Abstract
This paper aims to present and discuss a collection of empirical studies relating to the adoption and implementation of HRIS, by means of a content analysis of the findings of previous HRIS studies. A review of the relevant literature has shown that a large number of previous studies have attempted to identify factors determining the adoption and implementation of HRIS applications. For the purpose of this study, these factors are presented and discussed under two dimensions: internal and external environmental factors. However, as the findings of previous studies presented conflicting results, these factors needed to be examined empirically at an aggregate and individual level.

Keywords
Human Resource Information Systems (HRIS), Innovation Adoption, Innovation Diffusion, Internal Environmental Factors, External Environmental Factors

II. Internal Environmental Factors

A. Organizational Readiness and Competency
Organizational readiness refers to the level of financial and technological resources available to a firm, including infrastructure, relevant systems, and technical skills. Although the exact definition of organizational readiness differs among the literature, all agreed that organizational readiness has a strong influence on the adoption of organizational technologies. The organizational readiness construct is used to determine whether the organization has the necessary attributes needed to adopt HRIS.

The resource capabilities of a firm are related to organizational characteristics, such as the availability of financial resources, the management emphasis put on adoption, the availability of human resources, and the competitive attitude of the organization. Financial readiness refers to the resources available to pay for the costs of new innovations, necessary enhancements down the road, and continued usage costs. It is only reasonable to assume that having adequate financial resources is an integral factor in the adoption of innovation and in deciding the scale of adoption.

Nonetheless, it is important to note that Mehrats (2001) failed to find a relationship between financial resources and adoption, a result that is most likely caused by the fact that the large majority of firms would already have the financial resources for adoption at a basic level. Even in the case of a more costly adoption process, as studied by Chan and Mills (2001) no significant relationship between financial readiness and adoption was found.

Technological readiness refers to the level of sophistication in IT usage and management in an organization (Iacovou et al., 1995). Companies are more likely to adopt new technological systems if they are IT sophisticated, meaning that they have an established IT department with the necessary knowledge and capabilities (Iacovou et al., 1995). Thus, IT skills are essential for firms to develop successful IT applications. These complementary factors have been identified in many studies as a crucial element of IT implementation. In this context, IT skills are defined by the number of employees that work exclusively in tasks related to IT activities. It is expected that, controlling for other factors, firms with greater IT skills are more likely to be enhanced users.

1. Organizational Technical Support (IT Architecture)
Contains many basic elements. While indicate that IT infrastructure consists of a set of physical devices and software applications that are required to operate in the entire enterprise, it is equally comprised of a set of organization-wide services budgeted by management and comprising both human and technical capabilities.

In the development of HRIS, the Information Systems (IS) department was found to play a major role in facilitating the computerization of human resource information, as well as in the planning and developmental stages. Although HRIS has established independence from corporate Management Information Systems (MIS), it has not yet matured to be an independent entity within the personnel area in a large number of firms.
It has also been found that computer-skills training for relevant employees is necessary to achieve optimal HRIS effectiveness. Denton (1987) determined that one of the potential problems of HRIS management is a lack of employee technical training and experience in information management. Kavanagh et al. (1990) also commented that for a successful HRIS, appropriate training should go to all HR staff - including line managers, as well as other employees. The availability of human resources, mainly employees with prior knowledge and experience required to use HRIS applications, is a large factor in the successful adoption of an HRIS.

2. Employee Structure and Education Levels

have also been reported to positively influence innovation adoption, particularly in human resource management (HRM) (Kossek, 1987; Kimberly & Evanisko, 1981). IT skills and familiarity with electronic tools facilitate e-HRM adoption, as they are related to both the willingness and capability of the end users to utilize the system (Shrivastava & Shaw, 2003; Panayotopoulos et al., 2007; Voermons & van Veldhoven, 2007). However, a recent European study by Strohmeyer & Kabst (2009) found that education structures neither furthered nor hindered e-HRM adoption decisions, attributing this to the continuous spread of basic IT literacy in many demographic segments.

Another variable likely to affect the implementation of HRIS is the involvement level of HR management. Lederer (1984) reported that the HR department should be responsible for advocating the need for an HRIS, as it is in the best position to obtain and keep an organization’s management commitment to an HRIS. However, Kossek et al. (1994) found that in corporations, those in high-ranking HR positions were more likely to have negative perceptions of an HRIS - perhaps due to a possible power-shift brought on by changing systems. Their interviews revealed that HRIS use is viewed as a clerical activity that does little to enhance HR’s reputation. Pitman (1994) noted that user participation is a critical factor to successful change. As clerical staff have considerable responsibility in system operations, their support is crucial.

Finally, the critical role of effective internal communication (e.g. choosing appropriate methods; communicating early, extensively, and candidly) as a facilitator in HRIS implementation is underlined in many studies (Shrivastava & Shaw, 2003; Ruta, 2001). Furthermore, the networking and communication skills of an HR manager - especially in consensus building - are essential for the successful adoption of IS (McGourty et al., 1998). Sources of organizational readiness and competence, thought to influence the adoption and implementation of the HRIS applications, are given in Table 1.

B. Organization’s Demographic Characteristics

Anumber of studies have found that the demographic characteristics of organizations - including organization size, a firm’s experience with technology, the type of business, and organizational ownership - are important factors in organizational IT adoption (Iacovou et al., 1995).

1. Organization Size

is defined by Kimberly & Evanisko (1981) as an organization’s resources, transaction volumes, or total workforce. It plays an important role in innovation adoption because increasing size creates a ‘critical mass’, which justifies the acquisition of particular innovations and necessitates adoption behavior. Many innovation and IT studies have also pointed to organization size as an important precursor to adoption (Bajwa and Lewis, 2003; Bakker, 2010). Consistent with previous results (Flambach, 1993; Ball, 2001; Hausdorf & Duncan, 2004; Florkowski & Olivas-Lujan, 2006; Teo et al., 2007; Bakker, 2010), organization size should constitute a central adoption factor. Thong and Yap point out in their 1995 study that business size is the most important discriminator between adopters and non-adopters of IT within Singaporean small businesses. Additionally, the results of Ball’s 2001 survey of 115 companies in the United Kingdom on HRIS usage indicated that organizational size was the clear determinant of whether an organization has any HRIS, as well as whether it adopts certain applications.

Firm size is considered one of the most commonly studied determinants of IT adoption and diffusion. In a recent study, Lee and Xia (2006) analyzed, through meta-analysis, the association between firm size and IT innovation adoption, concluding that although a positive relationship generally existed, the relationship was moderated by five variables: type of IT innovation, type of firm, stage of adoption, scope of size, and type of size measurement. Three major arguments support the positive role of firm size in determining IT innovations, mainly: the benefits of the new IT is higher for larger firms; the availability of funds for these firms is greater; and many IT innovations, like the Internet, are scale enhancing and therefore larger firms adopted them sooner - and more intensively - because they capture economies of scale more quickly (Moch and Morse, 1977; Zhu et al., 2003) (there are two Zhu et al., 2003 studies, which one is this?); Gibbs et al., 2004; Nagai & Wat, 2004; Florkowski & Olivas-Lujan, 2006).

Damanpour (1992) has also argued that organization size has a positive effect on innovation adoption, stating that: 1. Size is a more significant factor in adoption for the manufacturing industry and other profit-making companies than it is for the non-profit sector. 2. A non-personnel or a log transformation measure of size leads to a stronger relationship between size and innovation than when a personnel or a raw measure is utilized. 3. The relationship

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<thead>
<tr>
<th>Source of Readiness and Competences</th>
<th>Discussed by Author(s)</th>
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<tr>
<td>Readiness of Financial Resources</td>
<td>Van Beveren &amp; Thomson, 2000; Kuan &amp; Chau, 2001; Mehrtens et al., 2001; Wagner et al., 2003; Chaveesuk, 2010</td>
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<tr>
<td>Readiness of Human Resources</td>
<td>DeSanctis, 1986; Denton, 1987; O’Connel, 1994; Van Beveren &amp; Thomson, 2000; Kuan &amp; Chau, 2001; Mehrtens et al., 2001; Wagner et al., 2003; Bakker, 2010</td>
</tr>
</tbody>
</table>

Table 1: Organization Readiness and Competences Studies
tends to remain steady no matter the type of innovation. 4. Size is most important in the implementation, not the initiation, of innovation. Lee and Cheung (1991) also found that organization size correlated positively with sophistication. However, some studies have suggested a negative relationship (Utterback, 1974; Hage, 1980), as well as non-significant interdependencies (Aiken et al., 1980; Gremlillion, 1984; Grover and Goslar, 1993). These inconsistent findings may be due to the different definitions of organizational size used by different researchers. It should also be noted that previous studies did not provide evidence on whether there is a relationship between the size of the firm and the actual level of implementation of HRIS applications.

2. A Firm’s Experience With Technology

and the length of time it has been committed to IT in the HR department has been found to have a strong effect on the overall success of IT in an organization (Tye & Chau, 1995; Teo et al., 2001). A firm’s past experience with technology, in terms of exposure and organizational learning, ultimately affects its future choices in adopting technology (Burgelman & Rosenbloom, 1989). This past experience can be measured through time since first acquisition, number and type of technologies or applications adopted, percentage of personnel familiar with the technologies, and the current level of assimilation and integration of the technologies. Osterman (1994), Ichnioswki, Shaw and Preissnishi (1995), and Freeman, Chi, and Kleiner (2007) found that younger businesses were more likely to adopt workplace innovations, as they have not yet had time to build up an entrenched management or practices that would be threatened by the adoption or diffusion of organizational innovation.

3. The Type of Business

is also a factor in IT adoption, as the industry in which a company operates plays an important role in HRIS adoption (Rashid and Ai-Qirim, 2001). Companies in high-technology sectors, such as telecommunications, use more elaborate HR information systems, often adopting HRIS earlier than other sectors in order to maintain a ‘high-tech’ appearance (Galanaki, 2002). Industries with a high proportion of clerical work, such as banking, promise an uncomplicated adoption, since there is a high share of workplace computers and computer literate employees. In contrast, industries with mainly non-clerical tasks, like building construction, do not generally consider workplace computers and computer literacy as a characteristic of their task structure (Arad, Hanson & Schneider, 1997). While both the manufacturing and service industries express an intention to adopt ICT, the greatest move toward this trend is found in service-based small and medium sized enterprises (SMEs) (Tan et al., 2003 there is no Tan et al., 2003). Despite these findings, some literature has expressed doubt on whether sectoral differences in HRIM adoption actually exist (Ball, 2001; Yeung et al., 2003; Ghofakhshehloo et al., 2011).

4. Organizational Ownership Characteristics

are another important factor. Casile and Davis-Blake (2002) found, in the context of adoption, that private sector organizations were more responsive to technical factors, whereas public sector organizations were more responsive to institutional factors. However, the effect of ownership type has been seldom examined in the HRIS implementation literature.
2. Organizational Complexity
referring to the levels of organizational hierarchy, the number of branches, and the number of departments and employees within an organization – is an important factor in the implementation of LAN technology (Ellis et al., 1994). Lai and Guynes (1997) dispute this, finding no significant relationship between integrated services digital network (ISDN) adoption and the degree of centralization, formalization, or complexity. They argue that other factors may overpower structural factors. Eder and Igbaris (2001) similarly found that organizational structure was not related to the diffusion or infusion of intranets.

3. Organizational Specialization
represents the different specialties found in an organization (Kimberly & Evanisko, 1981; Damanpour, 1991). By employing specialists, organizations acquire new ideas, practices, and technical skills, which are prerequisites for adopting innovation (Moch & Morse, 1977). Specialization is often considered to be positively correlated with organizational innovativeness (Moch & Morse, 1977; Kimberly & Evanisko, 1981; Damanpour, 1991; Frambach, 1993; Grover & Goslar, 1993). The diversity in background of an organization’s employees increases the number of information sources by which an organization may learn of new sources of innovation (Zaltman et al., 1973).

4. The institutionalization of HRM
or the existence of a formal HR-department, appears to increase the likelihood of a firm adopting HRIS, acting as an internal promoter. This is because, although the advantages of adoption are beneficial for the whole organization, gains such as alleviation of administrative burdens via automation are most beneficial for the HR department. Motivation, capacity, and ability to adopt HRIS are considerably higher when there is an institutionalized HR department (Strohmeie & Kabst, 2009). This is even more apparent in larger firms. As the HR administrative burden grows, the need for automation becomes more imperative. Additionally, the recognition of HR as a “change agent” or “strategic partner” is more likely to influence the adoption and implementation of HRIS applications and practices (Ulrich, 1997; Lepak & Snell, 1998; Lengnick-Hall & Moritz, 2003; Bakker, 2010). Ulrich (1997) identified four roles of HR:
• Administrative expert: Traditional role of HR, which implies responsibility of HR for the efficiency of their own functions, as well as the entire organization. The HR staff primarily participates in administering HR practices (e.g. payroll).
• Employee champion: The HR staff is assumed to be responsible for the engagement of employees within the organization - helping the employees to meet the demands placed on them, representing the ideas and mindset of employees in management discussions, and offering opportunities for growth.
• Change agent: HR is responsible for building the organization’s capacity to adapt new HRM methods (e.g., HRIS), and thereby take away any resistance or fear of this change.
• Strategic partner: Combination of the former three roles, as well as aligning HR practices with strategic management. Bakker (2010) reported that the role of HR affects the features of an e-HRM application, finding that organizations which indicate their HR as supporting staff before e-HRM implementation are more likely to feature e-HRM with “basic” strategic activities – payroll, collection of employee data. Organizations who regard their HR department as a competitive advantage are more likely to feature e-HRM with “advanced” strategic activities - training and development of employees, developing job content, and employee reward programs. Collaboration of HRM and IT has also been identified as a crucial success factor in HRIS adoption and use. This collaboration can ensure successful integration of technology into HRM processes, responding to the need for quality HRM services (Panayotopoulou et al., 2007).

Table 3: Organizational Structure Studies

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<tr>
<th>Organizational Structure Variables</th>
<th>Discussed by Author(s)</th>
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<tbody>
<tr>
<td>Centralization</td>
<td>Hage &amp; Aiken, 1967; Moch &amp; Morse, 1977; Kimberly &amp; Evanisko, 1981; Damanpour, 1991; Grover &amp; Goslar, 1993; Rogers, 1995</td>
</tr>
<tr>
<td>Formalization</td>
<td>Hage &amp; Aiken, 1967; Moch &amp; Morse, 1977; Kimberly &amp; Evanisko, 1981; Damanpour, 1991; Grover &amp; Goslar, 1993; Rogers, 1995</td>
</tr>
<tr>
<td>Specialization</td>
<td>Zaltman et al., 1973; Moch &amp; Morse, 1977; Kimberly &amp; Evanisko, 1981; Damanpour, 1991; Frambach, 1993</td>
</tr>
<tr>
<td>Standardization</td>
<td>Eder and Igbaris, 2001</td>
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<tr>
<td>Complexity</td>
<td>Eder and Igbaris, 2001</td>
</tr>
<tr>
<td>Institutionalization of HRM</td>
<td>Strohmeie &amp; Kabst, 2009</td>
</tr>
<tr>
<td>Comprehensiveness of HRM</td>
<td>Strohmeie &amp; Kabst, 2009</td>
</tr>
<tr>
<td>HR Role</td>
<td>Ulrich, 1997; Lepak &amp; Snell, 1998; Lengnick-Hall &amp; Moritz, 2003; Bakker, 2010</td>
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C. Top Management Support and Commitment
Researchers argue that top management support - involvement and participation of the executive or top-level management - of an innovation plays a large role in adoption or early adoption of that innovation (Jarvenpaa & Ives, 1991; King & Teo, 1996; Raymond & Bergeron, 1996). The strong commitment of top management, especially of a particular ‘innovation champion’, leads to early adoption, while a lack of top management commitment inhibits adoption (Mehrtens et al., 2001; Chan and Mills, 2002). Given the important role of top-level managers in organizations, it is not surprising that top management support has been one of the most widely discussed organizational factors in several HRIS adoption studies (Kavanagh et al., 1990; Jones and Arnett, 1994; Pitman, 1994; Wong et al., 1994). As Jarvenpaa and Ives (1991) stated, “Few nostrums have been prescribed so religiously and ignored as regularly as executive support in the development and implementation of management information systems” (p. 205). In addition to verbal support, top management can demonstrate their confidence in HRIS by personally utilizing the system. Their frequent personal HRIS usage may result in sufficient delegation of resources and an increased pressure for HRIS success. Ang et al. (2001) examined 47 Malaysian public sector agencies on IT usage to support total quality management (TQM). Among the organizational factors explored, the researchers found top management support for IT applications as the highest predictor of IT usage. Kosset et al. (1994) also mentioned that user skill
level might be strongly related to the variance in attitudes toward the value of an HRIS.

Top management support has also been recognized as essential for creating a supportive climate and providing adequate resources for the adoption and implementation of new technologies (Premkumar & Roberts, 1999). Shrivastava et al. (2003) concluded that there is universal agreement that large-scale technology projects generally fail due to managerial, and not technical, reasons. Additionally, they identified that climate conduciveness for technology implementation related positively to the extent of neutralization of inhibitors. Lado and Wilson (1994) realized that conditions in the firm’s external and internal environment might enable or constrain the capacity of HR systems to develop and exploit organizational competencies.

According to Thong et al. (1996), top management, with its broader perspective, is better able to identify business opportunities for the exploitation of IT and provide appropriate strategic vision and direction for the adoption and implementation of new innovations or technologies. Visible top management support also sends signals about the importance of the innovation, helping to overcome organizational resistance to HRIS. This, in turn, leads to positive attitudes on the part of users towards the use of the new technology and thus leads to a smoother conversion from existing work procedures (Weill, 1992). By virtue of their leadership role, top management is also able to ensure that adequate resources will be allocated if the innovation is adopted. Pitman (1994) cited visible management support and commitment as critical success factors.

Johannessen (1994) reports that successful innovation can also be associated with an open management style, stating that this can be reinforced by means of communication-related IT. In a study of large innovative organizations, Quinn (1986) revealed that IT innovation would emerge continuously, because top management would appreciate innovation and would contribute actively to keep up the value system and atmosphere of the organization in a manner that supports innovation.

Management support is one of the key recurring factors affecting system success and computing acceptance (Lucas, 1975; Kwon & Zmd, 1987; Igbiria et al., 1994). Razali and Vrontis (2010) indicated that top management involvement and organizational commitment appeared as the two largest coefficients for the impact on the acceptance level of employees toward the new HRIS implemented in the Malaysian Airlines System. Nagai and Watt (2004) also indicated that support of top management was one of the most important factors in successful implementation of HRIS in Hong Kong.

It is also worth noting that the adoption of an innovation process may vary across cultures in the rate of innovation activity and in the importance placed on management decisions (Murphy & Southey, 2003).

The literature has also acknowledged the critical nature of the ‘innovation champion’ - “a charismatic individual who throws his or her weight behind an innovation” (Rogers, 2003, p.414) - in the successful adoption of HRIS. A champion’s willingness to explore new usages, ability to use a variety of influential tactics, and engage in risk-taking has been shown to result in a greater rate of innovation adoption and is particularly important in the adoption of HRIS application (Ruppel & Howard, 1998; Murphy & Southey, 2003; Rogers, 2003; Urbano & Yordanova, 2008). Within this context, the power of the ‘innovation champion’ - in this case, the HR executive - is critical to HRM innovations (Wolfe et al., 1995). The relationship warrants further investigation in a human resource management-context, given the potential key role champions play as recipients and disseminators of HR information.

In the words of Kossek (1987), if the top management does not view HRM innovation favorably, it will simply not occur.

E. Corporate Culture

For many years, scholars in organizational behavior have attempted to demonstrate the relationship between an organization’s culture and its success. Successful organizations have the capacity to absorb innovation into their organizational culture and management processes, furthering the argument that the success of organizational adoption behavior is based, to some extent, on the culture of the organization (Lammiman, 1997; Tushman & O’Reilly, 1997). According to Tushman and O’Reilly (1997), corporate culture lies at the heart of organization innovation. Deshpandé and Webster (1989) reviewed several studies, compiling a common definition of corporate culture as “the pattern of shared values and beliefs that help individuals understand organizational functioning and thus provide them with the norms for behavior in the organization” (p. 4). This notion of culture is similar to the definition given by Trice and Beyer (1993), Lock and Kirkpatrick (1995), Hofstede (1998), and Martin and Terblanche (2003). This definition emphasizes the importance of the prevailing culture within an organization in relation to the degree of acceptance of a new innovation. Zaltman et al. (1973) suggest that for innovation to occur and be successful there must be a perception among managers and other users that the organization can adapt and implement the new processes. These perceptions are likely to derive from the prevailing organizational climate or culture, and whether it embodies norms and expectations that support openness, change, and risk-taking (O’Reilly, 1989; Baer & Frese, 2003).

Organizations with open and flexible corporate cultures adapt easily to new technology and the changes that come with it, as their employees at all levels tend to view changes positively and are more willing to adapt to the changes. This is especially true if a philosophy of empowering and motivating employees prevails in the organization (Cooper et al., 1990?, 1994; Ezzamel et al., 1996). Jones et al. (2005) similarly suggests that organizational cultures with a more supportive climate and flexible structures might be more advantageous to successful deployment of new technologies, than organizations with less flexible and more mechanistic cultures. Although some staff may be resistant to changing their ways, empowering them gives a sense of involvement in the shift away from manual systems. He further asserts that employees perceiving the culture of their organization as open are more inclined to have a positive attitude toward organizational change, and subsequently will more readily accept future changes. Another study by Kitchell (1995) found that organizations with cultures seen as being flexible or open, and having a long-term orientation, had a greater propensity in adopting advanced manufacturing technology.

Jackson (2011) states that organizational culture continues to be cited as an important factor in the success or failure of information systems (IS) adoption. This is evidenced by the growing trend in the number of studies that address cultural issues in IS literature over the last several decades. Osterman (1994) and Chi et al. (2007) found that small businesses, along with businesses that have high levels of employee autonomy or highly value employee welfare, were more likely to introduce employee involvement programs, have a TQM program, or utilize diverse planning teams. They further concluded that values such as flexibility, freedom, and
cooperative teamwork promote innovation, while values such as rigidity, control, predictability, and stability hinder innovation (Arad et al., 1997). Additionally, Hoffman and Klepper (2000) found that organizations low in sociability and high in solidarity – so-called ‘mercenary cultures’ - experienced more favorable outcomes with technology assimilation than did more networked, high sociability and low solidarity, cultures.

F. Perceived IT Innovation Characteristics

Based on an analysis of organizational innovation literature, several particular innovation characteristics have been identified as key determinants of innovation adoption. Rogers (1983, 1995) identified these five attributes of an innovation that can influence adoption as: relative advantage, complexity, compatibility, trialability, and observability. Studies undertaken by Kendall et al. (2001), Chen (2003), and Burke and Menachemi (2004) affirm that the five attributes of innovation characteristics proposed by Rogers (1995) influence the adoption of information systems. Researchers have since applied these innovation attributes when testing the adoption of an innovation by an organization, and they continue to be a topic of extensive discussion.

1. Relative Advantage

Refers to the expected benefits and usefulness arising from HRIS applications in comparison to other applications (Rogers, 1995). It has been found to be one of the best predictors, and positively related to, an innovation’s rate of adoption (Kendall et al., 2001; Limthongchai & Speece, 2003; Jeon, Han, and Lee, 2006). The common benefits of HRIS frequently cited in studies included improved accuracy, the provision of timely and quick access to information, and the saving of costs – all very important factors in terms of operating, controlling, and planning activities in HR (Tetz, 1973; Wille & Hammond, 1981; Lederer, 1984).

The degree of relative advantage is often expressed in terms of economic profitability, social prestige, or other benefits such as savings in time, effort, and cost (Rogers, 1995). An HRIS can improve the efficiency of an HR department by automating and digitizing administrative tasks, simplifying work flow and distributing better information to management. Other acclaimed benefits include quicker and less expensive recruitment. Many researchers have suggested that the most important benefit of HRIS is in allowing organizations to spend more time on decision-making and strategic planning, and less time on information input and day-to-day HR administration (Greer, Youngblood, & Gray, 1999). The growing awareness and understanding of the advantages of HRIS applications and tools among the organizations in Jordan could positively influence interest in adopting HRIS.

2. Perceived Compatibility

is defined as “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (Rogers, 2003, p.250). An innovation might be perceived as technically or financially superior et al. in accomplishing a given task, but it may not be adopted if a potential adopter views it as irrelevant to the company’s needs, as it may be incompatible with the firm’s socio-cultural values and beliefs, previously introduced ideas, or client needs for innovation (Rogers, 1995). This includes alignment with the firm’s business strategy (King & Teo, 1996; Walczuch et al., 2000), a factor that directly influences the adoption and integration of IT into the organization (Teo & Pian, 2003). Compatibility also depends on knowledge or familiarity with the innovation and its processes (Roberts & Berry, 1985; Duxbury & Corbett, 1996). Similarly, Grandon and Pearson’s research (2004) suggested that compatibility is one of the main factors that separates adopters from non-adopters.

According to Rogers’ model, compatibility consists of two dimensions: values of the adopter and practices of the adopter (Tornatzky & Klein, 1982; Moore and Benbasat, 1991; Kim, 2009). The first dimension relates to cognitive compatibility - what people feel or think about a technology - and the second with practical, or operational, compatibility (Tornatzky & Klein, 1982; Kim, 2009). As the adoption of new technologies often comes with organizational resistance, it is important, especially for business organizations, that the changes are compatible with its infrastructure, values, and beliefs. An HRIS also automates many of the routine HR administrative tasks and streamlines the workflow in the HR department. Users’ resistance to change in work practices and procedures, possible loss of jobs, and computer phobia are major impediments in the adoption and implementation of HRIS (Yeh, 1997; Teo & Pian, 2003). Therefore, organizations with a corporate culture that embraces change and encourages employees to learn would be more likely to adopt HRIS (Wille & Hammond, 1981; Lederer, 1984; Greengard, 1998).

3. Perceived Complexity

is defined as “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers 2003, p.257). The complexity of a new technology creates greater uncertainty for successful implementation and therefore increases the risk of the adoption process. It is also suggested that the perceived complexity of an innovation leads to resistance due to lack of skills and knowledge (Rogers, 1983), hence, this factor has been found to be negatively associated with adoption of IS innovations (Tornatzky & Klein, 1982; Cooper and Zmud, 1990; Grover & Goslar, 1993). In line with these findings, it is expected that HRIS’s complexity is negatively related to its adoption – seen as many HR departments have been slow in adopting HRIS. This is because, until recently, most HR systems have been difficult for non-technical professionals to understand and use. For those who have adopted HRIS, the systems are limited and generally maintained by the IS department, as the systems are complicated in design and require computer expertise to modify (Dunivan, 1991).

4. Perceived Trialability

is the degree to which an innovation may be experimented with on a limited basis (Chen, 2004). New ideas that can be tested first are generally adopted more rapidly than those that are not, as a testable innovation is less risky for the adopters (Fliegel & Kivlin, 1966). According to Mansfield (1986), the extent of the commitment required to try out the innovation, determines its adoption. He also notes that some innovations are more difficult to use in a trial period than others.

5. Perceived Observability

is the degree to which the results of an innovation are visible to others. This is relevant as the results of newly implemented innovations have varying degrees of observability and ease of communicating these results to others. According to Rogers (1995), observability in an innovation is an important factor in early adoption. Mansfield (1986) states that the rate of reduction of the initial uncertainty regarding the innovations performance affects its rate of diffusion.
6. Other Innovation Characteristics

Have also been cited by various researchers. Tornatzky and Fleischer (1990) identified perceived barriers and perceived benefits as technological innovation characteristics. A further two discussed by Herbig and Day (1992) are cost and risk. In a meta-analysis of research in this area, Tornatzky and Klien (1982) found that only three of Roger’s attributes - relative advantage, complexity, and compatibility - are consistently related to adoption.

In specific relation to HRIS adoption, findings also vary. Teo, Lim, and Fedric (2007) indicated that relative advantage and compatibility are positively related to the adoption of HRIS. Teo et al. (2007) concluded that none of the perceived innovation characteristics were found to be significant in the implementation of HRIS. They explained that the innovation characteristics may be associated with the initial decision to adopt HRIS, but they are not significant factors in the subsequent diffusion of the HRIS.

Table 4: Innovation Classical Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Researcher(s)</th>
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<tr>
<td>Relative Advantage</td>
<td>Tetz, 1973; Downs &amp; Mohr, 1976; Wille &amp; Hammond, 1981; Tornatzky &amp; Klein, 1982; Rogers, 1983; Lederer, 1984; Meyer &amp; Goes, 1988; Cooper &amp; Zmud, 1990; Moore &amp; Benbasat, 1991; Ramiller, 1994; Rogers, 1995; Rashid &amp; Al-Qirim, 2001; Kendall et al., 2001; Limthongchai &amp; Speece, 2003; Carter &amp; Belanger, 2004; Jeon, Han, &amp; Lee, 2006; Tan et al., 2009a; Tan et al., 2009b</td>
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<tr>
<td>Compatibility</td>
<td>Tornatzky and Klein, 1982; Raymond and Bergeron 96; Tan &amp; Teo, 2000; Rashid &amp; Al-Qirim, 2001; Allan et al., 2003; Limthongchai &amp; Speece, 2003; Carter &amp; Belanger, 2004</td>
</tr>
<tr>
<td>Complexity</td>
<td>Rogers and Shoemaker, 1971; Rogers, 1983; Davis, 1989; Cooper and Zmud, 1990; Rashid and Al-Qirim, 2001; Carter &amp; Belanger, 2004; Gharavi et al., 2004; Ziliak and McCloskey, 2004; Tan et al., 2009a; Tan et al., 2009b</td>
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<tr>
<td>Observability</td>
<td>Mansfield, 1986; Rogers, 1983; Slegers et al., 1998; Kogilah &amp; et al., 2008</td>
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<td>Trialability</td>
<td>Rogers, 1983; &amp; Raymond, 1996; Kendall et al., 2001; Khalifa &amp; Cheng, 2002</td>
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G. Socio-Demographic Characteristics of Decision-Makers

Organizational leaders frequently view innovation as an important factor in increasing organizational change, growth, and effectiveness (Damanpour & Schneider, 2006). Because of the relationship between a company’s leader and its promotion of innovation, several researchers have investigated how a leader’s personal and demographic characteristics affect the relationship between innovation characteristics and innovation adoption. (Damanpour & Schneider, 2006). Leadership characteristics - such as CEO knowledge of IT, CEO values, and CEO attitude towards an innovation - are also integral factors for IT adoption (Thong, 1999).

Damanpour and Schneider (2006), as well as a number of other researchers, have argued that a manager’s age and tenure negatively affect innovation and change in organizations. They indicated that senior managers “have been socialized into accepting prevailing organizational conditions and routines and have a greater psychological commitment to them; hence, they will be less willing to commit to changing them” (Hambrick & Mason, 1984; Huber et al., 1993; Damanpour & Schneider, 2006). As this would suggest, newer employees are more open to innovation (Huber et al., 1993).

A review of relevant literature has also identified other decision-makers’ traits that may influence the adoption of IT innovation, such as the ability of HR practitioners to develop networking activities and communication skills, as well as the degree of their knowledge, experience, education, and level of training (Damanpour, 1991). While some studies have argued against the impact of these characteristics on HR adoption behavior (e.g. Daellenbach et al., 1999), others tend to support the relationship between these characteristics and the adoption of innovation (e.g. Murphy & Southy, 2003).

Damanpour and Schneider (2008) report that research differs on the effects of gender on innovation. DiTomaso and Farris (1992) found that women R&D engineers consider themselves less innovative than their male counterparts, while at the same time Fox and Schuhmann (1999) found that female city managers consider themselves to be less entrepreneurial than men in the same position. However, according to Damanpour and Schneider (2006) gender has no effect on the initiation, adoption and implementation phases of the innovation and adoption process. Other research on the role of leadership implies that any differences between men and women regarding character traits or values has little affect on their leadership style or decisions (Bass 1990; Hoojiberg and Ditomaso, 1996) (Damanpour and Schuhmann, 2009).

It is generally assumed that education leads to an increase in innovation. The process of innovation requires constant problem-solving and expertise (Mumford 200). A number of studies have shown that company leaders with the benefit of education are more able to approach issues with complex problem-solving skills (Bantel and Jackson, 1989; Huber et al., 1993, Lee, Wong and Chong, 2005). Educated managers are also more adept at gaining new information necessary to reduce the uncertainty that comes with the adoption of innovation (Rogers 1995). Some have also argued that educated managers are more open to new ideas, leading to a better ability to both detect a need for innovation and create the environment necessary to foster it (Damanpour and Schneider 2006, Damanpour and Schneider 2009). The research of Fishbein and Ajzen (1972) also shows that a leader’s personal beliefs and attitudes usually affect behavioral intentions, hence influencing behaviors and outcomes. While these variables alone may not determine managerial decisions as other factors including education, job and extrinsic rewards must be taken into account, the exact causation is often unclear.

The adoption of innovation is also affected by organizational leaders’ values, including reinvention values and leaders’ attitudes or dispositions, including their affiliation with professional organizations (Sabet & Klingner, 1993) and perceptions of alignment of their interests in the innovation (Berry, Berry, & Foster, 1998). In general, a manager’s pro-innovation attitude or managerial innovation orientation positively affects innovation adoption.

Leadership style is also considered the key precondition for successful implementation of any system. Leadership style concerns the way in which management tends to influence,
coordinate, and direct people’s activities towards group objectives. indicated that many studies have classified leadership style into people-oriented and task-oriented leaders. People-oriented leaders focus on inter-personal relationships and are concerned with mutual trust, friendship, respect, and warmth. Conversely, task-oriented leaders tend to focus more on the task aspect of jobs and deal with defining and organizing tasks for goal achievement. Examined the relationship between leadership style with user participation and systems effectiveness over MIS growth stages. The researchers found mixed results. They found that leadership style varied in importance over the MIS growth stages. At the development stage and the maturity stage, both people-oriented and task-oriented styles had a positive significant relationship with system effectiveness. However, at the initiation stage, both styles had no effect on system effectiveness. They argued that at the initiation stage, the innovation is being introduced to the organization and users must learn the new technology on their own. Studies of organizational innovation have also found that senior executives influence the adoption of innovation by creating a favorable climate toward innovation (Hage & Dewar, 1973; Dewar & Dutton, 1986; Nystrom, Ramamurthy, & Wilson, 2002). For instance, innovation in information technologies in both public and private sectors is facilitated by managers’ proactive orientation toward adopting new technology. Although some studies have found no relationship between managers’ attitude toward New Public Management (NPM)/Reinventing Government (RG) and adoption of the innovations associated with it, found a positive relationship. Researchers support the idea that managers with a more favorable attitude toward innovation and change are more likely to support the adoption of the innovations associated with it, found a positive relationship. 

A. Competitive Pressure
Several empirical studies show that competitive pressure is a powerful driver of IT adoption and diffusion. As organizations move towards a knowledge-based economy, the pressures continue to grow for HR to reduce costs and serve a more strategic role in the organization. As competitive pressures increase, the importance of managing human resources well becomes more apparent. Organizations are thus using HRIS to help make more informed decisions, get the most out of their employees, streamline HR processes, and better allocate HR resources. Hence, the drive to be competitive in all business aspects will lead to the adoption and use of HRIS. However, found that competition was not a significant factor influencing the adoption of HRIS, indicating that competition does not truly provide any direct ‘push’ for organizations to adopt HRIS. This result may be due to the fact that many top managers and boards of directors perceive HRIS as more administrative than strategic and therefore do not view HRIS as being able to deal with the competition in the external environment. This implies that competition in the external environment would not induce organizations to adopt HRIS, however, once they have adopted HRIS and are more familiar with it and aware of its benefits, companies are willing to invest even further in HRIS when faced with additional external environmental pressures.

B. Vendor Support and Marketing Activities
There is a body of research that shows quality assistance from external IT experts, consultants, and vendors is one of the most important aspects of the IT adoption process (Wong & Zhu, 2006; Ghobakhloo et al., 2011). Studies have also shown that supplier-marketing activities have an important effect on the decision to implement new technology (Frambach et al., 1998). In his 1983 article, Rogers argues that marketing activities and competitive strategies are important factors affecting decision to adopt new innovations. In his 1983 article, Rogers argues that marketing activities and competitive strategies are important factors affecting decision to adopt new technologies. It is implied that in more turbulent and unstable environments, a more rapid adoption of innovative technology should be carried out. For instance, as pointed out by, due to market uncertainty, market conditions represent a major factor in the innovation process.

III. The Firm’s External Environmental Factors
External environmental factors influence the adoption and diffusion of new technologies because of their unique features and characteristics, which can present opportunities and constraints for technological innovation adoption. It is implied that in more turbulent and unstable environments, a more rapid adoption of innovative technology should be carried out.

Table 5: The Scio-demographic Characteristics of Decision-Makers

| Characteristics          | Discussed By                  
|--------------------------|-------------------------------
| Education                | Lee, Wong, & Chong, 2005      
| Age                      | Morris et al., 2005; Zhang, 2005 
| Experience               |                               
| Gender                   | Morris et al., 2005; Zhang, 2005 
| Organizational Leaders’ Values |                               
| Managerial Attitude Towards Change |                               
| Leadership Style         |                               

In his 2001 article, Chong analyzes the external environmental factors that he believes are most likely to influence the adoption of technology. The discussion includes: government policy, environmental uncertainty, infrastructure, the influence of trading partners, industry-specific competitive pressures, critical mass, and accepted industry standards. These factors can be found at the industry level, in the macroeconomic environment, or in national policies. A review of existing literature shows that external environmental constructs have been widely studied and generally found to be a significant factor in many IT adoption and diffusion studies. Reported that among the external factors relating to IT adoption - specifically the adoption of the Internet - the following factors are most common: pressure from competitors, customers, or suppliers; the role of government; partners’ alliances; technological infrastructure; outside technology consultants; and users’ expectations. These external factors are generally considered less important than internal factors and significantly less research has been conducted regarding them (Tan & Teo, 1998).
& Bergeron, 1996). In fact, several studies have shown that most SMEs are suffering from lack of IT experts and hiring external consultants. Pointed out that a lack of internal expertise has seriously hindered IS sophistication and evolution within small firms, and that these firms must overcome this problem through help from external sources or developing their own internal end-users’ computing skills. In a similar context, effectiveness of external expertise is also an influencing factor in IT adoption within SMEs. Study revealed that small businesses with higher levels of IS consultant effectiveness have higher-levels of user satisfaction and overall IS effectiveness.

A study by indicated that different marketing variables might stimulate or facilitate adoption, with three in particular that can be expected to significantly affect adoption probability. These are: the targeting of the innovation, the communication on the innovation, and the activities the supplier undertakes to reduce the risk of adoption for the potential customer. The quantity, quality, and value of information provided by the supplier of the innovation were also found to influence the adoption decision.

Quaddus and Hofmeyer’s 2007 article posits a positive relationship between awareness of innovation and the influence of vendors of business-to-business trading exchanges for small businesses in Western Australia. According to the study, awareness is an important perception factor, and vendors of an innovation were largely responsible for the awareness of that innovation.

C. Government Policies and Support

A review of the literature shows a significant relationship between IT adoption and government support. Government initiatives and policies have the potential to directly or indirectly stimulate the development of IT infrastructure and information provision to energize faster technology diffusion. An IT adoption study on companies in China suggests that government policies have an important role in shaping a firm’s IT infrastructure and management, but do not influence IT usage directly (Cui et al., 2008).

Other studies have indicated that government assistance is generally unhelpful. A study by on small businesses in six different European countries indicates that despite government attempts to assist SMEs in adopting IT by increasing public spending on technology projects, there are adoption barriers in the governmental agencies’ mechanisms to help these businesses. This finding is consistent with a study by of the computerization experience of 40 small businesses, computerizing through a government incentive program, with that of another 40 small businesses, which computerized without government assistance. The study shows that participation in a government computerization program does not necessarily result in a more effective IS. Furthermore, Fink’s 1998 study found that government grants do not necessarily result in a more effective IS. Additionally, unions may view the introduction of alternative channels for worker voice as a challenge to their authority and a way to limit their power and influence. The exact relationship between unionization and employee involvement program remains unclear. While Chi et al. (2007) and Ichniowski and Shaw (1995) found a negative association between unionization and the likelihood of introducing an employee involvement program, found no impact. Although, Chi et al. (2007) also found that once introduced, unionized firms are less likely to terminate such programs.

Businesses within developing countries also face their own set of issues, including: lack of telecommunications infrastructure, lack of skilled staff, low Internet penetration, and the hesitant adoption behaviors of developing countries. Revealed that because many institutions dealing with topics such as legislation, education, and industrial relations are nationally based, businesses are under pressure to adapt to their national institutional environment to maintain legitimacy and recognition. National data protection legislation offers a plain example. If rigid national data protection forbids the transfer of personal data via the Internet, the collaboration function of e-HRM will be strongly and negatively affected.

D. Network Externalities

This concept holds that the value of use to any single adopter is positively affected by the size of the network of other users. Organizations may adopt an innovation based on the number of other interrelated organizations in the market environment that have adopted the focal innovation. In the literature these external contingencies have been theorized as the concept of network externalities or critical mass. Found that there are many innovations for which an adopter’s utility increases with the number of other adopters, which they called the ‘network externality concept’. Frambacha and Schillewaert (2002) state that the theory of network externalities claims that the value of the focal innovation, and hence, its adoption probability, is intrinsically determined by the number of other users. In the case of organizational innovation adoption, positive network externalities exist when the intrinsic utility of an innovation increases as a firm’s suppliers, customers, or other organizations also use the innovation. For example, information systems may generate greater value and gain importance once a sufficient degree of a firm’s business partners rely upon these systems as well. Claim that communication between members of a social network can enhance the speed of innovation adoption. The extent to which organizational members share information with other organizations is referred to as their degree of interconnectedness. The greater the level of informal information sharing, the more likely organizational members will be exposed to new ideas (Frambach & Schillewaert, 2002; Rogers, 2003).

State that when considering government policies, we must look for actions or regulations that may ultimately affect technology adoption in a nation - such as investment tax credits aimed at making adoption easier or more accessible to certain groups of organizations. Government legislation and policies on economic development, technology transfer, and employee relations are among the wider political influences on technological and organizational decisions.

On the topic of employee relations, the presence of a union in an organization that wants to undertake more organizational innovation can be very beneficial. Workers in unionized businesses may be more willing to participate in employee involvement programs since they feel the union will protect their overall employment security. However, Freeman and Rogers (1999) found that workers’ desire to unionize decreases if the firm at which they are employed already has an employee involvement program, as this generates the feeling that they already have some voice in the firm. Additionally, unions may view the introduction of alternative channels for worker voice as a challenge to their authority and a way to limit their power and influence. The exact relationship between unionization and employee involvement program remains unclear.

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the innovation by others. Once legitimacy concerns are overcome and the innovation proves to be successful, the propensity of an individual firm to adopt the innovation increases as the number of adopting organizations increases. Assuming that the innovation proves successful, most organizations will eventually adopt the innovation. Several authors on organization behavior (e.g. Kraut et al., 1998) provide the important finding that network externalities seem to be most prevalent when there is a critical mass of users within an individual’s reference or work group. Similarly, found a positive relationship between communication and the successful adoption of organizational innovation. However, the innovation usage by others in an individual’s social environment is also important for innovations that do not possess interactivity. The innovation usage of a focal individual’s peers (e.g. superiors, colleagues, customers, etc.) may signal the importance and advantages of the innovation and motivate the individual to imitate and adopt the innovation. The participation of members of an organization in an informal network of relations facilitates the spread of information on a certain innovation and therefore may have a positive influence on its rate of adoption.

Also stated that the interaction between members of a social system can enhance the speed and rate of the adoption and diffusion process. The participation of organization members in informal networks facilitates the spread of information about an innovation, which may positively influence the probability of an organization adopting the innovation. Such an informal network may either connect organizations within the industry or organizations in separate industries. Several studies have shown that higher levels of network participation are associated with a higher rate of awareness of an innovation, and thus with a higher likelihood of adopting it.

From social psychological and economic perspectives, two types of social influence are distinguished: social norms and critical mass. In the information systems literature, have concluded that usage levels within the organization influence computer acceptance. However, it is believed that organizational members will exhibit more positive attitudes if people in their social environment also use the specific innovation. As result, social usage may influence acceptance over and above the attitudes held. Social norms or pressures have also been recognized as determinants of acceptance behavior. Social norms refer to “a person’s perception that most people who are important think that he should or should not perform the behavior in question”, (p.302). Social norms may influence an individual’s acceptance behavior directly if the focal individual is willing to comply with mandates of important peers who think an innovation should be accepted. The effects of social norms may also be indirect, experienced through attitudes. While found no direct significant effect of social norms on acceptance, found significant direct effects.

Discussion and Conclusion: A review of previous studies has shown that HRIS adoption behavior remains under-researched and that the majority of these studies have focused on the status of HRIS use and other HR applications, which have been integrated as a part of HRIS. Specifically, too little research has been done to address the effect of external factors on the adoption and implementation of HRIS applications, in order to provide a comprehensive range of these factors. It is also noted that the majority of these studies have examined the adoption of HRIS applications as an innovation in service sectors such as public universities, hospitals, banks, and account offices, while few studies were conducted in manufacturing sectors. Therefore, the findings of these studies cannot be generalized beyond these sectors.

A review of literature also showed that there is general agreement that factors determining technology adoption depend on the type of technology, suggesting that no one standard approach can be adopted across technologies and that factors that motivate the adoption of specific technologies require specific attention. This is consistent with criticism of existing technology adoption research. The adoption process of HRIS applications is also considered highly complex and costly. The impact of such factors could be more important in developing countries, such as Jordan, than in well-developed countries.

A large number of the previous studies of IT adoption are cross-sectional, employing a survey method or a case study to assess various factors affecting adoption - including the characteristics of IT, organizations, and the external environment. Generally, these studies make use of factors identified from the organizational innovation adoption literature rooted in innovation theory, assess the relevance of these factors to a particular IT under study, and in some cases, identify additional factors. Analyses of these studies showed that these diffusion factors were examined independently for the sake of clarity. However, in reality, they might exert their effects on the process of diffusion interactively. This interaction between factors can be either potentiating or mitigating, and the relative weight of each variable may change according to the circumstances characterizing the innovation and its context (Wejnert, 2002).

Furthermore, review of these studies showed that results are inconsistent and conflicting. Empirical evidence produced mixed findings regarding many aspects, as discussed through the literature. It was also noted that some of these investigations were conducted in isolation, without benefit from the experience of findings from other studies. It should also be noted that the majority of these studies are confined to the experience of developed countries such as the United States and the United Kingdom.

It is worth mentioning that despite fifty years of investigating adoption of innovation in organizations, academic research has not produced compatible theories that can direct management practice. It is observed that although the adoption process consists of different stages, most innovation of IT adoption studies focus on the dichotomous adoption/non-adoption decision. Furthermore, previous studies did not give clear evidence on how the interaction of internal and external factors can influence the organization’s adoption of HRIS behavior and its implementation level. Additionally, none of these studies articulated the differences in the determinants of the adoption of HRIS and its implementation of applications.

It is noted that in many of these studies, practical implications of research findings are only stated in general terms, and little attempt is made to report the reliability of the scale of measurement for data collection. Furthermore, much of the early research on innovation emphasizes using the “individual” as the unit of analysis, whereas most recent research on innovation uses the “organization” as the unit of analysis.

Finally, the study of innovation should be distinguished between its two processes – innovation adoption and innovation diffusion - and needs either cross-sectional or longitudinal investigation. This study, therefore, has come to bridge this gap by exploring factors determining the adoption and implementation of HRIS applications and its value in a cross-sectional way, using organization as the unit of analysis.
References


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