Predicting eGovernment Acceptance by Employees Working in the Public Human Development Organizations: Case of Morocco

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***Abstract*— Nowadays, efficiency of human development policies is devoted to the eGovernment (eGov) systems contribution in improving activities of public organizations. However, investment in these systems is faced to financial, organizational, and behavioral issues. These latter could be explained by the eGov acceptance matter. Moroccan government has carried out many eGov initiatives. However, the majority of eGov programs have failed to meet the fixed objectives [40], [16]. This failure caused the recedes of Morocco in the last world ranking of eGov. The low score of Human Capital sub-index was reported as one of the main causes of this recedes [60]. This brings us to question the eGov acceptance factors, especially within Public Human Development Organizations (PHDO). Referring to the Technology Acceptance Model (TAM), this paper aims to develop a model predicting employee's Intention to accept eGov within PHDO in Morocco. For this issue, authors conducted a study on eGov acceptance by employees working in a PHDO named: Social Development Agency, located in Rabat-Moroccan administrative capital. The data was collected through an online questionnaire during a two months period. The collected data was captured and analyzed with SPSS software, while a further analysis was conducted using the structural equation modeling approach. Findings showed that the proposed model explains about 38,6 % of the variance in employees Intention to use eGov system. They also asserted that Attitude, and Perceived Risk influence considerably the Intention to use eGov system. However, perceptions of Usefulness and Ease of Use had no significant impact on this Intention.**

***Keywords*— eGov Acceptance, Human Development, Public Sector and Morocco**

I. INTRODUCTION

Countries that manage to take advantage of eGov advances are best placed to carry out an accelerated and balanced socio-economic and political development. Indeed, the United Nations Development Program (UNDP) considers the use of information systems (IS) as a relevant tool to reduce poverty in the world [57]. According to the report published by UNDP [58], under the theme "Making New Technologies Working for Development", the unprecedented progress in the twentieth century in terms of human development is largely the result of technological advances. As concerning developing countries, although the African continent moves very slowly in the eGov world ranking with late and uneven progress [59, 60], capabilities granted to eGov in accelerating the development process, prompted certain African countries (e.g., Mauritius; Morocco; Tunisia; South Africa; and the Seychelles) to be involved in the course of human development for more sustainable and equitable progress [59]. Despite the importance of eGov in the progress of human development, results obtained from eGov researches e.g., [5]–[7] showed that in addition to financial and organizational barriers, the implementation of eGov may have to deal with human resources behaviour [23].

Since 1982, Moroccan government started the integration of eGov in public organizations. This integration has favoured the promotion of human development. However, the integration process is faced to many constraints such as acceptance issue. In this perspective, this paper investigates factors predicting eGov acceptance by employees working in Moroccan PHDO. To do, we considered the Social Development Agency (SDA) as the site of our study, and SPADS (Projects Management Information System) as the studied eGov system to be studied.

To develop the research model, authors referred to TAM [19]. This is motivated by the usefulness of the TAM as a powerful model predicting eGov in public organizations [28], [53], [23]. The rest of the paper is structured as follow: the second section presents the theoretical background related to TAM and its application in eGov acceptance studies. The third illustrates the proposed research model and hypothesis. The research methodology is presented in the fourth section, as of the fifth section, it exposes findings discussed in the sixth section and followed by the conclusion and managerial implications.

II. THEORETICAL BACKGROUND

A) Technology Acceptance Model

Results derived from the social psychology research have shown that, the acceptance to take an action or to adopt a particular behavior by an individual is strongly influenced by the Intention (INT) of this later [25], [3], [4]. This served as a

theoretical vector for the majority of researches interested in IS acceptance in different areas and communities.

In 1989, Davis et al [19], referred to the theoretical foundations of the Reasoned Action Theory [25], to develop TAM. This model was considered as the first model of behavioral intention that has been designed to predict the IS acceptance. Subsequently, several similar models have been developed, e.g., Spiral model of the stages of change [46]; Community readiness model [45] UTAUT model [63], [64]; However, TAM was the most used, particularly in the areas of IS management [19], [1], [12], [35], [62].

According to the TAM, the actual use of a particular IS (e.g., eGov) by an individual depends mainly on his intention. As assumed by TAM, INT is influenced by Attitude (ATT) construct which is defined as: An individual's positive or negative evaluative affect about performing a particular behavior. It is determined by the beliefs that an individual associates with the consequences of performing behavior, coupled with the evaluation of these consequences [25]. In the IS management domain, ATT is defined as the positive or negative feelings about performing the IS acceptance [18]. Davis et al [19], considered the Perceived Usefulness (PU) and Perceived Ease of Use (PEU) as two constructs that exercise a significant influence on ATT, and INT, insofar as: PU is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context [19]. PEU is defined as the degree to which prospective user expects the target system to be free of effort [19].

B) TAM Applications in eGov Area

The use of TAM in different areas (e.g., eCommerce, police investigations, eHealth) to examine the willingness of organizations' workers to accept IS, proved the appropriateness of TAM to study the eGov acceptance within public organizations [28]. Literature on the application of TAM to human development areas is presented according to two different approaches: 1) researches that mobilized TAM to study the IS acceptance behavior in different areas of human development, as such as : Education, Health, Justice, Environment...etc ; and ; 2) researches that has addressed the same issue but in the context of eGov acceptance studies (e.g., eEducation [67], [32]; eHealth [22]; eJustice [48]; eAdministration [39], [13]. The main difference between the two approaches remains in:

- The first approach is partial and selective, while the second is universal and structured around the human development dimension ;
- The first approach questions the use of TAM in both public and private sectors, but does not take into account the human development dimension, while the second focuses more particularly on the use of IS in the public sector, but the capitalization of the obtained results is done with the objective of serving citizens.
- According to the findings in Table I, there are several variables that have a significant influence on the users' INT to accept eGov. These variables differ from case to case, depending on the studied eGov' features, and targeted population' characteristics (employees, citizens, business). Indeed, the PU and the PEU explain, in combination with other factors (e.g., Trust, Self-Efficacy, and Experience), a variance rate in INT to use eGov ranging from 43.5% [66] to 84% [10].

Table I : Determinants of eGov acceptance intention

Authors	Country	Target	R2	Significant determinants
Susanto [52]	Australia, New Zealand, Canada, United Kingdom, USA, Spain, Singapore, Turkey, Kuwait.	Citizens	N/A	Expected performances, expected efforts, perceived usefulness, compatibility, trust, interpersonal influence, self-efficacy, and perceived risk.
Suki and Ramayah [53]	Malaysia	Employees	67%	Perceived usefulness, perceived ease of use, compatibility, external influence, interpersonal influence, self-efficacy, facilitating conditions and subjective norms.
Lean et al [34]	Malaysia	Citizens	91%	Trust, perceived usefulness, perceived relative advantage and perceived image, complexity.
Carter [10]	USA	Citizens	84%	Perceived usefulness
Wangpipatwong et al [66]	Thailand	Citizens	43.5%	Perceived usefulness, Self-efficacy
Carter and Bélanger [11]	USA	Citizens	85.9%	Perceived ease of use, compatibility and reliability.
Gilbert and Balestrini [26]	UK	Citizens	32%	Perceived relative advantages factors (optimized time, optimized cost); and Perceived obstacles factors (experience, quality of information, financial security, low stress, Trust and visual attractiveness of websites).

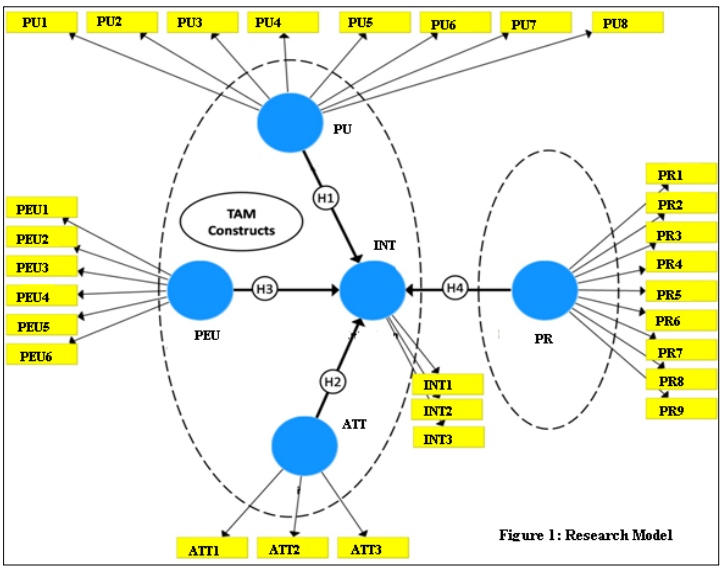

Figure 1: Research Model

III. RESEARCH MODEL AND HYPOTHESES

Our research model is composed of 5 constructs (Fig. 1), extending the TAM model by including a direct link from the variables of Perceived Risk (PR) and PEU to INT. The model is represented as a causal relationship schema. The circles represent the constructs which were measured by a set of items, with arrows representing hypotheses 1 to 4.

By referring to the relations proposed by TAM**,** the research hypothesis related to the PU and ATT constructs are formulated as follows:

H1: Perceived Usefulness is positively related to the Intention to use eGov by PHDO' employees.

Some authors e.g., [18], [19], argue that the role of ATT in the process of IS acceptance is limited to its partial mediation, while others view that the ATT doesn't mediate the relationship between salient beliefs and INT or actual usage, [55], [27]. However, several others researchers argue that the ATT construct have a fully mediation linked salient beliefs and INT [49], [56], [14], hence we hypothesized that:

H2: Attitude is positively related to the Intention to use eGov by PHDO' employees.

The hypothesis concerning PEU and PR variables, are as follows:

Davis et al [19], advance that PEU is a significant secondary determinant of people's INT to use an IS. In other hand, Venkatesh [61] asserted that PEU has a direct effect on INT, and an indirect effect on INT via PU. Hence, we hypothesized that:

H3: Perceived Ease of Use is positively related to Intention to use eGov by PHDO' employees.

PR is considered as the feeling of uncertainty experienced by an individual about the potential negative outcomes that will follow the use of a particular product or service. Bauer [9] defines PR as a combination of feelings of uncertainty intensified by the severity of the consequences that would be implied by a particular behaviour. PR can influence the decision to accept an IS when decision-making conditions create feelings of uncertainty, discomfort, and/or anxiety [20]. Based on these definitions, we hypothesized that:

H4: Perceived Risk exert a negative influence on Intention to use eGov by PHDO' employees.

IV. RESEARCH METHODOLOGY

Our target population is composed of 136 employees, spread over the 16 regional sections of the SDA in Morocco. The sample for this study is composed of 81 employees representing 64% of the overall population. It is composed of 60 men and 21 women. The surveyed participants all make use of the target eGov in performing their professional tasks. Table II presents the demographic profile of the sample.

Table II: Demographic profile of the sample

Profile	N	%	Gender	N	%
Project management officer	39	48,1	Male	60	74,1
Project presentation officer	2	2,5			
IS service officer	1	1,2			
Development agent	21	25,9			
Regional coordinator	11	13,6			
Financial officer	1	1,2	Female	21	25,9
Registry office officer	1	1,2			
Planning officer	3	3,7			
Juridical service officer	1	1,2			
Financial administrator	1	1,2			
Total	81	100	Total	81	100

To build our measurement instrument, we conducted semi-directive interviews with 10 employees who work at the headquarters of SDA, and who have ever used the targeted eGov system. The obtained qualitative data were subjected to a textual analysis process. This helped us to generate the measurement items which we adapted to the original constructs' instruments developed by the previous researches. The obtained measurement instrument is composed of 65 Items, and divided into seven sections. The first section is devoted to the orientation questions. The other sections focus on a set of latent variables, which we measured through a Likert scale with 7 points; from strongly agree to strongly disagree. Indeed, after setting the measurement instrument, we conducted our quantitative study through online survey. The collected data were then submitted to a confirmatory analysis process based on SEM approach.

V. RESULTS OF THE CONFIRMATORY ANALYSIS

To test the research model, we employed the Partial Least Squares (PLS) method, which is adequate to validate predictive models using reflective constructs [15]. This method is strongly recommended in the case of predictive studies with small sizes sample and considerable number of manifest variables. According to this statistical approach we

used Smart-PLS software version 3.2.7 to assess both of the measurement model and structural model.

A) Measurement Model

In accordance with the recommendations of Hulland [31], the evaluation of the measurement model was carried out through the examination of two psychometric criteria: 1) reliability, and 2) validity of the Measurement Model.

1) Reliability of the Measurement Model

The reliability assessment was established on the basis of three parameters: 1) Internal Consistence (IC/Cronbach's alpha) (Table III); 2) Factor Loadings (FL) (Table IV), and; 3) the composite reliability test (CR) (Table IV).

The results obtained from the IC test lead us to a measurement scales with the reliability coefficient (α) ranging from [α = 0.836, to α = 0.940].

Table III : Internal Consistence matrix (Cronbach's alpha)

Constructs	Items		α	Rejected Items	Adjusted α
ATT	ATT1	ATT 2	0,940	N/A	0,940
	ATT 3				
PU	PU1	PU2	0,886	PU2 PU6 PU7 PU8	0,913
	PU3	PU4			
	PU5	PU6			
	PU7	PU8			
PR	PR1	PR 2	0,873	RP8	0,874
	PR 3	PR 4			
	PR 5	PR 6			
	PR 7	PR 8			
	PR 9				
INT	INT1	INT2	0,836	N/A	0,836
	INT3				
PEU	PEU1	PEU2	0,713	PEU6	0,885
	PEU3	PEU4			
	PEU5	PEU6			

The value of α is between 0 and 1, so, higher the alpha coefficient is closer to the value 1, higher is the internal consistency of the used items. Some authors recommend that α value should be higher than 0.7 to decide on the reliability of the measurement scales [43]. On the basis of these recommendations, all constructs were retained (with α> 0,8).

Table IV : Factor Loadings and Composite reliability matrix

Constructs	Items		FL > 0,6		CR>0,7
ATT	ATT1	ATT 2	0,923	0,950	0,961
	ATT 3		0,960		
PU	PU1	PU3	0,901	0,898	0,936
	PU4	PU5	0,871	0,877	
PR	PR 1	PR 2	0,828	0,688	0,900
	PR 3	PR 4	0,780	0,592	
	PR 5	PR 6	0,694	0,835	
	PR 7	PR 9	0,720	0,667	
INT	INT1	INT2	0,873	0,915	0,899
	INT3		0,804		
PEU	PEU1	PEU2	0,769	0,877	0,916
	PEU3	PEU4	0,857	0,890	
	PEU5		0,740		

The acceptable threshold for a loadings coefficient should be above the value of 0.6 [29], [30]. The FL test (Table IV) shows that all constructs except the PR, display a FL values above the required threshold (FL> 0.6). Concerning PR, the fourth item was rejected given its low FL value (FL= 0,592). As for the CR coefficient, a good CR is established when CR >0.7 [42, 56]. The results in the Table 4 shows an excellent CR for all proposed measurement scales, with an average value of CR= 0.916.

2) Validity of the Measurement Model

According to Lewis et al [36], the examination of construct validity can be achieved through two types of measurements: 1) the Convergent Validity; and 2) the Discriminant Validity. The Convergent Validity is confirmed when the items of a given construct are significantly correlated with it. The Convergent Validity can be evaluated on the basis of four psychometric parameters, namely: 1) the AVE> 0.5[24]; 2) the FL; 3) CR; and, 4) IC (Cronbach's Alpha).

Table V : Convergent validity Matrix

Constructs	Items		SF > 0,6		α > 0,7	CR >0,7	AVE >0,5
ATT	ATT1	ATT 2	0,923	0,950	0,940	0,961	0,892
	ATT 3		0,960				
PU	PU1	PU3	0,901	0,898	0,913	0,936	0,787
	PU4	PU5	0,870	0,877			
PR	PR 1	PR 2	0,837	0,682	0,870	0,899	0,561
	PR 3	PR 4	0,805	0,592			
	PR 5	PR 6	0,666	0,826			
	PR 7	PR 9	0,753	0,671			
INT	INT1	INT2	0,872	0,915	0,836	0,899	0,749
	INT3		0,805				
PEU	PEU1	PEU2	0,769	0,877	0,885	0,916	0,687
	PEU3	PEU4	0,857	0,890			
	PEU5		0,740				

According to the Table V the four psychometric parameters are satisfied, hence, the Convergent validity is confirmed for our measurement model. Otherwise, discriminant validity is confirmed when the value of AVE is above the threshold value of 0,5 and, its square root is superior to all other cross correlations [24]. As stated by the results in Table 6, Discriminant Validity test shows that the square root of the AVE of each construct is greater than the value of the correlations with other latent variables [15], which indicates an adequate Discriminant Validity of the measurement model.

Table VI : Construct correlation matrix, AVE and square root of AVEs

Constructs	VME	PR	ATT	PEU	INT	PU
PR	0,535	0,749				
ATT	0,892	-0,417	0,944			
PEU	0,687	-0,401	0,589	0,829		
INT	0,747	-0,496	0,502	0,488	0,865	
PU	0,792	-0,263	0,673	0,589	0,332	0,887

B) Structural Model

After assessing the quality of the measurement model, we tested the structural model in order to assess the formulated hypotheses. Indeed, we examined the degree to which the model fit with the empirical data. The structural model provides information about the model's predictive power given by R^2, and the strength of the path relationships among the

model constructs (see Table VII). R^2 is a statistic coefficient which varies from 0 to 1. It is 0 when the exogenous variables do not provide any information on the endogenous variables, and it is 1 when the explanation of the variance of these variables is perfect. According to the results in Table VI, The INT has a R^2 value of 0.386, which means that the model accounts for 38, 6 % of the INT variance. According to Chin [15], this score confers the model a moderate explanatory power. The hypothesis test was performed by measuring the standardized partial regression coefficient "β" for each hypothetical relationship. The coefficient β can be evaluated according to its sign (+/-) and its absolute value, while its significance is established on the basis of two statistics: t-value> 1.96, and p-value <0.05.

Table VII : Determinant Coefficient (R^2) & Results of Path Coefficients test

Dependant construct	R^2	Hypothetical relationships		β	T-V > 1,96	P-V < 0,05)	Results
INT	0,386	H1	PU-> INT	-0,088	0,670	0,503	Rejected
		H2	ATT-> INT	0,290	2,00	0,046	Accepted
		H 3	PEU-> INT	0,249	1,807	0,071	Rejected
		H4	PR -> INT	-0,298	3,418	0,001	Accepted

As we can observe in Table VII, results showed that the construct of PR (β =-0,298; p=0,001), and ATT (β= 0,290; p=0,046) exert respectively a significant negative and positive influence on the INT. Results reveals also the insignificant influence of PU (β =-0,088; p=0,503), and PEU (β = 0,249; p=0,071), on the INT.

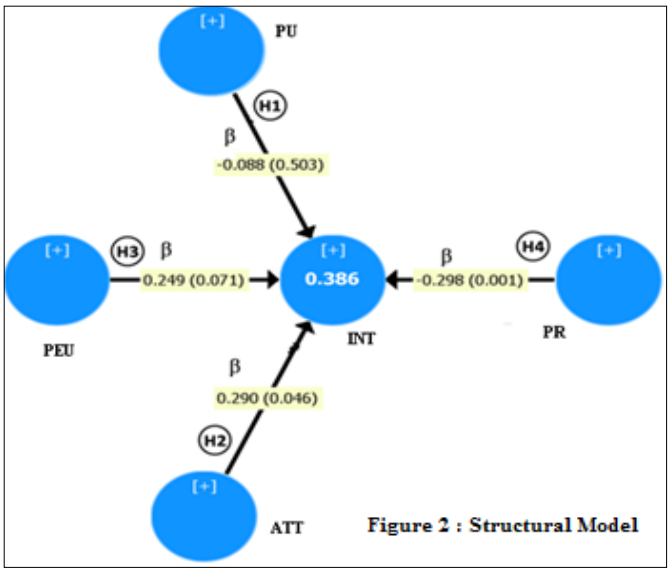

Figure 2 : Structural Model

VI. DISCUSSION

Hypothesis 1 (H1) supposing that PU affects positively the INT to use eGov by PHDO' employees was not supported. The obtained result on the relation between the PU (β = -0.088; t = 0.670; p = 0.503) and INT revealed an unexpected contradiction with the confirmations advanced by the TAM [18], [19], which suggests the direct influence of the PU on the INT. This result shows that, when PHDO' employees decide to use eGov, they do not attach importance to what this use can brings them as a benefits/advantages. This result is consistent with the results obtained in several studies e.g., [49], [14].

Hypothesis 2 (H2), suggesting that ATT influences positively the INT to use eGov by PHDO' employees, was supported. Indeed, based on the results of the hypothesis test (Table VII), the ATT (β = 0.290; t = 2; p = 0.046) exerts a positive and significant influence on the INT to use the eGov, and explains jointly with PR a total variance of 35.4 % (R^2 = 0. 354, with PU and PEU=Cst). This result shows that Moroccan PHDO' employees are likely to use eGov according to the favourable ATT they develop towards its use. In reference to previous research, this result is compatible with the results obtained in different studies, such as [19], [8], [17], [47], [38], [53], [52], [41].

Hypothesis 3 (H3), assuming that PEU affects positively the INT to use eGov by PHDO' employees, was not supported. As for the PU construct, the obtained result about the relation between the PEU (β = 0.249; t = 1.807; p = 0.071) and the INT was opposite to what Davis et al [19] claim about the direct influence of the PEU on the INT. This result shows that PHDO' employees don't take in consideration the ease of use aspect when they are deciding to use eGov. This results is consistent with the findings in many similar researches e.g., [54], [67], [37].

Hypothesis 4 (H4), predicting that PR impacts negatively the INT toward using eGov by PHDO' employees, was confirmed. As we have assumed, the results showed that the PR (β = -0.298; t = 3.418; p = 0.001) exerts a significant and negative influence on the INT to use eGov system. This result indicates that, the higher the PR is, the lower is the INT to use eGov by Moroccan PHDO' employees. Referring to the literature on the influence of PR on INT, this finding is consistent with the results obtained by many researchers e.g., [50], [51], [44], [33].

VII. CONCLUSION AND MANAGERIAL IMPLICATIONS

The present study attempt to determine factors predicting the acceptance of eGov by employees working in the Moroccan public organizations (especially PHDO's structures). The results showed that the proposed model explains 38,6 % of total variance of the intention to use eGov by these employees. They have also indicated that attitude and perceived risk are the only factors that exert a considerable influence on the intention to use eGov by the target population. However, perceptions of usefulness and ease of use had no significant impact on the decision to use eGov by employees. Otherwise, the outcomes of this study warn strategists and decision makers of Moroccan public organizations (e,g., PHDO), on the managerial practices which they should adopt to promote and encourage effective use of eGov by employees. Indeed, for the eGov to be accepted and used effectively by the employees, the eGov strategist must take into account the following considerations:

1) The attitude tends to develop from individual beliefs (perceived usefulness, perceived ease of use) [9]. Hence,

to maintain a positive attitude towards the use of eGov by PHDO's employees, it is advisable to know which aspects/conditions could change/transform these individual beliefs. This could reveal other determining factors and conditions that should be reviewed, adapted and considered before the development or implementation of any eGov system.

2) The utility and benefits of using the eGov by employees, should be demonstrated, i.e., how the eGov use reduces stress and interpersonal conflict, optimizes time management and meeting deadlines, improves efficiency and guarantees the traceability of operations/tasks ;

3) The employees' skills on eGov use need to be improved by organizational support and adapted training sessions.

4) The eGov system must allow employees to correct instantly and within a specified time the technical errors they may commit intentionally. This is supposed to reduce the intensity of perceived risk in the use of eGov by employees,

5) To promote eGov acceptance by PHDO's employees, eGov strategists are invited to consult and involve employees in the eGov development and implementation process.

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