Individual Adaptation in the Face of Enterprise IT Changes in the Organization

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Abstract: Individual adaptation plays an important role in using enterprise information technology (IT). In the life cycle of enterprise IT in the organization, various factors can change IT and its related work tasks. Therefore, users have to adapt to these changes. Since the use of information technology depends on the capabilities acquired through individual adaptation behaviours, it is essential to examine these behaviours in more detail. This study presents the factors affecting individual adaptation behaviours as a model. The results of the experimental test of the model show that technology experience and IT knowledge affect an individual's perception of task difficulty, and personality traits moderate the relationship between task difficulty and individual adaptation behaviours. One of the advantages of the proposed model is separating the roles of managers and users in different periods of enterprise IT adaptation. Also, paying attention to users' personal characteristics in explaining the differences in adaptation behaviours among employees is another advantage of this model.

Keywords: Individual Adaptation, Use, Enterprise IT, Work Tasks, Information Technology Features

Introduction

Individual adaptation behaviours play an important role in using enterprise IT by empowering employees (Bravo & Ostos, 2021). The use of enterprise IT — such as the Enterprise Resource Planning (ERP) system — is often mandatory in the organization (Elie-Dit-Cosaque, & Straub, 2011; McAfee, 2006; Rezvani, Dong & Khosravi, 2017). The reason is that organizations spend a lot to implement these technologies to meet industry standards and achieve the expected

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benefits (Bhattacherjee, Davis, Connolly & Hikmet, 2017; Wu, Choi, Guo & Chang, 2017). However, achieving the mentioned benefits is impeded by many problems due to the failure to use the features of these technologies optimally. The features of enterprise IT refer to "the building blocks or components" which help users undertake work tasks (Griffith, 1999). At the initial stages of adopting enterprise IT, the desired benefits of the organization are not usually realized due to the low use of IT features by users. Therefore, organizations seek to create conditions to use IT dynamically after initial adoption (Lumor, 2019; Hassandoust & Techatassanasoontorn, 2021; Carter, Petter, Grover & Thatcher, 2020). Accordingly, it is inevitable for organizations to face periods of change in the features of enterprise IT and the work tasks supporting it.

In enterprise IT, senior executives often make decisions about changes in the features and tasks (Bagayogo, Lapointe & Bassellier, 2014) as they support organizational processes (Techakriengkrai, Techatassanasoontorn, & Tan, 2021). In the face of these changes, users must acquire the required capabilities as soon as possible, ensuring that the service provision flow in the organization is not threatened (Tyre & Orlikowski, 1996). The behaviours that lead to acquiring these capabilities are known as individual adaptation behaviours. Studies conducted on individual adaptation behaviours (e.g., Bagayogo *et al.*, 2014; Barki, Titah & Boffo, 2007) have solely categorized these behaviours and have not examined the factors influencing them.

It should be noted that individual users perceive changes in technology features and work tasks in idiosyncratic ways and engage in individual adaptation behaviours based on them (Jasperson, Carter & Zmud, 2005). This issue, along with the users' differences in using enterprise IT (Fadel, 2012b; Grgecic, Holten & Rosenkranz, 2015), has led to the main question of the present study as follows:

> What factors explain the differences in individual adaptation behaviours in the face of enterprise IT changes and work tasks?

Failure to identify the factors influencing individual adaptation behaviours poses problems in planning and providing the resources needed to manage the different periods of change in the features of enterprise IT in the organization. We believe that providing a model can make it possible to actively manage enterprise IT in the organization. In this regard, with the help of the concepts proposed in Giddens' (1984) theory of structuration, a conceptual model is proposed to explain the reasons for the differences in individual adaptation behaviours. Then, the proposed model is tested using experimental data. Thus, the main contribution of this research is to provide a model to explain individual adaptation behaviours in different periods of enterprise IT adaptation in the organization. Changes in enterprise IT features may be

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caused by factors such as productivity improvement requirements, technological developments, and changes in laws and regulations.

The rest of this article is organized as follows: First, the literature related to adaptation behaviours is reviewed, and then the research model and hypotheses are developed. In the following sections, the research method and data collection method are discussed. Then, the results and findings of the research through the experimental test are reported. In the discussion section, the implications of the study in both theory and practice are explored.

Literature review and theory development

One of the widely-used models in the study of adaptation behaviours is the Coping Model of User Adaptation (CMUA), proposed by Beaudry and Pinsonneault (2005). In this model, the individual evaluates the new enterprise IT in two stages. In the primary appraisal, the consequences of IT are classified as an opportunity or threat. One individual may find IT enhancing his effectiveness in the organization, while another may view technology as a factor in losing his job. The high or low degree of the individual's control over the situation is measured in the secondary appraisal.

This appraisal is performed according to the three components of work, self, and technology control. In continuation, such appraisals will lead to adaptation strategies that can be emotion-focused or problem-focused. In emotion-focused adaptation, the individual's perception of the situation undergoes a change, and the situation itself remains unchanged. Problem-focused adaptation, on the other hand, causes people to adapt their environment, technology, or themselves. Table 1 presents the studies that have used CMUA to examine how users react to a new enterprise IT in the organization.

As shown in Table 1, individual adaptation behaviours can be divided into two general groups of communication behaviours and independent exploration behaviours (Bagayogo *et al.*, 2014; Barki *et al.*, 2007). Users' appeal to any of these behaviours might have various reasons. For example, Saeed and Abdinnour (2011) consider the two factors of novel situations and the possibility of other people having more knowledge as reasons people want to seek help and assistance from others. Other studies (e.g., Bruque, Moyano & Eisenberg, 2008; Jasperson *et al.*, 2005) examined the role of individual adaptation behaviours in the successful implementation of enterprise IT in the organization. However, these studies have not examined the factors affecting adaptation behaviours. It should also be noted that the common point among all these studies is their focus on implementing new enterprise IT in the organization. In other words, these studies have not dealt with the issue of enterprise IT changes after implementation and the need for the personnel's adaptation to it.

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Table1. Types of individual adaptation Behaviour in different phases of IT implementation

Study	Target IT	Stage of IT Implementation	Individual Adaptation Behaviour
Beaudry & Pinsonneault (2005)	Account management system	Acceptance (Resistance), Use	Seeking Training
Beaudry & Pinsonneault (2010)	Integrated account management system	Acceptance (resistance), usage	Seeking social support (looking for advice, Understanding, and moral support from colleagues)
Elie-Dit-Cosaque, & Straub (2011)	ERP systems	Acceptance (resistance), usage	Looking for Training
Fadel (2012a)	Enterprise electronic medical system (EMS)	Acceptance, usage	Seeking social support, Training, Seeking help from colleagues, Practicing with the system, Seeking moral support
Fadel (2012b)	Enterprise electronic medical system (EMS)	Usage, Infusion	Seeking social support
Stein *et al.* (2015)	Software package	Acceptance (resistance), Usage	Seeking social support
Bala & Venkatesh (2016)	ERP system, multi-module PLM system	Acceptance (resistance), Usage	Looking for Training, Learning from Peers, supervisors, and Help desk
Bhattacherjee *et al.* (2017)	Computerized patient order entry system (CPOE)	Acceptance (resistance), Usage	Seeking social support, Experimentation with IT features
Wu *et al.* (2017)	EMR system	Usage	Exchange information among peers

With the beginning of the use of enterprise IT and its intertwining with the operational and managerial processes of the organization, the expected advantages of IT gradually appear in the organization (Zmud & Apple, 1992; Carraher-Wolverton & Burleson, 2021). However, events that arise from inside or outside the organization (such as requirements for performance improvements, technological improvements or changes, and changes in regulations) cause changes in the enterprise IT, which in turn, lead to periods of IT adaptation (Aanestad & Jensen, 2016; Carraher-Wolverton & Burleson, 2021). During this adaptation, work tasks also undergo some changes (Tyre & Orlikowski, 1994; Tyre & Orlikowski, 1996). These changes will allow users to re-appeal to individual adaptation behaviours to gain the necessary capabilities in this way.

In these periods of change, users are not confronted with a new enterprise IT, but with a set of new or modified tasks that they must evaluate. In other words, since the individual's work has become dependent on enterprise IT, the issue of appraising the expected consequences of technology loses its function. In addition, users employ different adaptation behaviours in these periods of change due to differences in characteristics such as knowledge, skills, experience, and personality (Bruque *et al.*, 2008). Considering the change of the unit of analysis from "IT level" to "task level" as well as the difference in individual behaviours, in this study, we decided to provide a model to explain individual adaptation behaviours.

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Research model and hypothesis development

The structuration theory was used to develop the model. Structuration is the process through which the existing structures (IT and work tasks) are altered by human factors (Giddens, 1984). A set of actions and interventions (by managers) causes the enterprise IT and its related work tasks to change. The result of such changes is a set of new or modified tasks confronting which the users must appeal to a set of adaptation behaviours at the individual level. These adaptation behaviours take different forms depending on users' knowledge, experience, and personality traits.

Accordingly, one engages in the cognitive activity of "appraising the task difficulty" before engaging in individual adaptation behaviours. An individual's perception of the task difficulty is affected by their knowledge level. Therefore, the first set of hypotheses in this study examines this relationship. In the second set of hypotheses, we discuss the moderating role of personality traits of individuals and indicate that the relationship between an individual's perception of the task difficulty and the type of adaptation behaviour is affected by their personality traits.

The impact of IT knowledge on an individual's perception of the task difficulty

When implementing enterprise IT, organizations spend a lot of money on training (Gupta & Bostrom, 2006; Sein, Bostrom & Olfman, 1999). The output of the learning process is defined by the levels of knowledge individuals acquire. With the help of this knowledge, people evaluate the assigned tasks. Typically, task characteristics that affect IT use are divided into three levels: analyzability (difficulty), interdependence, and complexity (Bagayogo, 2014). Among these three characteristics, task difficulty is determined based on the user's evaluation (Li & Belkin, 2008; Parkes, 2017). It should be noted that complexity has two aspects, objective and subjective (Hærem, Pentland & Miller, 2015; Wood, 1986). However, task complexity is considered an objective characteristic to simplify the model in this study.

The changes made in the tasks are of specific complexity and interdependence. However, task difficulty depends on the users' appraisal that can have different levels. According to the explanations presented so far, the first research hypothesis is formulated as follows:

The individual's enterprise IT knowledge affects their perception of task difficulty.

In enterprise IT, mere knowledge about how that technology works is not enough, and people must have a broader level of business knowledge to fully understand its capabilities (Coulson, Olfman, Ryan & Shayo, 2010; Gupta & Bostrom, 2006; Sein *et al.*, 1999). The framework developed by Olfman, Bostrom & Sein (2006) can appropriately reflect the individual's

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required levels of knowledge about enterprise IT. These levels of knowledge include Command-based, Tool Procedural, Business Procedural, Tool Conceptual, Business Conceptual, Business Motivational, and Meta-cognition. Here, it is hypothesized that the different appraisals of the task difficulty are performed due to individuals' different levels of knowledge. Therefore, the sub-hypotheses of the first section are presented as follows:

> Hypothesis 1. (a) Command Based, (b) Tool Procedural, and (c) Business Procedural knowledge are related to the individual assessment of task difficulty.
>
> Hypothesis 1. (d) Tool Conceptual, (e) Business Conceptual, and (f) Business Motivational knowledge are related to the individual assessment of task difficulty.

According to Parkes (2017), task difficulty results from task and user characteristics. In other words, a task with a certain level of complexity and interdependence can have different degrees of difficulty for users.

The moderating role of personality traits in the relationship between an individual's perception of task difficulty and individual adaptation behaviours

Users engage in a set of adaptation behaviours based on their assessment of the difficulty of the task(s) assigned. In addition to the individual, peers (other users), work and technology experts, and managers play a role in the formation and occurrence of individual adaptation behaviours. These adaptation behaviours can be divided into learning activities such as using the documents provided, experimenting with IT features and work tasks, communicating with peers and work and technology experts, and even managers (Jasperson *et al.*, 2005). Table 2 classifies individual adaptation behaviours into two categories of communication and exploratory activities, and presents examples of each.

Table2. Individual Adaptation Behaviours (adapted from Barki *et al.* (2007); Jasperson *et al.* (2005))

Exploration activities		Communication activities	
Experimentation (learning by doing)	Documentation	Communication with experts (internal/external)	Communication with Peers
Take advantage of the simulated environment, Experimentation with IT features	written comments, images, flowcharts, manuals, conceptual models, workflows, video/audio files…	Virtual Classroom Webcasting Video Broadcasting Email, …	Online networks Phone calls Email, …

Personality traits affect learning in the workplace (Rausch, 2013). Personality traits are the basis of individuals' adaptation to the environment (Huang, Ryan, Zabel & Palmer, 2014), and individuals can describe their behaviours by referring to personality traits (Roccas & Sagiv, 2010). Given the issues mentioned above, it is predicted that one of the factors that affect the

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relationship between an individual's perception of the task difficulty and their adaptive behaviours is their personality traits.

In this respect, the second main hypothesis is formulated as follows:

> Personality traits have a moderating effect on the individual's perception of task difficulty and their individual adaptation behaviours.

Figure 1 depicts the conceptual model examining individual adaptation behaviours in using enterprise IT.

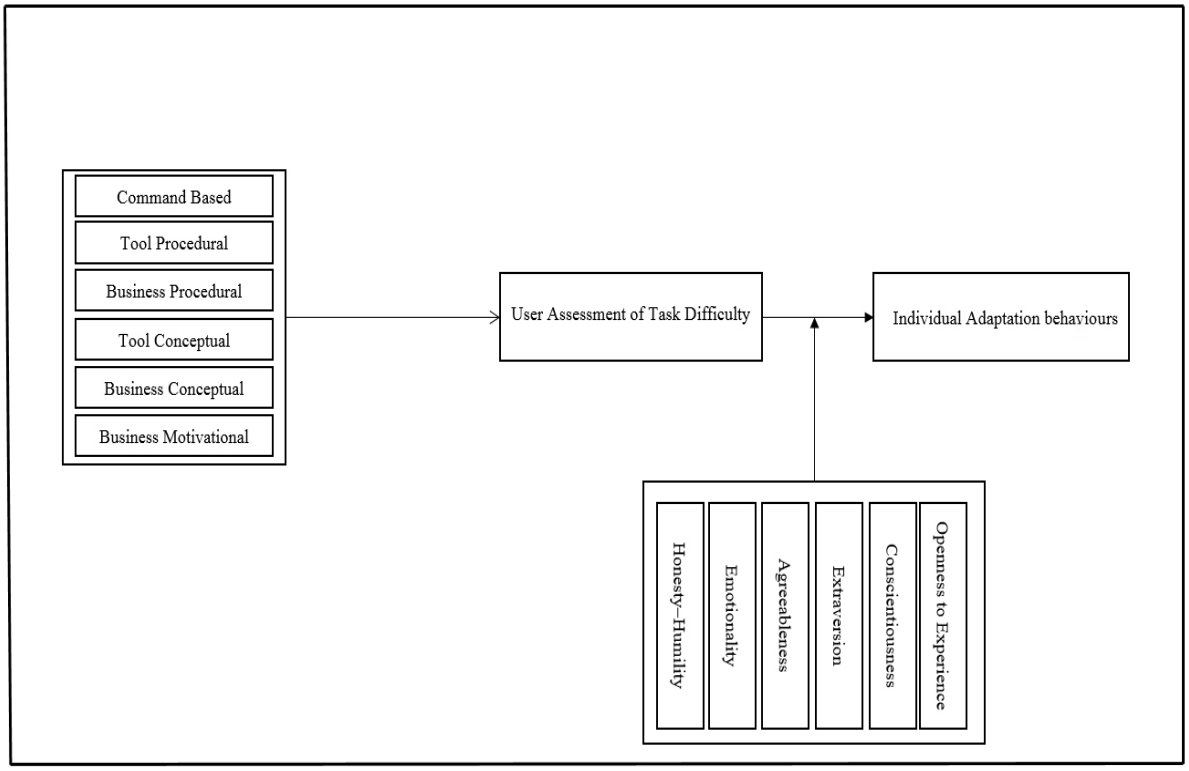

Figure 1. Conceptual Model of Individual Adaptation Behaviour Within the Context of Enterprise IT Use

Various models have been developed to measure personality traits. The Five-Factor Model (FFM) is a typology of traits that have been the subject of most studies. These five factors include the dimensions of openness to experience, agreeableness, extraversion, conscientiousness, and neuroticism. However, in recent lexical research conducted at the level of different languages, a six-factor HEXACO model has been proposed to measure personality traits. In this model, a sixth factor called "honesty-humility" has been added to the five personality traits.

The HEXACO model has three factors in common with the FFM. In the HEXACO model, a relatively updated definition of "agreeableness" has been used, and "neuroticism" has been revised to include the "emotionality" factor. Also, in this model, a new factor called "honesty-humility" has been introduced (Hilbig *et al.*, 2013). The present study uses the HEXACO

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model to measure personality traits. Therefore, the sub-hypotheses in the second part are presented as follows:

> Hypothesis 2. (a) Honesty-Humility, (b) Emotionality, and (c) Agreeableness have a moderating effect on the impact of assessment of task difficulty on individual adaptation behaviour.
>
> Hypothesis 2. (d) Extraversion, (e) Conscientiousness, and (f) Openness to Experience have a moderating effect on the impact of assessment of task difficulty on individual adaptation behaviour.

Research method

Sampling and data collection

In order to experimentally test the proposed conceptual model (Figure 1), the status of using CB[i] software in the headquarters of the state-owned Bank A and its four branches in Tehran was investigated. The CB software covers the stages of registering a loan application to its approval. Using this system, all operations performed through the branch by the customer are recorded and maintained in the system in a centralized manner and can be followed and acted upon. At the time of data collection, a relatively large set of changes had taken place in the CB software, and the features of the technology and work tasks had undergone profound changes. A set of intra-organizational requirements to increase system productivity was mentioned as the reason for such changes.

The total number of experts who used CB software was 250. To facilitate and expedite the research work, instead of studying the whole statistical population, a sample of 153 people (sample size was calculated using Cochran's formula) was used. Of the respondents, 53.3% were male, and 46.7% were female. Age: 9.9% of the respondents were under 30 years old, 39.4% were between 30 and 35 years old, and 50.7% were over 35 years old. Education: 59.2% of respondents had a master's degree or higher. Experience: 91.4% of the respondents had more than ten years of working experience in the organization, and 68.4% were familiar with CB software for 2 to 5 years.

Measurement of constructs

Measurement scales in this study were developed based on a review of the literature and using the existing measurement scales (see Table 3).

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Table 3. Conceptual Model Constructs

Construct	Source/Dimension
IT Knowledge	Developed by Sein *et al.* (1999); Coulson *et al.* (2010); Olfman *et al.* (2006).
Task Difficulty	Mostly adapted from Van de Ven & Delbecq (1974).
Personality traits	Adapted from de Vries (2013).
Individual Adaptation Behaviours	Developed from Gupta & Bostrom (2006); Barki *et al.* (2007); Jasperson *et al.* (2005); Bagayogo *et al.* (2014).

One of the most important issues in designing a measurement instrument is ensuring its content validity. Content validity is realized based on literature review and expert judgment (Boudreau, Gefen & Straub, 2001; Mingers & Standing, 2020). Content validity can be defined as "the ability of selected questions to reflect the characteristics of the measured construct". In this study, to ensure content validity, the relevant literature was reviewed, and the opinions of five experts familiar with the research area were used. In designing the questionnaire items, simplicity and impartiality were tried to be observed as much as possible. In Appendix 1, Table A, the questionnaire items are presented. Table 3 lists the constructs of the conceptual model and their theoretical origins. As shown in Table 3, the conceptual model constructs include IT knowledge, task difficulty, personality traits, and individual adaptation behaviours.

Data analysis

In this study, Partial Least Squares (PLS), as a component-based structural equation modelling method, was used for analyzing the data. PLS makes it possible to model latent constructs in small and medium-sized samples (Chin, Marcolin & Newsted, 2003; Mateos-Aparicio, 2011). Also, PLS allows simultaneous modelling of structural and measurement paths. It is useful for testing moderating effects (Chin *et al.*, 2003).

Measurement model

The measurement model is evaluated by examining construct validity (including discriminant and convergent validity) and reliability. In this study, two methods were used to estimate convergent validity:

1. The indicators of each construct should have a load greater than 0.70[ii] (Chin, 1998).
2. The average variance extracted for each construct should be more than 0.50 (Fornell & Larcker, 1981).

Table B in Appendix 2 shows the indicators of each construct. Two issues are important in measuring discriminant validity. First, each factor load in its corresponding construct must be higher than the other. Second, the value of AVE calculated for each construct must be greater than the common variance between that construct and the other constructs (i.e., the square of

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the correlation coefficients among the constructs) in the model (Chin, 1998). Table C in Appendix 2 shows the discriminant validity indices.

To estimate reliability, composite reliability and Cronbach's alpha method were used. The composite reliability method, proposed by Werts, Linn and Jöeskog (1974), provides a better reliability estimation along with the traditional Cronbach's alpha. As shown in Table 4, the constructs studied have acceptable reliability.

Table 4. Reliability and Validity indices

Constructs investigated	Cronbach's Alpha	CR	AVE	Constructs investigated	Cronbach's Alpha	CR	AVE
Tool procedural	0.882	0.927	0.808	Experimentation	0.833	0.900	0.750
Honesty - humility	0.813	0.887	0.640	Communication with experts(work and technology)	0.913	0.931	0.661
Documentation	0.728	0.846	0.647	Communication with peers	0.838	0.879	0.511
Tool conceptual	0.802	0.879	0.708	Business motivational	0.910	0.937	0.788
Business conceptual	0.726	0.845	0.647	Individual's perception of task difficulty	0.873	0.908	0.663
Agreeableness	0.717	0.825	0.545	Extraversion	0.800	0.870	0.626
Emotionality	0.813	0.877	0.640	IT knowledge	0.679	0.906	0.558
Conscientiousness	0.740	0.830	0.567	Command based	0.878	0.916	0.732
Personality traits	0.944	0.950	0.643	Individual adaptation behaviours	0.941	0.947	0.679
Openness to experience	0.791	0.865	0.617	Business procedural	0.781	0.873	0.697

The findings of the study are presented in Figure 2. The values of 0.19, 0.33, and 0.67 are respectively considered weak, medium, and strong R^2 coefficients (Chin, 1998). Hence, the values calculated for R^2 coefficient indicate that the model enjoys a good fit.

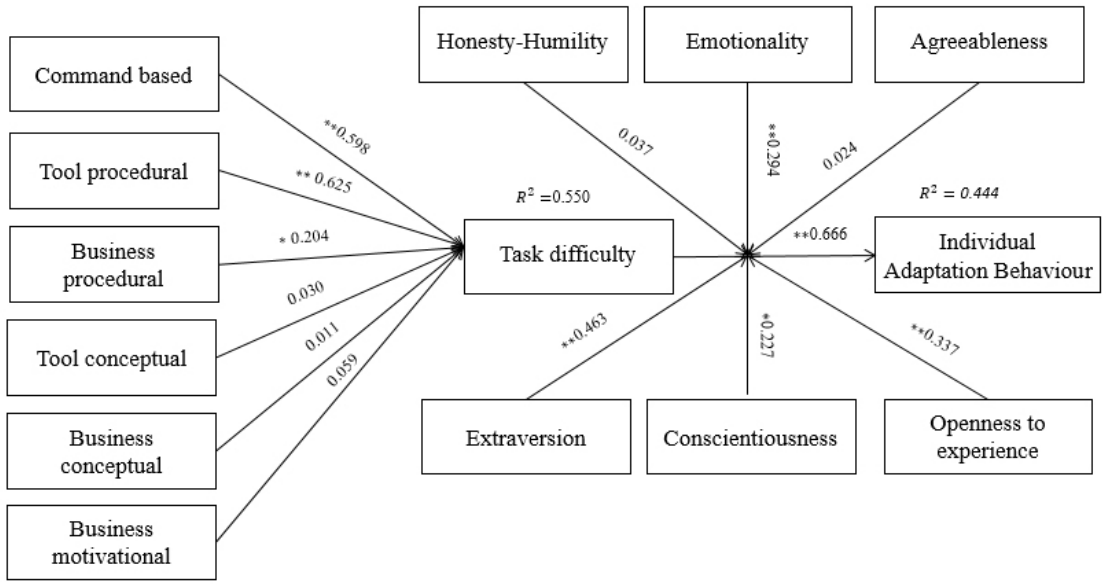

Figure 2. Structural model and hypotheses tests

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Results

The results of the main variables of the model

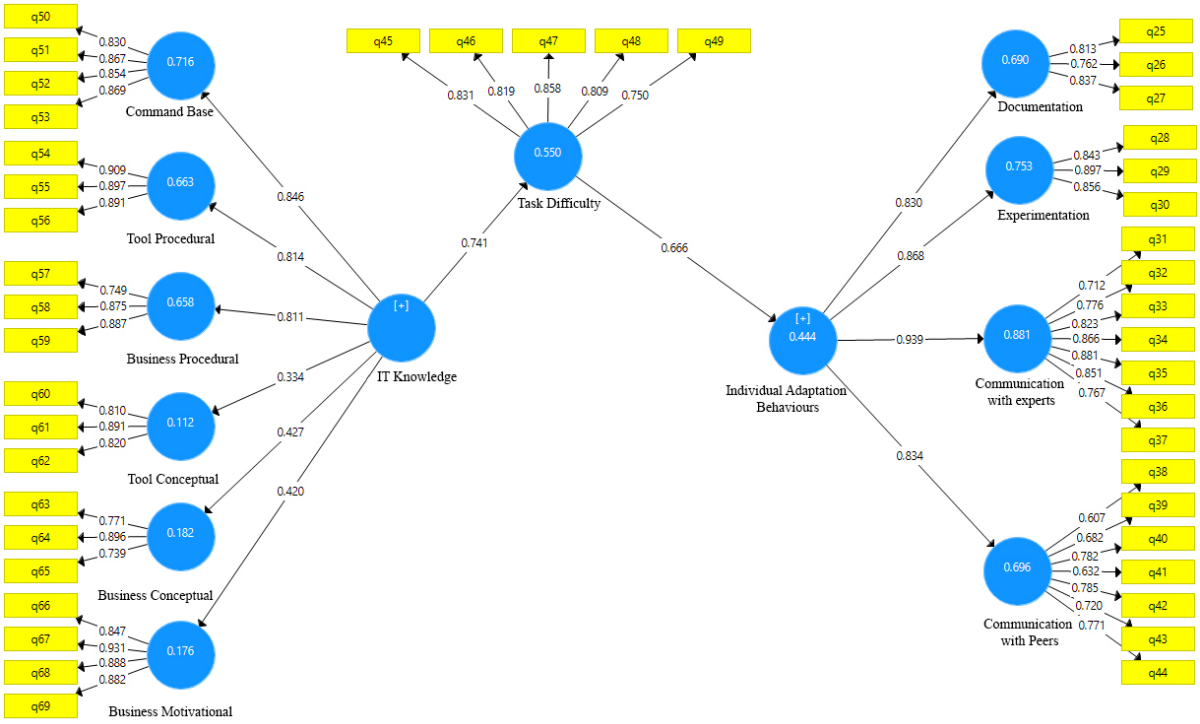

Figure 3. Structural equation model estimating path coefficients

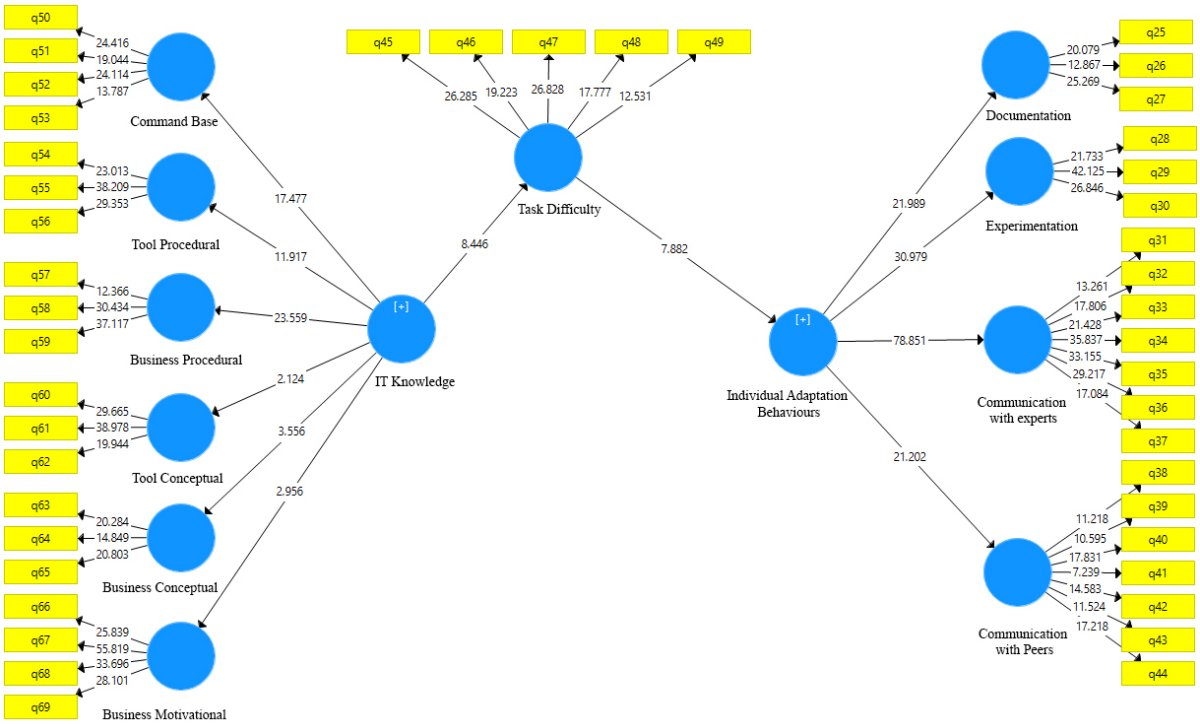

Figure 4. Structural equation model with significant coefficients

Based on the analysis of the collected data, the results of the model fit in the two states of "regression coefficient estimation" and "test of significance of these coefficients" are shown in

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Figures 3 and 4. The regression coefficients have standardized values in the approximate range of -1 to +1. The closer these estimated coefficients are to +1, the stronger and positive relationships they indicate in the structural model (the same applies to negative values). The closer the estimated coefficients are to zero, the weaker the relationships are.

In line with the test of significance of the estimated path coefficients, experimental values of *t* are calculated. When *t* is larger than the critical value, it is concluded that with a certain probability of error (i.e., significance level), the corresponding path coefficient is significantly different from zero. The common critical values are 1.65 (significance level of 10%), 1.96 (significance level of 5%), and 2.57 (significance level of 1%) (Hair *et al.*, 2017). Based on these results, the knowledge related to enterprise IT affects the individual's perception of task difficulty (t=8.446, β=0.741), and the individual's perception of task difficulty affects individual adaptation behaviour (t=7.882, β=0.666).

To investigate the effect of each level of technology knowledge on the individual's perception of task difficulty, the model of this section was run in the SmartPLS software, whose results are shown as path coefficients and t-statistics in Table 5.

Table 5. Path coefficients and t statistics (independent variable: individual's perception of task difficulty)

Independent variable	Path coefficient (β)	t Statistics	Status
Command based	0.598	**7.619	supported
Tool procedural	0.625	**8.026	supported
Business procedural	0.204	*2.145	supported
Tool conceptual	0.030	0.382	-
Business conceptual	0.011	0.120	-
Business motivational	0.059	0.783	-

** $P < 0.01$ * $P < 0.05$

As shown in Table 5, the three knowledge levels "command-based" (t = 7.619, α <0.01), "tool-procedural" (t = 0.026, α <0.01), and "business procedural" (t = 2.145, α <0.05) affect an individual's perception of task difficulty. That is, hypotheses 1(a), 1(b), and 1(c) are supported. In contrast, hypotheses 1(d), 1(e), and 1(f), which represent the impact of knowledge levels "tool conceptual," "business conceptual," and "business motivational" on the individual's perception of task difficulty, are rejected.

To investigate the hypothesis about the impact of personality traits as a moderating variable on the relationship between the perception of task difficulty and individual adaptation behaviours, the structural equation model was run in two states to estimate the path coefficients and the significance of these coefficients. The results are shown in Figures 5 and 6. As can be seen, first, the moderator variable (personality traits) is entered into the model as an independent variable. Then, it is defined as a moderator variable in the software. This

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moderating variable (latent variable shown in olive) is the product of the individual's perception of task difficulty and personality traits. In other words, this variable shows the simultaneous effect of personality traits and the individual's perception of task difficulty on individual adaptation behaviour. According to the estimated regression coefficient (β = 0.226) and the *t* statistic (t = 2.240), personality traits have a moderating effect on the relationship between the individual's perception of task difficulty and individual adaptation behaviour.

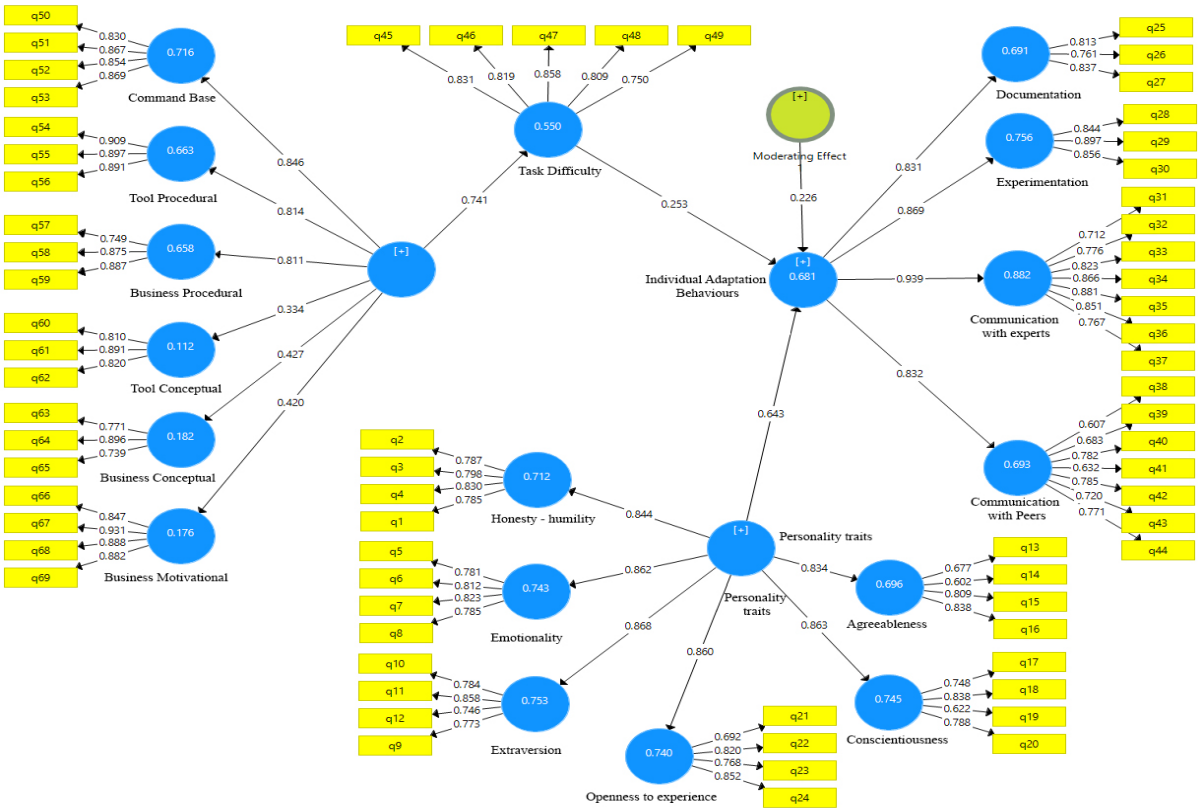

Figure 5. Structural equation model estimating the path coefficients of the moderator variable

To examine the moderating power of personality traits, Cohen's F² (Cohen, 1988) was used:

$$F^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

$$F^2 = \frac{0.681 - 0.444}{1 - 0.681} = 0.743$$

Since the obtained value is 0.743, it can be said that personality traits are of high moderating power. The path coefficients and t statistics for examining the moderating role of different personality types are presented in Table 6. (Each personality trait was first entered as an independent variable into the model, then defined as a moderating variable.)

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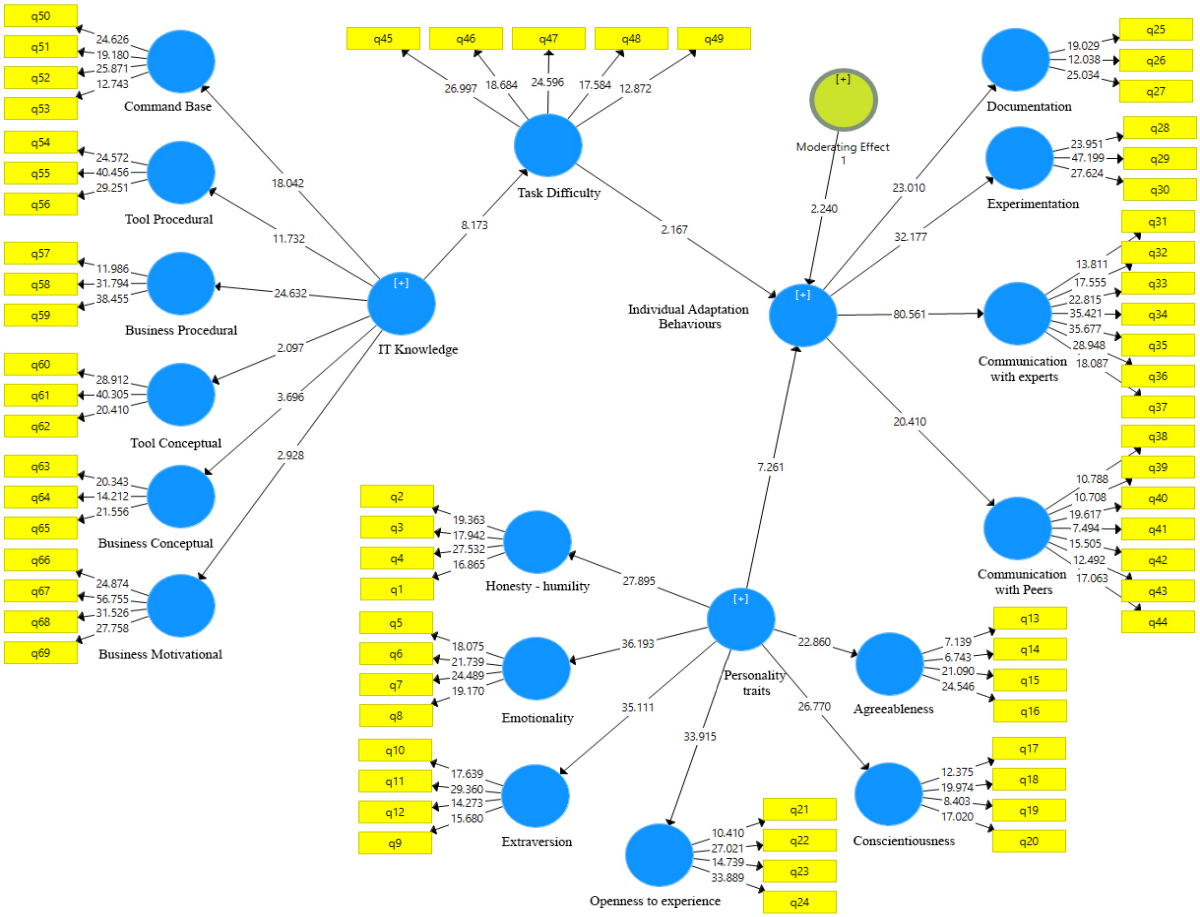

Figure 6. Structural equation model with significant coefficients of the moderator variable

Table 6. Path coefficients and t statistics (independent variable: individual adaptation behaviour)

Variable	Path coefficient (β)	t Statistic	Status
Honesty and humility	0.037	0.618	-
Emotionality	0.294	**3.375	Supported
Agreeableness	0.024	0.552	-
Extraversion	0.463	**5.353	Supported
Conscientiousness	0.227	*2.465	Supported
Openness to experience	0.337	**4.451	Supported

** $P < 0.01$ * $P < 0.05$

As shown in Table 6, the four personality traits of "emotionality" (β = 0.294, t = 3.375, α <0.01), "Extraversion" (β = 0.463, t = 5.353, α <0.01), "Conscientiousness" (β = 0.227, t = 2.465, α <0.05), and "openness to experience" (β = 0.337, t = 4.451, α <0.01) have a moderating effect on the relationship between an individual's perception of task difficulty and individual adaptation behaviour. In other words, hypotheses 2(b), 2(d), 2(e), and 2(f) are supported. In contrast, hypotheses 2(a) and 2 (c), which represent the effect of the personality traits of "honesty and humility" and "agreeableness", respectively, are not confirmed.

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Analysis of demographic variables

One of the issues analyzed at the end is demographic variables. The variables of work experience, technology experience, and gender cause differences in individual behaviours (Jasperson, 2005) and can effectively explain individual adaptation behaviours. Here are three general hypotheses:

1. Work experience significantly affects the individual's perception of task difficulty.
2. Technology experience significantly affects the individual's perception of task difficulty.
3. Gender has a significant effect on individual adaptation behaviours.

Work experience and technology experience

One-way analysis of variance (ANOVA) was used to investigate the effect of work experience and technology experience on an individual's perception of task difficulty (Table 7). In this test, when the significance level is less than 0.05, there is a significant difference among the means of the samples. It should be noted that ANOVA alone does not determine which means are different, which is why we also used post hoc tests.

Table 7. ANOVA Results

		Sum of squares	df	Mean square	F	Sig
Work experience	Between groups	0.589	2	0.295	0.916	0.402
	Within group	47.899	149	0.321		
	Total	48.488	151			
Technology experience	Between groups	23.256	3	7.752	45.471	0.000
	Within group	25.232	148	0.170		
	Total	48.488	151			

As shown in Table 7, the significance level of the work experience variable is 0.402, higher than the error level of 0.05, so the significance of the test is not confirmed. In other words, work experience does not significantly affect an individual's perception of task difficulty. Although work experience is one of the components that determine individual differences and lead to the familiarity of employees with the information flow in the organization (Fuerst & Cheney, 1982; Jasperson *et al.*, 2005), the results of the experimental test in this study show that differences in work experience do not cause a difference in adaptation behaviours. A possible explanation for this result could be related to the relatively long work experience of most people surveyed: 91.4% of the respondents had more than ten years of experience in the bank, which shows a good knowledge of work processes among the majority of employees.

As can be seen in Table 7, the significance level of technology experience is 0.000, which is less than the error level of 0.05, so the significance of the test is supported. In other words,

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people with different technology experiences have different perceptions of task difficulty. The differences between the means of the groups using Least Significant Difference (LSD) and Tukey tests are presented in Tables 8 and 9.

Table 8. The results of the LSD Test

I	J	Mean differences (I-J)	Mean standard error	Significance	95% Confidence interval	
					Lower	Higher
1 year and less	1-2 years	0.22857	0.18020	0.584	-0.2397	0.6968
	2-4 years	0.95439*	0.17721	0.000	0.4939	1.4149
	4-5 years	1.11064*	0.17900	0.000	0.6455	1.5758
1-2 years	1 year and less	-0.22857	0.18020	0.584	-0.6968	0.2397
	2-4 years	0.72581*	0.08397	0.000	0.5076	0.9440
	4-5 years	0.88207*	0.08767	0.000	0.6543	1.1099
2-4 years	1 year and less	-0.95439*	0.17721	0.000	-1.4149	-0.4939
	1-2 years	-0.72581*	0.08397	0.000	-0.9440	-0.5076
	4-5 years	0.15625	0.08135	0.224	-0.0551	0.3676
4-5 years	1 year and less	-1.11064*	0.17900	0.000	-1.5758	-0.6455
	1-2 years	-0.88207*	0.08767	0.000	-1.1099	-0.6543
	2-4 years	-0.15625	0.08135	0.224	-0.3676	0.0551

*mean difference is significant at 0.05 level.

In presenting the results of the Tukey test (Table 9), the technology experience is divided into homogeneous subgroups. These results indicate that the means are significantly different. The mean technology experience of 1 year and less is homogeneous with 1-2 years, and they fall into one category. The mean technology experience of 2-4 years and 4-5 years is homogeneous and falls into the same category. The mean of groups shows that, as the technology experience increases, people evaluate the assigned task(s) as less difficult. The results reported in the literature also confirm this finding. The technology experience affects behaviour through its positive effect on the richness of individual knowledge (Vankatesh & Davis, 2000). As the experience of working with technology increases, the user spends less time on tasks (Jeyaraj, 2022). Therefore, technology experience is also one of the components leading to individual differences, and its different levels can cause different adaptation behaviours.

Table 9. The Result of Tukey Test

Technology experience	N	1	2
4-5 years	47	2.8894	
2-4 years	57	3.0456	
1-2 years	42		3.7714
1 year and less	6		4.0000
Level of significance		0.679	0.362

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Gender

A paired comparisons test was used to investigate the impact of gender on individual adaptation behaviour. To this aim, two hypotheses are considered:

$$H_0: \mu_f = \mu_m$$

$$H_1: \mu_f \neq \mu_m$$

Table 10. The results of the t-test with two independent samples

	Levin's test		t-test with two independent samples						
	F	Sig.	t	df	Sig.	MD	SE	95% Confidence interval	
								Lower	Higher
Equal variances	0.117	0.732	0.674	150	0.501	0.06544	0.09705	-0.12632	0.25720
Non-equal variances			0.677	149.04	0.500	0.06544	0.09671	-0.12566	0.25655

Since, in Table 10, the significance value of Levin's test is 0.732 and is more than 0.05, the results of the first row are used. Given that the value of the two-way significance level is greater than 0.05% (0.501), then H_1 is rejected, and H_0 is substantiated. In previous studies (such as Vankatesh & Morris, 2000), gender was identified to influence the adoption of new IT in the organization. So far, the effect of this variable on individual adaptation behaviours during the change of enterprise IT characteristics has not been studied. The experimental test results in this study show that gender does not affect the relationship between an individual's perception of task difficulty and individual adaptation behaviours. In other words, there is no significant difference between the individual adaptation behaviour of males and females.

Discussion

User adaptation plays a key role in the successful implementation of enterprise IT in the organization (Wu *et al.*, 2017). In this study, an attempt was made to gain a proper understanding of the type of users' reactions to the beginning of an enterprise IT adaptation period and work tasks in the organization.

As shown in Table 5, user knowledge is limited to three levels: command-based, tool procedural, and business procedural. It should be noted that deeper levels of users' knowledge lead to a proper understanding of enterprise IT by them (Coulson *et al.*, 2010). Therefore, due to the users' insufficient knowledge, it can be argued that users evaluate the difficulty of the assigned tasks at a high level. The main reason for the insufficiency of users' knowledge levels is the cost of training. The lack of appropriate training programs by organizations causes users to use different adaptation behaviours to cover their knowledge weaknesses.

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Table 6 shows the effect of different dimensions of the HEXACO model on the relationship between individual perceptions of task difficulty and individual adaptation behaviours. In the HEXACO model, the dimensions of honesty-humility, emotionality, and agreeableness reflect altruism, and the dimensions of extraversion, conscientiousness, and openness to the experience reflect engagement. Altruism is a trait that leads people to activities, thoughts, and feelings such as sympathy, kindness, compassion, caring and concern for others. Engagement or investment of energy in areas of interest is a prominent feature for differentiating individuals and manifests itself in three different areas of social, task, and idea (de Vries, Wawoe & Holtrop, 2016). As can be seen in Table 6, dimensions of the HEXACO model that reflect engagement have a moderating effect on the relationship between an individual's perception of task difficulty and individual adaptation behaviour. This is the first time this issue has been explored, and the results can be useful for researchers to gain a deeper understanding of individual adaptation behaviours. Different characteristics have been mentioned in the literature for each dimension of extraversion, conscientiousness, and openness to experience. Extraversion involves actively investing energy in the social sphere (such as socializing, leading, and entertaining). Conscientiousness includes the active investment of energy in the task area (such as working, planning, and organizing), and openness to experience is related to an active investment of energy in the area of ideas and opinions (such as learning, imagining, and thinking) (Ashton & Lee, 2007; de Vries *et al.*, 2016).

As shown in Table 6, among the dimensions that reflect altruism, only emotionality has a moderating effect on the relationship between an individual's perception of task difficulty and individual adaptation behaviour. Although this is the first time this issue has been explored, it should be noted that some characteristics of the emotionality dimension, such as help-seeking and empathy/attachment, are associated with individual adaptation behaviours. Agreeableness and honesty-humility do not moderate the relationship between an individual's perception of task difficulty and individual adaptation behaviour. De Vries *et al.* (2016) do not consider agreeableness as related to job performance. Fairness and sincerity are among the dimensions of the honesty-humility factor, and tolerance and forgiveness are among the characteristics of agreeableness (Ashton & Lee, 2007).

Implications for theory

In this study, the issue of individual adaptation behaviours during different periods of enterprise IT adaptation and work tasks was investigated. One of the most widely used models in the literature for examining employee adaptation with enterprise IT is the CMUA model. The CMUA model is often used when introducing a new IT in the organization to study the

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different reactions of users to it. Contrary to the claims of Beaudry and Pinsonneault (2005), we believe that the CMUA model does not work well for examining individual adaptation behaviours during changes in technology features and work tasks. The reason is that, during the changes, the user is not faced with a new enterprise IT to decide whether to use it or not. Here, due to the dependence of the organization's workflow on enterprise IT, the user must acquire the necessary capabilities as soon as possible. Therefore, this study presents a new conceptual model for investigating individual adaptation behaviours during different periods of change.

Table 11 compares the components of the proposed conceptual model and the CMUA model to clarify the issue further. The first comparative component deals with the users' cognitive evaluation. In the CMUA model, the cognitive assessment takes place in two stages. The nature of these evaluations is commensurate with the introduction of a new enterprise IT in the organization; whereas, in the proposed conceptual model of this study, the user evaluates the changes in the enterprise IT in one step and based on their perception of the difficulty of the task(s) assigned. The cognitive assessment has a complete conceptual relationship with the research topic presented in this article. The second comparative component deals with the issue of individual adaptation behaviours.

Table 11. Comparing the components of the proposed conceptual model and the CMUA model

Models	Cognitive Appraisal	Individual Adaptation	Level of Analysis	Reappraisal	Individual characteristics	Context of use
CMUA	Primary appraisal: Perceived opportunity Perceived threats Secondary appraisal: Perceived controllability	Benefits Satisficing, Benefits Maximizing, Self Preservation, Disturbance Handling	Users	Y	N	Introduction of New IT in Organization
Our conceptual-ization	Assessment of Task Difficulty	Exploration activities: Experimentation (learning by doing) Documentation Communication activities: Communication with Experts (internal/external) Communication with Peers	Users & managers	Y	Y	Continuous use of IT

Note: Y = has been considered; N = has not been considered

In the CMUA model, based on the cognitive assessment performed by users, the following four adaptation strategies are proposed: **benefits maximizing** (high opportunity-control), in which the adaptation strategy is problem-focused, and the individual takes complete advantage of the opportunities provided by IT; **benefits satisfying** (low opportunity-

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control), where adaptation efforts are minimal, so people satisfy themselves with the benefits IT provides; **disturbance handling** (high threat-control), where the individual engages in problem-focused efforts to handle the situation and emotion-focused efforts to minimize negative consequences; and **self-preservation** (low threat-control), in which the adaptation strategy is emotion-focused. In this case, the individual withdraws from the new IT and uses it as little as possible. As shown in these strategies, moving from a "benefits maximizing" strategy to a "self-preservation" strategy reduces an individual's willingness to use enterprise IT. However, in various periods of change in the enterprise IT in the organization, the goal is the full and optimal use of IT. Therefore, adaptation efforts that focus on employee empowerment are relevant. For this purpose, in the proposed conceptual model, after the user evaluates the difficulty of the task(s) assigned, a set of adaptation behaviours that are divided into two groups of exploratory and communication behaviours are presented.

The third comparative component deals with the level of analysis. The level of analysis in the CMUA model is limited to users, while in the proposed conceptual model, the analysis is performed at both managerial and individual levels. As shown in Figure 7, in enterprise IT, managers and employees play different roles in changing technology features and work tasks. Therefore, differentiation between roles makes it possible to properly identify individual adaptation behaviours. The fourth comparative component deals with the issue of re-evaluation. The CMUA model is based on a recursive pattern. In this model, the output of adaptation strategies adopted by users can affect (strengthen/weaken) the perception of IT. This shift in perception can, in turn, lead to different adaptation strategies. In the proposed conceptual model, the individual's assessment of task difficulty is moderated by adopting individual adaptation behaviours and routine use of IT (Figure 7). Learning that takes place during individual adaptation behaviours enhances one's knowledge, and the routine use of IT raises one's level of experience.

The fifth comparative component deals with demographic characteristics. The CMUA model does not address the individual characteristics that cause behavioural differences. Individual characteristics affect the use of and adaptation to IT in the organization (Xu & Lu, 2022). In the proposed conceptual model in this study, to explain the differences in adaptation behaviours among employees, various individual characteristics are examined. Among the studied characteristics (personality traits, knowledge, gender, work experience, and technology experience), the influence of personality traits, knowledge, and technology experience on individual adaptation behaviours was observed to be significant. The sixth and last comparative component deals with the area of use. The CMUA model is most used when introducing new enterprise IT in the organization. In contrast, our proposed conceptual model can be applied during the life cycle of enterprise IT in the organization (Carraher-Wolverton

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& Burleson, 2021), and make it possible to properly understand the mechanism of adopting individual adaptation behaviours.

This research can also shed some light on the relationship between the tasks assigned to employees during the use of enterprise IT and their performance. Users' evaluation of assigned tasks based on knowledge and experience leads to adopting various adaptation behaviours. Since individual adaptation behaviours and the use of IT are closely related (Barki *et al.*, 2007), a better understanding of these behaviours can facilitate employee performance appraisal.

Implications for practice

Implementation of enterprise IT in the organization is associated with different periods of IT adaptation and work tasks. In the conceptualization presented in this article, managers and employees play different roles at two different levels. Managerial decisions lead to changes in enterprise IT and work tasks, and, at the individual level, employees make it possible to use IT through various learning activities by adopting individual adaptation behaviours (Deng & Chi, 2012; Hsieh, Rai & Xin Xu, 2011). Managing different periods of enterprise IT adaptation and work tasks and gathering information about individual adaptation behaviours can lead to the organization's success in the use of enterprise IT.

Managing various IT adaptation periods and work tasks

The extent to which expectations from an enterprise IT adaptation period and work tasks are met is crucial in determining when and how to launch subsequent periods. Figure 7 shows the relationship between the different periods of these changes. During the routine use of enterprise IT, it is possible to evaluate the effectiveness of the modifications made (Tyre & Orlikowski, 1996). If the interval between adaptation periods is too short, employees cannot adapt to continuous changes, so the flow of service delivery in the organization will be disrupted. Also, if this interval is too long, the organization cannot properly respond to requirements such as changes in business rules or those related to productivity. Therefore, creating a proper balance between periods of change and stability can bring more benefits to the organization.

Collecting information about individual adaptation behaviours

During the use of enterprise IT, users engage in a variety of adaptation behaviours, which, as shown in Table 2, are of different types. Collecting adequate information about the details of each adaptation behaviour will help managers to provide the resources needed (such as communication infrastructure[iii]) for the success of these behaviours. Regarding the type of individual adaptation behaviours in the face of assigned tasks, it is possible for managers to

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accurately assess the output of the training process in the previous stages. This can lead to proposing complementary training courses or using new methods to transfer knowledge to employees. Therefore, it can be concluded that without a rich dataset, it is unlikely that the organization can tangibly develop the management of different periods of enterprise IT use.

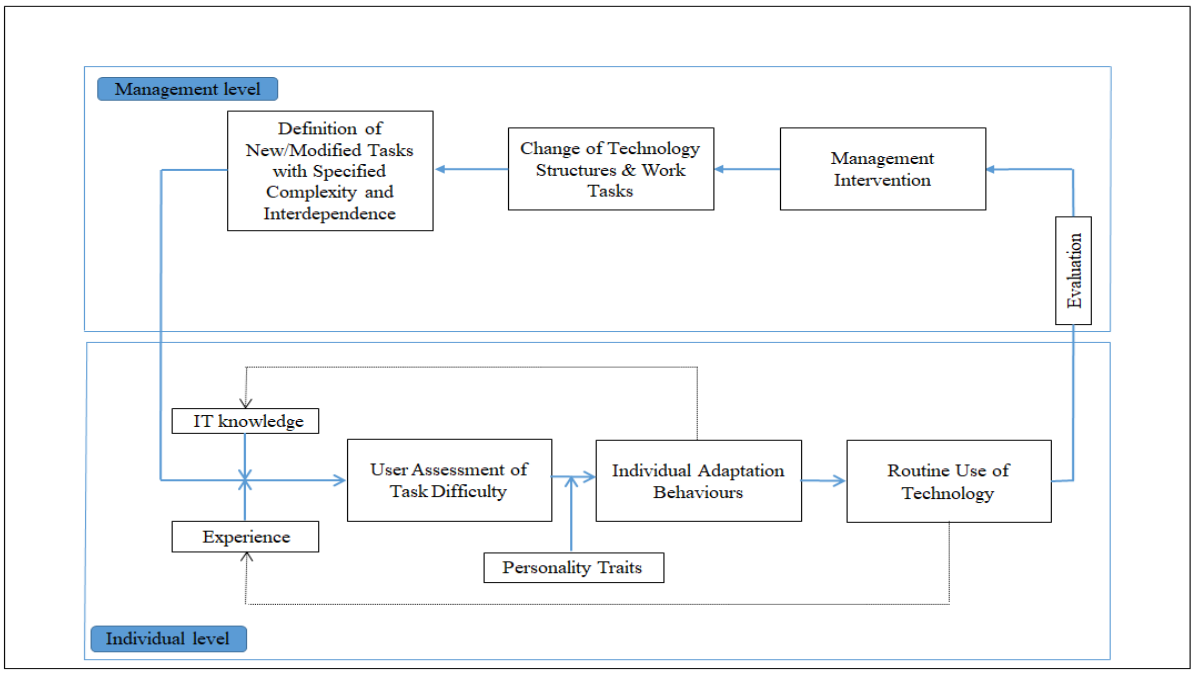

Figure 7. The relationship between the individual and management actions

Conclusion

Given the various periods of enterprise IT change in the organization, it is important to understand the mechanism of individual adaptation behaviours to make use of IT possible. In this study, using structuration theory, the factors affecting individual adaptation behaviours in the framework of a conceptual model were presented. With the help of this conceptual model, it is possible to explain the reasons for differences in individual adaptation behaviours.

The focus of this study is on a period of change in the features of enterprise IT in isolation, while organizations are usually faced with different periods of change in technology and work tasks (Jasperson *et al.*, 2005). Future research can examine adaptation behaviours throughout the enterprise IT lifecycle in the organization. Usually, the extent and severity of changes in technology features and work tasks require different individual adaptation behaviours. Creating a portfolio of these behaviours and interpreting their evolution can help to better understand adaptation behaviours and clarify the relationship between different IT adaptation periods and work tasks.

This study also focuses on an IT type (enterprise IT) implemented in a specific organizational context. By focusing on other types of IT implemented in various organizational contexts,

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future studies can help to further generalize the findings of this study. In addition, investigating the impact of each of the individual adaptation behaviours on the use of enterprise IT can be considered a topic for future research.

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Appendix 1

Table A. Questionnaire Items

		Row	Please indicate the degree to which you agree or disagree with each of the following statements.	Completely agree	Agree	Neither agree nor disagree	Disagree	Completely disagree
Personality traits	Honesty–Humility	1	I find it difficult to lie.					
		2	I would like to know how to make lots of money in a dishonest manner.					
		3	I want to be famous.					
		4	I am entitled to special treatment.					
	Emotionality	5	I am afraid of feeling pain.					
		6	I worry less than others.					
		7	I can easily overcome difficulties on my own.					
		8	I have to cry during sad or romantic movies.					
	Extraversion	9	Nobody likes talking with me.					
		10	I easily approach strangers.					
		11	I like to talk with others.					
		12	I am seldom cheerful.					
	Agreeableness	13	I remain unfriendly to someone who was mean to me.					
		14	I often express criticism.					
		15	I tend to quickly agree with others.					
		16	Even when I'm treated badly, I remain calm.					
	Conscientiousness	17	I make sure that things are in the right spot.					
		18	I postpone complicated tasks as long as possible.					
		19	I work very precisely.					
		20	I often do things without really thinking.					
	Openness to Experience	21	I can look at a painting for a long time.					
		22	I think science is boring.					
		23	I have a lot of imagination.					
		24	I like people with strange ideas.					

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		Row	Please indicate the degree to which you agree or disagree with each of the following statements.	Completely agree	Agree	Neither agree nor disagree	Disagree	Completely disagree
Individual Adaptation Behaviours	Documentation	25	To achieve the required capabilities, I use the photos and flowcharts provided.					
		26	To achieve the required capabilities, I use the conceptual models and instructional videos provided.					
		27	To achieve the required capabilities, I use the written notes provided.					
	Experimentation	28	To understand how the system works, I personally enter data on different pages.					
		29	Based on the predesigned scenario, I investigate the function of different system sections.					
		30	I gain functional skills through trial and error.					
	Communication with experts (Work & Technology)	31	To achieve the required capabilities, I communicate with the experts through email.					
		32	To achieve the required capabilities, I communicate with the experts through short messages and phone calls.					
		33	To achieve the required capabilities, I communicate with the experts through face-to-face contact.					
		34	To achieve the required capabilities, I communicate with the experts through LAN Messenger.					
		35	To achieve the required capabilities, I communicate with the experts through social networks (Instagram and Twitter).					
		36	To achieve the required capabilities, I communicate with the experts through domestic messengers (Gap, Sorush, Bale).					
		37	To achieve the required capabilities, I communicate with the experts through foreign messengers (Whatsapp, telegram, WeChat, Line).					
	Communication with Peers	38	To achieve the required capabilities, I communicate with colleagues through email.					
		39	To achieve the required capabilities, I communicate with colleagues through short messages and phone calls.					
		40	To achieve the required capabilities, I communicate with colleagues through face-to-face contact.					

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		Row	Please indicate the degree to which you agree or disagree with each of the following statements.	Completely agree	Agree	Neither agree nor disagree	Disagree	Completely disagree
		41	To achieve the required capabilities, I communicate with colleagues through LAN Messenger.					
		42	To achieve the required capabilities, I communicate with colleagues through social networks (Instagram and Twitter).					
		43	To achieve the required capabilities, I communicate with colleagues through domestic messengers (Gap, Sorush, Bale).					
		44	To achieve the required capabilities, I communicate with colleagues through foreign messengers (Whatsapp, Telegram, WeChat, Line).					
Task Characteristics	Difficulty	45	Your perception of the assigned task is that it is immediately executable. (R)					
		46	Your perception of the assigned task is that the sequence of its steps is understandable (R)					
		47	Your perception of the assigned task is that its execution requires time to think					
		48	Your perception of the assigned task is that its execution requires communication with informed people.					
		49	Your perception of the assigned task is that its successful execution requires having necessary knowledge resources.					
IT Knowledge	Command Base	50	The training course was focused on the general functions of the system.					
		51	The provided training course explains the system commands and its general structure (syntax).					
		52	The provided training course explains the meaning of system commands (semantically).					
		53	Without the help of the training course provided, it is impossible to recover from the error.					
	Tool Procedural	54	The provided training course makes it possible to use methods for performing a general task.					
		55	The provided training course makes it possible to collect different commands for performing a function.					

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		Row	Please indicate the degree to which you agree or disagree with each of the following statements.	Completely agree	Agree	Neither agree nor disagree	Disagree	Completely disagree
		56	Without the help of the training course provided, it is impossible to recover from the error.					
	Business Procedural	57	The training course provided focused on learning a complete business process.					
		58	The training course provided focused on providing relevant information about different specialized tasks.					
		59	The training course provided makes it possible to gain a proper cognitive understanding of the system.					
	Tool Conceptual	60	The training course focused on the workflow of all processes and their impacts on the organization.					
		61	The training course provided comprehensive information about the system structure and its general goals.					
		62	The training provided makes it possible for the learning to be transferrable to new situations.					
	Business Conceptual	63	The training course focused on the relationship between different processes of the system.					
		64	With the help of the training course provided, it is possible to face errors engaging several processes.					
		65	With the help of the training course, it is possible to understand the interdependence of activities in the system.					
	Business Motivational	66	The training course focused on learning the functions of technology for people and the organization.					
		67	The training course provided information about the system's usefulness for the organization.					
		68	The training course increased people's willingness to learn.					
		69	The training course led users to have a positive view of the results of using the system.					

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Appendix 2

Table B. Convergent validity indices

Latent Variable	Observed variables	factor loadings	Latent Variable	Observed variables	factor loadings	Latent Variable	Observed variables	factor loadings	Latent Variable	Observed variables	factor loadings
Honesty–Humility	Q1	0.785	Documentation	Q25	0.813	Difficulty	Q45	0.831	Business Motivational	Q66	0.847
	Q2	0.787		Q26	0.762		Q46	0.819		Q67	0.931
	Q3	0.798		Q27	0.837		Q47	0.858		Q68	0.888
	Q4	0.830		Q28	0.843		Q48	0.809		Q69	0.882
	Q5	0.781	Experimentation	Q29	0.897		Q49	0.750			
Emotionality	Q6	0.812		Q30	0.856		Q50	0.830			
	Q7	0.823		Q31	0.712	Command Base	Q51	0.867			
	Q8	0.785	Communication with experts (Work & Technology)	Q32	0.776		Q52	0.854			
	Q9	0.773		Q33	0.823		Q53	0.869			
Extraversion	Q10	0.784		Q34	0.866	Tool Procedural	Q54	0.909			
	Q11	0.858		Q35	0.881		Q55	0.897			
	Q12	0.746		Q36	0.851		Q56	0.891			
	Q13	0.677		Q37	0.767	Business Procedural	Q57	0.749			
Agreeableness	Q14	0.602		Q38	0.607		Q58	0.875			
	Q15	0.809		Q39	0.682		Q59	0.887			
	Q16	0.838	Communication with Peers	Q40	0.782	Tool Conceptual	Q60	0.810			
	Q17	0.748		Q41	0.635		Q61	0.891			
Conscientiousness	Q18	0.838		Q42	0.785		Q62	0.820			
	Q19	0.622		Q43	0.720	Business Conceptual	Q63	0.771			
	Q20	0.788		Q44	0.771		Q64	0.896			
	Q21	0.692					Q65	0.739			
Openness to Experience	Q22	0.820									
	Q23	0.768									
	Q24	0.852									

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Table C. Discriminant Validity Assessment results

	1	2	3	4	5	6	7	8	9	10	11	12	13
Experimentation	0.866												
Communication with experts (work & technology)	0.798	0.813											
Communication with peers	0.587	0.663	0.715										
Business motivational	0.234	0.200	0.272	0.887									
Individual perception of task difficulty	0.476	0.560	0.708	0.237	0.814								
IT knowledge	0.539	0.528	0.651	0.420	0.741	0.746							
Command-based	0.473	0.478	0.626	0.224	0.779	0.646	0.855						
Individual adaptation behaviour	0.818	0.739	0.634	0.256	0.666	0.648	0.590	0.824					
Business procedural	0.486	0.454	0.530	0.224	0.552	0.711	0.557	0.565	0.834				
Tool procedural	0.470	0.509	0.537	0.233	0.644	0.714	0.621	0.589	0.644	0.899			
Documentation	0.719	0.721	0.603	0.190	0.552	0.559	0.473	0.810	0.552	0.562	0.804		
Tool conceptual	0.180	0.202	0.160	0.269	0.114	0.334	0.116	0.134	0.350	0.115	0.111	0.841	
Business conceptual	0.133	0.173	0.166	0.300	0.190	0.427	0.111	0.123	0.350	0.183	0.168	0.702	0.805

Endnotes

i. CB is the name that refers to the enterprise IT under study to observe the privacy requirements.

ii. Although the indicators of some constructs are less than 0.7 (between 0.6 and 0.7), given that the average variance extracted for each construct is over 0.5, the measurement model has an acceptable convergent validity.

iii. Table 2 lists some of these communication infrastructures, such as Webcasting and Online Networks.

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