

Exploring Factors Affecting the Adoption of HRIS in SMEs in a Developing Country: Evidence from Cameroon

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Abstract. With the increasing effect of globalization and technology, Human Resource Information Technology plays a key role in today's modern enterprise management. However, developing countries such as Cameroon are facing challenges in its implementation. The aim of this research is to explore factors influencing the adoption of HRIS by SMEs. To understand this issue, this paper integrates the unified theory of acceptance and use of technology (UTAUT) model. Primary data have been collected through survey by administering structured questionnaire to the employees (HR department) of a number of organizations. We found that Performance Expectancy and Internal Social Influence have a significant effect on the intention to adopt HRIS. In contrast, the specific groups –age and education– are significantly different in the relationship between Adoption Intention and Use. Of course, these findings open the door for future research issues, including explaining why SMEs organizations are sluggish to respond to HR innovation.

Keywords: HRIS, factors of adoption, UTAUT, Cameroon

1 Introduction

One of the most spectacular changes of this century is no doubt the development of Information and Communication Technologies (ICTs). Many organizations are becoming more and more dependent and use them for their daily management so as to achieve their goals and take more advantage of information technology (IT) and human resource management (HRM), the two constructs being correlated. Human resource information system (HRIS) plays an important role in the modern enterprise management [1]. More than being at the heart of HR, HRIS is increasingly occupying the “heart of the firm” because it brings together all the different actors of the social capital [2]. In the past years, researchers have attempted to give a definition of HRIS, but Tannenbaum's definition is the one that is commonly accepted in the literature review. It is composed of three main concepts, namely: HR, Information, and System.

HRIS is defined as a “system used to acquire, store, manipulate, analyze, retrieve and distribute pertinent information about an organization’s human resources” [3].

As a matter of fact, HRIS allows managers not only to follow up their employees’ work on a regular basis, but also to offer indicative dashboards that are very necessary for a better implementation of a HR strategy aligned with the business strategy [4]. Scholars have agreed that using HRIS can provide a number of benefits, not only for the HR function, but also for line managers and the whole organization [5]. While medium and large organizations have spent a huge amount of money and reserves on implementing HR software [6], efforts and considerable resources are to be dedicated small organizations as well. Some of the disadvantages of a HRIS [4] involve data entry errors, cost factor such as costly technology to update in system, initial investment cost and training costs of users [7, 8], cost per-hire for a new employee in a specialized field, high cost and risk of implementing new software [9], malfunctions or insufficient applications to support human resources needs, staffing because of a strong demand in specialized knowledge and the finding of qualified specialist with human resources functional area knowledge, security due to unauthorized access and hacking strategic information.

Taking into consideration that Information and communication technologies (ICTs) continue to be the main drivers of the information society, Cameroon is one of the countries of the sub-Saharan regions which offers a range possibility of IT development. The World Development Report 2016: Digital Dividends, published in January 2016, revealed that the Internet penetration rate in sub-Saharan Africa is in constant growth (from 1.22% in 2006 to 10.84% in 2014). The Bretton Woods institutions believes efforts have to be done. Thus, Cameroon, due to its geography strategic position, can play a major role as a driver for the digital economy in the sub-region. According to the 2015-16 Affordability Report, released in February 2016 by the Alliance for Affordable Internet (A4AI), Cameroon is the 19th country in Africa with an Affordability Drivers Index (ADI) of 25.97%, which is certainly low but encouraging. Moreover, according to the McKinsey Global Institute (MGI), in one of its report published in august 27th, 2014, Cameroon is ranked 8th in Africa, in a ranking on the level of involvement of new technologies.

As other developing countries, Cameroon is facing many challenges in the adoption of technology (HRIS as well), specifically the involvement of end users, the management reluctance; the cost factor, the work culture, the training and learning, the lack of technological knowledge and a strong organizational internal resistance, to name but a few. Despite the importance of HRIS in any modern organizations, some authors seem to agree that HRIS adoption remains insignificant and still suffers a low level of investigation [10], particularly in developing countries [11] like Cameroon [12]. Regarding specifically the case of SMEs, IT adoption by this corporate category has been a regular topic of few studies [13]; but, in this regard, much has to be done in the context of Cameroon. This research paper aims to contribute to filling that gap in the relevant literature, by analyzing some critical factors influencing the Use of HRIS.

2 Theoretical Background

HRIS must be able to cover all the HR management processes, and the various tasks computerized so as to better respond to the needs and thereby to assist management in a better decision-making process [14]. Efficient, regular management is only ensured owing to HRIS adoption [15]. One of the usages of a well integrated HRIS will be through simple spreadsheets and easily performed complex calculations [16]. The significance of the implementation of an IT system such as HRIS will vary from one organization to another. Therefore, HRIS helps in proper planning of HR [17], keeping records, managing talent and knowledge and enhancing decision-making [18]. Firms are facing many challenges when it comes to implementing new technologies, especially in a globally changing environment; so goes with HRIS, the adoption and use of which is possible only when the potential adopters forecast and perceive the net benefits of it, such as competitive advantage [19].

Some research works have explored factors influencing the adoption of the human resource information system (HRIS) in a growing economy, notably in sectors such as banking [20, 21] and the academic environment [22, 23]. Alam *et al.* [24] performed a survey to identify critical factors influencing the decision of hospitals' management in Bangladesh to adopt HRIS. They used the Human-Organization-Technology fit (HOT-fit) model and the Technology-Organization-Environment (TOE) framework. They found that IT infrastructure, top management support, IT capabilities of staff, perceived cost, and competitive pressure are the main critical factors which have a significant effect on the decision to adopt HRIS. In addition, they discovered that the technological dimension stood as the most significant dimension.

On their part, Mamun and Islam [25] revealed that management perception toward HRIS performance fully depended on the experience, gender and education of managers, but was at the same time associated with the organizational origin. Bal *et al.* [26] rather asserted that performance with the HRIS is influenced by system quality, information quality and perceived ease of use. The fact that HR department staff lack knowledge about HRIS [12] does not underrate the importance of this technology. Haines and Petit [27] earlier founded that the presence of a specialized HRIS unit would increase system usage.

Few researches have been carried out on the effects of usage. Ron Hanscome [28], research director of HCM technologies at Gartner Inc., said industry vendors now view the user experience as a competitive battleground. As a consequence, user experience is now used as one of those things where a major change might happen frequently. It would therefore be essential to continuously evolve and improve user experience, as it would have an effect on future implementation, because of usage experience and each software update would in turn have an incremental improvement in usability.

Among the various models and theories proposed for the adoption of ITs, the Unified Theory of Acceptance and Use of Technology (UTAUT), formulated by Venkatesh *et al.* [29], is a model of technology acceptance that aims to describe the intended use of an information system by users. In a consumer acceptance and use context, Venkatesk *et al.* [30] adapted the four constructs (i.e. Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions) of UTAUT that influence behavioral intention to use a technology and/or technology

use. Based on literature review, it has been confirmed that many scholars have used this model in their studies, using subset constructs, in various context. For example, Al-Khowaiter et al. [31] used the social influence construct in a context of a public administration in Saudi Arabia and found that it has both direct and indirect effect for encouraging employees to use HRIS. Moreover, Rahman et al. [21] in their study identified the four above mentioned constructs of UTAUT and proposed a simplify conceptual model without moderating effects (age, gender, experience).

Based on these prior studies, we conceptualize the research model below (Fig. 1). Thus, this study endeavors to test hypothesis regarding HRIS adoption and the variability of Facilitating Conditions and Adoption Intention toward HRIS's use in terms of age, gender and education.

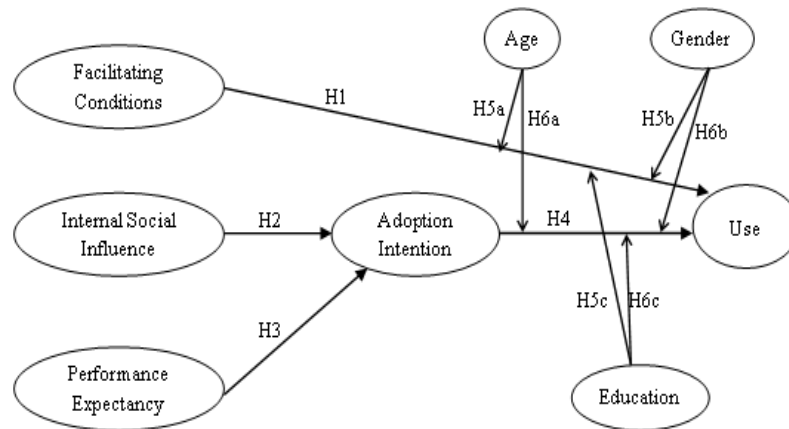


Fig. 1. Research Model

Facilitating Conditions. Many salient factors produce a unique and direct effect on use, without the intermediation of the intention to adopt. They can be considered as a degree to which an individual believes that the perception or non-perception of subjective elements could support the use of the system [29].

H1: Facilitating Conditions have a positive influence on the Use of HRIS.

Internal Social Influence. Venkatesh et al. [29]. stated that it is the degree to which an individual perceives that the people he considers important think he should use a system. And in that case, such people will encourage him.

H2: Internal social influence has a positive influence on the intention to adopt HRIS.

Performance Expectancy. It is a degree to which an individual believes that using the system will have a positive effect on its job performance, so as to attain personal gains [29]. It is an outcome expectation at the individual level, viewed as a perceived usefulness.

H3: Performance expectancy influences users' intention to adopt HRIS.

Adoption Intention. The Adoption Intention is influenced by users' attitude and perceived usefulness of the system by end users. It describes that desire to use the

system. People who intend to adopt a technology are more likely to use it [29] as the Use describes the intensity of the use of HRIS in daily life.

H4: The intention to adopt HRIS has a positive influence on the Use of HRIS.

Age, Gender, and Education. The effects of Facilitating Conditions and Adoption Intention on Use will be significantly different for each specific group of moderators.

H5 (a-c): Age, gender, and education are significantly different for the relationship between Facilitating Conditions and Use of HRIS

H6 (a-c): Age, gender, and education are significantly different for the relationship between Adoption Intention and Use of HRIS

3 Methodology

Firms were not targeted neither for their industry nor their category. Perhaps the target population of respondents for this research was made up of employees working in various public and private organizations in Yaounde and Douala, two cities of Cameroon, mainly in the HR department, using the HR software to accomplish their daily tasks. The sampling frame was a list of workers at the HR department without HR Managers. Items for constructs used in the research model were developed from previous research, and then modified for use in HRIS within the Cameroonian context, in order to enhance their validity. The nature of this research work is hypothetico-deductive, and only quantitative data have been used to conduct the study. These data has been collected from primary source through conducting both online and field survey. The survey has been conducted using structured questionnaires to collect data and measure the constructs of the above proposed model, utilizing a seven-point Likert scale ranging from “(1) strongly disagree” to “(7) strongly agree”. Pre-test with six former students in IS Management (Master’s level) and pilot study of 20 respondents drawn from our population were carried out consecutively, and the various feedback received were used in designing and testing the efficiency of the final questionnaire.

Among the 510 questionnaires sent, 278 were returned and only 258 were usable, giving a response rate of 50.58%. Exploratory Factor Analysis has been conducted to ensure reliability and convergent validity of each item of our model. Then Structured Equation Modeling (SEM) has been performed to identify the relationship between constructs. The SmartPLS 3.2.6 software developed by Ringle et al. [32] has been used to perform the analyses [33].

4 Data Analysis and Results

4.1 Demographic Information

The demographic characteristics of our respondents are shown in Table 1.

Table 1. Demographic Characteristics of Respondents

Profile	Description	Frequency	Percentage
Gender	M	120	46.51%
	F	138	53.49%
Age	20 - 30	106	41.09%
	31-40	101	39.15%
	41-50	11	4.26%
	51-60	40	15.50%
	Over 61 years	0	0
Educational background	High school	20	7.75%
	Bachelor degree	76	29.46%
	Master	162	62.79%
	PhD and above	0	0

Of the 258 respondents, 138 were women (53.49%). It is a fairly average distribution. Concerning educational background, the majority of the respondents 62.79% are holders of a master's degree while 29.46% are bachelor's degree holders. It can be noted that the HR training program ends at least at the level of bachelor's degree. That is why our population is more concentrated on these two levels. The participants' average age was between 20 and 40 (80.24%), which is an eloquent proof of the HR services/departments' inclination for a relatively young staff.

4.2 Demographic of Respondents

Measurement Model. To assess the measurement model, internal reliability, convergent and discriminant validity are used [34]. For each construct, we shall measure the internal reliability (*Composite Reliability-CR* and the *Cronbach's Alpha*). The acceptable value of these measures must be greater than 0.70 [35, 34]. As for the convergent validity measured by the *Average Variance Extracted (AVE)*, the preferred value is greater than 0.50 [36, 34]. *Cross loading* and correlations between constructs are also key measures for convergent validity, so as to ensure that the items being used match their correspondent constructs and that these constructs are independent. Concerning the *outer loadings*, Hair et al. [34] underlined that further analysis should be carried out for values between 0.40 and 0.70 and that items below 0.40 should be removed.

The results of the CR, Cronbach's Alpha and AVE are shown in Table 2.

Table 2. Constructs Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
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Adoption Intention	0.923	0.925	0.963	0.928
Facilitating Conditions	0.818	0.857	0.861	0.528
Internal Social Influence	0.769	1.300	0.838	0.582
Performance Expectancy	0.847	0.855	0.907	0.764
Use	1.000	1.000	1.000	1.000

Table 2 shows that CR value ranges from 0.838 to 1.000 > 0.7, and that the Cronbach's Alpha of the construct ranges from 0.769 to 1.000 > 0.7., which indicates a strong internal consistency and reliability of our constructs. As for AVE, their value ranges from 0.528 to 1.000 > 0.5. Based on these previous findings, we can conclude that the convergent validity is insured. As for the HTMT ratios of correlation between the constructs, the different corresponding values are set forth in Table 3. Such values are acceptable because they are below the threshold of 0.90 [34]. On the basis of the findings, both the reliability and validity of the constructs are guaranteed.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

	Adoption Intention	Facilitating Conditions	Internal Social Influence	Performance Expectancy	Use
Adoption Intention					
Facilitating Conditions	0.365				
Internal Social Influence	0.323	0.280			
Performance Expectancy	0.813	0.376	0.380		
Use	0.888	0.246	0.386	0.775	

Structural Model. The *Bootstrapping* method allows testing the significance of the relationship between the constructs featuring in the model through the interpretation of the *t-statistics*, as well as the correlation between these constructs by looking deeply on the values of the *path coefficient*.

To express some significance, the *t-statistics* must be greater than 1.96. Table 4 summarizes these values.

Table 4. Structural Model Testing Hypothesis using Bootstrapping

Hypothesis		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV)	P Values
H1	Facilitating Conditions -> Use	-0.015	-0.010	0.034	0.445	0.656
H2	Internal Social Influence -> Adoption Intention	0.160	0.166	0.030	5.347	0.000
H3	Performance Expectancy -> Adoption Intention	0.677	0.678	0.031	21.514	0.000

H4	Adoption Intention -> Use	0.858	0.855	0.023	37.096	0.000
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Table 5. R-square and R-square Adjusted

Latents constructs	R Square	R Square Adjusted
Adoption Intention	0.553	0.550
Use	0.727	0.725

Table 4 shows that the relationships *Adoption Intention -> Use* ($t = 37.096$), *Internal Social Influence -> Adoption Intention* ($t = 5.347$) and *Performance expectancy -> Adoption Intention* ($t = 21.514$) have significant effects on the adoption of HRIS. Thus, these findings support hypotheses H2, H3 and H4. However, Table 5 highlights the values « R^2 » and « R^2 adjusted » of the latent constructs « Adoption Intention » and « Use ». The variable « Adoption Intention » is explained at 55% by the variables « Internal Social Influence » and « Performance expectancy », but in turn it explains up to 72% of the variance of the variable « Use ». As far as the values of R^2 are greater than 0.25, we can conclude that our model is quite good and interesting [34].

Multigroup Analysis (MGA). The multigroup analysis assesses whether predefined data groups present significant differences for the group-specific model estimations. For this purpose, we decided to use the PLS-MGA approach (Partial Least Squares Multigroup Analysis). It focuses on the bootstrapping results for each group [37]. The PLS-MGA method [38] represents an extension of Henseler’s MGA [37]. This method is an important non-parametric test for the comparison of the group-specific *bootstrapping* PLS-SEM results. p -value smaller than 0.05 or larger than 0.95 indicates a significant difference from the probability of 0.05.

Table 6. Multigroup Analysis of the Group “Age”

	Path Coefficients-diff (GROUP_AGE(20-30) - GROUP_AGE(31-40))	p-Value (GROUP_AGE(20-30) vs GROUP_AGE(31-40))
Adoption Intention -> Use	0.434	0.000
Facilitating Conditions -> Use	0.029	0.622

Table 7. Multigroup Analysis of the Group “Education”

	Path Coefficients-diff (GROUP_EDUC(Bachelor’s degree, ..) - GROUP_EDUC(Maitrise/Master))	p-Value (GROUP_EDUC(Bachelor’s degree) vs GROUP_EDUC(Maitrise/Master))
Adoption Intention -> Use	0.158	0.002
Facilitating	0.059	0.165

For the sake of simplifying our study, we decided to restrict analyses to only the two groups relating to age and education profile: GROUP_AGE(20-30) vs GROUP_AGE(31-40) and GROUP_EDUC(Bachelor's degree) vs GROUP_EDUC (Maîtrise/Master). We considered the others values irrelevant.

Table 8. Multigroup Analysis of the Group “Gender”

	Path Coefficients-diff (GROUP_GENDER(F) - GROUP_GENDER(M))	p-Value (GROUP_GENDER(F) vs GROUP_GENDER(M))
Adoption Intention -> Use	0.033	0.318
Facilitating Conditions -> Use	0.079	0.162

Table 6 shows that the two groups of age are significantly different for the relationship Adoption Intention -> Use (p -value = 0.000 < 0.05). The analysis of the values of each group path coefficient: GROUP_AGE (20-30) ($path\ coefficient = 0.885 - R^2 = 0.910$) and GROUP_AGE (31-40) ($path\ coefficient = 0.451 - R^2 = 0.327$) reveals that the first group is stronger than the second group, which means that respondents' age range 20-30 has a more significant effect on that relationship than the one ranging from 31 to 40 does. Apparently, the younger respondents will be more sensitive due to their age as they are likely to have a good intention to adopt new technologies.

Table 7 shows that the two education groups are significantly different as concerning the relationship Adoption Intention -> Use (p -value = 0.002 < 0.05). The values of path coefficient are fairly equal between the two groups: GROUP_EDUC(Bachelor's degree) ($path\ coefficient = 0.890 - R^2 = 0.919$); and GROUP_EDUC(Master) ($path\ coefficient = 0.732 - R^2 = 0.0582$). However, although they are not so different from each other, the analysis of the values of R^2 highlights that Bachelor's degree holders have a stronger explanation on the Use of HRIS than Master's degree holders. Given their lower level of education as compared to the other group, holders of bachelor's degree are more enthusiastic and willing to learn more in order to gain more advantage. So, they will supply more efforts.

As for Table 8, there is no significant difference between the two groups of gender as it may appear in the relationships Adoption Intention -> Use (p -value = 0.318 > 0.05) and Facilitating Conditions -> Use (p -value = 0.162 > 0.05). Moreover, paths coefficients' values for each gender group are fairly equal in absolute value ($path\ coefficient = 0.874$ for F and 0.841 for M for the relationship Adoption Intention -> Use and $path\ coefficient = 0.018$ for F and -0.061 for M for the relationship Facilitating Conditions -> Use). On the other side, for the same gender group, these values are greater for the link Adoption Intention -> Use although their contributions to R^2 are fairly equal in each group.

Based on these findings, it clearly appears that the hypotheses H6a and H6c are supported

5 Discussions

Our study contributes to IS research in general and to IT adoption in particular, especially in the Cameroonian context, where the available relevant literature is poor, like in most developing countries. Therefore, by applying the UTAUT model to investigate the various factors influencing HRIS adoption in SMEs in Cameroon, this research work certainly adds new knowledge to the existing literature. One major theoretical contribution consisted in identifying and analyzing critical factors influencing the Use of HRIS by modifying UTAUT2 [30] with the removal of the extended constructs and the application of the subsequent model at the level of consumers. This conceptual model modifies and completes the one formulated by Rahman *et al.* [21]. Prior research works have corroborated some results of Al-Khowaiter *et al.* [31], Dečman [39], Rahman *et al.* [21], Noutsu *et al.* [12] and Venkatesh *et al.* [29]. The findings can be summarized as follows: Social influence and performance expectancy influence the adoption of ITs (including HRIS), while the intention to adopt influences the Use. Furthermore, we demonstrated how some individual characteristics such as age and education are significantly different between the relationship Adoption Intention -> Use. In-depth analyses reveal that the impact of Adoption Intention on Use is stronger for young people, but also more important for people with low educational background. Young people tend to face an accurate ability in processing new technologies, thus affecting their intention to adopt, only if they perceive its usefulness. Moreover, holders of bachelor's degree explain 91.90% of variance of the Use of HRIS. By adopting a technology, they tend to use it because it affects their learning of new technologies, while the holders of master's degree think they already have the maximum knowledge in IT adoption. As a consequence, they won't make any effort because of their complex of superiority.

Another aspect is the insignificant effect of Facilitating Conditions on Use. While the findings of the original UTAUT, in line with Kemayou *et al.* [13], proved the contrary—that is, Facilitating Conditions constitute a significant factor in the adoption process—our study could not ascertain such a statement. Furthermore, there is no significant difference in the relationship of the selected individual characteristics. This evidence could be explained by the fact that very few organizations have so far implemented such a technology in Cameroon and that the system was not well perceived by our interview respondents.

The SME sector in Cameroon which constitutes 95% of the economy fabric is rich and diversified, but unfortunately it is not well organized and lacks maturity in terms of IT implementation. With the recent signature of economic partnership agreements with some international counterparts, Cameroon-based organizations are expected to be more competitive. This will undoubtedly drive the domestic economy and help firms to be more proactive, efficient, and mature while providing them with innovative solutions. This external social influence will necessarily impact on the social groups inside the organization and the performance expectancy these people think they can benefit in performing their daily tasks [40, 41].

While identifying critical factors for the adoption of HRIS in our context, the study attempts to examine the significant difference of each specific-group of the individual characteristics. Future research may focus on a number of limitations faced by this study. This includes failure to study the moderating effects of these variables and their

subsequent joint effect, and to expand the scope of the study to more urban and rural areas as well as HR departments. In addition, the outcome of this study might not be the perfect reflection of the entire scenario in Cameroon as we have not covered all geographic areas of the country and could not consider the point of view of all employees. So, by incorporating entities in other areas while taking into account more viewpoints from end users, another research work will surely bring more insights enabling a fair generalization of findings and, thus, a comparison between firms in cities with those in rural areas.

In the current globalized world, organizations are doomed to interact, exchange information, compete or merge with others more than ever, for a better global positioning. Changes are all the more impressive as organizations connected to the same network will not necessarily react in the same way, because of specific factors such as culture and geographic situation. It may look interesting to deeply investigate the impact of such specific factors in further research.

With the rapid growth of ITs, SMEs in Cameroon will significantly gain net benefits if they use it to enhance their strategy, boost their productivity, obtain accurate information or innovate. In Cameroon like in other developing countries, the adoption of ITs (including HRIS) represents a major challenge because of economic and infrastructural constraints [24].

In addition, they are sustainable indicators for managers willing to implement the HRIS in their industry. The results revealed that the specific groups of Age and Education are significantly different for the relationship Adoption Intention -> Use. So, managers can create segmentation in their firm during the phase of implementation, so as to apply a group policy for specific-groups that are significantly different. It is commonplace that HRIS will also significantly help managers to analyze not only the perceived costs of a modern system, but also the competitive pressure from the surrounding environment when it comes to gaining strategic business advantage. The internal social influence has a positive effect on the Adoption Intention of the HRIS. Besides, managers are expected to build on HRIS to be able to develop a strategy for increased cohesion between the social corps, because the more people interact and exchange information in an organization, the more the organization gains in both knowledge accumulation and maturity.

6 Conclusion

This research work has extended the understanding of HRIS adoption by testing the phenomenon in a developing economy. It is obvious that organizations can benefit from HRIS only if this system is effectively adopted and used by the adopters. Such adoption and use will involve the engagement of all stakeholders within the organization's chain, from the end users to the managers. The aim of this study was to identify critical factors that can influence the adoption of HRIS within our context. The review of the literature has already acknowledged that several factors do influence the HRIS adoption at different levels and contexts. For such factors, including factors of UTAUT, it was showed that performance expectancy and internal social influence produced positive effects on the intention to adopt HRIS, and that age

and education, have significant group-specific difference in the relationship between Adoption Intention and Use. By contrast, there is no significant difference between gender groups. Using UTAUT in our model, our study has confirmed—and sometimes denied—many of the findings developed in the extant literature; better still, it has once more demonstrated that UTAUT is one of the predictive models for IT adoption.

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