and as a result enhanced organizational performance (Rimi et al., 2017; Masum et al. 2020). It can be interpreted that through adopting and employing those innovations in human resources management (HRM), those sample organizations have started a new pressure on their competitors. But this pressure is expected to encourage positive increase in performance to be received from those innovations.

The technological transformation experienced in HRM can also be associated with the ideas on why institutions adopt practices. Purcell (1999) and Hope-Hailey (2001) are

recognized with being the first to associate HRM field with institutionalism. Due to differences in institutional context that impact the formation of HRM as well as organizational performance, the subject of HRM has begun to be described more by new institutionalism (e.g. by academics like Selznick, Meyer, Rowan, Scott, DiMaggio, Powell & Zucker) (Berthod, 2016).

According to institutional theory, the pattern of practice adoption in an organization depends on the degree to which a given practice conflicts with other organizational practices. Organizations often overcome such conflicts by decoupling or ceremonial adoption (Meyer & Rowan, 1991; Boiral, 2007) which describes that practice is accepted on a very superficial level and without any sincere effort to be integrated to current system and be understandable by all organization (Collings & Dick, 2011).

As Wright & McMahan (1992) clarified, the adoption of HRM systems does not always necessarily have to be a rational decision linked with the organization's strategic objectives, but may be based on a sense of legitimacy surrounding the organization (Jiang & Messersmith, 2018). It is stated that organizational isomorphism is investigated over similarities seen in different organizations belonging to a population (Paauwe & Boselie, 2005). In other words, if a population unit starts to look like other populations units that are subject to identical circumstances, isomorphism is the case (DiMaggio & Powell, 1983; Marler & Boudreau, 2017)).

When practices are institutionalized, they begin to be accepted for grounds of legitimacy rather than efficiency by organizations (Meyer & Rowan, 1977; Zucker, 1987). Organizations acquire particular patterns including structures, programs, policies, and procedures by coercive, imitative, and normative processes (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1987). In other words, organizational patterns may be adopted as being imposed by the authority (coercive isomorphism), through imitating successful samples as a response to uncertainty (mimetic isomorphism) and for just being appropriateness (normative isomorphism). Thus, organizations can increase their prospects of survival and gain credibility within the society (DiMaggio & Powell, 1983).

Aligned with the study by Tolbert and Zucker (1996), it is proposed that the adoption of an organizational practice consists of two elements; patterned behaviours and

symbolic characteristics associated with those behaviors. Being proposed as a method of assessing acceptance of new technologies (Klonglan & Coward, 1970), ceremonial adoption is firstly described by Meyer & Rowan (1977). Ceremonial adoption is associated with the lack of trust in its true worth that result from the degree of voluntary mental acceptance towards a new system (Kim et al., 2016; Mahmud et al., 2017). It is predicted by high levels of implementation followed by low levels of internalization (Chen & Wang, 2006; Collings & Dick, 2011).

The internalization of a management practice adoption was firstly mentioned by Kostava and Roth (2002). It is stated that the adoption of a practice has actual implementation phase and internalization phase. Even if several organizations embrace the first phase (implementation), it may not be always possible to progrees to second phase (internalization) for them (Kostova & Roth, 2002; Chen & Wang, 2006; Kim et al., 2016). Internalization explains the level of value and commitment decicated to a new practice by users. In other words, internalization reveals whether a newly implemented organizational practice is given a symbolic importance (Kostova, 1999). According to Nair and Prajogo (2009), a high degree of internalization in ISO standards is positively related with a high level of operational success (Kim et al., 2016). If managers do not trust in a kind of a organizational practice, they do not need to invest time and effort into its implementation and the outcomes may be unsatisfactory (Ahlvik & Björkman, 2015).

Such an attitude can also be observed in the adoption of new HRM practices especially transferred from the headquarters of multinational companies (Ferner, 2009). Internalization is required for its "action-generating" feature, that encourage executives to put effort in the adoption of the practice (Kostova & Roth, 2002:217; Beletskiy & Fey, 2020). Accordingly, the extent of conviction and dedication of unit HR managers to corporate HR practices can reflect the internalization of HRM. Thus, "intensity of effort" of HR practitioners are as decisive as their skills and abilities in the adoption of HRM practices (Cohen & Levinthal, 1990).

Internalization can also be exemplified with the transition of explicit knowledge to tacit organizational knowledge (Simó, 2015). Tacit knowledge is defined to be the primary source of organizational knowledge able to develop the innovation capabilities within organization (Liu & Cui, 2012; Mohajan, 2016).

As tacit knowledge is described as "practical intelligence" by Sternberg and Horvath (1999), it is also called as "useful knowledge" from a social science perspective (Sternberg, & Horvath, 1999; Mohajan, 2016). Thus, it is recognized as a useful tool for some efficiency determinants such as enhanced job quality, decision making, organizational learning, competitiveness, increased accuracy of tasks as well as considerable time savings (Abidi et al., 2005; Haldin-Herrgard, 2000; Selamat & Choudrie, 2004; Mohajan, 2016).

Another sample shows that the internalisation of ISO 9000 can provide continuous improvement with employee training, communication management across the organization, and documentation (Nair & Prajogo, 2009). It is assumed that approaches increasing quality performance can positively affect operational performance (Maani et al., 1994), which may be exemplified as quality, on-time delivery and cost (Imai, 1986). The adoption and internalization of high quality is expected to have a favorable impact on organizational performance which leads to fewer faults or reworks and further leads to lower operational costs (Deming 1982, Garvin 1988, Mann & Kehoe 1994; Juran & Gyrna 1993, Hackman & Wageman 1995).

Operational performance is positively connected with internalization of the standards, that can be observed in time saving (on-time delivery) and cost saving along with innovation as particular characteristics of quality (Nair & Prajogo, 2009). If it is associated with HR systems, instant data access can be achieved through HRIS. When the technological system used in HRM is as internalized as possible, time saving provided via on time data delivery can be increased.

Cost saving advantage resulted from the internalization of a system may emerge on a larger scale. It is said that knowledge give opportunities for companies in terms of economic and social growth by enabling low-cost and efficient service delivery, while also promoting international competitiveness (World Bank, 2012; Mohajan, 2016). In the research of Nakhle (2011), cost saving feature of internalization is exemplified with a multinational company (MNC) experience. Employees are expected to attend training programs based on the location of their business unit, which might be in the different countries, depending on the given firm's training program. Training classes are generally offered at the regional office. However, the cost effectiveness of sending an employee to a foreign unit is evaluated before organizing training program.

Additionally, salaries are determined according to market conditions as well as the cost of living. The benefits and rewards are designed in accordance with labor laws of host country that never allow the subsidiary to fall below the minimum wage, although it can give superior benefits (Nakhle, 2011). This practice may imply that the internalization of a MNC's human resources practices can lead to cost saving through both compliying with multinational standards and providing employee retention with optimal benefits.

The internalization can also mediate the information effect of an innovation. When a change is internalized, tacit and explicit knowledge can work together to complement each other and grow over time through reciprocal interactions (Nonaka, 1994). It is experienced that internalization necessitate the active use of prevailing practices to influence behavior and decision-making (Nair & Prajogo, 2009).

Organizational routines can be associated with tacit knowledge that is, primarily practical. In other words, what is learnt in practice is gained through an individual's actions and interactions with other people and objects, rather than through communication (Baumard, 2002, Blackler, 1995, Cook and Brown, 1999, Cook and Yanow, 1993, Lave and Wenger, 1991, Wenger, 1998). Tacit knowledge is strongly entrenched in actions, behaviors and participations (Nonaka, 1994:16).

Consistently, Davenport and Prusak (1998) describe the internalization of information through its transfer from outside to inside of the organizations. They define external knowledge as the information extracted from external environment via competitive intelligent systems. Structured internal knowledge is preserved as recorded information rather than data. Thus, it is recommended to employ community-based electronic discussion systems, and similar storing mechanisms to utilize informal internal knowledge that is indeed largely tacit. A similar sample can be associated with different organizational memory information systems (OMIS) found in the study of Stein and Zwass (1995) who regard these systems as facilitators of human relationships (Mohajan, 2016).

Internalized information is an organization's greatest strategic asset through which operations and competitiveness of a company can be renewed and sustained (Nonaka & Konno, 1998). It is not only crucial for daily activities but also for competitive

advantage (Nonaka et al. 2000). It is seen that almost 90 % of organizational knowledge has a tacit format (Wah, 1999; Mohajan, 2016).

Especially by the twenty-first century, knowledge has become the most significant resource and a critical component for firms, that necessitates the use of information resources to generate economic and corporate strategic approaches to maintain their competitive advantages (Nissen, 2005; Suppiah & Sandhu, 2010; Mohajan, 2016). As a dynamic technique that involves interactions via all type of communication (Mládková, 2012), internalized information may have a vital influence in the strategic planning performance of managers and other professional responsibles (Bennett, 1998; Brockmann & Anthony, 1998).

The internalization of strategical impact and HR's role may also be exemplified in the study of Jansson and Rozenbachs (2016). It is observed that recruitment strategy of a company could be changed to compete in a specific market, through using an HR analytics able to present data for hiring alternatives of a critical profile group. The new recruitment perspective based on time-to-fill linked to cost to hire strategy was embraced and adopted by business management as well. Thus, having utilized the data derived from HR analytics, HR responsible could provide significant support for strategic business decisions. It is implied that any data produced by HR analytics can only turn into genuine strategic HR activities as long as they are internalized by the successful cooperation of different units within the company (Jansson & Rozenbachs, 2016).

The notion that organizations must evolve and adapt to the demands of today's competitive climate has also raised the question of how capable they are for this adaptation. From knowledge-based perspective, a practice adoption may also need a level of absorptive capacity as a managerial capability (Zhou, Fey & Yildiz, 2018). Knowledge-based approach asserts that having knowledge and learning how to use it can lead to a inimitable competitive advantage (Barney, 1991; Kogut & Zander, 1992). It is important to drive knowledge generation in order to accomplish common goals as well as offer strategic value to the organization (Wang et al., 2018).

Based on Cohen and Levinthal's work (1990, absorptive capacity is identified as the the firm's capacity to perceive the value of fresh, external information, integrate it, and

use it for economic purposes (128). Absorptive capacity is grouped under two categories; potential absorptive capacity (PAC or PACAP) and realized absorptive capacity (RAC or RACAP). On the one hand, potential absorptive capacity (PACAP) explains to the institutional capacity to develop and improve routines that facilitate the incorporation of existing knowledge with acquired knowledge, so consists of "knowledge acquisition" and "knowledge assimilation capability". On the other hand, realized absorptive capacity (RACAP) clarifies the institutional capacity to refine, expand, and elevate existing competencies or create new ones by combining acquired knowledge and includes "knowledge transformation capability" and "knowledge exploitation capability" (Ali & Park, 2016; Vlačić et al., 2018).

Realized absorptive capacity can be associated with the capacity of an organization to incorporate knowledge in its operations and processes (Zahra & George, 2002; Krstić & Petrović, 2011; Vlačić et al., 2018). As transformation reflects the capacity of an organization to replace current procedures with newly obtained external knowledge, or reexamine in a different way; exploitation refers to the use of existing and transformed knowledge in its production and operations (Lau & Lo, 2015) to maintain continuous growth (Kamal & Flanagan, 2012). According to Liu and Hsu (2011), the exploitation of knowledge resources and capabilities can lead to sustainable competitive advantage (Rahomee et al. 2014).

Regarding HRM literature, the exploitation ability of HR departments has a crucial role in the adoption of corporate HRM strategies among the senior decision makers of MNC subsidiaries (Beletskiy & Fey, 2020). It is suggested that HRM can stimulate employees within the organization to use knowledge uncommonly. Since human capital is a strategic resource, HRM practices may encourage employees' actions in line with strategies. Motivated employees can better concentrate on knowledge-based value creation and production. When their motivation is high, employees produce mutual activities and tasks for the accomplishment of common goals in order to influence productivity and inventiveness (Foss, 2011). Since effective HRM practices are able to promote an organization's effectiveness (Wang et al., 2018), it may be inferred that the novel systems increasing the impact of HRM can result in organization's competitive advantage.

It is commonly agreed that there is a significant positive connection between absorptive capacity and innovation performance (Chen & Huang, 2009; Wang &Han, 2011; C. Lin, et al. 2012; Cassol et al. 2016) and as well as organizational performance (Cooper & Molla, 2016). Further, the mediating role of absorptive capacity in the relationship between information technology (IT) system competency and company performance is supported by many empirical research (Bolívar-Ramos et al., 2013; Cooper and Molla, 2016; Wu et al. 2019).

Exploitation, respresenting realized absorptive capacity (RACAP) may be seen as a method for putting new information into practice along with existing information (Sørensen & Ulrika, 2001). With the usage of alternative information systems, it is possible to take advantage of quick transcription of pertinent data which in turn leads to enhanced flexibility, improved control over processes, and time savings benefits (Cepeda-Carrión et al., 2012).

Exploitation is supposed to facilitate the utilization of transcribed information in practice, rather than just expecting the advantages from an information system. Any reduction in time in the fulfillment of whatever process via an information system may not be solely based on the system itself but supposed to be triggered by the exploitation capacity of actors using that system. Thus, it can be thought that time saving advantage in the fulfillment of HR functions also depends on the mediating effect of knowledge exploitation capacity in HR department and organization in general. The production and use of knowledge can also explain the intangible advantages of organizational operations, as well as their connection with organizational performance (Zahra et al., 1999). Since actions are executed and assessed on a regular basis inside the organization, the exploitation ability can be associated with organizational reaction in terms of the speed and synchronization (Kohli et al., 1993; Jiménez-Barrionuevo et al., 2019).

It is asserted that big data investments have failed due to the lack of a robust mechanism able to react and interpret the data-driven intelligence (Gupta & George, 2016). In other words, there is a need for employees equipped with capacity to benefit from information analytics (Ross et al, 2013). Thus, the notion of absorptive capacity, which is related with the firm's ability to perceive value and utilize it for commercial purposes, should be incorporated in the value chain generation of the system in use

(Yoo & Roh, 2018). When the most crucial success metrics of information technology (IT) adoption are investigated; cost reductions, decreased search costs, and time savings can be identified among the net benefits (DeLone & McLean, 2003).

According to Chesbrough (2003), competitive strength can only be achieved by accomadation of internal and external information rather than just creating the greatest suggestions. Having exploited this knowledge integration, businesses may benefit from significant cost savings in the creation of new innovations and the recovery of existing practices (Wallin & Krogh, 2010:145; Seyfettinoğlu, 2015).

In their study on information systems, Cooper and Molla (2017) reveal that information systems (IS) units are able to foster new capabilities and use current capabilities to utlize sustainable information systems (IS) knowledge. It has been discovered that exposure to information systems (IS) combined with prior experiences leads to IS-environmental absorptive capacity, and hence additional efficiencies such as operational efficiency and cost savings (Cooper & Molla, 2016; Molla & Abareshi, 2012).

The acquisition of new information and its subsequent practical adoption might result in the reinterpretation of major contributions and so self-renewal of the organization. Rather than the concepts such as firm's corporate strategy and its position in environmental volatility, strategic renewal should be associated with the leverage and the distribution of new information (Liao et al., 2003). Likewise, in their study on collaborative learning, Möller and Svahn (2006) take attention to exploitation capacity of network agents in the increase of knowledge resources in terms of strategic renewal. They state that the self-renewal of an organization is determined by realized absorptive capacity. It can be inferred that the capture of a new knowledge is a continuous cycle necessitating organizational regeneration (Nonaka & Takeuchi, 1995).

Absorptive capacity may contribute to the strategic roles inside the organization. As long as knowledge is embedded in systems, processes, and procedures to be disseminated within the organization, strategic renewal can be achieved (Huber, 1991). In other words, the exploration of knowledge and exploitation of existing knowledge is critical for strategic renewal (March, 1991). It is assumed that decision makers, who have experienced a significant cost saving along with rapid access to information, can

also gain insight into the situations and concentrate on problem solutions resulting in more strategic judgments (Seddon et al., 2017).

Effective decision-making may be associated with the establishment of organizational strategy and converting the resources into real results. It is possible to assess the predictive conditions in accordance with the strategic perspective and make judgments that are consistent with organizational objectives (Carton et al., 2015; Kock & Gemünden, 2016). When strategic way of thinking is absorbed, it can motivates businesses for reorganization and restructuring to face with situaitons even in the tough times.

The exploitation can be particularly observed in operational and technical parts of HRM functions. Having aligned HRM systems with company objectives, HR department is expected to produce strategy and enable planning (Ulrich, Younger, Brockbank, & Ulrich, 2013). It is supposed to create a sufficient platform for establishing, sustaining, and simplifying HRM processes in recruitment, compensation and benefits, training and development, and performance assessment (Huselid et al., 1997; Ulrich et al., 2008). Since operational success frequently depends on strategic guidance and innovation (Aldrich et al., 2014), its competence is seen as a need for strategic engagement (Cappelli, 2015; Beletskiy & Fey, 2020). Even if the exploitation is initially exercised in operational HRM functions, it ultimately results in the strategic trafnsformation of HR department (Beletskiy & Fey, 2020).

2.4. Hypotheses Development

Based on the systematic literature review, the hypotheses development can be carried out through considering respectively independent variable, dependent variables and mediating variables. In this study, independent variable that is thought to have a direct effect on dependent variables is HRIS, and dependent variables are time saving, cost saving, information effect and the strategic impact and HR's role. It is supposed that the impact of HRIS on HRM is experienced through explanatory factors that consists of dependent variables.

There are also mediating variables that are firstly affected by independent variable and then able to affect dependent variables; which are IT infrastructure, top management support, competitive pressure, ceremonial adoption and realized absorptive capacity.

It is argued that the variables supposed to act as mediators can only arise in case of the contribution of HRIS. Since these variables are not independently existing phenomena, their existence can only be accepted as long as they are triggered by an innovation such as HRIS. In other words, those variables can only affect dependent variables as long as they are affected by HRIS. For this reason, in this study there are mediating variables acting between HRIS and HRM.

In the light of these explanations, firstly, the direct impact of HRIS on HRM is explained. Then, this impact is detailed in terms of dependent variables. Finally, the mediating effect between HRIS and HRM is presented.

2.4.1. The Impact of Human Resources Information Systems (HRIS) on Human Resources Management (HRM)

Due to the requirements of digital era, HRM has started to be transformed through the implementation of competent HR systems. HRIS is a technological platform designed to gather, preserve and analyze information in relation to HRM and able to disseminate and utilize the foreseen results for the sake of organization in general. Aside from successful usage, the impact of HR systems is determined according to whether the information is disseminated and delivered to the decision-makers in quick, clear, complete, reliable, and continuous manner (Kaygusuz et al., 2016).

The justification for the use of HRIS can be associated with the development of HR functions; the generation of sophisticated HRM reports; the regular evaluation of processes, procedures and policies; and the restructure of HR department wih the emphasis on its strategic function (Teotia, 2012). In order to reveal the present situation, it is necessary to assess the impact of HRIS on HRM. It is also critical to analyze the decisive factors through which such an impact is experienced in the organizations. In the light of the current literature, it can be assumed that there is positive relationship between HRIS and HRM.

It is stated that HRIS can render administrative efficiency including quicker data processing, better communication, more accurate data, fewer HR expenses, and overall HR productivity gains by making metrics more accessible. HRIS usage is also perceived as a way for HR professionals to become strategic partners with senior management (Beadles et al., 2005; Kwame, 2019; Ramirez & Tejada, 2020). It enables

HR departments to be more efficient and supply better data for decision-making. With the help of strategic diffusion of information offered by HRIS, total efficiency and effectiveness can be provided within the organization (Kovach et al. 2002). (Arpoh-Baah et al. 2020). Thus, following hypothesis can be formulated:

H1: The use of human resource information system (HRIS) has a positive impact on human resources management (HRM).

2.4.1.2. Time Saving

It is possible to save a significant amount of time to be spent for the fulfillment of HRM funcions through HRIS within the organization. Aligned with this assumption, the deployment of HRIS can lead to systematical arrangement as well as timely completion of HRM functions (Tetz, 1973; Wille & Hammond, 1981; Lengnick-Hall & Moritz; 2003; Beadles et al., 2005; Ramirez & Tejada, 2020) such as online transaction of processes and the fulfillment of administrative duties. It has been experienced that the time devoted on HRM functions such as recruiting, training, data analysis, document processing and decision making have decreased through HRIS usage (Begum et al., 2020; Arpoh-Baah et al., 2020).

HRIS can eliminate job duplication and streamline numerous work processes, resulting in increased efficiency. High volumes of data can be handled with greater accuracy without the need for manual intervention (Ramirez & Tejada, 2020). As a result, labor-intensive HR activities can be performed with human resources information systems (HRIS) in a faster and efficient manner (Dery, Grant & Wiblen, 2006; Targowski & Deshpande, 2001; Kumar & Parumasur, 2013); which is critical for gaining organizational competitive advantage (Masum et al. 2015). Based on the first hypothesis (H1), following sub-hypothesis (H1a) can be proposed:

H1a: The factor structure of time saving is optimal predictor.

2.4.1.3. Cost Saving

It is possible to take relevant and useful data at a very low operational cost, without the need of an outside agent and only through an accurate HRIS technology (Wang et al. 2017). Another key benefit of using HRIS in HRM functions is cost savings, which include savings in fixed expenditures, the cost of job advertisements, risk assessment, financial management, personnel control, workforce planning, promotion planning,

and the costs of any other operational reports (1973; Wille & Hammond, 1981; Kovach & Cathcart; 1999, Legnick-Hall & Moritz, 2003; Tetz, Lengnick-Hall & Moritz, 2003; Parry, 2009; Akman, 2010; Arpoh-Baah et al., 2020; Ramirez & Tejada, 2020; and Begum et al., 2020).

It has been stated that HRM systems promise cost reductions via improving coordination and control over HR activities (Sturman et al, 1996). HRIS can help businesses save money by optimizing formerly labor-intensive tasks, as well as promote and protect communication within the organization, thereby may be utilized to increase efficiency (Wiblen, Grant & Dery, 2010; Kumar & Parumasur, 2013). Based on the first hypothesis (H1), following sub-hypothesis (H1a) can be proposed:

H1b: The factor structure of cost saving is optimal predictor.

2.4.1.4. Information Effect

Organizational data can be easily organized, categorized, updated and analyzed with the information effect of HRIS (Tetz, 1973; Wille & Hammond, 1981; Targowski & Deshpande, 2001; Ngai & Wat, 2006; Sergio, Pez, Sebasti & Ugarte, 2010; Shani & Tesone, 2010; Kumar & Parumasur, 2013; Kushwaha et al., 2018; and Begum et al., 2020). Instead of spending several hours dealing with non-strategic tasks (Arpoh-Baah et al. 2020), comprehensive information based on up-to-date data may be more preferable (Makkar & Sanjeev, 2014). Better data analysis contributes to the efficiency of the information effect and hence facilitate decision making (Beadles et al., 2005; Udomphol & Siengthai, 2016; on HR operations such as compensation and incentives, training and development, and the recruitment and the selection of the most appropriate candidates (Arpoh-Baah et al. 2020).

The type and amount of the information provided by the increased level of useful data may allow HR department to make better decisions may represent the significance of system usage in HRM (Lengnick-Hall & Moritz, 2003). As a mechanism for sharing information, HRIS provides decision support applications that help HR and non-HR managers, as well as all employees across the organization (Kovaeh & Cathcart, 1999; Kovach et al., 2002; Masum et al., 2018; and Ramirez & Tejada, 2020). Based on the first hypothesis (H1), following sub-hypothesis (H1c) can be proposed:

H1c: The factor structure of information effect is optimal predictor.

2.4.1.5. The Strategic Impact and HR's Role

It is possible to assist organizations to gain an appropriate strategic vision through a well-equipped and sophisticated HR system. Having devoted less time to routine chores with HRIS usage, HR professionals can focus on more strategic tasks and HR department can influence the entire workforce (Shibly, 2011; Kumar & Parumasur, 2013). Since HR professionals can concentrate on strategic activities, corporate operations and policies (Remenyi et al., 1993; Zuboff, 1988), transformative development can be prioritized (Quaosar et al., 2018:5). Thus, an HRIS can encourage organizational strategies that increase the efficiency and profitability (Targowski & Deshpande, 2001; Dery et al., 2006; Kaygusuz et al., 2016).

HRIS may have a significant influence on the relevance of HR departments, resulting in a more strategic/managerial partner role and opening up new avenues for HR professionals to contribute strategic value to the business (Kovach et al., 2002; Lengnick-Hall & Moritz, 2003; Beadles et al., 2005; Dulebohn & Johnson, 2013;). The strategic role of the HR department is expected to result in the effective fulfillment of HR responsibilities as well as an increase in the organization's competitive advantage (Dery et al, 2013; Sergio et al., 2010; Kumar & Parumasur, 2013; Ramirez & Tejada, 2020). Based on the first hypothesis (H1), following sub-hypothesis (H1d) can be proposed:

H1d: The factor structure of strategic impact and HR's role is optimal predictor.

2.4.2. The Mediating Effects between Human Resources Information Systems (HRIS) on Human Resources Management (HRM)

Besides to the direct impact of human resources information systems (HRIS) on human resources management (HRM), the variables acting as mediators in this relationship is also clarified.

2.4.2.1. IT infrastructure

The integration of HRIS with an organization's IT infrastructure has become increasingly important. However, the existing IT infrastructure of an organization may not be enough to reap the benefits of a new innovation. The adoption of an innovation requires to have a developed IT infrastructure in order to experience that innovation's positive performance. In other words, the use of an innovation can leads to have a

sophisticated IT infrastructure through which the impact factors of that innovation can be experienced. In this study, it is assumed that the implementation and use of a HRIS firstly affect IT infrastructure that in turn affect the time saving, cost saving, information effect and the strategic impact and HR's role. Many studies have confirmed that the performance of the organization is positively affected by IT investment (Weill, 1992; Barua et al., 1995; Mitra & Chaya, 1996; Menon et al., 2000; Kohli & Devaraj, 2003; Banker et al., 2006; Liang et al. 2010). Further, it has been found that IT infrastructure is a major facilitator of corporate effectiveness (Bharadwaj, 2000; Sambamurthy et al., 2003; Santhanam & Hartono, 2003; Zhu & Kraemer, 2002; Masum et al., 2015; Alam et al., 2016; and Begum et al., 2020).

It is stated that HRIS leads to time saving in the fulfillment of HR functions, and this impact is facilitated by IT infrastructure (Reddick, 2009; Thite et al. 2012; Bal et al., 2012; Kumar & Parumasur, 2013). In an organization, IT infrastructure may fulfill regular information systems functions. However, the use of HRIS in an organization may necessitate active utilization of IT infrastructure. Thus, an IT infrastructure modified according to the needs of HRIS, can minimize the time to correct mistakes, the cycle of the steps, and even turnaround times (Boateng, 2018). In other words, the relationship between HRIS and time saving can be positively mediated by IT infrastructure.

It is discovered that the information generated from a technology-based system (Kavanagh, et al. 1990), that is ready, accessible, and reliable can result in cost savings (Lederer, 1984; Enshur et al., 2002, Lepak & Snell, 2002; Lengnick & Moritz, 2003; Boateng, 2018; and Ramirez & Tejada, 2020). Through an IT infrastructure reconfigured by HRIS, cost saving can be experienced in communication expenditures (Wu et al., 2019), in the salaries of additional staffs (Said et al. 2014) and in HR processes such as selection, recruitment, orientation, as well as data entry charges of employees (Arpoh-Baah et al. 2020). Thus, the relationship between HRIS and cost saving can be positively mediated by IT infrastructure.

With the potential automation feature of IT infrastructure, data is gathered without human involvement, properly created, accurately summarized, appropriately distributed and converted into specific forms; so that HRIS can meet the various needs of HR staffs (Wu et al., 2019; Teo et al., 2001; Aswanth & Brijball, 2013; Ramirez &

Tejada, 2020; and Masum et al., 2018). It should be underlined that all potential features of IT infrastructure do not have to be actively used in all organizations. It may be inferred that as long the automation feature of IT infrastructure is activated due to HRIS, IT infrastructures' data-intensive feature (Odun-Ayo et al. 2017) can promote rapid and precise decisions (Chaveesuk & Horkondee, 2015) on HR functions (Arpoh-Baah et al. 2020). Therefore, the relationship between HRIS and information effect can be positively mediated by IT infrastructure.

It is also asserted that the inventive inclination of a system can aid an organization's strategic HRM goals (Muriithi et al., 2014; Nawaz & Gomes, 2014; Kavanagh & Johnson, 2015; Mauro & Borges-Andrade, 2020). As HRIS positively transform IT infrastructure on behalf of HRM, HR departments can turn to be strategic partners through staying up by this technological support (Lori & Elaine, 2002; Targowski & Deshpande, 2001; Pasqualetto, 1993; Kumar & Parumasur, 2013; Boateng, 2018; and Lajšić, 2019). Having an IT infrastructure on a default basis may not be sufficient, rather IT infrastructure should be adjusted with respect to HRIS in order to practice on the strategic effect of HRIS. It is maintained that the relationship between HRIS and the strategic impact and HR's role is positively mediated by IT infrastructure.

Being affected by the nature of HRIS, IT infrastructure can actualize the possible consequences of HRIS, so following hypothesis can be suggested:

H2: The impact of human resource information system (HRIS) on human resources management (HRM) is mediated by IT infrastructure.

2.4.2.2. Top Management Support

Top management support is identified as the most important success factor for the performance of an organizational practice. The availability of critical resources, authority, or power required for the achievement of a project is also enabled by top management support (Teo et al., 2007; Lian et al., 2014; Masum, 2015; and Alam et al., 2016). However, top management support alone may not be enough to affect the performance of an innovation. There should be a tool to stimulate the necessitation of top management support. When an innovation is firstly launched, started to spread, or imposed by the industry, top managers of an organization are supposed to contemplate on that innovation to evaluate whether it can increase competitive advantage of their

organization. Top managers cannot be aware of the potential outcomes of HRIS until they closely witness up its performance in their organizations. What should be underlined here is that top management support is not a separate action but rather a HRIS-oriented support. In other words, HRIS firstly provide a vision, insight and awareness to top managers through managing their perception towards an HR system, then top managers can offer a favorable perspective, support and dedication for innovation usage (Tsai & Tang, 2012; Chan & Chong, 2012; Chaveesuk & Horkondee, 2015). It can be interpreted that the successful HRM results is affected by top manager support within the organizations (Ramirez & Tejada, 2020), however this support must have been affected by HRIS and turned to be a HRIS-oriented support. It is exemplified that senior management actions have an influence on ERP integration even under unavoidable industry-forced situations (Liang et al. 2007) in which HRIS usage may be a compulsory action rather than a preference.

Data management used to enable quick reaction and rapid access to information (Ikhlas & Al-Shqairat, 2010), may also be executed by senior managers within the organization. When top managers are met with HRIS, they are supposed to start being qualified for using the system. Based on timely judgments of top managers who have experienced or witness the execution of HRIS, HR system can quickly generates data. HRIS affect the vision of top managers to support the effective execution of HR functions, and those functions monitored, controlled or supervised by top management, time saving benefit to be gained from the system can be better realized. Through fulfilling HR functions such as workforce planning, hiring, positioning, compensation, as well as budgeting, HRIS would have contributed to operational management (Bal et al., 2012). Since HRIS has been used to specifically assess labor supply, it is able to directly influence top management's long-term business plans (Siengthai & Udomphol, 2016). It may be deduced that HRIS can affect top management's vision towards the fate of the organization, and in order to be committed to their plans top managers can give necessary support for the timely management of human resources functions. Top managers can think that the faster day-to-day functions are performed, the more time can be left for organizational development. Thus, the relationship between HRIS and time saving can be positively mediated by top management support.

It is asserted that HRIS may prevent costly mistakes and save business' money that would otherwise be expended (Johnson & Guental, 2011; Kumar & Parumasur, 2013). Having proven itself as not being an unnecessary expenditures, HRIS can persuade top management of the necessity for a new system viewed as an unnecessary expenditure (Ngai & Wat, 2006; Shani &Tesone, 2010). This proof can be obtained by market research, bencmarking studies or opportunity costs analysis to be presented to top managers. It should be emphasized that as the cost of an HRIS is weighted against the cost savings gained via an HRIS, the investment can be immediately repaid (Boateng, 2007). Through regularly calculating and overviewing the cost of HR functions such as ROI (the return on investments) on training or turnover costs, an HRIS can provide constant cost savings. Being convinced for its being cost driven rather than costly featured, top managers can better promote, support and encourage to pursue HRIS usage. Even, they can invest in more sophisticated HR systems to boost cost saving advantage of HRIS. Therefore, the relationship between HRIS and cost saving can be positively mediated by top management support.

A wide range of HR data can be served as various types of reports throughout the organization (Beckers & Bsat, 2002). The utilization of informative reports obtained by HRIS is thought to be influenced by top management support. It is claimed that top authorities are the primary human agency in charge of translating external impacts into managerial actions through relying on their common sense. The managerial decisions can be taken by the thoughts and judgments of top managers (Liang et al., 2007), which are indeed led by HRIS. The support to be received form top management can enhance the information effect resulted from the execution of an technology innovation (Mitchell, 2006; Siengthai & Udomphol, 2016). HRIS can augment top management support which in turn increase the information effect. In other words, the relationship between HRIS and information effect can be positively mediated by top management support.

HRIS can assist HR professionals can serve as the strategic partners to top management (Beadles et al., 2005; Khan et al., 2017); however, management authorities decide to what degree they can strategically act. The decision of top management on the strategic role of HR may be seen in the choice to establish a distinct HR department or to segregate HR activities among other functional departments

within the organization (Jansson & Rozenbachs, 2016). Having employed a high-tech system to fulfill HR functions within the organization, top managers can delegate HR practitioners across HR department to a strategic position. It can be stated that HRIS can increase the realization of top management support and that can in turn act as either catalyst or a blocker to contribute to HR's strategic role (Jansson & Rozenbachs, 2016). In this sense, it can be hold that the relationship between HRIS and the strategic impact and HR's role can be positively mediated by top management support. Thereby, following hypothesis can be suggested:

H3: The impact of human resource information system (HRIS) on human resources management (HRM) is mediated by top management support.

2.4.2.3. Competitive Pressure

As in all innovations; the launch, the spread or the recognition of a technological product within an industry can be perceived as not only an opportunity but also a threat for the fate of companies. In order to survive in their environment, organizations are supposed to adopt and start using necessary innovations. It is sure that every organization may be more or less subject to pressure from the industry in which they have been operating (Grover, 1993; Teo et al., 2007). Being gradually accustomed to such a logical system that necessitate competitive strength and specialized developments, organizations can respond to competitive pressure. Therefore, organizations are supposed to show superior performance in their surroundings (Scott & Meyer 1991).

It has been noticed that corporations might be the most proficient users of modern technology in terms of increasing efficiency through the encouragement provided by competitive pressure (Grandon & Pearson, 2004; Battisti et al. 2007; Masum, 2015; Alam et al., 2016). According to many empirical researches, competitive pressure is identified as the primary motivator of technology usage (Sadowski et al., 2002; Beveren & Thomson, 2002; Scupola, 2003; Zhu et al., 2003; Gibbs & Kraemer, 2004; Tarique et al. 2006). As a representer of recent technology, HRIS can be perceived as a positive threat within industry, through which competitive pressure on organizations can be increased. With the spread of HRIS, firms may begin to feel excessive pressure from the industry and may feel compelled to use this new system. In other words,

HRIS can increase competitive pressure, and this increased pressure within industry can raise the effective fulfillment of HR functions.

At this point, the term of "hypercompetition" (D'Aveni, 1994) is described as not only a reason but a result of an innovation as well (Rue¨l, 2011). It is important to alter the way of doing business, through applying information technology (IT) to execute processes with a faster speed and better timeliness (Rue¨l, 2011). However, such a competition is indeed triggered by the innovation itself.

Specifically, due to the increased competitive pressure, the digital transformation in HRM may be observed with fewer stages and shorter cycle times (Lengnick-Hall & Moritz, 2003:367, Rue¨l, 2011). HR data can be promptly retrieved from the given system and organizational choices can be done quickly. Competitive pressure can be an enabler of accurate and faster big data analysis (Chaveesuk & Horkondee, 2015). It can be maintained that the relationship between HRIS and time saving can be positively mediated by competitive pressure.

Competitive firms may also be driven to pursue advanced technologies to better utilize their costs. It is claimed that the cost level of a company is predicted to be reduced as a consequence of a process innovation (Boone, 2000). As cloud computing is linked to competitive pressure, there is a positive relationship between the usage of cloud computing and cost saving (Marston et al., 2011; Reese, 2009).

While competitive pressure seems to result in the adoption of cloud computing (Lumsden et al., 2013; Hadhri et al., 2017), the introduction of such a sophisticated system to the market can accelerate competitive pressure. As companies start using HRIS, they can find themselves in another competition with their counterparts using HRIS. Having obtained more value at a lower cost, companies can achieve economical development (Spacey, 2020). As HRIS increase the prevailing competitive pressure, cost saving both in the fulfillment of HR functions and across organizations can be increased by this pressure as well. Therefore, the relationship between HRIS and cost saving can be positively mediated by competitive pressure.

Competitive pressure can serve as a vehicle for the dissemination of information (Lin & Lin, 2008), being induced by HRIS usage. Concerning the information effect, competitive pressure is associated with the deployment of interorganizational systems

(Grover, 1993), information transmission (Ramamurthy et al., 1999), and the implementation of e-business benefiting all enterprise (Ramamurthy et al., 1999; Dasgupta et al., 1999; Zhu et al., 2003; and Lin & Lin, 2008). What the industry imposes as competition is, in fact, organizational knowledge (Powell & Dent-Micallef, 1997; Spender, 1996; Teece, Pisano, & Shuen, 1997; Rue¨l, 2011). Businesses are compelled to seek out and use innovations able to provide more responsive services, clearer information, efficient procedures, and user-friendly software (Pudjianto et al., 2011), so better tools and approaches can improve the effectiveness of the organization's human resources (Tarique et al., 2006). After having sufficient information, organizations start to compete for more information. It can be inferred that any tool able to produce more information can also promote competitive pressure in parallel. Thus, it can be claimed that the relationship between HRIS and information effect can be positively mediated by competitive pressure.

Today, being strategic may be associated with being a part of competition. There is no business that wants to be left behind, so it is important to take a part in continuous competition. It has been widely accepted that the strategic HR's role has become inevitable in today's competitive environment, since HR's operational responsibilities has no longer effect on the company performance. HR practitioners are expected to promote strategic thinking and alter behaviors inside the organization under all circumstances (Tarique et al., 2006 ; Lin & Lin, 2008; Kuipers & Giurge, 2017; Rimi et al., 2017; and Masum et al., 2020).

The strategic impact on HR's role seems to be an inevitable outcome of digital investments, considered as a strategy to increase the competitive positions of organizations (Nwankpa & Merhout, 2020). The digitalization in HRM can lead to the effective fulfillment of HR functions but this also derives from the fact that digital HR systems can keep competitive pressure alive within industry which results in increased HR effectiveness in organizations. In other words, it can be said that the relationship between HRIS and the strategic impact and HR's role can be positively mediated by competitive pressure.

Thus, following hypothesis can be suggested:

H4: The impact of human resource information system (HRIS) on human resources management (HRM) is mediated by competitive pressure.

2.4.2.4. Internalization

The implementation and use of an innovation may not always be followed by internalization, which stems from the lack of mental acceptance of that innovation. Internalization can be identified as a key mediating influence in the context of innovation. Since the internalization of an innovation is considerably greater than the desire to use that technology, it is recommended businesses to prioritize internalization in their innovation activities (Kim et al., 2016; Mahmud et al., 2017). It is stated that internalization is a crucial step in the assessment of technology or a company's transformation (Cohen & Levinthal, 1990; Chen & Wang, 2006; and Beletskiy & Fey, 2020). Ceremonial adoption may be noticeable in HRM efforts through distinguishing whether symbolic or a real value is attributed to HR practices adopted (Kostova, 1999; Kostova & Roth, 2002; Ferner, 2009). It is believed that the performance of HR functions can not be boosted as long as they are not sufficiently internalized (Ahlvik & Björkman, 2015). As a kind of innovation tool in HRM, HRIS can necessitate and promote internalization for the effective fulfillment of HR functions.

It has been observed that the use of electronic document is favorably related to time saving in today's knowledge-intensive businesses (KIFs) that are intended to internalize new learnings (Haas & Hansen, 2007; Ruél, 2011). When new information is internalized and transformed into practical intelligence, it is possible to create organizational efficiencies such as increased task accuracy and considerable time savings (Imai, 1986; Abidi et al., 2005; Haldin-Herrgard, 2000; Selamat & Choudrie, 2004; Mohajan, 2016). Consistently, the internalization of standards has a significant relationship with operational performance, evidenced by time savings (on-time delivery) and cost savings as quality attributes (Nair & Prajogo, 2009). It can be inferred that internalization resulted from HRIS usage can contribute to greater time saving in HRM. Even if HRIS can positively affect time saving, this effect can be better realized by internalization that is already affected by HRIS. Thus, it can be asserted that the relationship between HRIS and time saving can be positively mediated by internalization.

The acceptance and internalization of a high quality system is predicted to improve organizational performance, contributing to less errors and the duplicated works, and ultimately lower operating costs (Deming, 1982; Imai, 1986; Garvin, 1988; Juran & Gyrna, 1993; Mann & Kehoe, 1994; Hackman & Wageman, 1995; Nair & Prajogo, 2009 ; Nakhle, 2011; and Mohajan, 2016). When a system usage entails internalization, it is expected to result in cost effectiveness in a greater level. Since internalization does not exist separately, there should be a instrument for the emergence of internalization. From innovation perspective, internalization can only be achieved by means of a new system. As long as a system necessitates internalization of practices, the potential cost saving advantage of that system can be experienced even in a large scale. Based on this assumption, it can be argued that the relationship between HRIS and cost saving can be positively mediated by internalization.

Internalization can also act as a buffer for the information effect of an invention. When a change is internalized, implicit and explicit knowledge can complement one another and expand over time via a dynamic synergy (Nonaka, 1994). Internalization of information is defined as the flow of information from the outside to the inside of organizations (Davenport & Prusak, 1998). As external knowledge is identified as information acquired from the external world by competing intelligent systems, structured internal knowledge is stored as recorded information rather than data. It is important to use community-based electronic discussion platforms and comparable archiving methods to benefit from informal internal knowledge (Mohajan, 2016). As a result, the internalization can be actualized by the intentional application of established practices to affect actions (Nissen, 2005; Suppiah & Sandhu, 2010; Liu & Cui, 2012; and Simó, 2015) that is also critical for HR decision making (Nair & Prajogo, 2009). As HRIS is already able to benefit HRM in terms of information effect, such an effect can be improved by means of internalized resulted from HRIS usage. In this sense, it can be stated that the relationship between HRIS and information effect can be positively mediated by internalization.

Internalized knowledge, as a dynamic strategy that incorporates interactions through all types of communication (Mládková, 2012), may have a significant impact on managers' and other professionals'strategic planning performance (Bennett, 1998; Brockmann & Anthony, 1998; Nonaka & Konno, 1998; Wah, 1999; Nonaka et al.,

2000). Based on the data usage produced via HRIS, strategic business decisions may be considerably promoted by HR practitioners. Further, any data generated via HR analytics can only be transformed into meaningful strategic HR actions not only with the internalization by HR department, but also by the organization as a whole (Jansson & Rozenbachs, 2016; Mohajan, 2016). Although HRIS can promote the staregic impact and HR's role, this impact can be increased by virtue of internalization. If HRIS is mentally as well as sincerely accepted, the performance to be delivered by HR functions can be maximized. In other words, when HRIS fulfilling HR practices are internalized, the strategic impact to be received from HRIS can be boosted. Therefore, it is maintained that the relationship between HRIS and the strategic impact and HR's role can be positively mediated by internalization. Deriving from these explanations as well as assumptions, following hypothesis can be suggested:

H5: The impact of human resource information system (HRIS) on human resources management (HRM) is mediated by internalization.

2.4.2.5. Exploitation

As they attempt to adapt to today's environment, organizations are evaluated in terms of their ability to exploit new learnings, which comprises of freshly transformed and dominant knowledge within the company. Being one of the elements of realized absorptive capacity (RACAP), exploitation explains the utilization of information gathered from both internal and external sources through putting them into practice (Sørensen & Ulrika, 2001; Cepeda-Carrión et al., 2012). The exploitation of information obtained via inventive activities may be required for the efficient company regeneration (Stopford & Baden-Fuller, 1994).

New information gained from a new innovation must be adapted with existing knowledge; hence, an instrument to prompt the motive capable of combining the new with the present is necessary.Having affected by this instrument, exploitation can operate as a stimulant in the connection between the performance of an innovation and its results inside the business. It is stated that HR departments' exploitation ability has a critical effect in the adoption of corporate HRM initiatives (Beletskiy & Fey, 2020). In this sense, HRIS necessarily entails exploitation in order to successfully perform HR activities within organization.

The creation and exploitation of knowledge can explain the intangible benefits of organizational activities, as well as their relationship to organizational performance (Zahra et al., 1999). It is feasible to profit from speedy transcription of mainstream data when using alternative information systems, which leads to more flexibility, greater process control, and time savings (Cepeda-Carrión et al., 2012). Since HR activities are carried out and continually monitored within the organization, exploitation capacity may be linked to organizational responsiveness in terms of speed and synchronization (Kohli et al., 1993; DeLone & McLean, 2003; Jiménez-Barrionuevo et al., 2019). As HRIS can directly results in time saving in the performance of HR activities, this advantage can exceed by means of exploitation. Theerfore, it can be stated that the relationship between HRIS and time saving can be positively mediated by exploitation.

As the success measurements of information technology (IT) implementation are reviewed, another one of the other main net gains can be associated with cost effectiveness in terms of reduced search costs and cost savings (DeLone & McLean, 2003). Since competitive strength can only be obtained through combining internal and external knowledge, the new ideas should not remain as the thought level (Chesbrough, 2003). It is observed that sustainable information systems can affect information systems related absorptive capacity and such exploitation can result in cost savings, operational performance, and corporate reputation (Molla & Abareshi, 2012; Cooper & Molla, 2016). With the deployment of new innovations as well as the reconstruction of current processes, businesses can take advantage of knowledge integration may profit from considerable cost reductions (Wallin & Krogh, 2010:145; Seyfettinoğlu, 2015). Based on these findings, it can be supported that the relationship between HRIS and cost saving can be positively mediated by exploitation.

Realized absorptive capacity is also critical for improving the quality of analytical decision-making. Knowledge that has been transformed and exploited can provide a business with a transparent perspective of the industry in which the business operates. Thoroughly interpreting disseminated information, realized absorptive capacity can eliminate doubts, misunderstandings, and confusions not only within the organization, but also towards all stakeholders. It is implied that exploitation capability may offer the framework for the clarity, reassessment, and even closure of decision-making by

delivering continuous inflows of beneficial knowledge to the organization (Nonaka & Takeuchi, 1995 ; Liao et al., 2003; Möller & Svahn, 2006; Carton et al., 2015; Kock & Gemünden, 2016; Seddon et al., 2017; and Yoo & Roh, 2018). Exploitation, as a method of merging new and existing knowledge in use, can boost information effect beyond what HRIS can deliver alone. Hence, it can be proposed that the relationship between HRIS and information effect can be positively mediated by exploitation.

It is essential to evaluate the forecasted circumstances from a strategic standpoint and make decisions that are in line with company goals (Carton et al., 2015; Kock & Gemünden, 2016). The exploitation may be visible especially in the operational and technical aspects of HRM processes such as recruiting, compensation and benefits, training and development, and performance as long as they are streamlined in an adequate framework (Huselid et al., 1997; Ulrich et al., 2008).

Through synchronizing HRM systems with long term plans, HR department can realize its strategical function (Ulrich et al., 2013). Since operational success is based on strategic direction, it is seen as a necessity for strategic action (Aldrich et al., 2014; Cappelli, 2015; Beletskiy & Fey, 2020). It can be said that exploitation eventually leads to the strategic transformation of the HR department (Beletskiy & Fey, 2020), by acting as as catalyst in the strategic fulfillment of HRM tasks via HRIS. For this reason, it can be advocated that the relationship between HRIS and the strategic impact and HR's role can be positively mediated by exploitation.

Based on the explanations in relation to exploitation feature of realized absorptive capacity, following hypothesis can be suggested:

H6: The impact of human resource information system (HRIS) on human resources management (HRM) is mediated by exploitation.

Having presented the hypotheses development, the variables / constructs that make up the research model to be analyzed by structural equation modelling (SEM) are displayed in Figure 2.1.

Figure 2. 1. Research Model: Structural Equation Modeling (SEM)
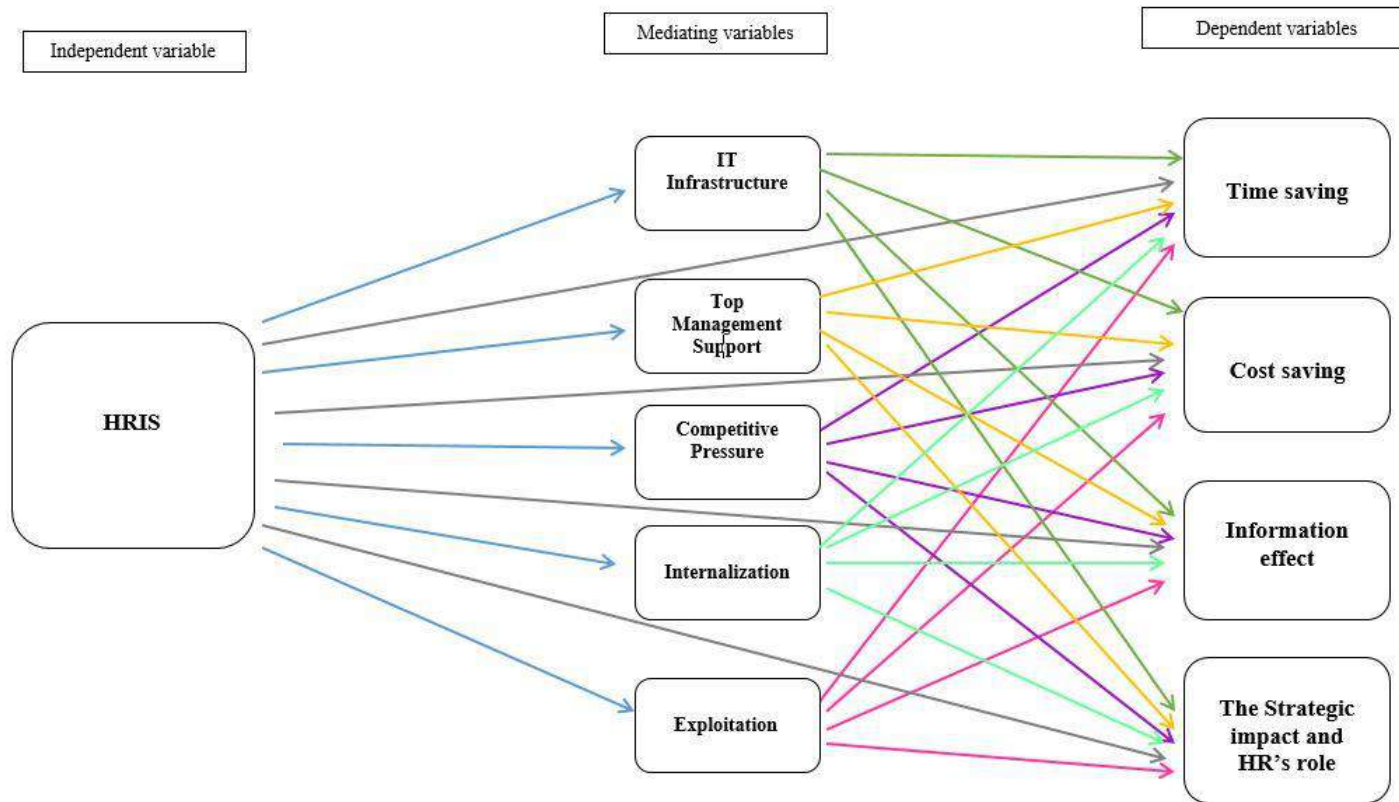
2.5. Measures of the Study

In this research, ten constructs are considered; HRIS (Human Resources Information Systems), IT infrastructure, top management support, competitive pressure, internalization, exploitation, and time saving, cost saving, information effect, and the strategic impact of HR's role. These constructs are ranked according to five categories, with 1 = (strongly disagree) 2 = (disagree), 3 = (neutral), 4 = (agree), and 5 = (strongly agree). Reliable and validated measures used in past researches are identified for each of the variables in this study.

2.5.1. Human Resources Information Systems (HRIS)

The eleven items developed by Iqbal, Ahmad, Raziq, Borini (2019) to explore the value creation opportunities offered by e-HRM practices is adopted for HRIS. As translated into Turkish the meaning of two items were the same, so one of two items is preferred and ten items of this scale is used. The response is sought using a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and and proved reliable having alpha (α) ranges between 0.76 to 0.78. This scale is preferred since there is scarcity of scale attributing to HRIS in the literature and it is used in a quiet recent study as a good measure for the impact of HRIS on HRM.

2.5.2. Time Saving

For time saving indicator, questions are adopted from the study of Beadles et al. (2005). A similar version of this scale is also used in the study of Kushwaha et al. (2018) and in the study of Siengthai & Udomphol (2016). The response is sought using a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.95 alpha (α) value. A seven item-scale for time saving is used in this study.

2.5.3. Cost Saving

For cost saving indicator, questions were adopted from the study of Beadles et al. (2005). A similar version of this scale was also used in the study of Kushwaha et al. (2018) and in the study of Siengthai & Udomphol (2016). The response is sought using a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and

proved reliable having 0.94 alpha (α) value. A four item-scale for cost saving is used in this study.

2.5.4. Information Effect

For information effect indicator, questions are adopted from the study of Beadles et al. (2005). A similar version of this scale is also used in the study of Kushwaha et al. (2018) and in the study of Siengthai & Udomphol (2016). The response is sought using a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.90 alpha (α) value. A four item-scale for information effect is used in this study.

2.5.5. The Strategic Impact of HR's Role

For strategic impact & HR's role, questions were adopted from the study of Beadles et al. (2005). A similar version of this scale is also used in the study of Kushwaha et al. (2018) and in the study of Siengthai & Udomphol (2016). The response is sought using a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.97 alpha (α) value. A six item-scale for strategic impact & HR's role is used in this study.

2.5.6. IT Infrastructure

For IT infrastructure variable, questions are adopted from an earlier study that consist of four items used by Alam et al. (2016). The original IT infrastructure scale is adapted from Grover (1993), Hartono et al. (2010), Masum (2015) and Al-Dmour (2015). The response is sought using a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.90 alpha (α) value.

2.5.7. Top Management Support

For top management support variable, questions are adopted from the study of Alam et al. (2016) that consist of three items. The original top management support scale is adapted from McGinnis & Ackelsberg (1983), Grover (1993), Teo et al. (2007) and Premkumar & Roberts (1999). The response is sought on a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.82 alpha (α) value.

2.5.8. Competitive Pressure

For competitive pressure variable, questions are adopted from the study of Alam et al. (2016) that consists of three items. The original competitive pressure scale is adapted from Premkumar & Roberts (1999), Teo et al. (2007), Sophonthummapharn (2009) and Masum (2015). The response is sought on a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.94 alpha (α) value.

2.5.9. Internalization

For internalization variable, questions are adopted from the ceremonial adoption scale in the study of Kostova & Roth (2002) is preferred. The original internalization scale is adapted from Mowday, Steers, and Porter's (1979) Organizational Commitment Questionnaire. The response is sought on a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.92 alpha (α) value that ranges 0.80 to 0.95 by country. As translated into Turkish the meaning of two items are almost the same, so one of two items is preferred and six items of this scale is used.

2.5.10. Exploitation

For exploitation variable, questions are adopted from the realized absorptive capacity scale in the study of Soo et al. (2016) is preferred. The adapted measures are from Jansen et al. (2005), Lichtenthaler (2009), and Flatten et al. (2011). The response is sought on a five point Likert scale (endpoints: 1 = strongly disagree, 5 = strongly agree) and proved reliable having 0.86 alpha (α) value. As translated into Turkish the meaning of three items are almost the same, so one of three items is preferred and four items of this scale is used.

CHAPTER 3
RESEARCH METHODOLOGY

3.1. Chapter Overview

This chapter presents respectively research design, research paradigm, the rational for research approach, the population of the study, data collection procedure, research instrument, analytical procedure, data analysis plan, and ethical considerations.

3.2. Research Design

The notion of research design is central to one of the crucial issues faced by researchers in deciding the data-theory relationship in management research (Easterby-Smith et al., 2008). Understanding the fundamental research philosophies is beneficial for three reasons (p.56). Firstly, it can aid in the clarification of research design. Next, philosophical knowledge can assist the researcher in determining which designs will work and which will not. Further, it can help the researcher in identifying, and perhaps creating, designs that are outside of his/her previous experience.

3.3. The Philosophical Orientation of Research Design

The four main research terminologies are defined as ontology, epistemology, methodology, and methods (Easterby-Smith et al., 2008:60). As ontology refers that reality is external and objective (i.e. theory of existence), epistemology means that knowledge is only of significance if it is based on observations of this external reality (i.e. theory of knowledge). It is stated that both ontology and epistemology are central to deciding the research methodology). The methodological preference can be explained through the assumption that "the acceptance of a particular epistemology usually leads the researcher to adopt methods that are characteristic of that position" (Easterby-Smith et al., 2008:62).

Since there is a brief qualitative section that involves interviewing with key people (senior HR professionals), it is only performed in order to understand the reality (the impact of HRIS on HRM) as a unified whole within its natural context (Candy, 1991).

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However, the main research approach of this study is quantitative, the research paradigm can be associated with realist/objectivist ontology and empiricist epistemology. It starts with the ontological assumption that HRIS-enabled HR practices exist with in organizations. After confirming the external reality (ontological relativist position), the study moves to the epistemological relativist position, that knowledge is only significant if it is based on observations of this external reality, to test the hypotheses (Bryman & Bell, 2007:28).

3.4. Rationale for Research Approach

This study employs quantitative approach that involves development of subsequent concepts and conceptual model. Before carrying out quantitative approach, a semi qualitative part consisting of interview is taken place in order to become familiar to research subject as well as to provide data triangulation. It is aimed to gain a comprehensive understanding for the impact of Human Resources Information System (HRIS) on Human Resources Management (HRM) in companies. Thus, it is thought that an up-to-date subject can be better analyzed through choosing a well-designed quantitative approach in which empirical validation steps can be sufficiently revealed.

Quantitative research approach is employed to test specific hypotheses and explain the relationships between the variables (Riff, Lacy, & Fico, 2014:3). Survey research is the most appropriate quantitative method of the research carried out for this study because it provides a broad coverage of the range of situations and is a quick, economical and efficient means of gathering information (Easterby-Smith, Thorpe, & Lowe, 1991; Zikmund, 2003). The data collected by survey research can be turned into initial findings with the help of statistical analysis and further analysis can be built on these initial findings by seeking patterns and relationships in the data by performing advanced modelling techniques (Lacey & Luff, 2007). Structural Equation Modelling (SEM) is preferred to build sophisticated explanations of how the data addresses the original research questions.

3.5. Sampling Design

The unit of analysis of this study is individuals since it is believed that an insight for the impact of HRIS on HRM can only be provided through individuals. As sampling design, the probability sampling is used in which every member of the population has an equal chance of being selected into the study.

The sampling methods can be chosen according to some benefits such as lower costs, greater accuracy of results, greater speed of data collection, and availability of population elements (Blumberg et al., 2005:228). Having considered especially the availability of population elements, simple random sampling is preferred in this study. Even if sampling seems to have been selected by purposive approach due to belonging to only one profession, all participants are randomly chosen, indeed.

The population of the study involves HR employees working at companies operating in industrial and free zones in the province of Izmir and Manisa, Turkey. Being a selected segment of the population, sampling is chosen to draw conclusions which can be generalizable to the targeted population (Bryman & Bell, 2007).

As the sampling of semi strcutured in-depth interview consists of twelve HR professionals including HR specialist, HR generalist, HR responsible, HR manager and HR supervisor; the sampling for questionnaire consists of HR practitioners.

For the participants of survey, not only HR employees but administrative affairs employees fulfilling HR activities are also included, since there is still no separate HR department in some companies. Thus, HR administrators, HR analysts, HR staffs, HR assistants and other administrative affairs staffs participate in survey. The reason of the different titles for HR positions in different companies actually derives from the organizational structures, their being local, international or global and the managerial decisions of the companies.

3.6. Research Instrument

It is important to choose a relevant research instrument for data collection in order to fulfill the objectives of the study (Zikmund, 2003). Since the capacity of the instrument is supposed to be sufficient to answer the research questions as well as reveal the reliability and validity of the research (Sekaran, 2000).

In this study, in depth interview and quantitative survey are respectively used. The semi structured in-depth interview is employed to provide a general understanding for the prevailing situation in relation to the impact of HRIS on HRM. Interview questions are designed as open-ended and flexible through which respondents are not limited in their answers (see Appendix 2). As semi structured in-depth interview is completed, the main points that would be asked in questionnaire are determined and the final version of structured questionnaire could be prepared.

Survey is an appropriate tool to conduct quantitative research for obtaining standardized data to further explore the relationships between the hypothesis and the variables through a sample population (Pinsonneault & Kraemer, 1993). Survey questionnaire conducted in this study has two parts. Part 1 requires demographic information such as education level, sector and position, placed at the beginning of the questionnaire. Since it is recommended that personal information should be asked at the start or at the end of the survey instrument (Sekaran, 2000). Part 2 comprises 50 closed-ended questions under the sections of HRIS, IT infrastructure, top management support, competitive pressure, ceremonial adoption, absorptive capacity, time saving, cost saving, information effect and the strategic impact and HR's role in HRM All these constructs are measured using a five point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree) (see Appendix 4).

3.7. Data Collection

The semi structured in-depth interview was conducted between 1 August 2019 and 1 October 2019. Having searched for potential companies in different industrial zones in İzmir, the interview was mentioned via mail groups of HR associations. The potential interviewees who want to participate in research returned to e-mail and they were informed about general content of the interview. Then, those, who confirmed their willingness to participate via e-mail were chosen for face-to-face meetings. All

identifiers in relation to qualitative data (i.e. the name of positions and of companies) are removed from the transcripts prior to analysis. During the completion period of interview, the outline of questionnaire questions are prepared in parallel, but is revised after interview results.

The survey data was collected from December 2019 to April 2020. The distribution of questionnaires is conducted through digital questionnaire developed in Google Forms Software (https://forms.gle/nrr7RLQw7GinrLHn8) declared through sending to e-mail groups of population of the study. The number of participants vary in each firms, since the number of HR employees who consent to participate in survey as well as the total number of HR employees in the each firms is different. While two HR employees participate in survey in some firms, the number of participants are three or one in some others. The confidentiality of the participants was assured and no name or signature was required on the questionnaire.

Although English is commonly used by HR employees working at companies in Izmir and Manisa, the questions of both semi structured in-depth interview and questionnaire are prepared in Turkish to prevent the misunderstanding of the subject and provide the greater speed of data collection. When translated into Turkish, some questions of questionnaire refer to the same meaning; thus, they are deducted. When analyzing, the results of all research instruments are translated into English.

3.8. Response Rate

Among fifteen potential interviewees, the face to face meetings could not be organized for three of them due to their higher workload. The response rate of semi structured in-depth interview is twelve, which number is believed to be able to provide theoretical saturation for the initial part of the research.

For quantitative data, A total of 750 survey questionnaires are distributed into 255 firms chosen randomly in all industrial and free zones in Izmir and Manisa, 182 firms participate in survey with a return rate of 71.3 %. As a result, 539 questionnaires are returned with a return rate of 71.8 % (n=539). Additionally, 12.7 % of questionnaires (n=61) are discarded due to incomplete sections and a large number of missing values.

The remaining 478 questionnaires are firstly subjected to a prior analysis. The questionnaires in which it is stated that HRIS has not been used are not included in the

final analysis. In other words, if any respondents choose the option that "We don't currently use any kind of HRIS", the questionnaires of those respondents are extracted before the final analysis. Since it is a comprehensive study on human resources information systems (HRIS), the result of the analysis on the respondents who have not been using any kinds of human resources information systems (HRIS) may not express a meaningful result. Thus, 450 questionnaires out of 539 questionnaires are used for final data analysis, the response rate (83,4 %) of which is considered acceptable for this type of study (> 50 %).

3.9. Data Analysis Plan

The data collected through the interviews are analyzed using MAXQDA 20.20. sofware. The code system of qualitative research consists of the codes derived from the analysis of 10 open-ended interview questions. With the help of the functional hierarchy of MAXQDA software, themes, categories and codes can be arranged respectively.

The data collected through the questionnaires are analyzed using SPSS (Statistical Package for Social Sciences) for Windows 25.0 and AMOS (Analysis of Moment Structures) 22.0 programs. As descriptive statistical analyses are executed via SPSS 25.0 program, confirmatory factor analysis (CFA) and SEM (Structural Equation Modeling) analyses are run via AMOS 22.0 program.

3.9.1. Data Entry

Data entry is performed separately for each type of research carried out in this study. The data collected through interviews are transcribed, then the transcriptions are entered as texts into MAXQDA program. Having converted texts via program, commonalities and differences can be detected and potential themes, categories and codes can reveal. After completing coding process, the processed data are entered into a spreadsheet with particular headings identifying each question or sub-question as being coded (Adams et al., 2014).

The data collected through questionnaire are firstly thoroughly checked for proper entry, corrections are made for double digit entry and extracted to SPSS 25.0. The output subjected to statistical analysis through SPSS 25.0 was then extracted to AMOS

22.0 through which overall SEM can be exported as well as analyzed and then displayed in this study.

3.9.2. Data Coding and Editing

The coding and editing of qualitative data starts with the digital re-transcription of raw data, that is firstly prepared in Microsoft excel and then uploaded to MAXQDA software. The process in developing data-driven codes involves identifying themes from various interviews, which provide further level of categorisation as well as a basis for structuring a write-up of data (Cooper, 2017). Having ensuring the utility/reliability of the codes based on an iterative process, codebook can evolve respectively from the arrangement of themes, categories and codes (DeCuir-Gunby et al., 2011).

For coding and editing of quantitative data collected from the questionnaires, SPSS 25.0 software package is employed. Data is entered directly into SPSS through SPSS data editor, the interface of which resembles an Excel spreadsheet. Each case is entered into a separate row and each attribute (the data for a single variable) is entered into each column. Data coding and editing process is completed in order to screen the data, detecting missing or incomplete values, determining normality of data, and performing descriptive statistics.

3.9.3. Justification for Data Analyses Preference

Qualitative data obtained from the opinions, thoughts and feelings of interviewees can be analyzed through respectively being subject to themes, categories and codes via MAXQDA program. Having provided allignment with the main argument of this study, the key inferences can be drawn from the results of qualitative analysis based on the codes having higher frequencies.

Quantitative data collected via questionnaires and descriptively revealed via SPSS are analyzed through structural equation modelling (SEM) via AMOS program. SEM seems as the most appropriate technique, since it is able to examine both measurement modelling and structural modelling by testing the relationships among multiple variables (Gefen et al., 2000; Tabachnick & Fidell, 2001). With the help of the six stages of SEM, it is possible to identify respectively the constructs, the measurement

model, the adequacy of the sample size, the measurement model validity, the structural model, and the structural model validity (Hair et al., 2010).

As a very powerful statistical technique, SEM has a number of advantages, such as modelling interactions, coping with nonlinear situations, allowing correlations between independent variables, including measurement errors in the model, taking measurement errors with correlations between them, and revealing the relationship between multiple independent and dependent latent variables measured with more than one observed variable (Cengiz et al,, 2007:107).The construct representation for measurement model and construct interrelationships for structural model can be achieved through AMOS technique in order to fulfill the objectives of this study. Therefore, the interdependent nature of this research is thought to be only achieved through such a sophisticated technique.

3.10. Ethical Considerations

There are some potential ethical issues to be carefully considered when planning as well as conducting the research; respectively, (1) the sensitivity issues related to ethics, and (2) the commitment to follow the set of rules (Eisner & Peshkin, 1990). A researcher is supposed to put him/herself in the participant's position and determine there is any plausible potential of damage that may be avoided or at least minimized (Polonsky & Waller, 2010).

It is recommended that researcher ensure the secrecy and confidentiality of the information, as well as the privacy and anonymity of the respondent, provide respondent's prior consent (not forced) to participate, and emphasize clear representation of the research purpose and objectives, and appropriate representation of respondent information only assessing relevant components (Sekaran, 2000; Cohen et al., 2000). Having followed the recommendations mentioned in the literature, the ethical issues are very rigorously considered and followed in order to ensure the integrity of this research. Participants are informed in detail through appendixes and their consent are obtained (see Appendix 1 and Appendix 3).

CHAPTER 4
RESEARCH ANALYSIS

4.1. Chapter Overview

This chapter presents research analysis that respectively consists of a small qualitative analysis followed by the quantitative analysis. The chapter begins with structured semi structured in-depth interview in order to become familiar to the subject of the study and provide data triangulation. Then, the main analysis of the study is carried out via quantitative survey. The results of questionenaire is analyzed with structural equation modelling (SEM). The constructs of the model is analyzed according to measures preferred for the empirical validation and as a result the hypotheses are evaluated and overall research findings are summarized. Each stage of the analysis is covered in depth in the following sections.

4.2. The Analysis of Interview Results

Qualitative data obtained from the interviewees are analyzed via MAXQDA program which have a functional hierarchy including respectively; themes, categories and codes. Having provided allignment with the main argument of this study, the key inferences can be drawn from the results of qualitative analysis based on the codes having higher frequencies.

Through open-ended and flexible questions, it is investigated whether any applications for human resources management (HRM) is used, whether any built-in system exists for enterprise resource planning (ERP), which human resources (HR) functions are performed through the sytems used. Having gained an understanding of the fulfillment of human resources management (HRM) in organizations, the status of human resources information systems (HRIS) is examined in terms of the usage reasons, the expectations and the changes requested from any kind of human resources information systems (HRIS). With the help of the answers of interview questions, a general picture

is tried to be taken to reveal the impact of human resources information systems (HRIS) on human resources management (HRM) in today's organizations.

Demographic results of the analysis derives from the first part of the interview including open-ended questions; respectively sector, position and experience. Firstly, eight of them have been working at companies operating in production sector, two of them have been working at companies operating in retail industry sector and two of them has been working at a company operating in logistic sector. Next, the interviewees consist of six human resources managers, three human resources supervisors, one human resources specialist, one human resources generalist and one human resources responsible. Additionally, the work experiences of one of them refers to five years and below, the work experience of nine of them are between six and eleven years and the work experiences of two of them refers to eleven years and above.

After demographic analysis, the results of ten questions taken place in the second part of the interview are descriptively analyzed through code frequencies. Figure 4.1. shows the subcodes model for HRIS applications.

Figure 4. 1. Subcodes Model for HRIS Applications
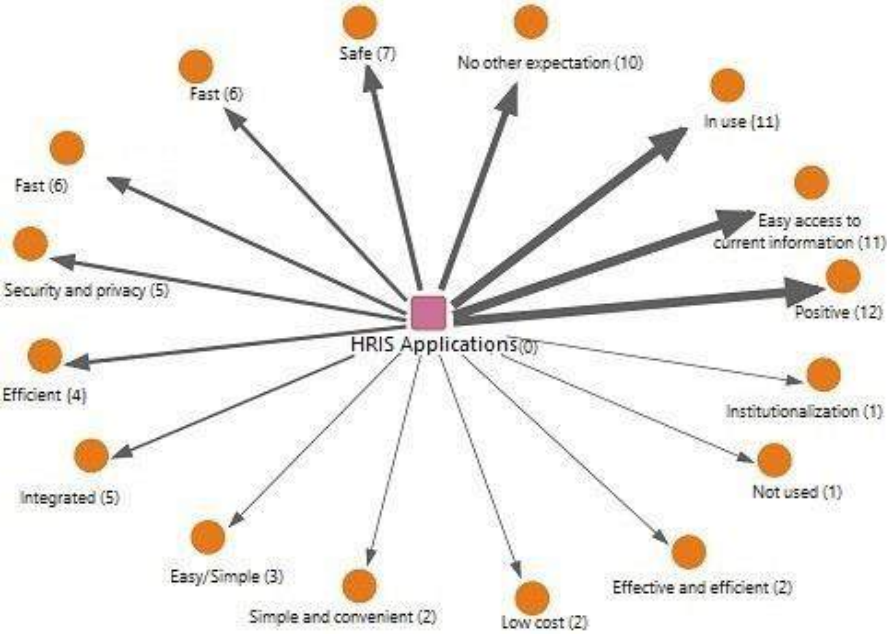
"HRIS applications" is mostly associated with the code of "positive" in twelve times which is supported by "easy access to current information" (eleven times), "in use"

(ten times), "no other expectation" (ten times), "safe" (seven times), "fast - HRIS usage reasons/critearia" (six times), "fast - the impact of HRIS on HRM functions" (six times), "security and privacy" (five times), "efficient" (five times), "integrated" (five times), "easy/simple" (three times), "simple and convenient" (two times), "low cost" (two times), "effective and efficient" (two times), "not used" (one time), and "institutionalization" (one time). Then, relational analysis is carried out in which the thicker lines shows the strenght of the relationship between codes. Figure 4.2. shows a relational analysis for the functions of human resources management (HRM).

Figure 4. 2. Relational Analysis for HRM Functions
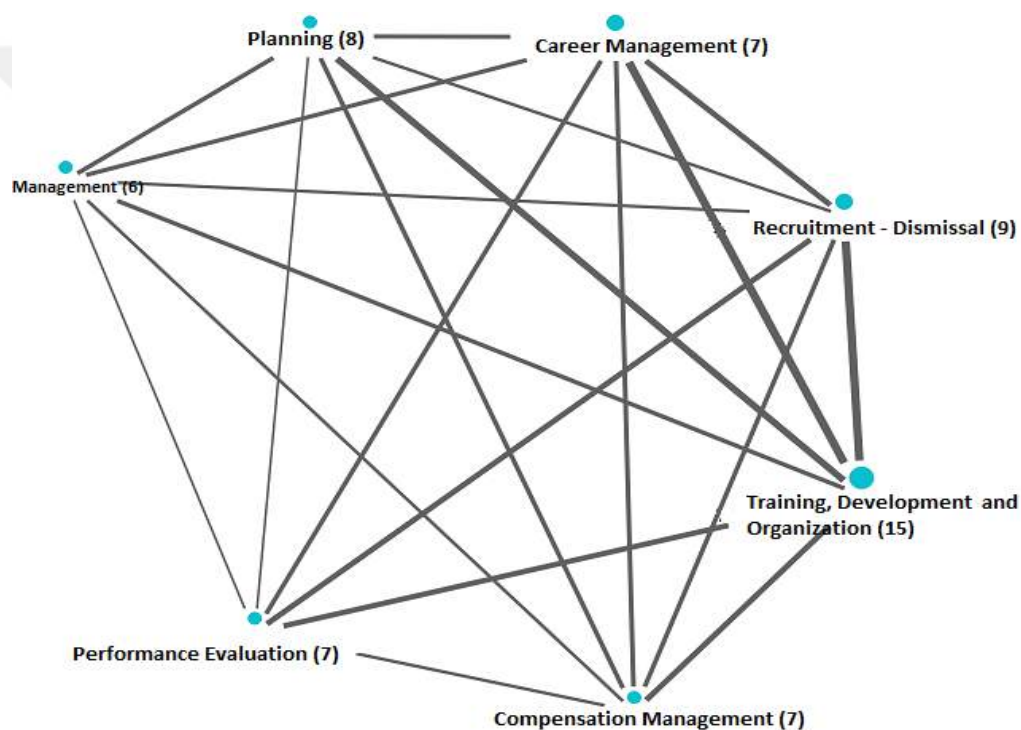
As can be seen in Figure 4.2., the thicker lines shows the strenght of the relationship between codes. It is seen that there is a strong relationship between "training, development and organization", "career management" and "recruitment-dismissal" which means that some HRM functions act together due to the interconnections between them. Similarly, there is an interconnection between "training, development and organization", "performance evaluation" and "compensation management". Since those HRM functions move together, it can be inferred that there is a need for an

enhanced HR system using the same data for the fulfillment of HRM. In relation to "HRIS usage reasons / criteria" category, the most frequent codes can be identified as "easy access to current information", "simple and convenient", "security and privacy", "fast", and "low cost". According to interview results, it is seen that "the impact of HRIS on HRM" tends to be perceived via those concepts. Even though some concepts have relatively higher code frequencies, they could not be chosen due to not being sufficiently supported by theoretical background comprehended in the systematic literature review part of this study. Based on the systematic literature review; time saving (fast code), cost saving (low cost code), and information effect (easy access to current information) are chosen to be explanatory factors of HRM structure as the system oriented concepts. Not only system related factors, but human related factors are also decided to be chosen. Under the theme of "the changes requested in HRIS", there is a frequent code; "the responsibility of strategic decision making being undertaken by senior management" which can be associated with "the strategic impact and HR's role".

Then, the intermediary factors supposed to affect the relationship between HRIS and HRM are investigated. As "the changes requested in HRIS" theme and "the expectations from HRIS" category are taken into consideration, it is seen that both "simplification" and "improvement" are demanded. The presence of different thoughts towards HRIS may point out "absorptive capacity". Additionally, the code of "institutionalization" under "HRIS usage reasons / criteria" category can be associated with "ceremonial adoption". Further, the factors affecting an innovation adoption can also be inferred from the interview results. Since interviewees reply all the questions through considering technology, organization and environment that they have been experienced. Due to the higher emphasis on TOE framework, its sub constructs are also included as variables. It is important to underline that all variables of this study are based on systematic literature review. The interview results are just able to justify the variables of this study. Thus, interviw part can be thought as a small introduction for the analysis that is able to offer insight for the main argument of this study. The summary of the themes based on the key findings of interview results are given place in Table 4.1.

Table 4. 1. The Summary of Themes derived from Interview Results

	Themes	Questions	Key Findings
HRM (Human Resources Management)	The Relationship between HR Department and Organization	Q: How do you define the role of HRM in organization?	Interviewees define the role of HRM as an strategic function that improves cross-functional communication through adding value in a variety of areas within the organization.
		Q: When did your company first introduce HRM practices?	The experiments of HRM practices ranges from six to sixteen years. The average HRM experiment of interviewees is below ten years.
		Q: How do you define the role of your profession in your company?	Interviewees tend to define themselves not only as a personnel managers but also as strategic partners involving mostly with organizational development.
	The Classification of HRM Functions	Q: How do you classify HRM functions?	It is implied that through the use of same employee data in a digital manner, HRM functions can act together. In other words, HRIS usage can facilitate the fulfillment of all other HR functions with the help of its unique platform.
HRIS **(Human Resources Information System)**	ERP Applications	Q: Which ERP program is being currently used in your company and for HRM functions in your department? Why?	No matter which type og program is used, the most important reasons of ERP usage in HR department can be associated with time saving and cost saving benefits.
	HRIS Applications	Q: Have you already implemented HRIS in your company?	Most of the interviewees (eleven out of twelve) have been using HRIS in their organization.
		Q: Why have you been using HRIS in your company? Which criteria are taken into account on HRIS usage in your company?	The most important reasons of HRIS usage/criteria can be identified as being easy access to current information, security and privacy, fast, and low cost. As an interesting sample, institutionalization is even mentioned.
		Q: How do you evaluate the impact of HRIS on HRM functions?	All interviewees think that HRIS has a posiive impact on HRM functions. The reasons to use HRIS can be explained by keeping step with today's digitalized business environment.
	The Changes Requested in HRIS	Q: Is there any change which you want to see in HRM within your company?	Interviewees are almost totally glad of HRIS that they have been using. The further expectations are simplification in applications and its being taugth correctly.

4.3. The Overview of Quantitative Analysis

The data obtained in the study is analyzed using SPSS (Statistical Package for Social Sciences) for Windows 25.0 and AMOS (Analysis of Moment Structures) 22.0 program. The analysis begins with descriptive statistics including mean, standart deviation and Cronbach's alpha values; and continues with normality analysis indicating the skewness and kurtosis of the scales. Based on descriptive statistisc, demographic analysis of the survey is presented. Then, the analysis provides confirmatory factor analysis (CFA) of each construct in order to establish the reliability and validity of the variables. All constructs of the study are separately examined for their correlations and relationships. Having revealed measurement model and strcutural model for each construct, the analysis is subject to path analysis that consist of six different models and the final model. As model 1 shows the the direct impact of HRIS on dependent variables, Model 2 to Model 6 reveals the impact of mediating variables on the relationhsip between HRIS and HRM, and Model 7, final model, refers to all relationships between constructs. The analysis is also supported by correlation analysis, convergent validity (CV) and discriminant validity. With the help of the results of all these analyses, the hypotheses are interpreted and overall analysis of the research conducted via SEM is presented.

4.4. Demographic and Organizational Profile of the Respondents

It is aimed to present the demographic profile of the respondents after identifying the respondents who have been experienced any kinds of human resources information systems (HRIS). Among four hundred seventy eight (478) respondents from 182 company in total, twenty eight (28) participants have declared that they have not used any kinds of human resources information systems (HRIS) in their organizations. It is thought that there is no need to include the number of respondents who have not any ideas as well as any experiences about any kinds of human resources information systems (HRIS) in the analysis. Therefore, it is believed that the result of the analysis on the respondents who have been using human resources information systems (HRIS) can yield a meaningful

result. The distribution of the kind of HRIS used by respondents are presented in Table 4.1 below.

Table 4. 2. The distribution of the kinds of HRIS used by participants

Whether to use HRIS or not		n	%
We don't currently use any kind of HRIS	Yes	28	5.9
	No	450	94.1
Total		**478**	**100.0**
The kind of HRIS employed in the company			
Desktop office software	Yes	23	5.1
	No	427	94.9
In-house HRIS	Yes	38	8.4
	No	412	91.6
Stand-alone, not integrated applications for different HRM fields	Yes	62	13.8
	No	388	86.2
Best of breed software specific for HR Departments	Yes	86	19.1
	No	364	80.9
HRIS as a module of enterprise-wide integrated software	Yes	226	50.2
	No	224	49.8
Cloud based applications	Yes	15	3.3
	No	435	96.7
Total		**450**	**100.0**

Having excluded the respondents who have not been experienced human resources information systems (HRIS); namely, twenty eight respondents (28), the distribution of the kind of HRIS used by respondents, the number of which is four hundred fifty (450), is demonstrated. As Table 4.2. presents, the great number of participants with 94.1 % have been using human resources information systems (HRIS). It is observed that two types of human resources information systems (HRIS) has been used by respondents under 10 percent; respectively, desktop office software (5.1 %) and in-house HRIS (8.4 %). It can be interpreted that there are still companies that have been using initial versions of human resources information systems (HRIS) for their human resources (HR) activities. 13.8 %

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of the respondents express that they have been using stand-alone, not integrated applications for different human resources management (HRM) fields and followed by 19.1 % of respondents using best of breed softwares specific for HR Departments. The highest portion of participants corresponds to a little more than half a percentage state that they have been using HRIS as a module of enterprise-wide integrated software (50.2 %). It can be said that enterprise resource planning (ERP) are still much in request and widely preferred by organizastions. It is also revealed that the lowest percentage of respondents have been using cloud based applications (3.3 %), the reason of which may be related to either being not ready for high-tech systems or being content with current ones they have been using for human resources management (HRM).

The demographic and organizational profile of the respondents in terms of the level of education, the sector in which they have been working, the position they occupy are presented with percentages in Table 4.3.

As the distribution of the participants are examined according to their educational status, it is seen that 5.6 % of the participants have high school degree, 17.6 % of the participants have associate degree, 55.3 % of the participants have undergraduate degree and 21.6 % of the participants have graduate degree. The largest number of respondents have undergraduate degree that refers to more than half of the all participants.

The category of specific sectors in which participants have been working is identified as food industry with 22.9 % and followed by textile with 12.7 %. The distribution of sectors continues as plastic with 6.4 %, paper, cardboard and packaging with 5.1 %, furniture with 2.0 %, machinery with 3.8 %, metal with 3.8 %, automotive spare parts with 2.4 % and agricultural products with 2.0 %. The rest of the sectors belonging to different categories is listed under "other" category with 38.9 % having the largest category as percentage.

Table 4. 3. Demographic and Organisational Profile of the Respondents

Demographics		n	%
The level of education	High school	25	5.6
	Associate degree	79	17.6
	Undergraduate degree	249	55.3
	Graduate degree	97	21.6
Sector	Food	103	22.9
	Textile	57	12.7
	Plastic	29	6.4
	Paper, Cardboard and Packaging	23	5.1
	Furniture	9	2.0
	Machine	17	3.8
	Metal	17	3.8
	Automotive spare parts	11	2.4
	Agricultural products	9	2.0
	Other	175	38.9
Position	HR Administrator	247	54.9
	HR Analyst	19	4.2
	HR Staff	84	18.7
	HR Assistant	49	10.9
	Other	51	11.3
Total		**450**	**100.0**

As the distribution of the use of HRIS according to HRM functions is examined, it should be taken into consideration that more than one HRM function was allowed to be chosen when questions were asked to participants. As Table 4.4. presents, HRIS is preferred to mostly execute compensation management (payroll, social benefits and inducement management) (n=447), followed by recruitment (n=443) and administrative affairs (n=410). The preferences continues with knowledge management (n=360), training and development (n=355), performance appraisal (n=308), laborforce planning (n=298), organizational development (n=163), career and talent management (n=147), and finally followed by grievance management (n=105) as the least preferred HRM function executed in HRIS (Table 4.4).

Table 4. 4. The distribution of the use of HRIS according to HRM functions

HRM Functions for which HRIS is used	n
Administrative affairs	410
Compensation management (payroll, social benefits and inducement management)	447
Recruitment	443
Training & development	355
Performance appraisal	308
Grievance management	105
Knowledge management	360
Organizational development	163
Laborforce planning	298
Career & talent management	147

4.5. Descriptive Statistics

Descriptive statistics, that consist of mean, standart deviation and internal consistency of scale constructs via Cronbach alpha, for each construct of the impact HRIS on HRM is given in Table 4.4. It is seen that the total mean of the scale items on HRIS is 4.11. When each scale item under this construct is examined, it is confirmed that the item of "Managers use HRIS to receive formal information about a wide range of issues relevant to the branch & its operation" (H9) has the highest mean score with 4.30.

For IT infrastructure, the total mean of the scale items is 4.54. The values of each scale item under this construct indicate that the item of "The organization has speedy internet facility" (IT3) has the highest mean score with 4.57.

With respect to top management support, the total mean of the scale items is 4.31. As the values of each scale item under this construct reveal that the item of "Top management has allocated adequate resources for the adoption of HRIS" (TMS2) has the highest mean score with 4.34.

In terms of competitive pressure, the total mean of the scale items is 3.59. It is found that the item having the highest mean score with 4.07 is "Our organization actively keeps track of new use of technology by competitors" (CP3) under this construct.

In relation to internalization, the total mean of the scale items is 4.21. Among the values of each scale item under this construct, there are two items having the same as well as the

highest mean; that are "HRIS really inspires the very best in me in the way of involvement at my work" (I4) and "I am extremely glad that I am involved in the adoption of HRIS" (I5) with 4.27 mean score.

With respect to exploitation, the total mean of the scale items is 4.19. Among the values of each scale item under this construct, the highest mean value belongs to the item of "Our employees have the ability to successfully link existing knowledge with new knowledge or insights" (E3) with the value of 4.32.

On time saving, the total mean of the scale items is 4.28. Since the item of "Our HRIS has improved the data input and data maintenance process" (TS3) has the highest mean score with 4.35, it is especially thought that the time spent on data inputting maintenance is reduced by HRIS.

For cost saving, the total mean of the scale items is 3.27. Consistently, the item of "Our HRIS has decreased data input expense" has the highest mean score with 4.44, which means that data input expenditure is reduced by HRIS.

In terms of information effect, the total mean of the scale items is 4.21. The values of each scale item under this construct indicate that the item of "Information generated from HRIS helps organization decided when training &skill development are necessary" (IE4) has the highest mean score with 4.57. This score is also consistent with the result of small interview part in which "training, development and organization" has the highest code frequency.

With respect to the strategic impact and HR's role, the total mean of the scale items is 4.13. There are two items having the same as well as the highest mean; that are "Overall our administration thinks that HRIS is effective in meeting strategic goals" (SI2) and "The information generated from our HRIS has made HR a more strategic partner in the institution" (SI4) with 4.30 mean score.

Table 4. 5. Descriptive Statistics

	Items	Mean	Standart Deviation	Cronbach Alfa
HRIS	**HRIS1**	**4.25**	**0.55**	0.854
	HRIS2	4.29	0.55	
	HRIS3	4.25	0.62	
	HRIS4	3.88	1.06	
	HRIS5	3.73	1.17	
	HRIS6	3.99	0.87	
	HRIS8	4.28	0.54	
	HRIS9	4.30	0.49	
	HRIS10	4.13	0.71	
	Total	4.11	0,48	
IT infrastructure	IT1	4.51	0.56	0.948
	IT2	4.54	0.53	
	IT3	4.57	0.50	
	IT4	4.55	0.53	
	Total	4.54	0.49	
Top Management Support	TMS1	4.32	0.51	0.868
	TMS2	4.34	0.60	
	TMS3	4.30	0.54	
	Total	4.31	0.48	
Competitive Pressure	CP1	3.34	1.29	0.881
	CP2	3.39	1.33	
	CP3	4.07	0.81	
	Total	3.59	1.05	
Internalization	I1	4.24	0.77	0.884
	I2	4.17	0.73	
	I3	4.18	0.81	
	I4	4.27	0.60	
	I5	4.27	0.60	
	I6	4.16	0.80	
	Total	4.21	0.54	
Exploitation	E1	4.28	0.50	0.749
	E2	4.36	0.50	
	E3	3.84	1.10	
	E4	4.30	0.46	
	Total	4.19	0.52	
Time Saving	TS2	4.19	1.01	0.854
	TS3	4.45	0.52	
	TS4	4.37	0.53	
	TS5	4.40	0.53	
	TS6	4.30	0.60	
	TS7	4.30	0.53	
	Total	4.28	0.45	
Cost Saving	CS1	2.91	1.06	0.760
	CS2	3.54	1.47	
	CS3	4.44	0.58	
	Total	3.27	0.72	

	IE1	4.29	0.52	
	IE2	4.10	1.03	
Information Effect	IE3	4.15	0.83	0.783
	IE4	4.32	0.57	
	Total	4.21	0.59	
	SI1	4.25	0.58	
	SI2	4.30	0.54	
The Strategic Impact and HR's Role	SI3	4.27	0.61	0.830
	SI4	4.30	0.53	
	SI5	3.56	1.22	
	Total	4.13	0.57	

Table 4. 6. Normality Analysis of the Scales

	Skewness	Kurtosis	Result
HRIS	-0.113	-0.259	Normal
IT Infrastructure	-0.375	-1.312	Normal
Top Management Support	0.043	0.090	Normal
Competitive Pressure	-0.207	-1.166	Normal
Internalization	-0.999	2.564	Normal
Exploitation	-0.003	-0.933	Normal
Time Saving	-0.426	0.907	Normal
Cost Saving	-0.090	-1.555	Normal
Information Effect	-0.865	1.878	Normal
The Strategic Impact and HR's Role	-0.093	-0.299	Normal

The results of the normality analysis of the scales used in the study are given in Table 4.5. The fact that the skewness and kurtosis values of the data, that are between ± 3, indicates a normal distribution (Hair at al., 2010).

4.6. Confirmatory Factor Analyses (CFA)

4.6.1. HRIS Scale

Figure 4.6. 1. The Model for the first level single factor CFA of HRIS
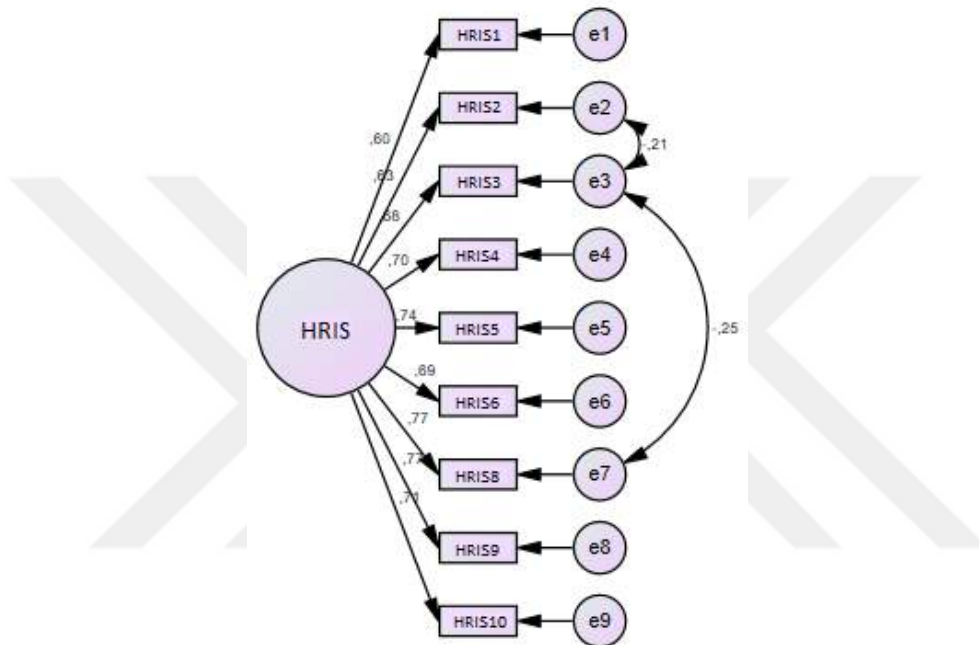
Table 4. 7. The measurement model of HRIS

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
HRIS α=0.854	HRIS1	0.600				
	HRIS2	0.627	11.945	***		
	HRIS3	0.676	11.755	***		
	HRIS4	0.699	9.899	***		
	HRIS5	0.741	10.385	***	0.51	0.86
	HRIS6	0.686	10.744	***		
	HRIS8	0.766	12.058	***		
	HRIS9	0.770	12.879	***		
	HRIS10	0.710	11.240	***		

The reliability of the measurement model is tested by looking at the average variance explained (AVE) and composite reliability (CR) values. The composite reliability value of the latent variables in the measurement model should be higher than 0.70 and the average explained variance value should be higher than 0.50. As can be seen in Table 4.6., CR value (0.86) is above the threshold value of 0.70 and AVE value (0.51) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.854 for the overall scale and to have a good degree of reliability. A Cronbach Alpha value greater than 0.70 indicates that the scales used are reliable. It can be inferred that the internal consistency of the scale used in the study is good.

Table 4. 8. Goodness of fit index of the structural model of HRIS

	Structural Model Values	**Recommended Values**
χ^2/df	2.301	≤ 5
RMSEA	0.054	≤ 0.08
GFI	0.962	≥ 0.80
AGFI	0.932	≥ 0.80
CFI	0.920	≥ 0.80
NFI	0.870	≥ 0.80
SRMR	0.079	≤ 0.10
	χ^2: 57.513, df:25, p:0.000	

According to confirmatory factor analysis (CFA), structural equation modeling (SEM) results of the scale are significant at the p=0.000 level, and 1 item out of 10 items is excluded from the scale due to its factor loadings' being low (HRIS7- "We use HRIS for recruitment & selection processes"), and the remaining 9 items are found to be related to the one-dimensional scale structure (Table 4.6.). As making improvements in the model, variables that reduce compliance are determined, and a new covariance is created for those with high covariance among residual values. Through the renewed fit index calculations, it is shown that the accepted values for the fit indices are provided (Table 4.7.).

4.6.2. IT Infrastructure Scale

Figure 4.6. 2. The Model for the first level single factor CFA of IT Infrastructure
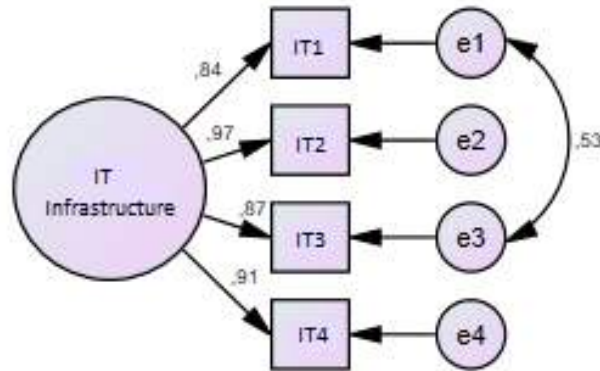
Table 4. 9. The measurement model of IT Infrastructure

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
IT Infrastructure α=0.948	IT1	0.843	-	-	0.81	0.95
	IT2	0.973	30.131	***		
	IT3	0.872	32.664	***		
	IT4	0.911	24.388	***		

As can be seen in Table 4.8., CR value (0.95) is above the threshold value of 0.70, and AVE value (0.81) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale was evaluated, it is found to be 0.948 for the overall scale and to have a good degree of reliability.

According to confirmatory factor analysis (CFA), structural equation modeling (SEM) results of the scale are significant at the p=0.000 level, and the 4 items constituting the scale are related to the one-dimensional scale structure (Table 4.8.). Improvements are

made and though the renewed fit index calculations it is shown that the accepted values for the fit indices are provided (Table 4.9.).

Table 4. 10. Goodness of fit index of the structural model of IT Infrastructure

	Structural Model Values	**Recommended Values**
χ^2/df	1.760	≤ 5
RMSEA	0.041	≤ 0.08
GFI	0.999	≥ 0.80
AGFI	0.991	≥ 0.80
CFI	0.999	≥ 0.80
NFI	0.999	≥ 0.80
SRMR	0.014	≤ 0.10
	χ^2: 1.760, df:1, p:0.000	

4.6.3. Top Management Support Scale

Figure 4.6. 3. The Model for the first level single factor CFA of Top management support
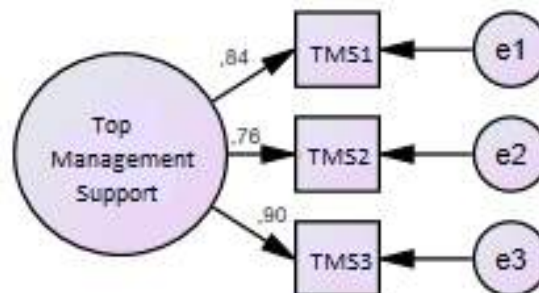
As can be seen in Table 4.10., CR value (0.87) is above the threshold value of 0.70, and AVE value (0.70) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadingss of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.868 for the overall scale and to have a good degree of reliability.

Table 4. 11. The measurement model of Top Management Support

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Top Management Support α=0.868	TMS1	0.839	-	-	0.70	0.87
	TMS2	0.762	15.279	***		
	TMS3	0.902	16.235	***		

A goodness of fit analysis could not be done on the "top management support" scale since CFA could not be applied to this scale. It is recommended that there should be more than three elements per factor when doing a CFA. The original measure used for this scale has also three items. Therefore, it would not be appropriate to perform CFA for this scale.

4.6.4. Competitive Pressure Scale

Figure 4.6. 4. The Model for the first level single factor CFA of Competitive pressure
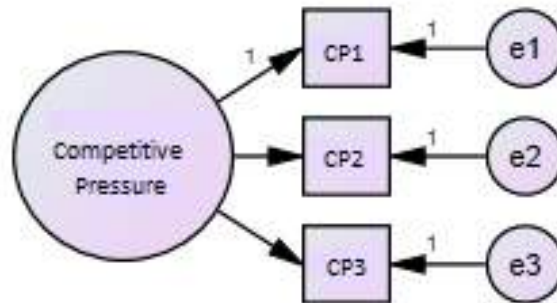
As can be seen in Table 4.11., CR value (0.90) is above the threshold value of 0.70, and AVE value (0.76) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loads of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.881 for the overall scale and to have a good degree of reliability.

Table 4. 12. The measurement model of Competitive Pressure scale

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Competitive Pressure α=0.881	CP1	0.991	-	-	0.76	0.90
	CP2	0.954	51.444	***		
	CP3	0.626	13.474	***		

A goodness of fit analysis could not be done on the "competitive pressure" scale since CFA could not be applied to this scale. It is recommended that there should be more than three elements per factor when doing CFA. The original measure used for this scale has also three items. Therefore, it would not be appropriate to perform CFA for this scale.

4.6.5. Internalization Scale

Figure 4.6. 5. The Model for the first level single factor CFA of Internalization
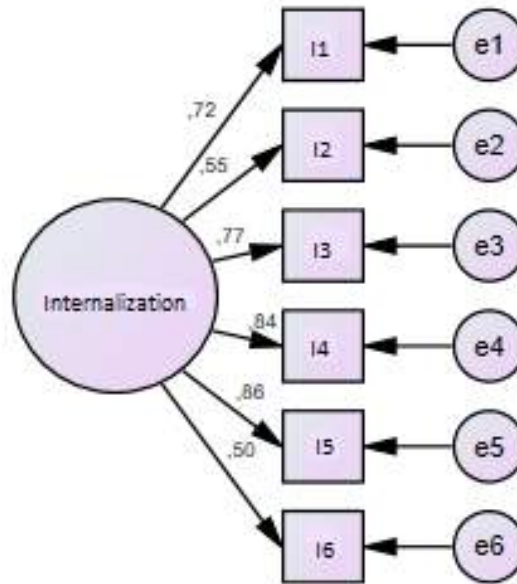
Table 4. 13. The measurement model of Internalization

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Internalization α=0.884	I1	0.724				
	I2	0.545	10.965	***		
	I3	0.770	15.505	***	0.52	0.86
	I4	0.837	16.774	***		
	I5	0.857	17.114	***		
	I6	0.505	10.152	***		

As can be seen in Table 4.12., CR value (0.86) is above the threshold value of 0.70, and AVE value (0.52) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loads of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it was found to be 0.844 for the overall scale and to have a good degree of reliability.

Table 4. 14. Goodness of fit index of the structural model of Internalization

	Structural Model Values	Recommended Values
χ^2/df	3.518	≤ 5
RMSEA	0.075	≤ 0.08
GFI	0.977	≥ 0.80
AGFI	0.946	≥ 0.80
CFI	0.981	≥ 0.80
NFI	0.973	≥ 0.80
SRMR	0.026	≤ 0.10
	χ^2: 31.659, df:9, p:0.000	

According to confirmatory factor analysis (CFA), structural equation modeling results of the scale Are significant at the p=0.000 level, and the 6 items forming the scale are related to the one-dimensional scale structure (Table 4.12.). It is shown in Table 4.13. that the accepted values for the fit indices are provided (4.13.).

4.6.6. Exploitation Scale

Figure 4.6. 6. The Model for the first level single factor CFA of Exploitation
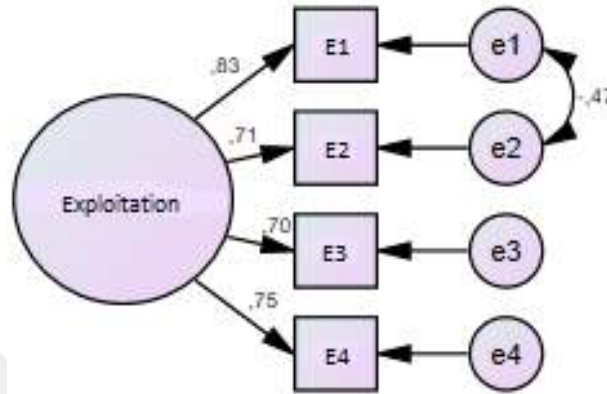
Table 4. 15. The measurement model of Exploitation

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Exploitation α=0.749	E1	0.834	-	-	0.65	0.88
	E2	0.708	13.414	***		
	E3	0.699	16.569	***		
	E4	0.752	26.424	***		

As can be seen in Table 4.14., CR value (0.88) is above the threshold value of 0.70, and AVE value (0.65) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.749 for the overall scale and to have a good degree of reliability.

Table 4. 16. Goodness of fit index of the structural model of Exploitation

	Structural Model Values	Recommended Values
$\chi2/df$	1.105	≤ 5
RMSEA	0.015	≤ 0.08
GFI	0.999	≥ 0.80
AGFI	0.994	≥ 0.80
CFI	0.999	≥ 0.80
NFI	0.997	≥ 0.80
SRMR	0.011	≤ 0.10
	$\chi2$: 1.105, df:1, p:0.000	

According to confirmatory factor analysis (CFA), structural equation modeling (SEM) results of the scale are significant at the p=0.000 level, and 4 items constituting the scale are related to the one-dimensional scale structure (Table 4.14.). Improvements are made and though the renewed fit index calculations it is shown that the accepted values for the fit indices are provided (Table 4.15.).

4.6.7. Time Saving Scale

Figure 4.6. 7. The Model for the first level single factor CFA of Exploitation
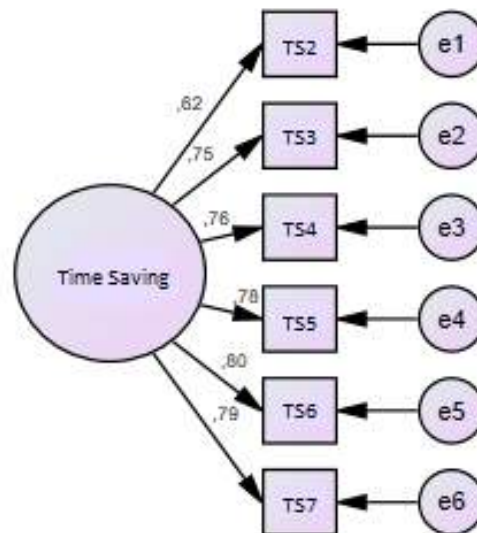
Table 4. 17. The measurement model of Time Saving

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Time Saving α=0.854	TS2	0.622				
	TS3	0.751	12.842	***		
	TS4	0.757	12.906	***	0.57	0.89
	TS5	0.782	13.203	***		
	TS6	0.797	13.374	***		
	TS7	0.790	13.302	***		

As can be seen in the Table 4.16., CR value (0.89) is above the threshold value of 0.70, and AVE value (0.57) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.854 for the overall scale and to have a good degree of reliability.

Table 4. 18. Goodness of fit index of the structural model of Time Saving

	Structural Model Values	Recommended Values
$\chi 2/df$	2.073	≤ 5
RMSEA	0.049	≤ 0.08
GFI	0.986	≥ 0.80
AGFI	0.967	≥ 0.80
CFI	0.993	≥ 0.80
NFI	0.986	≥ 0.80
SRMR	0.019	≤ 0.10
$\chi 2$: 18.657, df:9, p:0.000		

According to confirmatory factor analysis (CFA), structural equation modeling (SEM) Results of the scale are significant at the p=0.000 level, one item out of 7 items that made up the scale iss removed from the scale (TS1- "Our HRIS has decreased the time spent on recruiting and improved recruiting") due to its factor loadings' being low, and the

remaining 6 items are found to be related to the one-dimensional scale structure (Table 4.16.). It is shown in the table that the accepted values for the fit indices are provided (Table 4.17.).

4.6.8. Cost Saving Scale

**Figure 4.6. 8. The Model for the first level single factor CFA of Cost Saving**
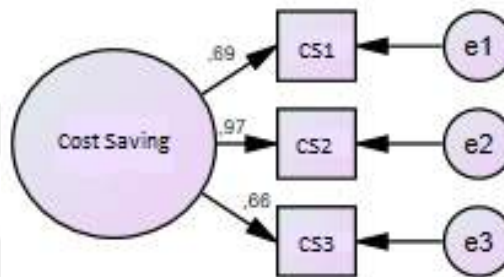
Table 4. 19. The measurement model of Cost Saving

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Cost Saving α=0.760	CS1	0.686			0.61	0.82
	CS2	0.970	10.774	***		
	CS3	0.656	12.122	***		

As can be seen in Table 4.18., CR value (0.82) is above the threshold value of 0.70, and AVE value (0.61) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.760 for the overall scale and to have a good degree of reliability.

A goodness of fit analysis could not be done on the "cost saving" scale since CFA could not be applied to this scale. It is recommended that there should be more than three elements per factor when doing a CFA. Although cost saving construct has four items at

the beginning, during factor analysis one of the item "Our HRIS has decreased the overall HR staff's salary expense" (CS4) has to be removed due to its lowest factor value. As a result "cost saving" scale comprises three components, and it would not be appropriate to perform CFA for this scale.

4.6.9. Information Effect Scale

Figure 4.6. 9. The Model for the first level single factor CFA of Information Effect
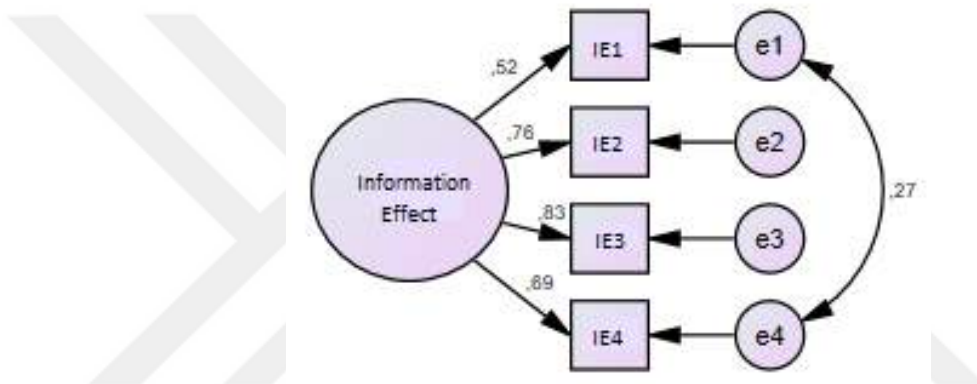
Table 4. 20. The measurement model of Information Effect

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
Information Effect α=0.783	IE1	0.519			0.50	0.80
	IE2	0.762	9.760	***		
	IE3	0.827	9.769	***		
	IE4	0.688	11.027	***		

As can be seen in Table 4.19., CR value (0.80) is above the threshold value of 0.70, AVE value (0.50) is equal to the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.783 for the overall scale and to have a good degree of reliability.

According to confirmatory factor analysis (CFA), structural equation modeling (SEM) results of the scale are significant at the p=0.000 level, and 4 items constituting the scale are related to the one-dimensional scale structure (Table 4.19.). Improvements are made and though the renewed fit index calculations it is shown that the accepted values for the fit indices are provided (Table 4.20.).

Table 4. 21. Goodness of fit index of the structural model of Information Effect

	Structural Model Values	Recommended Values
$\chi2/df$	3.977	≤ 5
RMSEA	0.081	≤ 0.08
GFI	0.996	≥ 0.80
AGFI	0.956	≥ 0.80
CFI	0.995	≥ 0.80
NFI	0.993	≥ 0.80
SRMR	0.013	≤ 0.10
	$\chi2$: 3.977, df:1, p:0.000	

4.6.10. The Strategic Impact and HR's Role

Figure 4.6. 10. The Model for the first level single factor CFA of The Strategic Impact and HR's Role
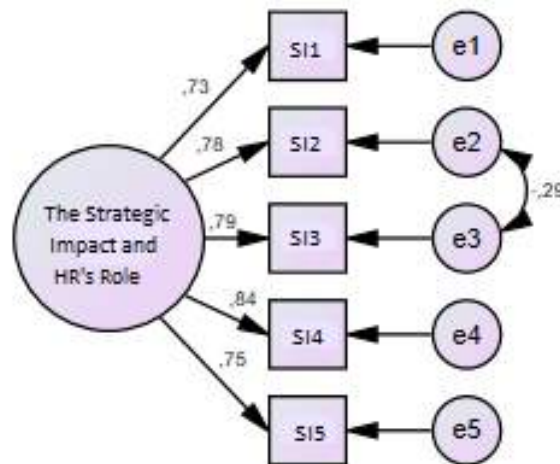
Table 4. 22. The measurement model of The Strategic Impact and HR's Role

Factors	Items	Parameter Estimates (Factor Loadings)	t Values	p Values	AVE	CR
	SE1	0.734				
Strategic Impact α=0.830	SE2	0.778	15.835	***		
	SE3	0.794	12.336	***	0.61	0.89
	SE4	0.844	20.082	***		
	SE5	0.753	12.605	***		

As can be seen in Table 4.19., CR value (0.89) is above the threshold value of 0.70, AVE value (0.61) is above the threshold value of 0.50. When the correlations between the variables are examined, it is seen that the factor loadings of the items are above 0.40 and all correlation relationships are significant. When the reliability of the scale is evaluated, it is found to be 0.830 for the overall scale and to have a good degree of reliability.

Table 4. 23. Goodness of fit index of the structural model of The Strategic Impact and HR's Role

	Structural Model Values	Recommended Values
χ^2/df	2.766	≤ 5
RMSEA	0.063	≤ 0.08
GFI	0.992	≥ 0.80
AGFI	0.969	≥ 0.80
CFI	0.981	≥ 0.80
NFI	0.971	≥ 0.80
SRMR	0.028	≤ 0.10
	χ^2: 11.065, df:4, p:0.000	

According to the confirmatory factor analysis (CFA), structural equation modeling (SEM) results of the scale are significant at the p=0.000 level, and 5 items constituting the scale are related to the one-dimensional scale structure (Table 4.21.). Improvements are made and though the renewed fit index calculations it is shown that the accepted values for the fit indices are provided (Table 4.22.).

4.7. Path Analyses

Figure 4.7. 1. Model 1 – The Impact of HRIS on dependent variables
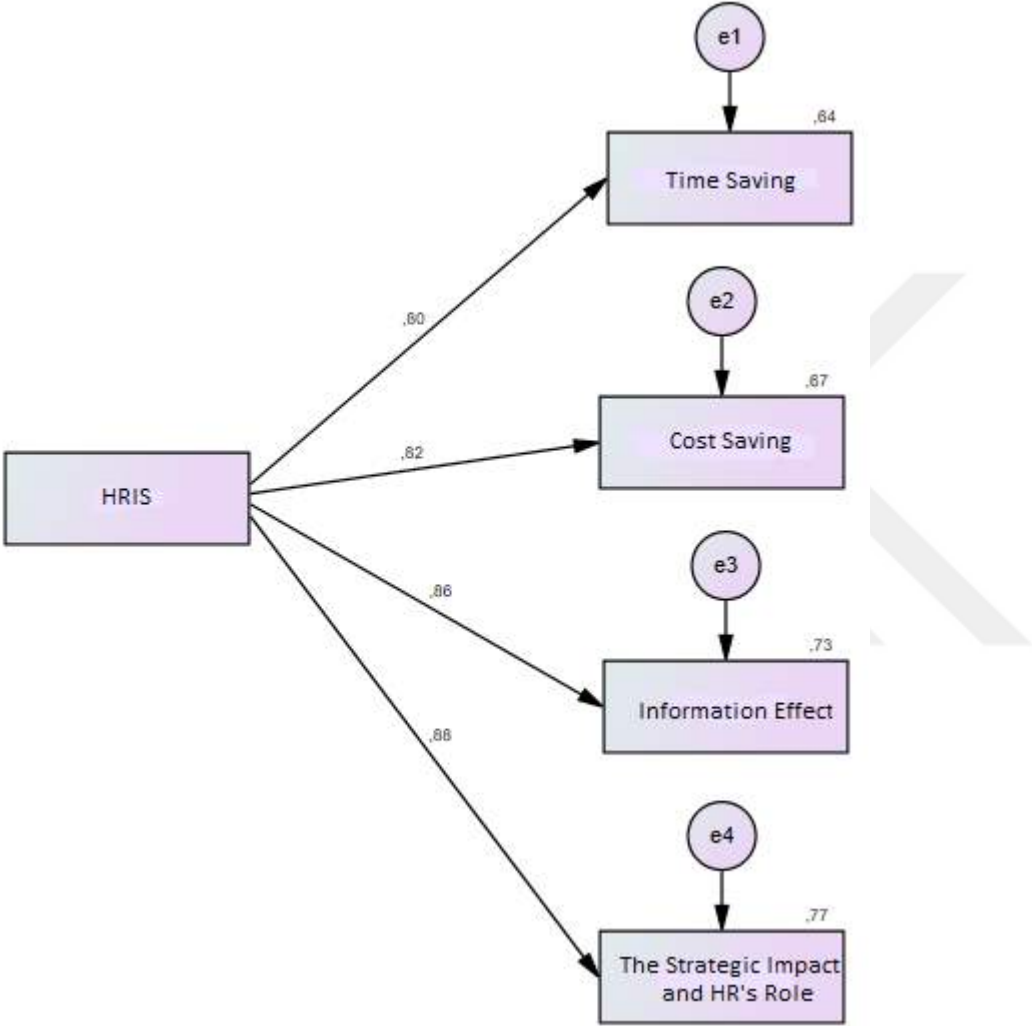
Table 4. 24. The Results of Model 1

Impact	Estimation	Standart Error	t	p
HRIS→ Time Saving	0.879	0.020	27.554	***
HRIS→ Cost Saving	0.857	0.020	20.510	***
HRIS→ Information Effect	0.801	0.025	19.704	***
HRIS→ The Strategic Impact and HR's Role	0.822	0.019	25.650	***
Fit indices: GFI: 0.941, AGFI: 0.852, CFI: 0.847, NFI: 0.838, SRMR: 0.071				

***p<0.05

The results for Model 1 are given in the Table 4.23. It is seen that HRIS has a statistically significant and positive effect on time saving (β=0.879, $p<0.05$), cost saving (β=0.857, $p<0.05$), information effect (β=0.801, $p<0.05$) and the strategic effect and HR's role (β=0.822, $p<0.05$).

Figure 4.7. 2. Model 2 – The Mediating Impact of IT Infrastructure between HRIS and dependent variables
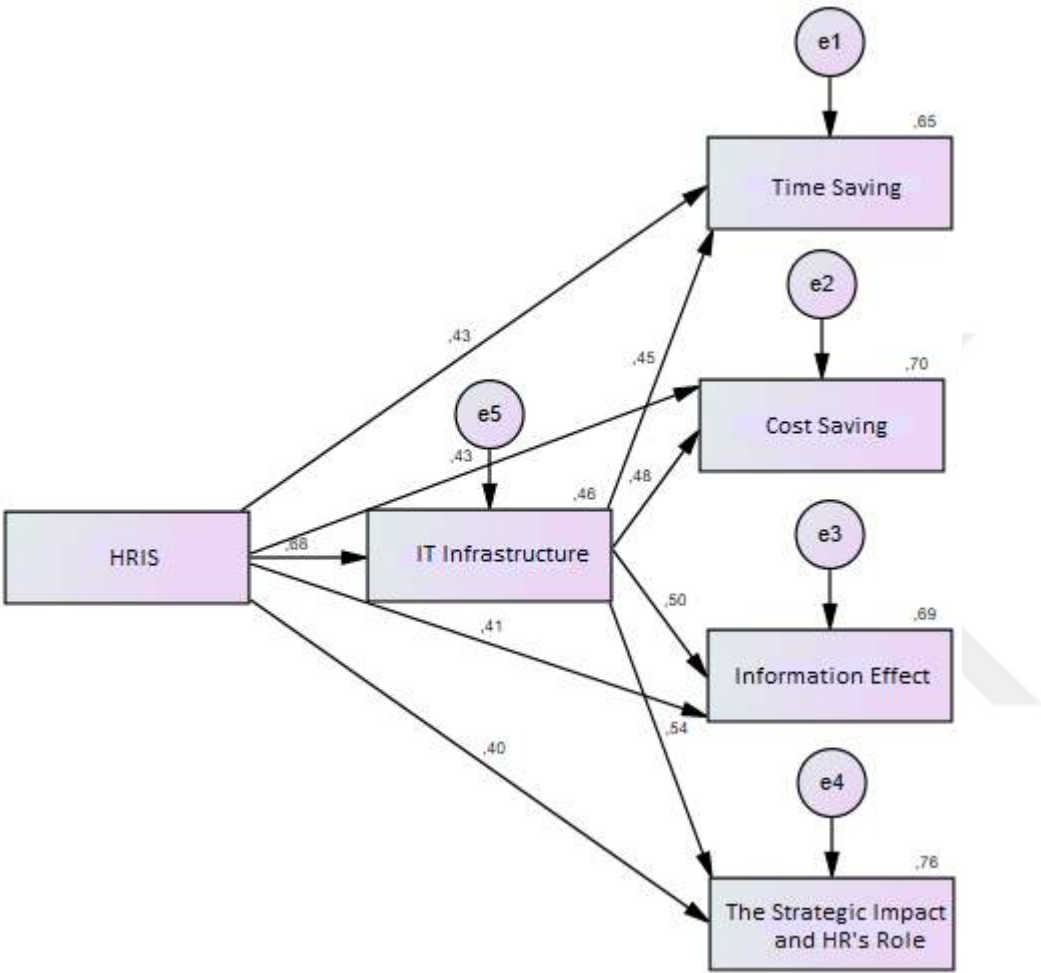
Table 4. 25. The Results of Model 2

	Impact	Estimation	Standart Error	t	p
HRIS→ Time Saving	Effect	0.879	0.020	27.554	***
	Direct Effect	0.433	0.036	7.289	***
	Indirect Effect	0.306		Confidence interval (0.182, 0.390)	
HRIS→ Cost Saving	Effect	0.857	0.020	20.510	***
	Direct Effect	0.433	0.031	8.269	***
	Indirect Effect	0.326		Confidence interval (0.205, 0.435)	
HRIS→ Information Effect	Effect	0.801	0.025	19.704	***
	Direct Efect	0.411	0.026	7.586	***
	Indirect Effect	0.338		Confidence interval (0.156, 0.441)	
HRIS→ The Strategic Impact and HR's Role	Effect	0.822	0.019	25.650	***
	Direct Effect	0.404	0.031	8.269	***
	Indirect Effect	0.371		Confidence interval (0.171, 0.488)	

Fit Indices: GFI: 0.978, AGFI: 0.923, CFI: 0.919, NFI: 0.910, SRMR: 0.052

***p<0.05

Before examining the mediating role of IT Infrastructure in Model 2, it is examined whether independent variable has an effect on the dependent variables. It is observed that independent variable HRIS has a statistically significant and positive effect on the dependent variables (p<0.05).

While the effect of the independent variable on the dependent variable is significant, it is examined whether there is a mediator role in this effect. The fact that the values in the 95% confidence interval of the obtained model do not include "0" (zero) according to the results shows that there is a mediator role in the model. All mediation roles appear to be significant. After deciding that there is an mediator role, it is examined whether the direct effect is significant in order to decide on the type of this mediator role. As a result, it is

decided that the direct effect is significant but the coefficient of effect is decreased and the mediators are partial mediators (p<0.05).

Figure 4.7. 3. Model 3 - The Mediating Impact of Top Management Support between HRIS and dependent variables

Table 4. 26. The Results of Model 3

	Impact	Estimation	Standart Error	t	p
HRIS→ Time Saving	Effect	0.879	0.020	27.554	***
	Direct Effect	0.668	0.039	10.122	***
	Indirect Effect	0.085		Confidence interval (-0.116, 0.291)	
HRIS→ Cost Saving	Effect	0.857	0.020	20.510	***
	Direct Effect	0.661	0.031	12.346	***
	Indirect Effect	0.131		Confidence interval (0.013, 0.276)	
HRIS→ Information Effect	Effect	0.801	0.025	19.704	***
	Direct Effect	0.581	0.029	9.225	***
	Indirect Effect	0.211		Confidence interval (-0.034, 0.394)	
HRIS→ The Strategic Impact and HR's Role	Effect	0.822	0.019	25.650	***
	Direct Effect	0.505	0.029	10.453	***
	Indirect Effect	0.306		Confidence interval (0.080, 0.460)	

Fit indices: GFI: 0.951, AGFI: 0.828, CFI: 0.780, NFI: 0.862, SRMR: 0.049

***p<0.05

Before examining the mediating role of Top Management Support in Model 2, it is examined whether independent variable has an effect on dependent variables. It is observed that independent variable HRIS has a statistically significant and positive effect on dependent variables (p<0.05). While the effect of the independent variable on the dependent variable is significant, it is examined whether there is a mediator role in this effect. The fact that the values in the 95% confidence interval of the obtained model do not include "0" (zero) according to the results shows that there is a mediator role in the model. It is seen that the mediating role of Top Management Support on the impact of HRIS on cost savings and the strategic impact and HR's role is significant. After deciding that there is an mediating role, it was examined whether the direct effect was significant in order to decide on the type of this mediator role. As a result, it is decided that the direct effect is significant but the coefficient of effect is decreased and the mediators are partial mediators (p<0.05).

Figure 4.7. 4. Model 4 - The Mediating Impact of Competitive between HRIS and dependent variables
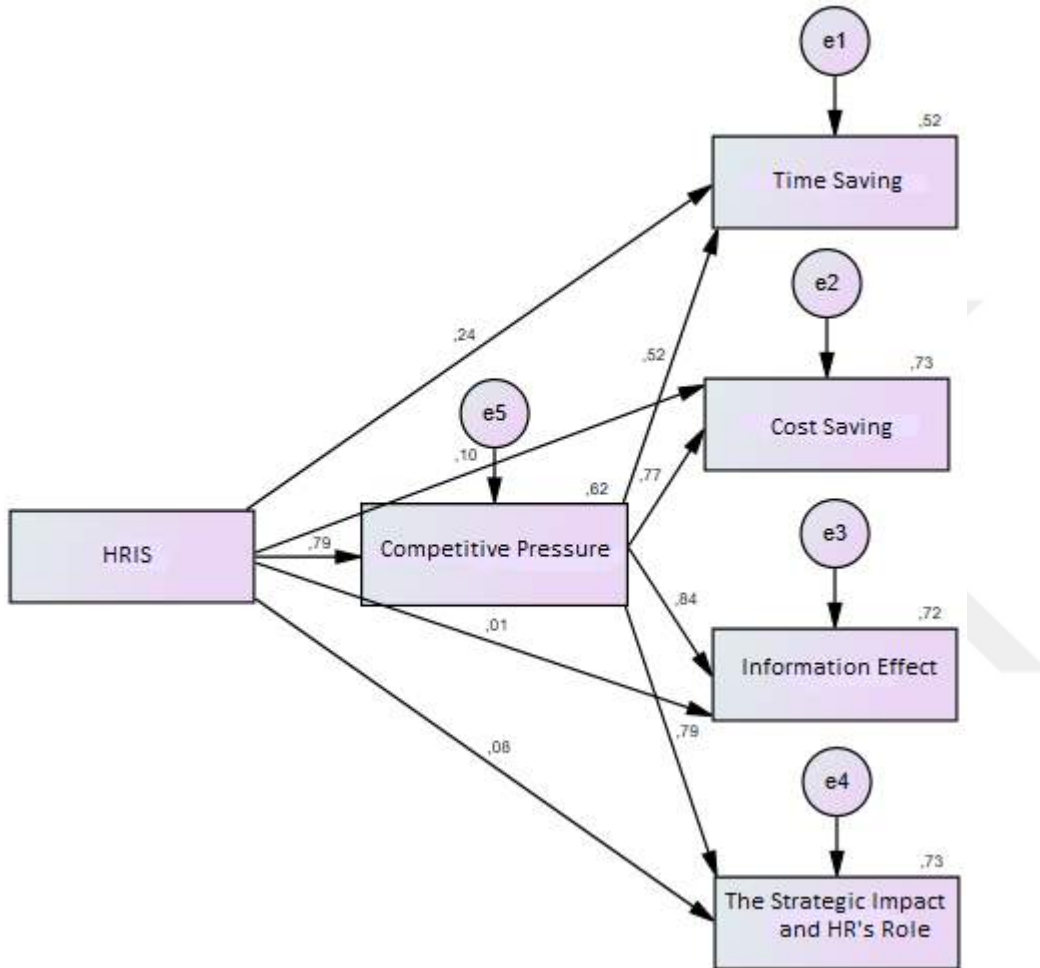
Table 4. 27. The Results of Model 4
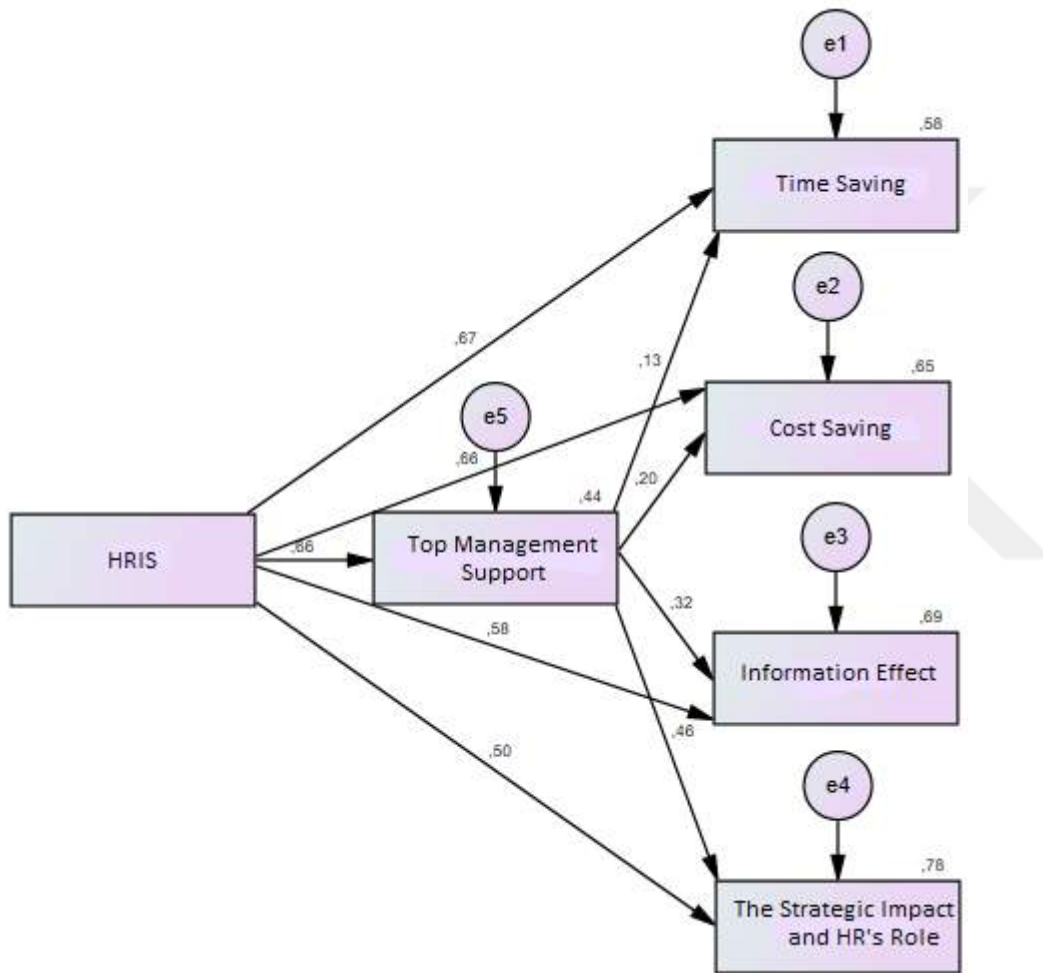
Impact		Estimation	Standart Error	t	p
HRIS→ Time Saving	Effect	0.879	0.020	27.554	***
	Direct Effect	0.235	0.060	2.236	***
	Indirect Effect	0.408	Confidence interval (0.063, 0.625)		
HRIS→ Cost Saving	Effect	0.857	0.020	20.510	***
	Direct Effect	0.105	0.045	1.417	0.156
	Indirect Effect	0.609	Confidence interval (0.321, 0.825)		
HRIS→ Information Effect	Effect	0.801	0.025	19.704	***
	Direct Effect	0.013	0.050	0.114	0.909
	Indirect Effect	0.663	Confidence interval (0.217, 0.948)		
HRIS→ The Strategic Impact and HR's Role	Effect	0.822	0.019	25.650	***
	Direct Effect	0.080	0.047	1.015	0.310
	Indirect Effect	0.624	Confidence interval (0.289, 0.884)		

Fit indices: GFI: 0.979, AGFI: 0.926, CFI: 0.962, NFI: 0.955, SRMR: 0.088

***p<0.05

Before examining the mediating role of Competitive Pressure in model, it is examined whether the independent variable has an effect on dependent variables. It is observed that independent variable HRIS has a statistically significant and positive effect on dependent variables (p<0.05). While the effect of the independent variable on the dependent variable is significant, it is examined whether there is a mediator role in this effect. The fact that the values in the 95% confidence interval of the obtained model do not include "0" (zero) according to the results shows that there is a mediator role in the model.

All mediation roles appear to be significant. After deciding that there is a mediator role, it is examined whether the direct effect is significant in order to decide on the type of this mediator role. As a result, it is decided that if the direct effect is significant but the coefficient of effect is decreased, it is partial mediator ($p<0.05$), and when the significance is lost, it is full mediator ($p>0.05$).

Figure 4.7. 5. Model 5 - The Mediating Impact of Internalization between HRIS and dependent variables
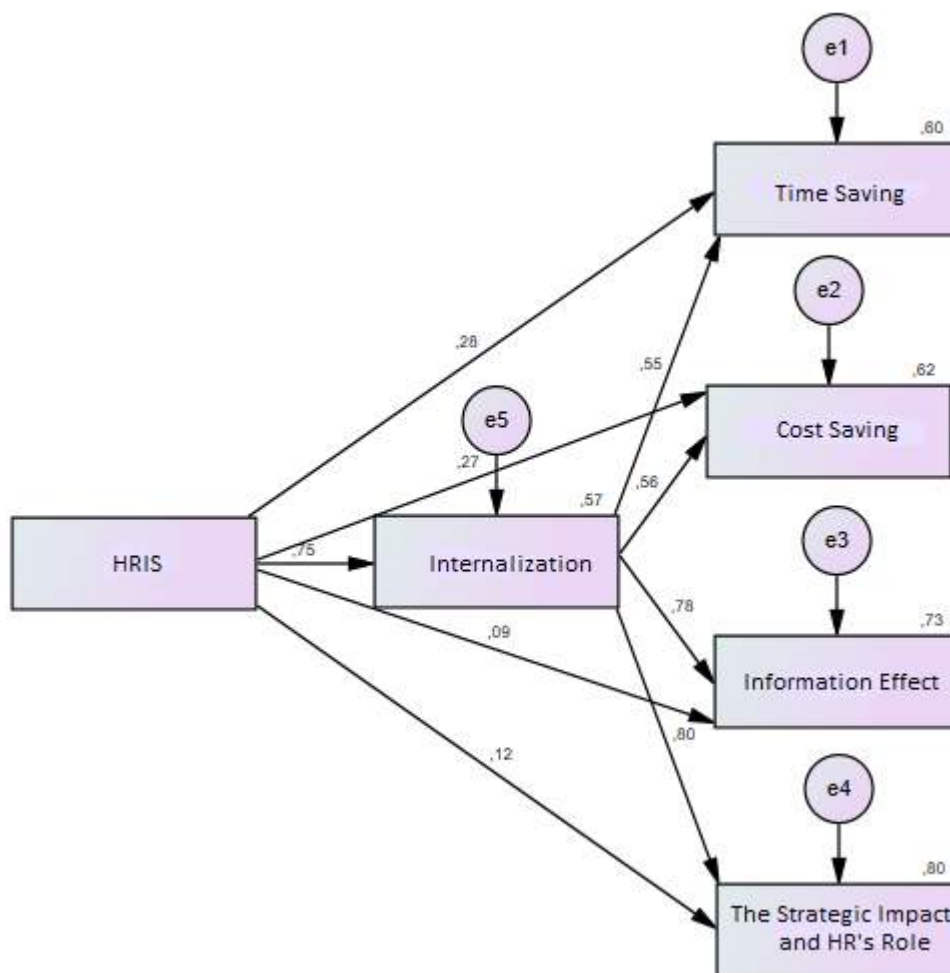
Table 4. 28. The Results of Model 5

	Impact	Estimation	Standart Error	t	p
HRIS→ Time Saving	Effect	0.879	0.020	27.554	***
	Direct Effect	0.276	0.047	3.543	***
	Indirect Effect	0.410	Confidence interval (0.268, 0.591)		
HRIS→ Cost Saving	Effect	0.857	0.020	20.510	***
	Direct Effect	0.275	0.045	3.611	***
	Indirect Effect	0.420	Confidence interval (0.264, 0.651)		
HRIS→ Information Effect	Effect	0.801	0.025	19.704	***
	Direct Effect	0.094	0.042	1.131	0.258
	Indirect Effect	0.587	Confidence interval (0.412, 0.834)		
HRIS→ The Strategic Impact and HR's Role	Effect	0.822	0.019	25.650	***
	Direct Effect	0.118	0.049	1.475	0.140
	Indirect Effect	0.602	Confidence interval (0.432, 0.893)		

Fit indices: GFI: 0.965, AGFI: 0.877, CFI: 0.919, NFI: 0.911, SRMR: 0.098

***p<0.05

Before examining the mediating role of Internalization in Model 5, it is examined whether independent variable has an effect on dependent variables. It is observed that independent variable HRIS has a statistically significant and positive effect on dependent variables (p<0.05). While the effect of independent variable on the dependent variable is significant, it is examined whether there is a mediator role in this effect. The fact that the values in the 95% confidence interval of the obtained model do not include "0" (zero) according to the results shows that there is a mediator role in the model.

All mediation roles appear to be significant. After deciding that there is an mediatory role, it is examined whether the direct effect is significant in order to decide on the type of this mediator role. As a result, it is decided that if the direct effect is significant but the

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coefficient of effect is decreased, it is partial mediator (p<0.05), and when the significance is lost, it is a full mediator (p>0.05).

**Figure 4.7. 6. Model 6 - The Mediating Impact of Exploitation between HRIS and dependent variables**
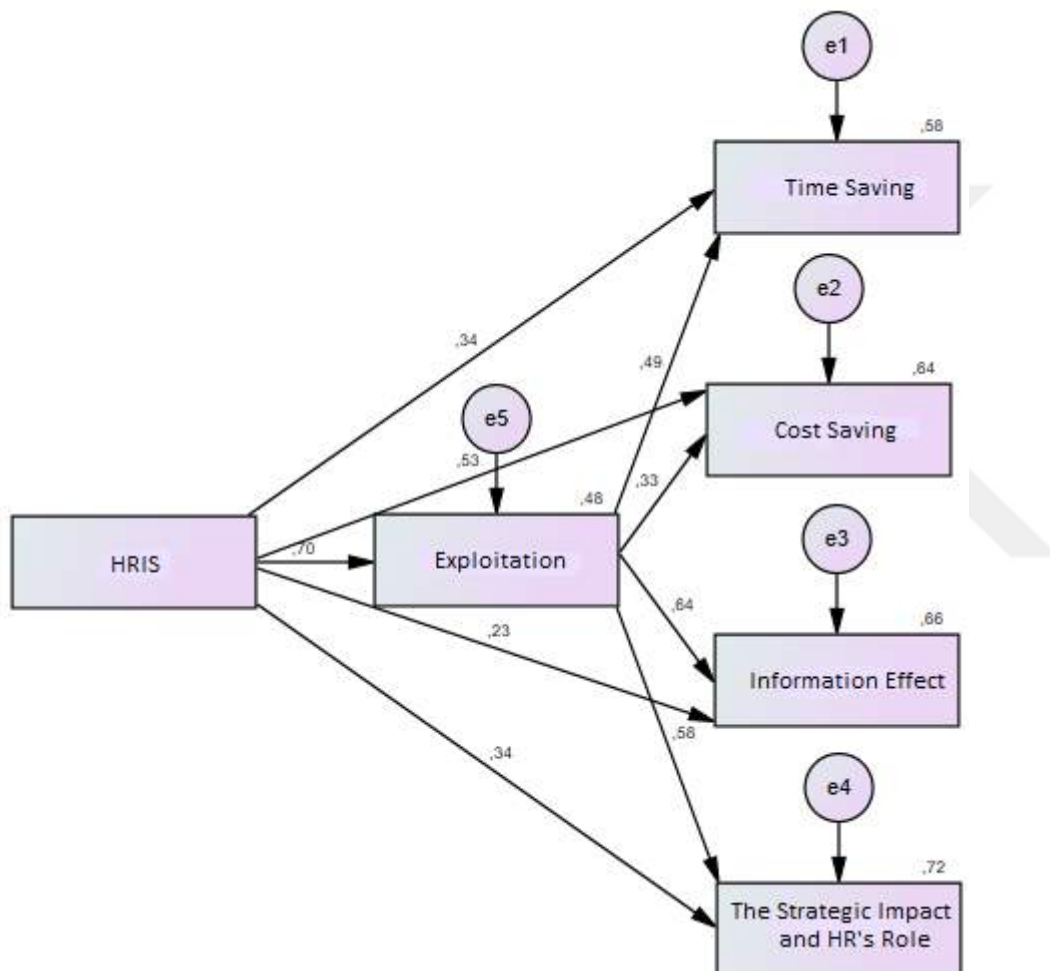
Table 4. 29. The Results of Model 6

	Impact	Estimation	Standart Error	t	p
HRIS→ Time Saving	Effect	0.879	0.020	27.554	***
	Direct Effect	0.338	0.043	4.655	***
	Indirect Effect	0.339	Confidence interval (0.186, 0.453)		
HRIS→ Cost Saving	Effect	0.857	0.020	20.510	***
	Direct Effect	0.535	0.032	10.353	***
	Indirect Effect	0.232	Confidence interval (0.153, 0.348)		
HRIS→ Information Effect	Effect	0.801	0.025	19.704	***
	Direct Effect	0.229	0.034	3.217	***
	Indirect Effect	0.443	Confidence interval (0.219, 0.612)		
HRIS→ The Strategic Impact and HR'Role	Effect	0.822	0.019	25.650	***
	Direct Effect	0.339	0.033	6.354	***
	Indirect Effect	0.402	Confidence interval (0.225, 0.530)		

Fit indices: GFI: 0.976, AGFI: 0.915, CFI: 0.947, NFI: 0.940, SRMR: 0.058

***p<0.05

Before examining the mediating role of exploitation in model 6, it is examined whether independent variable has an effect on dependent variable. It is observed that independent variable HRIS has a statistically significant and positive effect on dependent variables (p<0.05). As the effect of the independent variable on the dependent variable is significant, it is examined whether there is a mediator role in this effect. Since the values in the 95% confidence interval of the obtained model do not include "0" (zero), the results shows that there is a mediator role in the model. Then, all mediation roles appear to be significant. After deciding that there is an mediatıry role, it is examined whether the direct effect is significant in order to decide on the type of this mediator role. As a result, it is decided that the direct effect is significant but the coefficient of effect decreased and the mediators are partial mediators (p<0.05).

Figure 4.7. 7. Model 7 - The Overall Model
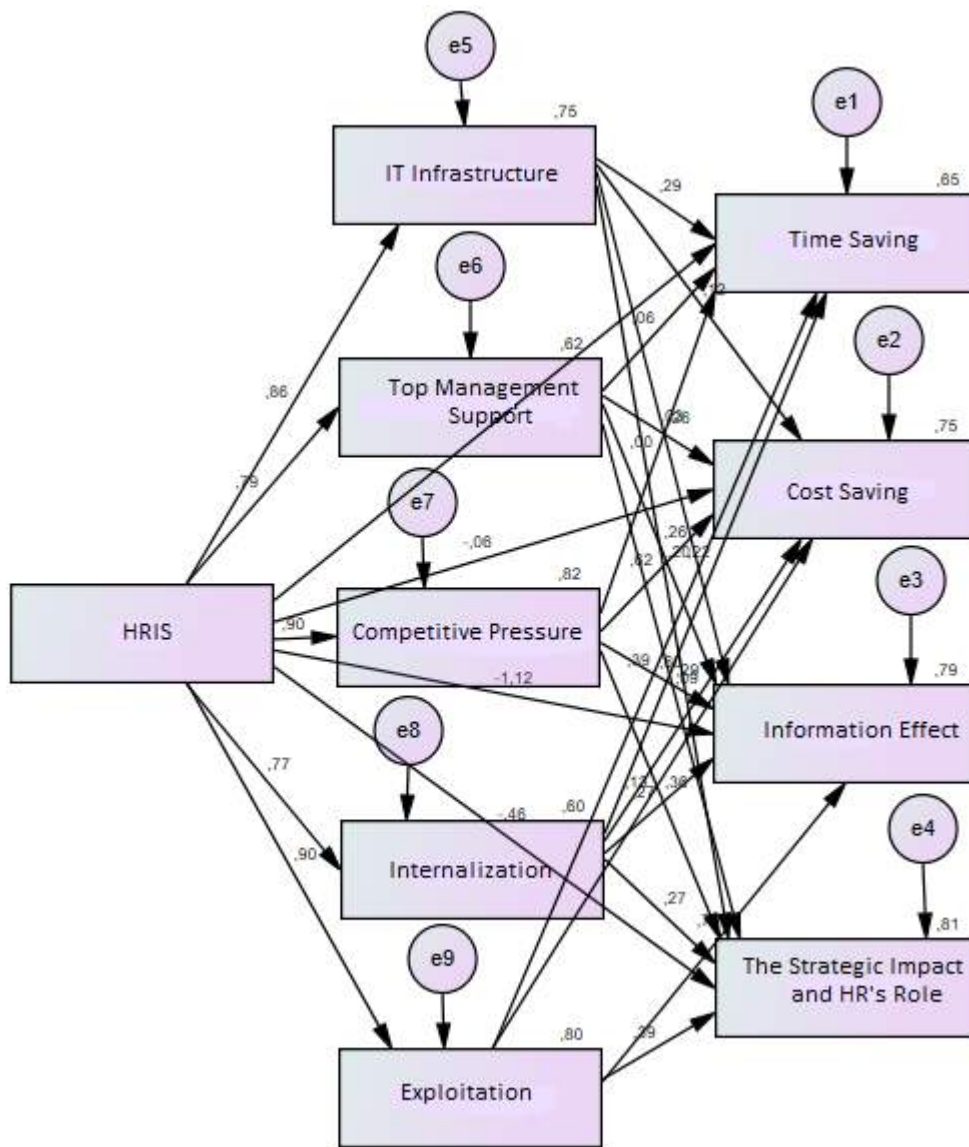
Table 4. 30. The Results of Model 7

Impact	Estimation	Standart Error	t	p
HRIS→Time Saving	-0.052	0.185	-0.182	0.855
HRIS→Cost Saving	-0.060	0.144	-0.280	0.779
HRIS→Information Effect	-0.772	0.150	-3.848	***
HRIS→ The Strategic Impact and HR'Role	-0.460	0.133	-2.325	***
HRIS→IT Infrastructure	0.865	0.015	27.162	***
HRIS→ Top Management Support	0.790	0.013	21.945	***
HRIS→Competitive Pressure	0.904	0.025	27.663	***
HRIS→Internalization	0.772	0.030	20.751	***
HRIS→Exploitation	0.897	0.018	26.626	***
IT Infrastructure →Time Saving	0.287	0.149	2.633	***
IT Infrastructure →Cost Saving	0.123	0.105	1.655	0.098
IT Infrastructure → Information Effect	0.262	0.113	2.510	***
IT Infrastructure → The Strategic Impact and HR'Role	0.201	0.113	2.518	***
Top Management Support → Time Saving	0.059	0.183	0.594	0.552
Top Management Support → Cost Saving	0.034	0.118	0.538	0.590
Top Management Support → Information Effect	0.256	0.113	3.273	***
Top Management Support → The Strategic Impact and HR'Role	0.294	0.123	4.513	***
Competitive Pressure → Time Saving	-0.005	0.113	-0.034	0.973
Competitive Pressure → Cost Saving	0.620	0.106	5.108	***
Competitive Pressure → Information Effect	0.596	0.123	3.243	***

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Competitive Pressure → The Strategic Impact and HR'Role	0.356	0.094	3.313	***
Internalization → Time Saving	0.224	0.053	3.451	***
Internalization → Cost Saving	0.094	0.041	1.909	0.056
Internalization → Information Effect	0.266	0.046	3.726	***
Internalization → The Strategic Impact and HR'Role	0.266	0.049	4.550	***
Exploitation → Time Saving	0.391	0.135	3.596	***
Exploitation → Cost Saving	0.126	0.122	1.323	0.186
Exploitation → Information Effect	0.765	0.133	5.639	***
Exploitation → The Strategic Impact and HR'Role	0.393	0.112	4.508	***

Fit indices: GFI: 0.963, AGFI: 0.873, CFI: 0.895, NFI: 0.887, SRMR: 0.096

***$p < 0.05$

4.8. Correlation Analysis

The relationship between the scales are tested by Pearson Correlation. According to the results, firstly there is a statistically significant and positive relationship between HRIS and IT infrastructure ($r = 0.692$, $p < 0.05$), between HRIS and top management support ($r = 0.607$, $p < 0.05$), between HRIS and competitive pressure ($r = 0.665$, $p < 0.05$), between HRIS and internalization ($r = 0.583$, $p < 0.05$), between HRIS and exploitation ($r = 0.647$, $p < 0.05$), between HRIS and time savings ($r = 0.695$, $p < 0.05$), between HRIS and cost savings ($r = 0.706$, $p < 0.05$), between HRIS and information effect ($r = 0.697$, $p < 0.05$) and between HRIS and the strategic impact and HR's role ($r = 0.738$, $p < 0.05$).

Table 4. 31. The Correlation Analysis of the Scales

	1	2	3	4	5	6	7	8	9	10
1- HRIS	1.000	0.692	0.607	0.665	0.583	0.647	0.695	0.706	0.697	0.738
p	-	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
2- IT Infrastructure		1.000	0.608	0.656	0.619	0.736	0.663	0.672	0.669	0.715
p		-	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
3- Top Management Support			1.000	0.635	0.560	0.657	0.556	0.605	0.629	0.729
p			-	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
4- Competitive Pressure				1.000	0.650	0.669	0.510	0.790	0.617	0.700
p				-	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
5- Internalization					1.000	0.645	0.561	0.618	0.578	0.663
p					-	0.000*	0.000*	0.000*	0.000*	0.000*
6- Exploitation						1.000	0.628	0.646	0.658	0.700
p						-	0.000*	0.000*	0.000*	0.000*
7- Time Saving							1.000	0.609	0.696	0.698
p							-	0.000*	0.000*	0.000*
8- Cost Saving								1.000	0.651	0.726
p								-	0.000*	0.000*
9- Information Effect									1.000	0.774
p									-	0.000*
10- The Strategic Impact and HR'Role										1.000
p										-

*p<0.05

Secondly, there is a statistically significant and positive relationship between IT infrastructure and top management support (r=0.608, p<0.05), between IT infrastructure and competitive pressure (r=0.656, p<0.05), between IT infrastructure and internalization (r=0.619, p<0.05), between IT infrastructure and exploitation (r=0.736, p<0.05), between IT infrastructure and time saving (r=0.663, p<0.05), between IT infrastructure and cost saving (r=0.672, p<0.05), between IT infrastructure and information effect (r=0.669, p<0.05), between IT infrastructure and the strategic impct and HR's role (r=0.715, p<0.05).

Thirdly, there is a statistically significant and positive relationship between top management support and competitive pressure (r=0.635, p<0.05), between top management support and internalization (r=0.560, p<0.05), between top management support and exploitation (r=0.657, p<0.05), between top management support and time saving (r=0.556, p<0.05), between top management support and cost saving (r=0.605, p<0.05), between top management support and information effect (r=0.629, p<0.05), and between top management support and the strategic impact and HR's role (r=0.729, p<0.05).

Forthly, there is a statistically significant and positive relationship between competitive pressure and internalization (r=0.650, p<0.05), between competitive pressure and exploitation (r=0.669, p<0.05), between competitive pressure and time saving (r=0.510, p<0.05), between competitive pressure and cost saving (r=0.790, p<0.05), between competitive pressure and information effect (r=0.617, p<0.05), and between competitive pressure and the strategic impact and HR's role (r=0.700, p<0.05).

Fifthly, there is a statistically significant and positive relationship between internalization and exploitation (r=0.645, p<0.05), between internalization and time saving (r=0.561, p<0.05), between internalization and cost saving (r=0.618, p<0.05), between internalization and information effect (r=0.578, p<0.05), and between internalization and the strategic impact and HR's role (r=0.663, p<0.05).

Fifthly, there is a statistically significant and positive relationship between exploitation and time saving (r=0.628, p<0.05), between exploitation and cost saving (r=0.646,

p<0.05), between exploitation and information effect (r=0.658, p<0.05), and between exploitation and the strategic impact and HR's role (r=0.700, p<0.05).

Additionally, there is a statistically significant and positive relationship between time saving and cost saving (r=0.609, p<0.05), between time saving and information effect (r=0.696, p<0.05), and between time saving and the strategic impact and HR's role (r=0.698, p<0.05).

Finally, here is a statistically significant and positive relationship between cost saving and information effect (r=0.651, p<0.05), between cost saving and the strategic impact and HR's role (r=0.726, p<0.05), and also between information effect and the strategic impact and HR's role (r=0.774, p<0.05).

4.9. Convergent Validity

Convergent validity is measured to test the degree of agreement between the measurements of the constructs of the research model (Hair et al., 2010). According to psychometric literature, the indicators of convergent validity are composite reliability index (CR value), factor loadings and average variance extracted (AVE) values. In order to ensure convergent validity, composite reliability value should be greater than average variance explained value (CR>AVE) and average variance explained (AVE) value should be greater than 0.5 (AVE>0.5 (Yaslioglu, 2017). In addition, the factor loads belonging to the scale should be greater than 0.5 (Costa et al., 2019).

When convergent validity of the study is evaluated, it is seen that CR values are greater than AVE values and also above 0.70. Like Cronbach Alpha, a CR above 0.70 provides additional empirical evidence for the reliability of the scale (Raykov, 1998). Further, it is found that all factor loadings are greater than 0.5. Based on the research findings, it can be stated that there is appropriate convergence within research model and convergent validity is achieved.

Table 4. 32. Convergent Validity

	Items	Factor Loadings	AVE	CR
HRIS	HRIS1	0.600	0.51	0.86
	HRIS2	0.627		
	HRIS3	0.676		
	HRIS4	0.699		
	HRIS5	0.741		
	HRIS6	0.686		
	HRIS8	0.766		
	HRIS9	0.770		
	HRIS10	0.710		
IT Infrastructure	IT1	0.843	0.81	0.95
	IT2	0.973		
	IT3	0.872		
	IT4	0.911		
Top Management Support	TMS1	0.839	0.70	0.87
	TMS2	0.762		
	TMS3	0.902		
Competitive Pressure	CP1	0.991	0.76	0.90
	CP2	0.954		
	CP3	0.626		
Internalization	I1	0.724	0.52	0.86
	I2	0.545		
	I3	0.770		
	I4	0.837		
	I5	0.857		
	I6	0.505		
Exploitation	E1	0.834	0.65	0.88
	E2	0.708		
	E3	0.699		
	E4	0.752		
Time Saving	ZT2	0.622	0.57	0.89
	ZT3	0.751		
	ZT4	0.757		
	ZT5	0.782		
	ZT6	0.797		
	ZT7	0.790		
Cost Saving	MT1	0.686	0.61	0.82
	MT2	0.970		
	MT3	0.656		

	BE1	0.519		
Information	BE2	0.762	0.50	0.80
Effect	BE3	0.827		
	BE4	0.688		
	SE1	0.734		
The Strategic	SE2	0.778		
Impact and	SE3	0.794	0.61	0.89
HR'Role	SE4	0.844		
	SE5	0.753		

4.10. Discriminant Validity

In order to provide an appropriate discriminant validity, average variance extracted (AVE) should be greater than the variance shared by the construct and other constructs that refers to the squared correlation between two constructs. Discriminant validity can be measured by the square root of the average variance extracted (AVE) values of each construct. As diagonal values (values in bold) represent the square root of the variance shared between the constructs and their measures concerning the amount attributable to measurement error (AVE), off-diagonal values are the correlations across constructs. It is recommended that the square root of AVE in any sub-dimension should not be less than the correlation between that sub-dimension and the other sub-dimension, and at the same time not less than 0.50 (Fornel & Larcker, 1981; Kianto et al., 2017). In this study, the diagonal elements are greater than the off-diagonal elements in the corresponding rows and columns, indicating appropriate discriminant validity. As can be seen in Table 4.32., only the value of the strategic impact and HR's role (0.738) is slightly higher than the value of HRIS (0.714) and the value of information effect (0.774), which can be tolerated. Based on the research findings, it can be stated that discriminant validity is ensured.

Table 4. 33. Discriminant Validity (The Square Root of AVE Values)

	1	2	3	4	5	6	7	8	9	10
1- HRIS	0.714									
2- IT Infrastructure	0.692	0.900								
3- Top Management Support	0.607	0.608	0.837							
4- Competitive Pressure	0.665	0.656	0.635	0.872						
5- Internalization	0.583	0.619	0.560	0.650	0.721					
6- Exploitation	0.647	0.736	0.657	0.669	0.645	0.806				
7- Time Saving	0.659	0.663	0.556	0.510	0.561	0.628	0.755			
8- Cost Saving	0.706	0.672	0.605	0.790	0.618	0.646	0.609	0.781		
9- Information Effect	0.697	0.669	0.629	0.617	0.578	0.658	0.696	0.651	0.707	
10- The Strategic Impact and HR'Role	0.738	0.715	0.729	0.700	0.663	0.700	0.698	0.726	0.774	0.781

4.11. The Evaluation of Quantitative Analysis

The results of SEM analysis can be interpreted in the light of the criteria that represent "Goodness of Fit Indices and Threshold Values in SEM" taken place in the table below.

Table 4. 34. Generally Accepted Goodness of Fit Criteria

Goodness of Fit Criteria	Perfect Fit Criteria	Acceptable Fit Criteria	Resources
CMIN / Df	$0 \leq X2/df \leq 3$	$3 \leq X2/df \leq 5$	Meydan & Sesen, 2015:37; Simon et al., 2010: 234-243
GFI	$\geq 0,90$	$\geq 0,80$	Simon et al., 2010: 234-243
AGFI	$0,95 \leq AGFI \leq 1,00$	$0,85 \leq AGFI \leq 0,95$	Shevlin et al.,2000:181-185; Simon et al., 2010:234-243
CFI	$0,90 \leq CFI \leq 1,00$	$0,80 \leq CFI \leq 0,90$	Dehon et al., 2005: 799-810
NFI	$\geq 0,90$	$\geq 0,80$	Hooper at al., 2008:53-60; Hu & Bentler, 1999:1-55; Simon et al., 2010:234-243
RMSEA	$0 \leq RMSEA \leq 0,05$	$0,05 \leq RMSEA \leq 0,08$	Simon et al., 2010: 234-243
SRMR	$0 \leq SRMR \leq 0,05$	$0,05 \leq SRMR \leq 0,10$	Schermelleh-Engel et al., 2003: 23-74

The "model fit" is evaluated according to frequently used fit indices sufficient to explain the model (Hair et al., 2010). "Chi-Square Fit Test" is the classical measure of goodness of fit and used to evaluate the suitability of SEM (Meydan & Sesen, 2015:37; Simon et al., 2010: 234-243). As an alternative to Chi-Square, GFI shows to what extent the model measures the covariance matrix in the sample and it is similar to R^2 in multiple regression. AGFI is a modified variant of GFI for the number of parameter estimates (Shevlin et al.,2000:181-185; Simon et al., 2010:234-243). "Comparative Fit Index" (CFI) is sensitive to the number of samples (Dehon et al., 2005: 799-810), but less affected by the small size of the sample than NFI (normed fit index). RMSEA (root mean square error of approximation) means the minimum error between observed and produced matrices (Simon et al., 2010: 234-243). SRMR is the standardized version of RMR (root mean

square residual) and its value is the difference between the mean variance or covariance of the sample and the population (Schermelleh-Engel et al., 2003: 23-74).

4.11.1. The Results of Hypotheses

H1: The use of HRIS has a positive impact on HRM.

HRIS is measured with nine items that make up the scale and related to the one-dimension scale structure (χ^2: 57.513, df:25, p:0.000). According to goodness of fit indices results of HRIS (Table 4.6), χ^2/df is 2.301 ($\leq$ 5), RMSEA is 0.054 ($\leq$ 0,08), GFI is 0.962 ($\geq$ 0,80), AGFI is 0.932 ($\geq$ 0,80), CFI is 0.920 is 0.920 ($\geq$ 0,80), NFI is 0.870 ($\geq$ 0,80) and SRMR is 0.079 ($\leq$ 0,10).

When the overall goodness of fit indices results are examined (Table 4.29.), it is seen that GFI is 0.941 ($\geq$ 0,90), AGFI is 0.852 ($\geq$ 0,85), CFI is 0.847 ($\geq$ 0,80), NFI is 0.838 ($\geq$ 0,80), and SRMR is 0.071 ($\geq$ 0,05).

H1a: The factor structure of time saving is optimal predictor.

H1b: The factor structure of cost saving is optimal predictor.

H1c: The factor structure of information effect is optimal predictor.

H1d: The factor structure of the strategic impact and HR's role is optimal predictor.

According to the results of overall model – model 7 (Table 4.29.), the factor structure of information effect and the factor structure of the strategic impact and HR's role have accepted values (p<0.05). But, p values of the impact of HRIS on time saving and cost saving are slightly higher (0.855, 0.779). However, when model 1 presenting the impact of HRIS on dependent variables are evaluated, it is seen that HRIS has a statistically significant and positive effect on time saving (β=0.879, p<0.05), cost saving (β=0.857, p<0.05), information effect (β=0.801, p<0.05) and the strategic effect and HR's role (β=0.822, p<0.05). When the results of both models (model 1 – Table 4.23. and model 7 - Table 4.29.) are taken into consideration, the sub-hypothesis H1a, H1b, H1c and H1d can be supported and therefore, H1 can be accepted.

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H2: The impact of HRIS on HRM is mediated by IT Infrastructure.

IT infrastructure is measured with four items that make up the scale and related to the one-dimension scale structure ($\chi2$: 1.760, df:1, p:0.000). According to goodness of fit indices results of IT infrastructure (Table 4.9.), $\chi2$/df is 1.760 ($\leq$ 5), RMSEA is 0.041 ($\leq$ 0,08), GFI is 0.999 ($\geq$ 0,80), AGFI is 0.991 ($\geq$ 0,80), CFI is 0.999 ($\geq$ 0,80), NFI is 0.999 ($\geq$ 0,80) and SRMR is 0.014 ($\leq$ 0,10). When the goodness of fit indices results of model 2 are examined (Table 4.24.), it is seen that GFI is 0.978 ($\geq$ 0,90), AGFI is 0.923 ($\geq$ 0,85), CFI is 0.919 ($\geq$ 0,80), NFI is 0.910 ($\geq$ 0,80), and SRMR is 0.052 ($\geq$ 0,05). According to the results of model 2 (Table 4.24.), the mediatior role of IT infrastrcuture appears to be significant. As a result, it is decided that the direct effect is significant but the coefficient of effect is decreased and the mediators are partial mediators (p<0.05).

The results of overall model – model 7 (Table 4.29.) is also considered for the evaluation of H2. The mediator role of IT infrastructure between HRIS and time saving, between HRIS and information effect and between HRIS and the strategic impact and HR's role can be accepted (p<0.05). However, p value for the the mediator role of IT infrasrtucture between HRIS and cost saving is slightly higher (0.098). When the results of both models (model 2 – Table 4.24. and model 7 - Table 4.29.) are taken into consideration, it can be inferred that IT infrastructure act as a partial mediator between HRIS and dependent variables, so H2 can be accepted.

H3: The impact of HRIS on HRM is mediated by top management support.

Top management support is measured with three items that make up the scale and related to the one-dimension scale structure. Due to being three-item scale, a separate goodness of fit analysis could not be performed for this scale. However, when the goodness of fit indices results of model 3 are examined (Table 4.25.), it is seen that GFI is 0.951 ($\geq$ 0,90), AGFI is 0.828 ($\geq$ 0,85), CFI is 0.780 ($\geq$ 0,80), NFI is 0.862 ($\geq$ 0,80), and SRMR is 0.049 ($\geq$ 0,05). Among these indices, AGFI, CFI, and SRMR are slightly less but still almost equal to threshold value. According to the results of model 3 (Table 4.25.), the mediatior role of top management support appears to be significant. As a result, it is decided that the

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direct effect is significant but the coefficient of effect is decreased and the mediators are partial mediators ($p<0.05$).

The results of overall model – model 7 (Table 4.29.) is also considered for the evaluation of H3. The mediator role of top management support between HRIS and information effect and between HRIS and the strategic impact and HR's role can be accepted ($p<0.05$). However, p value for the the mediator role of top management support between HRIS and time saving and between HRIS and cost saving are slightly higher (0.552, 0.590). When the results of both models (model 3 – Table 4.25. and model 7 - Table 4.29.) are taken into consideration, it can be inferred that top management support act as a partial mediator between HRIS and dependent variables, so H3 can be accepted.

H4: The impact of HRIS on HRM is mediated by competitive pressure.

Competitive pressure is measured with three items that make up the scale and related to the one-dimension scale structure. Due to being three-item scale, a separate goodness of fit analysis could not be performed for this scale. However, when the goodness of fit indices results of model 4 are examined (Table 4.26.), it is seen that GFI is 0.979 ($\geq 0,90$), AGFI is 0.926 ($\geq 0,85$), CFI is 0.962 ($\geq 0,80$), NFI is 0.955 ($\geq 0,80$), and SRMR is 0.088 ($\geq 0,05$). According to the results of model 4 (Table 4.26.), the mediatior role of competitive pressure appears to be significant. As a result, it is decided that if the direct effect is significant but the coefficient of effect is decreased, it is partial mediator ($p<0.05$), and when the significance is lost, it is full mediator ($p>0.05$).

The results of overall model – model 7 (Table 4.29.) is also considered for the evaluation of H4. The mediator role of competitive pressure between HRIS and cost saving, between HRIS and information effect and between HRIS and the strategic impact and HR's role can be accepted ($p<0.05$). However, p value for the the mediator role of competitive pressure on the relationship between HRIS and time saving is slightly higher (0.909). When the results of both models (model 4 – Table 4.26. and model 7 - Table 4.29.) are taken into consideration, it can be inferred that competitive pressure act as a partial mediator between HRIS and dependent variables, so H4 can be accepted.

H5: The impact of HRIS on HRM is mediated by internalization.

Internalization is measured with six items that make up the scale and related to the one-dimension scale structure (χ2: 31.659, df: 9, p: 0.000). According to goodness of fit indices results of internalization structure χ2/df is 3.518 ($\leq$ 5), RMSEA is 0.075 ($\leq$ 0,08), GFI is 0.977 ($\geq$ 0,80), AGFI is 0.946 ($\geq$ 0,80), CFI is 0.981 ($\geq$ 0,80), NFI is 0.973 ($\geq$ 0,80) and SRMR is 0.026 ($\leq$ 0,10). According to the results of model 5 (Table 4.27.), the mediatior role of internalization appears to be significant. As a result, it is decided that if the direct effect is significant but the coefficient of effect is decreased, it is partial mediator (p<0.05), and when the significance is lost, it is a full mediator (p>0.05).

The results of overall model – model 7 (Table 4.29.) is also considered for the evaluation of H5. The mediator role of internalization between HRIS and time saving, between HRIS and information effect and between HRIS and the strategic impact and HR's role can be accepted (p<0.05). However, p value for the the mediator role of internalization on the relationship between HRIS and cost saving is slightly higher (0.056). When the results of both models (model 5 – Table 4.27. and model 7 - Table 4.29.) are taken into consideration, it can be inferred that internalization is a partial mediator between HRIS and dependent variables, so H5 can be accepted.

H6: The impact of HRIS on HRM is mediated by exploitation.

Exploitation is measured with seven items that make up the scale are related to the two-dimensional scale structure (χ2: 1.105, df: 1, p: 0.000). According to goodness of fit indices results of technology structure χ2/df is 1.10 ($\leq$ 5), RMSEA is 0.015 ($\cong$ 0,08), GFI is 0.999 ($\geq$ 0,80), AGFI is 0.994 ($\geq$ 0,80), CFI is 0.999 ($\geq$ 0,80), NFI is 0.997 ($\geq$ 0,80) and SRMR is 0.011 ($\leq$ 0,10).

According to the results of model 6 (Table 4.28.), the mediatior role of exploitation appears to be significant. As a result, it is decided that the direct effect is significant but the coefficient of effect decreased and the mediators are partial mediators (p<0.05).

Table 4. 35. Summary of Results of the Hypotheses Tested

	Hypotheses	Result
H1	The use of HRIS (human resource information system) has a positive impact on HRM (human resources management). H1a - The factor structure of time saving is optimal predictor. H1b - The factor structure of cost saving is optimal predictor. H1c - The factor structure of information effect is optimal predictor. H1d - The factor structure of the strategic impact and HR's role is optimal predictor.	**Accepted**
H2	The impact of HRIS (human resource information system) on HRM (human resources management) is mediated by IT infrastructure.	**Accepted**
H3	The impact of HRIS (human resource information system) on HRM (human resources management) is mediated by top management support.	**Accepted**
H4	The impact of HRIS (human resource information system) on HRM (human resources management) is mediated by competitive pressure.	**Accepted**
H5	The impact of HRIS (human resource information system) on HRM (human resources management) is mediated by internalization.	**Accepted**
H6	The impact of HRIS (human resource information system) on HRM (human resources management) is mediated by exploitation.	**Accepted**

The results of overall model – model 7 (Table 4.29.) is also considered for the evaluation of H6. The mediator role of exploitation between HRIS and time saving, between HRIS and information effect and between HRIS and the strategic impact and HR's role can be accepted (p<0.05). However, p value for the the mediator role of exploitation on the relationship between HRIS and cost saving is slightly higher (0.186). When the results of both models (model 6 – Table 4.28. and model 7 - Table 4.29.) are taken into consideration, it can be inferred that exploitation act as a partial mediator between HRIS and dependent variables. Therefore, H6 can be accepted.

4.11.2. Discussion of the Results

As a result the analysis, all hypotheses of this study are supported. It is seen that the impact of human resources information systems (HRIS) on human resources management (HRM) is experienced as time saving, cost saving, information effect, and the strategic impact and HR's role through being mediated by IT infrastructure, top management support, competitive pressure, internalization and exploitation. Based on the results of hypotheses, the findings can be compared with previous studies in terms of consistencies and discrepancies.

In terms of HRM functions, the impact of human resources information system (HRIS) cannot be observed in "recruitment and selection", since HRIS7 - "We use HRIS for recruitment & selection processes" is extracted. Thus, the impact of HRIS can be experienced in all HR functions taken place in our scale but except for recruitment.

With respect to time saving scale, TS1 - "Our HRIS has decreased the time spent on recruiting and improved recruiting" is also extracted. It can be interpreted that HRIS is not able to reduce time spent on recruitment which statement is supported by the study of Beadles et al. (2005). Based on the results of this study, it can be interpreted that time spent on HRM tasks such as training, data input and data maintenance process, communicating information, correcting errors, making staff decisions can be reduced and the accuracy of planning can be improved through HRIS.

The effective fulfillment of HR functions in terms of time saving can be associated with the study of Tetz (1973), of Wille & Hammond (1981), Lengnick-Hall & Moritz (2003), Ramirez & Tejada (2020) and of Begum et al. (2020).

In cost saving structure, CS4 - "Our HRIS has decreased the overall HR staff's salary expense" is extracted. It can be interpreted that digitalization of HRM department does not lead to salary reduction or unemployment of HR staffs; instead, the use of HRIS is supposed to be fulfilled by qualified HR staffs. Although cost saving on training is not supported by the study of Beadles et al. (2005) and of Kushwaha et al. (2018), cost saving on data input expenses is consistent with those studies.

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The overall results of cost saving structure is able to make attribution to the study of Kovach & Cathcart (1999), of Legnick-Hall & Moritz (2003), of Tetz (1973), of Wille & Hammond (1981), of Lengnick-Hall & Moritz (2003), of Parry (2009), of Arpoh-Baah et al. (2020), of Ramirez & Tejada (2020) and of Begum et al. (2020).

In relation to information effect scale, the results of this study is in line with the study of Tetz (1973), of Wille & Hammond (1981), Kushwaha et al. (2018) and of Begum et al. (2020). It can be stated that information effect derived from HRIS help effective decision making on HRM functions and provide coordination with other departments. The information effect scale is also used as different scales such as decision making in some studies, this structure is indirectly supported by the study of Beadles et al., (2005) and of Udomphol & Siengthai (2016). The ultimate outcomes of information effect can be associated with the study of Lengnick-Hall & Moritz (2003), of Masum et al. (2018), and of Ramirez & Tejada (2020).

Regarding the strategic impact and HR's role, it is seen that HRIS is able to promote the importance of HR department, the effectiveness in meeting strategic goals, the strategic decision making of top administrators, the competitive advantage and is able to make HR department a more strategic partner in the institution. The result of this structure is consistent with the study of Lengnick-Hall & Moritz (2003), of Dulebohn & Johnson (2013) and makes attribution to the study of Kovach et al. (2002). As the strategic decision benefit of HRIS is mostly similar to the study of Ramirez & Tejada (2020) , the emphasis on HR's being strategic partner is especially consistent with the study of Sergio et al. (2010) and Kumar & Parumasur (2013).

According to the analysis of this study, IT infrastructure act as a partial mediator between HRIS and HRM. Although, there is not a sample directly referring partial mediating effect of IT infrastructure, it can be attributed to the study of Masum et al. (2015), of Alam et al. (2016), of Begum et al. (2020) who identify IT infrastructure as a critical success factor on the performance of an HRM innovation. However, the results of this study is not in line with the study of Pan & Jang (2008) defining IT infrastructure as insignificant in ERP adoption (Tariq, 2017).

Specifically, the positive influence of IT infrastructure on time saving is consistent with many recent researches such as Reddick (2009), Thite et al. (2012), Bal et al. (2012), Kumar & Parumasur (2013), and Boateng (2018). Cost saving resulted from IT infrastructure is relevant to the researches by Lederer (1984), Enshur et al. (2002), Lepak & Snell (2002), Lengnick & Moritz (2003), Ramirez & Tejada (2020), Boateng (2018) and Wu et al. (2019). With respect to information effect, IT infrastructure is emphasized by Chaveesuk & Horkondee (2015), Odun-Ayo et al. (2017), and Wu et al. (2019), and implied by Teo et al. (2001), Aswanth & Brijball (2013), Ramirez & Tejada (2020) and Arpoh-Baah et al. (2020). Similarly, IT infrastructure can facilitate the strategic impact and HR's role in the studies by Muriithi et al. (2014), Nawaz & Gomes (2014), Boateng (2018), Lajšić, (2019).

Top management support is also a partial mediator and its effect on HRM transformation find relevance in contemporary studies. It is identified as one of the important elements of HRIS context which is pointed out in the studies of Teo et al. (2007), Masum (2015), and Alam et al. (2016).

Top management support on time saving may be proven through the implications in the study of Ikhlas & Al-Shqairat (2010), Bal et al. (2012) and Siengthai & Udomphol (2016). Consistently, top management support on cost saving can be felt in the study of Boateng (2007), Shani & Tesone (2010), Kumar & Parumasur (2013). In terms of information effect, top management support can be observed in Mitchell (2006), Liang et al. (2007), and Siengthai (2016). Further, top management support can facilitate the strategic impact and HR's role which is implicitly supported by the researches of Beadles et al. (2005), and Khan et al. (2017) and exemplified in the study of Jansson & Rozenbachs (2016).

Similarly, it is found that competitive pressure act as a partial mediator between HRIS and HRM. Competitive pressure can be accepted as a significant enabler of information technology (IT) usage and deployment, in line with the previous studies Grandon & Pearson (2004), Battisti et al. (2007), Masum (2015), and Alam et al. (2016).

The significance of competitive pressure in terms of time saving can be associated with the studies of Lengnick-Hall & Moritz (2003), Rueˑl (2011), and Chaveesuk & Horkondee

(2015). Cost saving driven by competitive pressure may be exemplified in the studies of (Boone, 2000), Reese (2009), Marston et al. (2011), Lumsden et al. (2013), Hadhri et al. (2017), Spacey (2020). Information effect facilitated by competitive pressure is consistent in the studies of Grover (1993), Dasgupta et al. (1999), Ramamurthy et al. (1999), Zhu et al. (2003), Lin & Lin (2008), Ruėl et al. (2011). The strategic impact and HR's role can be stimulated by competitive pressure, in agreement with the studies of Tarique et al. (2006), Lin & Lin (2008), Kuipers & Giurge (2017), Rimi et al. (2017), Masum et al. (2020), Nwankpa & Merhout (2020).

Additionally, it is observed that internalization act as a partial mediator between HRIS and HRM. It can be interpreted that when HRM practices is driven by internalization, they are performed with an effort, conviction and dedication by HR practitioners (Cohen & Levinthal, 1990, Beletskiy & Fey, 2020). Being favorably related to real usage of an adoption (Kim et al., 2016), internalization can affect HRM performance in a positive manner.

With respect to time saving, internalization can act as a facilitator exemplified in different studies such as Imai (1986), Abidi et al. (2005), Haldin-Herrgard (2000), Selamat & Choudrie (2004), Nair & Prajogo (2009), Mohajan (2016). The internalization can be seen as an enabler of cost saving in the studies of Imai (1986), Deming (1982), Garvin (1988), Mann & Kehoe (1994), Juran & Gyrna (1993), Hackman & Wageman (1995), and Nair & Prajogo (2009), Nakhle (2011), and Mohajan (2016). The internalization can possibly influence the information effect that may be proven with the studies of Nonaka (1994), Davenport & Prusak (1998), Nissen (2005), Nair & Prajogo (2009), Simó (2015), Suppiah & Sandhu (2010), Liu & Cui (2012), and Mohajan (2016). The strategic impact and HR's role can also be promoted by internalization that may be demonstrated in Bennett (1998), Brockmann & Anthony (1998), Nonaka & Konno (1998), Wah (1999), Nonaka et al. (2000), Mohajan (2016), and Jansson & Rozenbachs (2016).

Finally, it can be recognized that exploitation act as a partial mediator between HRIS and HRM. As a representative of realized absorptive capacity (RACAP), exploitation is able

to utilize newly acquired information by combining with prevailing information (Sørensen & Ulrika, 2001), which feature can explain its mediating effect.

The assistance provided by exploitation on time saving can be seen in the studies such as Kohli et al. (1993), DeLone & McLean (2003), Cepeda-Carrión et al. (2012), and Jiménez-Barrionuevo et al. (2019). Cost saving can also be motivated by exploitation that find relevance in the studies of DeLone & McLean (2003), Wallin & Krogh (2010), Molla & Abareshi (2012), and Cooper & Molla (2017). With respect to information effect, exploitation can function as a catalyst associated with the studies of Nonaka & Takeuchi (1995), Liao et al. (2003), Möller & Svahn (2006), Carton et al. (2015), Kock & Gemünden (2016) and Seddon et al. (2017). Exploitation may help the strategic impact and HR's role arise in line with the studies such as Huselid, at al. (1997), Ulrich et al. (2008), Ulrich, et al. (2013), Aldrich et al. (2014), Cappelli (2015), and Beletskiy & Fey (2020).

In the light of the hypotheses results, research analysis findings of this study are presented through making comparison with previous studies in terms of consistent as well as discrepant aspects. Based on this evaluation, the majot findings of this study are interpreted in detail in the next chapter.

CHAPTER 5
CONCLUSION

5.1. Chapter Overview

This chapter presents the major findings of this study in the light of the results of the analysis, followed by theoretical and practical contributions, the limitations of the study and future directions. Through interpreting the overall results, concluding remarks are presented.

5.2. Discussion of Major Findings

In this study, it is investigated how human resources management (HRM) is affected by the usage of human resources informations systems (HRIS) in today's organizations. In order to find out the impact factors of human resources information systems (HRIS) as well as the mediating factors between human resources informations systems (HRIS) and human resources management (HRM); a systematic literature review, a semi qualitative research and a comprehensive quantitative research are carried out. Based on the systematic literature review, the results of research analysis are interpreted. The main research approach of this study is quantitative research; however, a semi qualitative research is also conducted in order to become familiar with the general aspects of the research subject as well as provide data trigulation for the sake of the study. With the help of quantitative research, the impact of HRIS on HRM can be uncovered by empirical validation.

According to the results of the analysis, it is seen that HRIS is still an evolving phenomenon. On the one hand, there are still companies that have not separate HR departments, so HRM is executed as administrative affairs or as sub function of accounting and finance departments. On the other hand, HRM is extensively experienced in many companies due to the global technological transformation. The difference in the

exercise of HRM can of course be associated with many factors such as size, industry, sector, the type of employment and the structure (being local, multinational or global) of the organizations.

The kinds of HRIS used in organization has a very wider range that extends from the earlier versions of desktop office software to the state of the art cloud based applications. There are still organizations that have not met with any kinds of HRIS yet. Even, a great deal of companies have been using HRIS as a module of enterprise-wide integrated software that can be accepted as an advancement especially for some industrial sectors. However, only a small percentage of companies have been using cloud based applications, which may stem from either not being ready for high-tech systems or being content with current ones. Although it is apparent that the current trends in HRIS refers to a significant progress, but there is still much to be done for total digital transformation of HRM to keep up with the global trend.

Aligned with the hyptheses results, it is seen that HRIS usage provide time saving, cost saving, information effect and the strategic impact and HR's role to the organizations for the effective fulfillment of HRM. Based on the mediation test results, it is seen that the relationhip between HRIS and HRM is partially mediated by IT infrastructure, top management support, competitive pressure, internalization, and exploitation. It can be said that organizations tend to use or pursue using HRIS for time related factors, cost driven targets, easy access to current information, and the requirement for strategic HR performance. When HRM fulfilled via HRIS are assisted by an IT infrastructure, supported by top management, subject to competitive pressure, internalized and facilitated by exploitation capacity, these impact factors can be better experienced.

At this point, it is important to underline that mediation assumptions tested in this study are siginificantly based on literature review. It should be emphasized that the subject of this study is HRIS usage and the potential effectiveness indicators to be received from HRIS in the fulfillment of HRM are investigated. Even at the beginning of the quantitative analysis, it was decided that the results of participants who have not any ideas as well as any experiences about any kinds of HRIS had to be removed in order to yield a meaningful

result. Since the focus of this study is not early adoption or implementation of HRIS, but the possible outcomes of HRIS being already used. the variables including IT infrastructure, top management support, competitive pressure, internalization, and exploitation are treated as mediators. Since these variables are not outside phenomena contributing to the degree of relationship and new things that organizations meet for the first time. Rather, these variables are already existing and being experienced factors in HRM, so supposed to be already affected by HRIS.

Specifically, HRIS may necessitate some adjustments or activation of present IT infrastructure, through causing the redesign of its some compoenents. Thus, HRIS affect IT infrastructure which in turn affect dependent variables. Similarly, top management support is not an external contribution, but rather a HRIS-oriented support. HRIS affect the perception of top managers towards HRM transformation, which subsequently affect dependent variables. Likewise, HRIS should be seen as a necessary tool through which organizations can respond to competitive pressure. Being responded by HRIS, competitive pressure can lead to further impact on dependent variables. Additionally, HRIS can necessitate and promote internalization for the effective fulfillment of HR functions, which ultimately influence dependent variables. Also, HRIS necessarily entails exploitation that consequently affect dependent variables. It can be stated that HRIS alone is able to lead to time saving, cost saving, information effect and the strategic impact and HR's role; however, these impacts can be increased by mediating variables.

Partially mediated relationships explain that there is not only a significant relationship between the mediator and the dependent variables, but the direct relationship between HRIS and dependent variables as well. In other words, HRIS has both direct and indirect effects on dependent variables due to partial mediation (Hayes, 2009; Hair et al., 2018). As the results of the models designed for each mediating variable suggest, it is seen that competitive pressure and internalization can act as full mediators in case of a more flexible confidence interval ($p>0.05$). It may be interpreted competitive pressure and internalization have stronger mediating effects on the dependent variables compared to other mediating variables in this study.

With respect to the impact of HRIS on HR functions, the results reveal that current HRIS are not effective enough for recruitment function. Although HR functions are taken as a bundle without exception in this study, the items related to recruitment has to be extracted due to their lower factor loadings. Thus, it can be inferred that the impact of HRIS can be experienced all HR functions except from recruitment. Further, it can be stated that there is not a totally digitalized system used for the fulfillment of recruitment including the whole process of identification and attraction of candidates, interviewing and selection of appropriate candidates, hiring and onboarding of new employees. Even though some of these steps are transferred to online systems, there is a need for a complete digitalized platform to carry out whole recruitment process. Therefore, it can be interpreted that there is still much to be done for the complete digitalization of recruitment function. Other application fields; administrative affairs, compensation management, recruitment, training and development, performance appraisal, grievance management, knowledge management, organizational development, labor-force planning, and career and talent management can be effectively performed through HRIS. Even if some HR functions have not being fulfilled in some organizations, HRIS is able to promote inactive HR functions through providing a comprehensive database along with promising benefits for the sake of HRM.

Aligned with the results of this study, the expectations towards HRIS can be associated with further progress for the digital transformation of HRM along with the clarification of business processes, quick and easy learning of the system, increased development and enhanced strategic role of HR department. However, all the expectations towards HRIS can only be met through not only using default system, but managing the system in a proper manner. This study has tried to provide a comprehensive reflection of the present impacts of human resources information systems (HRIS) on human resources management (HRM). It is hoped that such an ever-evolving phenomenon can be further investigated for the development of human resources management (HRM).

5.3. Contribution to Theory and Practice

This section outlines the theoretical and practical contributions through providing meaningful insight for the current status as well as the fate of human resourcs information systems (HRIS) usage in human resources management (HRM) in Turkey.

5.3.1. Contribution to Theory

This study is believed to theoretically contribute to human resources management (HRM) field through investigating an evolving phenomenon such as human resources information systems (HRIS) over a comprehensive systematic literature review. Having realized the missing points in prevailing literature, the main theoretical contribution of this study is to combine management and organization theories each of which are able to support the constructs of the research.

This study treat all HR functions as a bundle in order to emphasize the interconnections between the functions, that is realized especially when they are fulfilled via HRIS. The fact that the focus is not limited to only a few HR functions can provide a complete understanding of the impact of HRIS on HRM. On the one hand, the constructs of research model are given importance to have a robust theoretical foundation, thus the scales are carefully chosen for each construct. On the other hand, the methodological power of this study is based on the use of a sophisticated research method, structural equation modelling (SEM) that can be accepted as a comprehensive sample for further researches in HRM field.

Indeed, this study mainly revolve around institutional theory, TOE framework and knowledge based view (KBV). As the original contribution of the study can be associated with the selection and the combination of constructs, ceremonial adoption and realized absorptive capacity come into prominence as representatives of contemporary approaches.

Firstly, this study can be associated with institutional theory that has been accepted useful for conceiving the use of HRM systems. As the initial aim for the use of HRIS stem from rational decision making advocated by old institutionalism, the adoption of these systems are based on non-rationality of processes supported by new institutionalism (Purcell,

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1999; Hope-Hailey, 2001; Wright & McMahan, 1992; Jiang & Messersmith, 2018). As dependent variables (time saving, cost saving, information effect, and the strategic impact and HR's role) can be accepted as samples for rational decision making, the study imply that there are also other factors able to contribute to the relationship between HRIS and HRM.

Among the mediating variables, especially ceremonial adoption takes place as a representative of institutional theory, which construct is able to investigate whether the use of HRIS is a symbolic fulfillment or a genuine requirement. It can be considered as a new attempt to include institutional theory from ceremonial adoption perspective through which a theoretical gap can be filled in HRM literature. Due to the importance of an emphasis on internal and external factors surrounding an organization, there are also mediating variables identified with TOE framework (Tornatzky & Fleischer, 1990; Masum et al., 2016); IT infrastructure from technology dimension, top management support from organization dimension and competitive pressure from environment dimension. One other mediating variable, absorptive capacity, can also make attribution to knowledge based view (KBV) from knowledge transfer perspective. Aside from having knowledge, understanding how to use it gives a unique resource for gaining a sustained competitive advantage (Kogut & Zander, 1992). The amount of absorptive capacity of recipient units is accepted as a crucial dimension for the continuity of post-acquisition integration of the system (Zhou et al., 2018). Thus, adding human factor from absorptive capacity perspective can be accepted as a new approach for HRM literature.

With the help of comprehensive systematic literature review as well as a distinct research model, this study realizes the theoretical gaps in existing literature and tries to fill the missing points through presenting how an evolving phenomenon such as HRIS is both based on and able to serve for management and organization literature.

5.3.2. Contribution to Practice

The results of this study is believed to provide guidance for human resources (HR) professionals and serve for the fate of human resources management (HRM). From a practical standpoint, this study illuminates the most prominent benefits that HR practitioners may encounter when performing HR funtions through using HRIS.

As with all innovations, organizations may at first find it difficult to keep up with change or resist changing their current practices, or it may be questioned whether the actual outcomes will differ from the expected results. The implementation or upgrading of a system may be perceived as being time consuming, costly, complex, or incompatible with the current operation of HR department and organization. However, every step taken for the transformation of HRM is believed to lead to effectivity in the aspects aligned with the results of this study when especially considered in the long run.

The study provides a holistic approach for human resources management (HRM) through revealing that how using a mutual database facilitate the fulfillment of HR functions together. There may be still HR practitioners unable to deal with or not allowed to do all HR functions. This research can assist them become more aware of how to use HRIS to do HR responsibilities in a simple and effective manner. Moreover, HRIS usage is supposed to result in decreased times, reduced costs, superior information and enhanced strategic approach. However, simply using HRIS is not enough to reap these benefits; HR practitioners should keep some aspects in mind when using HRIS. It should be taken into consideration that IT infrastructure, top management support, competitive pressure, internalization, and exploitation may conritbute the relationship between HRIS and HRM, through which the positive impact of HRIS on HRM can be boosted.

It is important to underline that the benefits to be received through HRIS are not just for HR department, but for the sake of organization as a whole. It is believed that an organization that has streamlined and settled operational issues can better concentrate on strategic goals. As a result, HRIS may provide value to organizations, and HR functions performed by HRIS can help companies achieve strategic goals.

5.4. Limitations of the Study

The study also has some limitations that should be acknowledged in order to present an honest as well as impartial perspective. Firstly, the research is subject to limitation due to the selection of population and sample. During the previous stages, it is thought to carry out this research in three big cities of Turkey; including İstanbul, Ankara and İzmir. However, as trying to reach sample contacts in these cities, it is understood that the completion of both interviews and surveys may not be possible within the allotted time. Thus, this study is decided to be conducted in Izmir and Manisa, which has developing industrial and free zones as good indicators for the generalizability and representativeness of the study.

Aligned with the previous limitation, the research is also prone to common method bias. Although participant profile is able to show diversity, it could not be possible to conduct research for different profile of employees such as including employees of different departments within the organization, rather than just HR employees. However, due to the realization for the lack of knowledge about HRIS, the research has to be conducted on just HR employees. Having included a range of sectors as well as a variety of companies in the survey, the common method bias is tried to to be overcome.

Furthermore, rather than examining HRM practices separately, the study treating HRM mechanism as a whole in order to emphasize the interaction between them when they are performed via HRIS. There is a possibility that the study may hinder examining the particular relevancy of seperate HR functions with HRIS. Since the aim of the research is not concentrating on which HR functions can be best fulfilled or should be prioritized via HRIS, the coexistence of HR functions is found to be sufficient for this study.

Another limitation is related to finding appropriate measures for each structure of research model. The adaptation of measures to a comprehensive structural equation modelling (SEM) could not be an easy task, since the most of the original measures belongs to a single statistical method. This limitation derives from the lack of empirical research in HRM field and particularly about HRIS, that results in the scarcity of measures to be adopted in prevailing literature.

A final limitation can be associated with the lack of emphasis on personal data protection law. Personal data processing, as a part of the day-to-day job in HRM context, necessitates special attention in terms of personal data security (Ziebell et al., 2019:26). Personal Data Protection Law has been active since 2016 in Turkey, the aim of which is to protect people's basic rights and freedoms and notably the right to privacy, when their personal data is processed (Personal Data Protection Institution, 2016).

Despite advances in technology, preserving data security still remains a challenge because of systemic problems as well as human intervention. Thus, security and privacy deserve to be included as another impact factor of HRIS. Although security and privacy is already mentioned by interviewees and among the frequent codes of semi qualitative part of this study, it could not be chosen as an impact factor for some reasons. Since there has not been sufficient resources in HRM literature in relation to data protection in terms of security and privacy to be theoretically supporting this study. There has also been a belief that data protection is taken for granted especially in contemporary HR information systems. Thus, it is assumed that contemporary HRIS are able to protect data security, employee rights and their privacy as well.

5.5. Direction for Future Research

This study sets a new direction for human resources management (HRM) field through presenting a comprehensive research about human resources information systems (HRIS). There may be some subjects that remain to be explored for future research.

This study can be replicated in different contexts in order to more contribute to literature both theoretically and practically. Future research can also test the current study's model in different contexts which allow for interesting comparisons. Replicating this research in different contexts can reveal more practices and perceptions of HRIS and its impact on HRM. Conducting research on within the different provinces or regions of the country; across sectors within the same country, or even across countries can allow for better understanding of the impact of HRIS on HRM, which can contribute to a more detailed model. The current subject can also be investigated through a different methodology

through employing a comprehensive qualitative approach or a mixed method approach. Additionally, the mediating variables used in this study can be tested from moderating variable perspective in further research having different context in human resources management (HRM) field.

Additional research on a larger sample size can more decisively confirm the robustness of this study's findings. It may be a better chance to obtain broader responses that can be collected from a larger group of informants. Expanding research on a larger sample can better measure whether the findings are representative of the population in question. In order to overcome the possibility of common method bias, different categories of sampling can be incorporated such as including participants from different professions, so many companies, and different sectors as much as possible. Future researches may also identify more concepts in relation to total digitalization of HRIS such as cloud based applications, big data, artificial intelligence, industry 4.0 or 5.0, and society 5.0. It may be possible to obtain different findings in the next years when the digitalization of HRIS is likely to be more widespread.

Moreover, as already mentioned in the limitation part of this study, the security and privacy aspect of HR information systems should be investigated in future researches. Since security issues may deserve much attention due to increased use of technology especially in the next years. Although data protection feature of modern HRIS is taken for granted, it should be empirically validated. Even if HRIS is able to provide security and privacy, data processing is still more or less subject to human intervention. In the light of Personal Data Protection Law being executed since 2016 in Turkey, the cautions as well as necessary adjustments to be taken to prevent or minimize the potential insecurity of personal data may form another topic of future researches.

It is believed that whichever aspect, sampling, or method is preferred, further examination on human resources information systems (HRIS) can provide meaningful as well as complementary insights for human resources management (HRM) literature.

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APPENDIX 1
INFORMATION SHEET FOR INTERVIEWEES

To whom it may concern,

I would like to invite you to participate in a research study which I am conducting as a requirement for my PhD program at Yaşar University, İzmir, Turkey. My research topic is "The Impact of human resources information systems (HRIS) on human resources management (HRM): A Reflective Investigation". The aim of this study is to explore the current situation in human resources management and the impact of human resources information systems (HRIS) on the fulfilment of human resources management (HRM) in organizations. Participation in this qualitative survey is voluntary. However, it will be appreciated if you consent to participate in and provide insight to this research. If you agree to participate, I would like to visit you at your office in your convenient time for a face-to-face interview predicted to last approximately forty minutes to one hour. The interview consists of two parts; respectively, the introduction part and the core part. As the introduction part refers to demographics intend to recognize interviewees in terms of sector, company, position and experience at the company in question. The core part of the interview includes ten follow-up questions concerning my research topic. It is possible to withdraw from interview at any time without any negative consequences.

All the personal information provided by you will be kept confidential and your name will not appear in any report resulting from this research at any stage. All of your responses will be used for only in research purposes and will be strictly treated in an ethical and confidential manner. Thank you in advance for your assistance in this qualitative survey.

Kind Regards,

Gamze ÜNAL

APPENDIX 2
INTERVİEW QUESTİONS

Part 1

Sector   :

Company   :

Position   :

Experience   :

Part 2

1)   How do you define the role of human resource management in organization?

2)   When did your company first introduce the human resource management practices?

3)   How do you classify HRM functions?

4)   How do you define the role of your profession in your company?

5)   Have you already implemented HRIS in your company?

6)   Why have you been using HRIS in your company? Which criteria are taken into account on HRIS usage in your company?

7)   Which ERP program is being currently used in your company and for HRM functions in your department? Why?

8)   How do you evaluate the impact of HRIS on HRM functions?

9)   Is there any change which you want to see in human resource management within your company?

10) Is there any other thing that you want to add for the implementation of HRIS?

APPENDIX 3
INFORMATION SHEET FOR QUESTIONNAIRE PARTICIPANTS

To whom it may concern,

I would like to invite you to participate in a research study which I am conducting as a requirement for my PhD program at Yaşar University, İzmir, Turkey. My research topic is "The Impact of human resources information systems (HRIS) on human resources management (HRM): A Reflective Investigation". The aim of this study is to explore the current situation in human resources management and the impact of human resources information systems (HRIS) on the fulfilment of human resources management (HRM) in organizations. Participation in this quantitative survey is voluntary. However, it will be appreciated if you consent to participate in and provide insight to this research. If you agree to participate, you can access the link via https://forms.gle/nrr7RLQw7GinrLHn8. Survey questionnaire conducted in this study has two parts. Part 1 requires demographic information such as education level, sector and position, placed at the beginning of the questionnaire. Part 2 comprises 50 closed-ended questions measured using a five point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). The questionnaire is predicted to take approximately fifteen minutes of your time.

All the personal information provided by you will be kept confidential and your name will not appear in any report resulting from this research at any stage. All of your responses will be used for only in research purposes and will be strictly treated in an ethical and confidential manner. Thank you in advance for your assistance in this quantitative survey.

Kind Regard,

Gamze ÜNAL

APPENDIX 4

QUESTIONNAIRE

PART 1 - GENERAL INFORMATION	
Education Level	
Sector	
Position	
What kind of HRIS has currently being employed in your company? (Please choose one of the options below)	
We don't currently use any kind of HRIS	
Desktop Office Software (MS Excel etc.)	
In-house HRIS	
Stand-alone, not integrated applications for different HRM fields	
Best of breed software specific for HR Departments	
HRIS as a module of enterprise-wide integrated software	
For which functions have you been using HRIS? (More than one function can be chosen)	
Administrative affairs	
Compensation management	
Recruitment	
Training & development	
Performance appraisal	
Grievance management	
Knowledge management	
Organizational development	
Laborforce planning	
Career & talent management	
PART 2 - HRIS INFORMATION (Please choose one of the option best indicating the extent that you agree or disagree with each of the following statement in the presen situation.)	

In my organization;	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
HRIS is used for day to day administrative duties.					
HRIS is used for attendance & work schedules.					

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Managers use HRIS for managing employee benefits.					
I use HRIS for formal grievances & complaints.					
I use HRIS for online testing & learning.					
HRIS is used to appraise branch employees in our organization.					
We use HRIS for recruitment & selection processes.					
HRIS is used to access information about the latest updates in the industry.					
Managers use HRIS to receive formal information about a wide range of issues relevant to the branch & its operation.					
Managers use HRIS for talent management.					
In my organization;					
Our HRIS has decreased the time spent on recruiting and improved recruiting.					
Our HRIS has decreased the time spent on training and improved training.					
Our HRIS has improved the data input and data maintenance process.					
Our HRIS has decreased the time spent on communicating information within the institution.					
Our HRIS has decreased the time spent on correcting errors.					
HRIS has decreased the time spent onmaking staff decisions.					
HRIS has improved the accuracy ofplanning.					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In my organization;					

Our HRIS has decreased recruiting expenses.					
Our HRIS has decreased training expenses.					
OurHRIS has decreased data input expense.					
Our HRIS has decreased the overall HR staff's salary expense.					
In my organization;					
Information generated from HRIS hasincreased coordination between HRdepartment & top administrators.					
Information generated from HRIS helpsorganization to make more effectivepromotion decisions.					
Information generated from HRIS helpsorganization make better decisions inselecting best people.					
Information generated from HRIS helpsorganization decided when training &skill development are necessary.					
In my organization;					
Our HRIS has made the HR department more important to the institution.					
Overall our administration thinks that HRIS is effective in meeting strategic goals.					
The information generated from our HRIS has improved the strategic decision making of top administrators.					
The information generated from our HRIS has made HR a more strategic partner in the institution.					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our HRIS has promoted our institution's competitive advantage.					
In my organization;					

Our organization is highly computerized with internal and external network connections that connect the firm with its branches.					
The organization has sufficient software and database resources to support HRIS.					
The organization has speedy internet facility.					
The organization has a strong backup plan for network failure.					
In my organization;					
Top management enthusiastically supports the adoption of HRIS.					
Top management has allocated adequate resources for the adoption of HRIS.					
Top management is aware of the benefits of HRIS.					
In my organization;					
Competitor's adoption of HRIS places pressure on our organization to adopt HRIS.					
The overall operational practices in the industry pressure us to adopt HRIS.					
Our organization actively keeps track of new use of technology by competitors.					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In my organization;					
There is a need to make great deal of effort beyond that normally expected in order to help implement HRIS.					
My colleagues need to be told more that HRIS is a great way to reorganize the business.					
I find that my values and the values promoted by HRIS process are very similar.					

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HRIS really inspires the very best in me in the way of involvement at my work.					
I am extremely glad that I am involved in the adoption of HRIS.					
Often I find it difficult to agree with what HRIS suggests(reverse-scored).					
Regarding HRIS;					
Our employees record and store new acquired knowledge for future reference.					
Our employees have the ability to successfully link existing knowledge with new knowledge or insights.					
Our employees regularly meet to discuss how to utilize new knowledge to improve our current products, services or internal processes.					
Our employees are able to apply new knowledge in their practical work.					