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# Investigating Tools Selection, Adoption Intention, and Acceptance of Computer Technology in Private Higher Education in Egypt: Project Management Software Casual End-User Perspective

## Abstract

The chief aim of this research paper is to investigate the factors impacted the PM software casual end-user perspective in private HE in Egypt; these factors include tool selection, adoption intention, and user acceptance of computer technology. The study focuses on infrequent end-users (students and staff members). The selection of the HE sector in Egypt is the large number of the end-users. This group of end-users represents casual or infrequent user of PM software who are the potential usual end-users. The previous studies investigate project issues i.e. Critical Success Factors (CSFs), PM tools, techniques, usage extent, and importance across sectors and countries with narrow focused statistics on end-users' tools, methods, and techniques' preferences, the most frequently used software (s), reasons of software selection, and learning and adoption motives.

Differentiating the influences based on individuals categories provides managers and supervisors with a clear road map for promoting learning and adoption processes. Investigating such influences results in maximizing the gained PM benefits, provides a better understanding of individuals retentions, PM importance and value, learning and adoption reasons, and grants PM software developers the required information and statistics about end-user needs and preferences in relation to tools, methods, and used techniques. This is an essential step in the activity of identifying the requirements of software development process.

The study targeted participants were Business Administration- BA students and staff members in the private HE in Egypt. The survey questions were classified according to the participant's category (student or staff member). These participants were selected on the basis of the nature of their study which is unique in terms of its causal usage pattern of PM software. Both students and staff members were randomly investigated. They belonged to different departments, thus the collected data required independent analysis.

**Keywords:** Project Management (PM) Software, User Tool Selection, User Adoption Intention, User Acceptance of Computer Technology, Unified Theory of Acceptance and Use of Technology (UTAUT), Casual End-Users Perspective, Private Higher Education (HE) in Egypt

## الملخص

الهدف الرئيسي من هذه الورقة البحثية هو دراسة العوامل التي أثرت على منظور المستخدم النهائي لبرمجيات إدارة المشروعات في التعليم العالي الخاص في مصر. وتشمل هذه العوامل اختيار الأدوات ، نية الإستخدام ، وقبول المستخدم لتكنولوجيا الحاسوب. تركز الدراسة على المستخدمين النهائيين الغير منتظمين فى الإستخدام من الطلاب وأعضاء هيئة التدريس. يرجع إختيار قطاع التعليم العالي في مصر نظراً للعدد الكبير من المستخدمين النهائيين. كما تمثل هذه المجموعة من المستخدمين النهائيين المحتملين متكررى الإستخدام لبرمجيات إدارة المشروعات. تناولت الدراسات السابقة بالبحث قضايا المشروع مثل عوامل النجاح الحرجة وأدوات ، تقنيات إدارة المشروعات ، ومدى الإستخدام ، والأهمية عبر القطاعات والبلدان ذات الإحصائيات المحدودة التي تركز على أدوات المستخدم النهائي ، وأساليبه ، وتفضيلات التقنية ، البرمجيات الأكثر إستخداماً وأسباب إختيارها ودوافع التعلم وتبنى الإستخدام.

يوفر التمييز بين المؤثرات المعتمدة على على فئات الأفراد للمديرين والمشرفين خريطة طريق واضحة لتعزيز عمليات التعلم و الإستخدام. تؤدي دراسة هذه التأثيرات إلى زيادة الفوائد المكتسبة لإدارة المشروعات، وتوفير فهم أفضل للإحتفاظ بالمستخدمين وأهمية و قيمة إدارة المشروعات، وأسباب التعلم وتبنى إستخدامها، ويمنح مطورى برمجيات إدارة المشروعات المعلومات والإحصائيات اللازمة حول إحتياجات المستخدم النهائي وأولوياته فيما يتعلق بالأدوات و الأساليب والتقنيات المستخدمة التى تعد خطوة جوهرية في نشاط تحديد متطلبات عملية تطوير البرمجيات.

إستهدفت الدراسة المشاركين من طلاب إدارة الأعمال وأعضاء هيئة التدريس في التعليم العالي الخاص في مصر. كما تم تصنيف أسئلة الإستقصاء وفقا لفئة المشارك (طالب أو عضو هيئة التدريس). فتم اختيار هؤلاء المشاركين على أساس طبيعة دراستهم و التى تعتبر فريدة من نوعها من حيث نمط الإستخدام السببي لبرمجيات إدارة المشروعات. وتم دراسة الطلاب وأعضاء هيئة التدريس الذن ينتمون إلى أقسام مختلفة بشكل عشوائي. و بالتالى فالبيانات التي تم جمعها تتطلب تحليل مستقل.

**الكلمات الدالة :** برمجيات إدارة المشروعات، إختيار أدوات المستخدم ، نية التبنى للمستخدم ، قبول المستخدم لتكنولوجيا الحاسوب ، النظرية الموحدة لقبول وإستخدام التكنولوجيا، منظور المستخدمين النهائيين ، التعليم العالي الخاص في مصر.

# I. INTRODUCTION

Project Management (PM) software is unique in terms of its adopters and end-users categories because the users are not typical customers and the usage patterns are discrete with extreme variances from no adoption to high frequent adoption level. Although the early studies emphasized the great impact of PM adoption on motivating project success across sectors, the learning and adopting PM levels are still questionable and lower than desired. Having a high level of end-users' readiness enables and facilities the learning process as well as achieving the desired PM software usage targets in a smooth way.

# II. THE STUDY AIM AND PROBLEM

This research mainly targets studying factors that have impact on tool selection, adoption intention, and user acceptance of computer technology from the perspective of casual end-users in private universities in Egypt. The study aims at providing a good understanding of their readiness, motivation behind PM software learning. To address these issues, the most common used techniques, tools, and software were explored. Enabling the best practices results in benefiting from PM software adoption. Additionally, considering the potential benefits of adopting PM software from casual end-users' perspectives aids software developers to determine the real needs and requirements at an early stage of the software development process which increases software usability level. According to Sommerville (2011), one of the chief concerns of projects is to "meet customer expectations''.

Generally, the opportunity to attract the infrequent end-user cluster of PM software to become usual end-user is justifying more investigations to be conducted especially in the HE sector in Egypt with the large number of the end-users.

All of the above-mentioned issues support and highlight the significance of measuring the current adoption motivates of the causal PM end-users considering the impact of their current believes on PM importance, benefits, tools and techniques. The study also takes into consideration the possible impact of the users' preferences on PM tools and techniques as an essential step before any mandated corrective actions can take place in order to attract this category of end-users to increase their adoption level.

# III. LITERATURE REVIEW
## USER TOOL SELECTION , TECHNOLOGY USER ACCEPTANCE AND USAGE FACTORS

The individual perceptions about technology acceptance and usage were investigated in recent studies. For example Howard et al. (2017) focused on applying the Unified Theory of Acceptance and Use of Technology - UTAUT by Venkatesh et al.( 2003) in information modeling building concluded by a revised UTAUT model in the case of Building Information Modelling- BIM. According to UTAUT model, the reported factors that influence the information system behavioral intention were: the performance expectancy, effort expectancy, and social influence (Venkatesh et al. 2003). In the same model, Venkatesh et al. (2003) listed the age, gender, voluntariness, and experiences as moderators factors, while the behavioral intention and us-

age were the dependent variables. In 1989, user acceptance of computer technology was examined by Davis et al. (1989) and the perceived usefulness, and perceived ease of use were proposed as vital beliefs for individual's attitude towards computer usage (Davis et al. 1989). (Miltgen et al. 2013) addressed the factors' role in determining IT acceptance, and evaluating intention acceptance forming individual view. This study ended with theoretically and empirically integrated approach.

The modern studies which were concerned with user tools selection, adoption intention, and acceptance of technology were conducted from a particular angle such as: sector/ industry, tool, and user category. (Rahi et al. 2018a) is one of the most recent studies that has been concerned with the impact of UTAUT on particular sector/ industry. (Rahi et al. 2018a) examined the UTAUT role in the internet banking adoption context. The individuals' intention as critical factors have been studied by Karahoca et al. (2018). (Karahoca et al. 2018) investigation concentrated on the products in healthcare sector; the researchers recognized the critical factors which impacted individuals' intention to adopt "internet of things". (Karahoca et al. 2018) studied an individuals' intention to adopt a user who has a daily routine and considered the gender of the user. (Karahoca et al. 2018) stressed the significance of researching the facilitative factors for a user who is expected to use any technology on a daily basis as an essential early step before launching any technology into the market. In Karahoca et al. (2018) several theories have been integrated. (Rahi et al.

2018b) aimed to assess user's intention to adopt internet banking and intention to recommend technology by developing a structural equation model.

Project management software usage and selection impacted factors were investigated in 2003 by Liberatore and Pollack-Johnson (2003) who reported that improving project planning and control required PM methods and techniques i.e. Critical Path Method (CPM), and Program or Project Evaluation and Review Technique - PERT for risk analysis. Moreover, the study examined the relationship between the environmental and intermediate group factors; where the environmental group includes firm size, PM percent, years of experience in PM as a team member or leader, number of activities in a typical project, and number of projects worked on during the last year. While the Intermediate Factors- PM software usage group consists of software use category (project planning only versus planning and control), initial year of software usage, percent of projects worked on that used PM software in the preceding year, two years earlier, and five years earlier (Liberatore and Pollack-Johnson 2003). The study was concerned with the extent of PM software use, the use of PM software for planning versus planning and control, and the level of PM software package.

The project time management tools and techniques from the application angle were studied by Sawalhi and Enshassi (2005). Although this study focused only on the construction industry in the Gaza Strip, it presented information on the degree of usage and rank for time management tools and techniques, the necessity of the same from contractors, owners perspectives, and

ranks of the identified obstacles to non-efficient utilisation of project management tools and techniques – PTMTT. Work Breakdown Structure (WBS), bar chart, and resources are instances of the studied time management tools and techniques.

PM process, project organization, Information Management Systems, PM tools, PM metrics, project culture, and project leadership were presented as critical factors to project success by Milosevic and Patanakul publication that recognized these factors in 2005  (Milosevic and Patanakul 2005).

The role of using PM software tool on project success was examined by Broder and Pihir (2007). The study illustrated usage pattern of computers in project management which involved planning and management, the usage extend of specialized software tools, software satisfaction level, and its importance for project success. Additionally, Broder and Pihir (2007) discussed the key failure factors and how to prevent them by using software support.

PM education, and Information Communication Technology- ICT usage influences on project success in Croatia was studied by Pihir et al.(2008). The research outcomes illustrated the role of PM education in increasing project level of success and the importance of ICT Usage on activities such as time management, and staff management. Furthermore, Pihir et al.(2008) encouraged companies to invest in PM education due to its significant benefit.

# I. RESEARCH METHODS - DATA COLLECTION PROCESS, DATA ANALYSIS PROCESS, AND SAMPLE SIZE

This study adopts a quantities approach as it depends on a questionnaire as a data collection method. A questionnaire was designed to gather the desired data from the targeted participants. The collected  data was analyzed by the analytical tool of SPSS. Chi-square tests, and correlation analysis are adopted for study hypotheses' testing. According to Sekaran (2003) ″chi-square test is a nonparametric test that establishes the independence or otherwise between two nominal variables". Meanwhile, information about  the nature, direction, and significance of the bivariate relationships of the study variables' is analyzed using correlation analysis - A Pearson correlation matrix (Sekaran 2003). Thus, correlation analysis and chi-square tests are used to verify the presence of study variables relationships and hypotheses testing. This is in line with the study's aim, which is to investigate factors that influence tool selection, adoption intention, and user acceptance of computer technology in private universities in Egypt in the case of casual end-users.

Cluster differences were considered in the conducted analysis. The investigated cluster differences and adoption levels were demonstrated through the study outcomes. Software developers, project managers, leaders, PM experts, scholars, HE decision-makers, and educational programs developers are the main expected beneficiaries of the study outcomes.

The data collected from the participants covered the average duration of projects they participated in, the PM tools and techniques which they were aware of, and the frequent rate of adoption. Additionally, the participants provided their agreements in relation to the importance of PM adopting for project success, the dependency between gaining PM methodology benefits and sector or business area of the project, the influence of tool ease of use, and end-user field of specialization on user tool selection, and the opportunity of achieving more project success in case of PM software adoption.

## DATA ANALYSIS PROCESS

According to Sekaran (2003) reliability test of study measures testing the goodness of data,"the instrument uniformity is examined by the reliability test".

Table 1 illustrates the registered Cronbach's Alpha value on the scale of all questionnaire variables.

### TABLE 1 STUDY QUESTIONNAIRE  CRONBACH'S ALPHA VALUE

| Cronbach's Alpha | N of Items |
|---|---|
| .76 | 32 |

## SAMPLE SIZE

Because the learning process is a central learner process, the study concentrated on the infrequent PM end-user factors- i.e .experiences, age, and educational level- as these factors have an influence on user acceptance and use of technology, which resulted in targeting students and staff in private universities in Egypt.

Based on the data available in the website of Ministry of Higher Education in Egypt (2016), there are 19 Schools of Business Administration/Faculties of Management Business schools in 19 private universities in Egypt; (Appendix A). For the academic year 2016/2017, the number of registered students in the Egyptian HE private universities studying BA reached 19425 students (Ministry of Higher Education in Egypt 2016), and the number of staff members in Egyptian HE private universities teaching BA  for the same academic year 2016/2017 were 584 staff members - 20009 in total (Ministry of Higher Education in Egypt 2016).

The two groups private HE: students studying BA and staff members in Alexandria, Egypt performs the population of interest. The investigated college has 1541 enrolled major students and  90 staff members – 1631 in total. They were randomly selected where the first year non – major students were excluded. The simple random sampling is employed as a sampling technique. Based on Creative Research Systems (2012), the sample size will be 89 participants with ± 10.1  for the confidence interval, and  95% for the confidence level.

## GATHERING DATA METHODO-LOGY

The number of circulated questionnaires to the targeted participants exceeded 130, 63 questionnaires. After second attempt to reach more participants, 26 more questionnaires were handed; the conducted validation resulted in excluding 15 invalid question-

naires. In total, the number of completed questionnaires is 89.

# II. STUDY INVESTIGATED VA-RIABLES AND HYPOTHESES

The literature review offers a base background of the study outline, motivates investigating the infrequent or casual end-user of PM tools, and software adoption intention considering factors of technology acceptance and usage in general.

The study variables were User Tool Selection, User Adoption Intention, User Acceptance of Computer Technology, Perceived Ease of Use, Perceived Usefulness, Voluntariness of Use, Field of Specialization , Experiences, Major, Age, Gender, Average Duration of Project, and Educational Level. The study examined variables and hypotheses outline displayed – table 2 was constructed in light of the conducted review of the early studies. **H1:** There is no significant difference between the average duration of project and user tool selection; the same concept was applied for the rest of study hypotheses. Table 3 below illustrated each study variable and its corresponding hypotheses numbers.

## TABLE 2 STUDY VARIABLES AND HYPOTHESES

| Hypothese | Investigated Variables |
|---|---|
| H1 | The average duration of project * User Tool Selection |
| H2 | Age*User Tool Selection |
| H3 | Gender*User Tool Selection |
| H4 | Experiences in years * User Tool Selection |
| H5 | Educational Level * User Tool Selection |
| H6 | Field of Specialization* User Tool Selection |
| H7 | Major * User Tool Selection |
| H8 | Voluntariness of Use *User Tool Selection |
| H9 | Age *User Adoption Intention |
| H10 | Gender* User Adoption Intention |
| H11 | Experiences in Years * User Adoption Intention |
| H12 | Educational Level * User  Adoption Intention |
| H13 | Field of Specialization  * User Adoption Intention |
| H14 | Major * User Adoption Intention |
| H15 | Major * User Acceptance of  Computer Technology |
| H16 | Voluntariness of  Use * User Adoption Intention |
| H17 | Voluntariness of  Use * User Acceptance of  Computer Technology |
| H18 | Voluntariness of  Use * Perceived Ease of Use |
| H19 | Field of  Specialization * Perceived Ease of Use |
| H20 | Perceived Usefulness * User Tool Selection |
| H21 | Perceived Usefulness * User Adoption Intention |
| H22 | Perceived Usefulness *User Acceptance of  Computer Technology |

**TABLE 3 STUDY VARIABLES AND CORRESPONDING HYPOTHESES NUMBERS**

| Variable | Hypotheses Numbers |
|---|---|
| User Tool Selection | H1, H2, H3, H4,H5, H6, H7, H8 |
| User Adoption Intention | H9, H10, H11, H12,H13,H14,H16 |
| User Acceptance of  Computer Technology | H15,H17 |
| Perceived Ease of Use | H18,H19 |
| Perceived Usefulness | H20,H21,H22 |
| Voluntariness of Use | H8,H16,H17,H18 |
| Field of Specialization | H6,H13, H19 |
| Experiences | H4, H11 |
| Major | H7,H14,H15 |
| Age | H2,H9 |
| Gender | H3,H10 |
| Average Duration of Project | H1 |
| Educational Level | H5, H12 |

## QUESTIONNAIRE DESIGN

Simplicity, and time consumption concerns were taken into consideration when designing the questionnaire. The participant was asked to determine his/her knowledge level about PM tools, techniques and methods, as well as his/her frequent of use of them. The proposed responses regarding use frequency ranged from never to always use pattern. Considering the study target participants' natures who are not professional/practiced users of PM tools and techniques, a glossary is provided for Gantt chart, Work Breakdown Structure (WBS), Critical Path Method (CPM), PRINCE2(Projects IN Controlled Environments), Earned Value, Cause and effect chart, and Program or Project Evaluation and Review Technique- PERT char - PM tools/ techniques were included each was attached with its abbreviation at the end of the questionnaire along with a referring statement in the introduction of the questionnaire. The relationship between the study target participants, variables, question and statement, item, and options are summarized in Table 4.

## TABLE 4  QUESTIONNAIRE DESIGN  (TARGET PARTICIPANTS, STUDY VARIABLES, QUESTIONS, AND OPTIONS)

| | Variable | Q/ Statement | | Item | Options | |
|---|---|---|---|---|---|---|
| **Student and Staff Member** | Project Duration | The average duration of projects the participant was participated in | | Project Duration | Less than 24 Months | |
| | | | | | 25 – 48 Months | |
| | | | | | 49 – 72 Months | |
| | | | | | Other (in case you have never been involved in a project before) | |
| | Selected Tool / Technique / Method | Are you aware of this Tool / Technique / Method | | Gantt chart | Yes | No |
| | | | | Work Breakdown Structure (WBS) | | |
| | | | | Critical Path Method (CPM) | | |
| | | | | PRINCE2 (Projects IN Controlled Environments) | | |
| | | | | Earned Value | | |
| | | | | Cause and effect chart | | |
| | | | | PERT chart | | |
| | | | | Schedule Resources and Perform Resource Levelling | | |
| | User Adoption Intention | The rate of use | | Generate Project Budget | Never | |
| | | | | Develop a Risk Management Plan | Seldom | |
| | | | | Track and Manage Performance of the Project | Sometimes / Occasionally | |
| | | | | | Frequently | |
| | | | | Project Management Software | Always | |
| **Student and Staff Member** | PM Importance | Do you agree or disagree with the following statement | | Adopting PM methodology is vital for project success | Agree | Disagree |
| | Perceived Usefulness | | | Obtaining the benefits of adopting a PM methodology is dependent on the sector or business area of the project | | |

| | | | | | |
|---|---|---|---|---|---|
| | Perceived Ease of Use | | | User tool selection is influenced by how much it is easy to use | Agree | Disagree |
| | Field of Specialization | | | User tool selection is influenced by end-user field of specialization | Agree | Disagree |
| | PM software adoption | | | PM software adoption provides a better chance in projects success | Agree | Disagree |
| **Student** | Major | | Major | Varied |
| | Level | | Term | 1 To 8 |
| | Performance | | GPA | 0.00 To 4.00 |
| **Staff Member** | Experiences | | Number of years of experiences | Varied |
| | Specialization | | Field of Specialization | Varied |
| | | | Academic Rank | GTA |
| | | | | TA |
| | | | | Assistant Professor |
| | | | | Associate Professor |
| | | | | Professor |
| | Age | | Age | 18-22 |
| | | | | 23-27 |
| | | | | 28-32 |
| | | | | 33-37 |
| | | | | 38-42 |
| | | | | >43 |

# III. STATISTICAL ANALYSIS RESULTS

## A. DESCRIPTIVE ANALYSIS

The collected data has been analyzed using the SPSS16.0 , table 5 below displays the conducted descriptive analysis for the Age, GPA and Experiences in years.

## TABLE 5 DESCRIPTIVE ANALYSIS FOR THE AGE, GPA AND EXPERIENCES IN YEARS

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Age | 89 | 0 | 5 | 1.29 | 1.680 |
| GPA | 47 | 2.05 | 3.99 | 3.2287 | .55958 |
| Experiences in years | 47 | 1 | 21 | 9.34 | 7.066 |

Table 6 illustrates the study sample description using percentage corresponding with participants' responses and categorized into student and staff member as follows: students' categorization is based on student's major, GPA, and semester. For staff member based on experiences in years, field of specialization, academic rank, and age.

## TABLE 6 SAMPLE GENERAL DESCRIPTIVE USING PERCENT BASED ON PARTICIPANT CATEGORY

| | % | Variable | Responses | % |
|---|---|---|---|---|
| Student (52) | 58.4 | Student's Major | Business Information Systems | 32.6% |
| | | | Marketing and International Business | 40.38% |
| | | | Finance and Accounting | 17.3% |
| | | | Media Management | 9.72% |
| | | Student's GPA | $3.00 \geq GPA \geq 2.00$ | 31.9% |
| | | | $4.00 \geq GPA \geq 3.00$ | 68.1% |
| | | Student's Semester | 3 | 18% |
| | | | 5 | 8% |
| | | | 6 | 6% |
| | | | 7 | 56% |
| | | | 8 | 12% |
| Staff Member (37) | 41.6 | Experiences in Years | 1-5 | 40.4% |
| | | | 6-10 | 17% |
| | | | 11-15 | 8.5% |
| | | | 16-21 | 34.1% |
| | | Field of Specialization | Business Information Systems | 32.43% |
| | | | Marketing and International Business | 40.54% |
| | | | Finance and Accounting | 16.21% |
| | | | Media Management | 10.8% |
| | | Academic Rank | GTA | 8.1% |
| | | | TA | 35.1% |
| | | | Assistant Professor | 51.4% |

| | | | |
|---|---|---|---|
| | | Associate Professor | 5.4% |
| | Age | 18-22 | 51.35% |
| | | 23-27 | 5.40% |
| | | 28-32 | 13.51% |
| | | 33-37 | 10.81% |
| | | 38-42 | 16.21% |
| | | >43 | 2.7% |
| | Gender | Female | 73% |
| | | Male | 27% |

Table 7 below demonstrates the frequencies and percentage of the received participates responses toward statements concerning the relationships between adopting PM, the sector or business area of the project, the influence of the ease of use, and end-user field of specialization on the user tool selection, and the impact of PM software adoption on the achieved project success.

### TABLE 7 SAMPLE GENERAL DESCRIPTIVE STATISTICS USING FREQUENCIES AND PERCENT

| Statement | Responses Frequencies | % |
|---|---|---|
| Adopting PM methodology is vital for project success | Agreed (77) | 86.5% |
| | Disagreed (12) | 13.5% |
| Obtaining the benefits of adopting a PM methodology is dependent on the sector or business area of the project | Agreed (78) | 87.6% |
| | Disagreed (11) | 12.4% |
| User tool selection is influenced by how much it is easy to use | Agreed (80) | 89.9% |
| | Disagreed (9) | 10.1% |
| User tool selection is influenced by end-user field of specialization | Agreed (71) | 79.8% |
| | Disagreed (18) | 20.2% |
| PM software adoption provides a better chance in projects success | Agreed (82) | 92.1% |
| | Disagreed (7) | 7.9% |

### B. HYPOTHESES TESTING

**CORRELATIONS TESTS:** The existence of relationships between study variables and hypotheses testing were examined by correlation and chi-square tests. This section shows the results of the hypotheses testing through the conducted tests. Table 8 illustrates the correlations tests, results, and outcomes for the study hypotheses.

## TABLE 8 CORRELATION TESTS RESULTS FOR THE STUDY HYPOTHESES

| Hypothe-ses | Factors | N of Valid Cases | Pearson Correlation Value | Sig. (2-tailed) | Result |
|---|---|---|---|---|---|
| H1 | The Average Duration of Project* User Tool Selection | 89 | .109 | .309 | Not Significant |
| H2 | Age*User Tool Selection | 89 | .109 | .309 | Not Significant |
| H3 | Gender*User Tool Selection | 89 | -.252* | 0.017 | Significant |
| H4 | Experiences in years * User Tool Selection | 37 | -.40 | .790 | Not Significant |
| H5 | Educational Level * User Tool Selection | 37 | -.291 | .080 | Not Significant |
| H6 | Field of Specialization* User Tool Selection | 37 | .475** | .003 | Highly Significant |
| H7 | Major * User Tool Selection | 37 | .475** | .003 | Highly Significant |
| H8 | Voluntariness of Use *User Tool Selection | 89 | -.740** | .000 | Highly Significant |
| H9 | Age *User Adoption Intention | 89 | -.265* | .012 | Significant |
| H10 | Gender* User Adoption Intention | 89 | .395** | .000 | Highly Significant |
| H11 | Experiences in years * User Adoption Intention | 37 | -.740** | .000 | Highly Significant |
| H12 | Educational Level * User Adoption Intention | 37 | -.291 | .080 | Not Significant |
| H13 | Field of Specialization * User Adoption Intention | 37 | -.456** | .005 | Highly Significant |
| H14 | Major * User Adoption Intention | 37 | -.456** | .005 | Highly Significant |
| H15 | Major * User Acceptance of Computer Technology | 37 | .475** | .003 | Highly Significant |
| H16 | Voluntariness of Use * User Adoption Intention | 89 | .062 | .564 | Not Significant |

| | | | | | |
|---|---|---|---|---|---|
| **H17** | Voluntariness of Use * User Acceptance of Computer Technology | 89 | -.137 | .200 | Not Significant |
| **H18** | Voluntariness of Use * Perceived Ease of Use | 89 | .236 | .159 | Not Significant |
| **H19** | Field of Specialization * Perceived Ease of Use | 37 | .475** | .003 | Highly Significant |
| **H20** | Perceived Usefulness * User Tool Selection | 89 | -.137 | .200 | Not Significant |
| **H21** | Perceived Usefulness * User Adoption Intention | 89 | .62 | .564 | Not Significant |
| **H22** | Perceived Usefulness *User Acceptance of Computer Technology | 89 | .740** | .000 | Highly Significant |
| * Significant at the 0.05 level (2-tailed) | | | | | |
| ** Significant at the 0.01 level (2-tailed) | | | | | |

Figure 1 outlines the existence of relationships between the investigated factors of the study based on the conducted corrections tests outcomes.
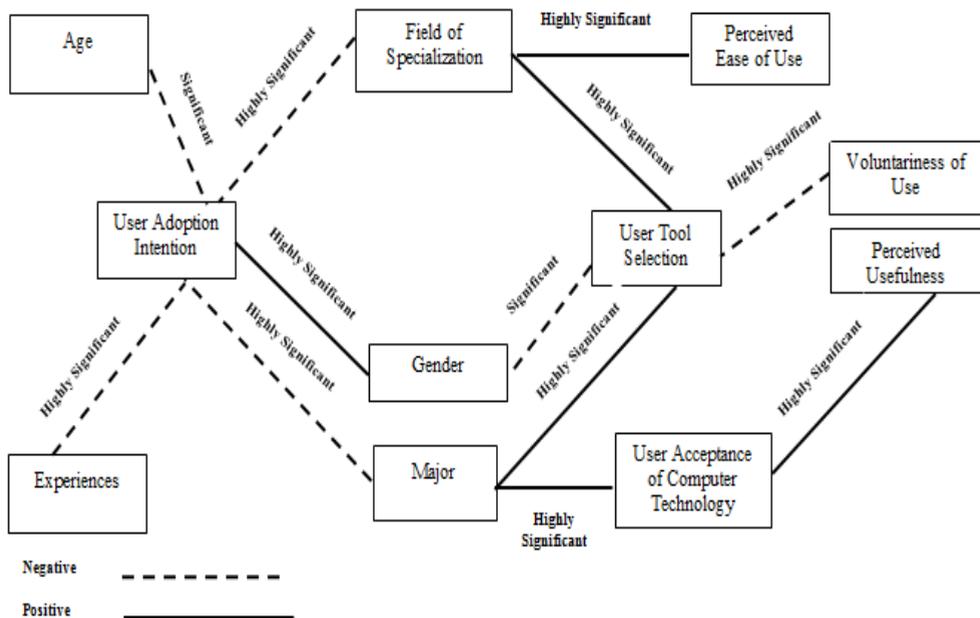


**FIGURE 1 THE STUDY FACTORS RELATIONSHIPS EXISTENCE BASED ON CORRECTIONS TESTS OUTCOMES**

**CHI-SQUARE TESTS:** Due to having two main participants' categories (students and staff members) the chi-square tests for each category were conducted independently for specific variables as illustrated below in Table 9. The table demonstrates the chi-square test results according to its associated participant group. In case of the staff members group, the results showed that there is a highly significant relationship between field of specialization and department. In case of student and staff groups, the results showed that there is a significant relationship between using PM software and how much it is easy to use.

## TABLE 9 CHI-SQUARE TESTS RESULTS`

| Factors | Pearson Chi-Square Value | Asymp. Sig. (2-sided) | Result |
|---|---|---|---|
| **Student** | | | |
| Major * GPA | 28.671[a] | .326 | Not Significant |
| Major * Term | 10.488[a] | .033 | Not Significant |
| **Staff** | | | |
| Experiences in Years * Department | 43.908[a] | .518 | Not Significant |
| Field of Specialization * Department | 111.000[a] | .000 | Highly Significant |
| Field of Specialization * Academic Rank | 7.909[a] | .543 | Not Significant |
| **Student and Staff** | | | |
| Age *User Tool Selection | 111.000[a] | .004 | Highly Significant |
| Gender*User Tool Selection | 46.971 [a] | .000 | Highly Significant |
| PM Software (Freq Use) * Obtaining the benefits of adopting a PM methodology is dependent on the sector or business area of the project | 9.597[a] | .048 | Not Significant |
| PM Software (Freq Use) * Adopting PM methodology is vital for project success | 6.766[a] | .222 | Not Significant |
| PM Software (Freq Use) * End-user field of specialization | 2.156[a] | .707 | Not Significant |

| | | | |
|---|---|---|---|
| PM Software (Freq Use) * PM software adoption provides a better chance in  projects success | 5.710[a] | .185 | Not Significant |
| PM Software * Obtaining the benefits of adopting a PM methodology is dependent on the sector or business area of the project | .283[a] | .594 | Not Significant |
| PM Software * Adopting PM methodology is  vital  for  project success | .215[a] | .643 | Not Significant |
| PM Software * How much it is easy to use | 70.643[a] | .000 | Highly Significant |
| PM Software * End-user field of  specialization | .350[a] | .554 | Not Significant |
| PM Software * PM software adoption provides a better chance in  projects success | 2.123[a] | .145 | Not Significant |

## IV. RESEARCH CONCLUSIONS

Examining the impact of the above mentioned factors on the PM software casual end-user tool selection, adoption intention, and acceptance of computer technology in private HE in Egypt is necessary for understanding the differences between the professional user and casual end-user regarding tool selection, adoption intention, acceptance of computer technology, and believes towards some PM aspects such as the importance of adopting PM for projects success, the role of adopting PM software in project success, and the impact of user field of specialization on between user tool selection.

Out of twenty-two study hypotheses, twelve hypotheses' tests resulted in confirming the existence of relationships or significant differences using chi- correlations and chi-square. In case of user tool selection, a significant relationship was verified between user tool selection, and gender. There are highly significant relationships between user tool selection and major, field of spe-

cialization, and voluntariness of use. In case of  user adaption intention, there is a significant relationship between the user adaption intention and age. Additionally, there are highly significant relationships between the user adaption intention and experiences in years, field of specialization, major, and gender. In case of user acceptance of computer technology  there are highly significant relationships between user acceptance of computer technology and perceived usefulness and major. For the perceived ease of use with field of specialization, a highly significant association confirmed. The factors of the perceived usefulness, and perceived ease of use previously reported as individual's computer usage attitude affected factors by  Davis et al. (1989); these factors showed significant and highly significant associations as mentioned above. The same results can be concluded about these factors.

The age, voluntariness, and experiences factors were stated by  Venkatesh et al. (2003) as moderators. Recent

study of Howard et al. (2017) examined technology acceptance and usage from individual perceptions. Investigating u-ser tools selection, adoption intention, and acceptance of technology in recent researches (Rahi et al. 2018a); (Karaho-ca et al. 2018); (Rahi et al. 2018b) from the angles of sector/ industry, tool, and user category support the necessity to c-onduct more studies on that subject wh-ich aim at recognizing end-user accord-ing to the category to which he/she bel-ongs, which includes usage pattern, sec-tor/ industry, and any other critical fact-ors (Karahoca et al. 2018). (Karahoca et al. 2018) reported performing research-es on the potential users as a requireme-nt that has to take place prior to techno-logy launching into the market.

The necessity for more investiga-tions which are concerned with the user acceptance of computer technology and end-user motives for the non-professional users are triggered by the need for providing a good understand-ing of the non-professional users' soft-ware usage patterns and attitudes. Con-ducting more examinations in relation to such factors will result in encourag-ing more non-professional users to adopt specific purpose software i.e. PM software in general, increasing software usage benefits, and user satisfaction level. Moreover, continuous develop-ment in software customization will enable achieving a high level of user acceptance.

To conclude, the outcomes and proven hypotheses of studies recently performed mentioned above support having more investigations on user mo-tives based on their belonged category, sector and their usage patterns and where generalizing these motives in all cases is not truly applicable.

HE decision-makers and educational programs developers are recommended to invest in students and staff members whom were observed PM methodology awareness through including PM in their educational programs, and curricu-la in different degrees, enhance PM adoption culture by encouraging staff members in their assigned projects and students in their term and graduations projects to adopt PM concepts, tools, methods, and techniques, and enable the availability of PM software in campuses laboratories, and provide students with PM software support by tutors and as-sistants.

## V. RESEARCH LIMITATIONS AND FUTURE WORK DIRECTIONS

Although the fact that PM is a well-defined established methodology that has great benefits for business regard-less of the sector to which it belongs, the availability of various PM applica-tions and soft wares. PM end-users adoption level determines the extent of benefits gaining. End-users are catego-rized according to their usage into casu-al/infrequent and professional /usual. Each end-user category has unique characteristics and factors that played an important role in determining their attitudes and computer acceptance and usage. The observed awareness of the role of PM, tools, methods and IT soft-ware encourages conducting of further studies about the identification of the similarities and differences between these end-users categories, and the de-velopment of the appropriate software for each end-user category on the basis of their identified characteristics, influ-ences factors, and needs.

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# APPENDIX A

| University Name | College / Faculty Name |
|---|---|
| 6 <sup>th</sup> October | Economic and Business |
| October for Modern Sciences and Arts - MSA | Faculty of Management Sciences |
| Misr University for Science & Technology (MUST) | Faculty of Business Administration and Economics |
| Misr International University (MIU) | Faculty of Business Administration and International Trade |
| The French University of Egypt | Faculty of Management and Information Systems |
| Heliopolis University | Faculty of Business and Economics |
| The British University In Egypt (BUE) | Faculty of Business Administration-Economics-Political Science |
| Pharos University In Alexandria (PUA) | Faculty of Financial and Administrative Sciences |
| Al-Ahram Canadian University | School of Business Administration |
| Modern University for Technology & Information (MTI) | Faculty of Management |
| Badr University in Cairo | School of Business & Economics |
| Future University in Egypt | Faculty of Commerce and Business Administration |
| Nahda University | Faculty of Marketing and Business administration |
| Sinai University | Faculty of Business Administration and International Marketing |
| The Arab Open University (AOU) | Faculty of Business Studies (FBS) |
| Egyptian e-Learning University | Business Administration |
| Delta University for Science and Technology | Faculty of Business Administration |
| Nile University | School Of Business |
| The German University in Cairo (GUC) | Faculty of Management  Technology |

Source:  Ministry of Higher Education in Egypt (2016)