

IDENTIFYING FACTORS AFFECTING AUDITORS' ADOPTION OF COMPUTER
ASSISTED AUDIT TOOLS AND TECHNIQUES (CAATTS): AN EMPIRICAL
INVESTIGATION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF INFORMATICS OF
THE MIDDLE EAST TECHNICAL UNIVERSITY
BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
IN
THE DEPARTMENT OF INFORMATION SYSTEMS

DECEMBER 2019

**IDENTIFYING FACTORS AFFECTING AUDITORS' ADOPTION OF
COMPUTER ASSISTED AUDIT TOOLS AND TECHNIQUES (CAATTS): AN
EMPIRICAL INVESTIGATION**

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ABSTRACT

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December 2019, 138 pages

Increasing use of Information Technologies in organizations both private and public, audit activities has become more complicated for audit bodies. At this stage, Computer Assisted Audit Tools and Techniques (CAATTs) provide many advantages to auditors to carry out their tasks in an effective and efficient manner in such an environment and expansion of CAATTs usage plays an important role for auditors and organizations. In order to increase usage of CAATTs, it is critical to know what factors are significantly affecting the adoption decision. In this respect, the main objective of this study is to reveal the factors affecting the Acceptance or Adoption of CAATTs by auditors. For this purpose, this study empirically explores the variables impacting use of CAATTs by Turkish auditors. As a result, a CAATTs adoption model is created in this study. In the scope of this study, firstly, studies related with the adoption of CAATTs were reviewed from 2000 to end of February 2019. This review gives information about past research on the field. At the end of the literature review, most significant factors affecting the CAATTs adoption are identified. Then, a technology adoption model and related hypotheses are proposed in the light of information derived from literature review. To test the hypotheses a quantitative method (questionnaire) is followed. Data is collected from auditors from Turkey. The model is tested using Structural Equation Modelling with Partial Least Squares (SEM-PLS). Inter-factor relationships are also introduced to the model after outcomes are obtained. At the end, the model's final version is developed and the most significant factors affecting the adoption of CAATTs by auditors are exposed.

Keywords: CAATTs, Audit, Technology Acceptance, Technology Adoption, Quantitative Research

ÖZ

DENETÇİLERİN BİLGİSAYAR DESTEKLİ DENETİM ARAÇ VE TEKNİKLERİNİ KABULÜNÜ ETKİLEYEN FAKTÖRLERİN BELİRLENMESİ: AMPİRİK BİR ARAŞTIRMA

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Aralık 2019, 138 sayfa

Bilgi Teknolojilerinin hem özel hem de kamu kuruluşlarında kullanımının artması, denetim faaliyetlerini denetim organları için daha da karmaşık hale getirmiştir. Bu aşamada, Bilgisayar Destekli Denetim Araç ve Teknikleri (BDDAT) denetçilere görevlerini daha etkin ve verimli bir şekilde yerine getirmeleri için birçok avantaj sağlamakta ve BDDAT kullanımının artırılması denetçiler ve kuruluşlar için önemli bir rol oynamaktadır. BDDAT kullanımını artırmak için, hangi faktörlerin kabul kararını önemli ölçüde etkilediğini bilmek çok önemlidir. Bu bağlamda, bu tez çalışmasının amacı denetçilerin BDDAT kabulünü etkileyen faktörleri ortaya koymaktır. Bu amaçla, bu çalışma Türk denetçilerin BDDAT kullanımını etkileyen değişkenleri ampirik olarak incelemektedir. Sonuç olarak, bu çalışmada bir BDDAT benimseme modeli oluşturulmuştur. Bu çalışma kapsamında öncelikle BDDAT kabulüne ilişkin çalışmalar 2000 yılından 2019 yılı Şubat ayı sonuna kadar gözden geçirilmiştir. Bu derleme, sahadaki geçmiş araştırmalar hakkında bilgi vermektedir. Literatür taramasının sonunda, BDDAT kabulünü etkileyen en önemli faktörler belirlenmiştir. Ardından, literatür taramasından elde edilen bilgiler ışığında ilgili hipotezlerle birlikte bir teknoloji kabul modeli önerilmiştir. Hipotezleri test etmek için nicel bir yöntem (anket) izlenmiştir. Anket ile Türkiye'den denetçilerden bilgi toplanmıştır. Model, Kısmi En Küçük Kareler ile Yapısal Eşitlik Modellemesi (SEM-PLS) kullanılarak test edilmiştir. Sonuçlar elde edildikten sonra faktörler arası ilişkiler de modele eklenmiştir. En sonunda nihai model geliştirilmiş ve denetçilerin BDDAT'yi benimsemesini etkileyen en önemli faktörler ortaya çıkarılmıştır.

Anahtar Sözcükler: BDDAT, Denetim, Teknoloji Kabul Modeli, Nicel Araştırma

To My Dear Daughter, Doğa

ACKNOWLEDGMENTS

First of all, I would like to thank my supervisor Prof. Dr. Sevgi Özkan Yıldırım, since she has been very supportive with her knowledge and guidance at all stages of this research.

Also, I would like to thank my parents Gülden Doğanay and Bayram Doğanay for their support and trust at all periods of my life.

I would like to thank my colleagues and managers for their support.

Finally, I am deeply grateful for my wife, Gözde Doğanay, for her great support and patience.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CAAT	Computer Assisted Audit Tools
CAATTs	Computer Assisted Audit Tools and Techniques
CFA	Confirmatory Factor Analysis
DOI	Diffusion of Innovations
EFA	Exploratory Factor Analysis
ELM	Elaboration Likelihood Model
GAS	Generalized Audit Software
ICT	Information and Communications Technology
ISACA	Information Systems Audit and Control Association
IT	Information technology
LDC	Least Develop Countries
PLS	Partial Least Squares
SEM	Structural Equational Modelling
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology

CHAPTER 1

INTRODUCTION

With expanding information age, information technologies have spread to many areas of life and the goods and services based on use of information technology has gained prevalence (Venkatesh, Morris, Davis, & Davis, 2003). In accordance with that, in last decade, thanks to the benefits provided by information technology (IT) to firms and public institutions, there has been a inimitable increase in the public and private sector investments on the information sector in the world (Laudon & Laudon, 2015). This fast developments in IT's use by business association has changed the methods by which they gather and uncover money related data. They are in reality encountering various and sophisticated IT structures which safeguard information on an electronic form as opposed to printed one (Arens et al., 2003; Khemakhe, 2001; Zhao, Yen, & Chang, 2004). Thus, auditors working for those organizations are confront with enormous work tests and stay up to date with the latest innovations in such a complex climate (Nurmazilah Mahzan & Lymer, 2014; Shaikh, 2005). They should see how the organization utilizes IT to gather, log, process and report transactions related to their financial activities or other information and in addition how to follow electronic source archives (Arens et al., 2003; Bedard, Jackson, Ettredge, & Johnstone, 2003; Bierstaker, Janvrin, & Lowe, 2014; Shaikh, 2005). It means that the audit activities have gained complexity and the burden of the auditors in such a complicated environment increased dramatically.

To fulfill these audit concerns and react to this fact, some recent standards on auditing prescribe to inspectors to execute Computer Assisted Audit Tools and Techniques (CAATTs or CAATs) to perform audit activity in an efficient and effective manner. The reality of today needs organizations to engage in the implementation of technology in order to better address the demands of globalization In this regard, the use of CAATTs is recommended to assist auditors in their work. (ISACA, 2010).

CAATTs are audit tools and techniques that can help auditors to complete their tasks in audit occupations (Braun & Davis, 2003). The guaranteed advantages for both auditors and audit firms to utilize CAATTs incorporate diminishing audit cost, enhancing quality and productivity of audit task, supporting convenient reports and improving audit effectiveness and efficiency (Dowling, 2009; Zhao et al., 2004).

However, in spite of these developing and quickened activities, which ought to rouse examiners to use the most recent auditing tools and techniques, many investigations and the world's trend demonstrates that there is little confirmation in regards to

CAATTs' acceptance (Al-Farah, Abbadi, & Shaar, 2015). Given CAATTs' potential benefits and public desire for qualified auditing, identifying the drivers for CAATTs' acceptance and adoption turns out to be progressively critical (Mansour, 2016). However, just a restricted number of scholarly studies have been directed that look to help more extensive comprehension of the issues of CAATTs adoption or acceptance – less still that especially concentrate on their adoption by auditors (Cash, Bailey, & Whinston, 1987; Debreceeny, Gray, Tham, Goh, & Tang, 2003; Rezaee, Sharbatoghlie, Elam, & McMickle, 2002; Vasarhelyi, Alles, Kuenkaikaew, & Littley, 2012; Vasarhelyi & Halper, 2018). More analyses are therefore needed to give a better idea of the inspirations and constraints for the auditors ' use of the CAATTs. (Nurmazilah Mahzan & Lymer, 2008).

1.1. Problem Statement

Expanding use of Information Technologies in associations both private and public, audit tasks has turned out to be progressively difficult for audit bodies. Although new technologies offer new opportunities to auditors to carry out their audit task faster and more efficient, the use and acceptance level of new technologies among auditors are still in question, especially in such a complex business environment. CAATTs, at this point, has been evolving since its beginnings. Some types of CAATTs are used by auditors to take the advantage of this technologies in audit process. Considering the innovative advancement in CAATTs and broad writing of technology acceptance models; the present condition of the related field should have been analyzed in more detail to reveal the current circumstance. In this respect, current research manages that issue by giving a systematic review of the literature and associated outcomes from a few points of view. Literature is reviewed considering the points:

- Definitions of CAATTs
- Types of CAATs
- Benefits of CAATTs
- Distribution of studies over the years
- Location of CAATs adoption researches
- Theoretical background used in researches
- Sample properties
- Most utilized research methods and analysis techniques
- Meaningful relations revealed

Another and the main issue managed in this study is identifying the constructs that influence acceptance of CAATTs. To manage this issue, a technology adoption model is designed which is dependent on the literature reviewed in this field. Proposed model tries to explain the effects of most significant factors, which are derived from literature such as perceived ease of use, perceived usefulness, facilitating conditions, social influence, management support, training and etc. on the adoption process of CAATTs in audit area.

1.2. Research Questions

The main purpose of this study is to enrich knowledge and awareness on the use/adoption of information technologies for audit activities. In this context, this investigation attempts to respond to following three main research questions:

- What is the current status of the technology acceptance of CAATTs in literature?
- What are the factors influencing auditors' behavioral intention to use CAATTs in audit task performance?
- How are the factors affecting auditors' behavioral intention to use CAATTs influencing each other?

In addition to three main research questions listed above, this study will also try to answer different detailed sub-questions supporting the main questions:

- Which technology acceptance or adoption theories/models are used in the literature?
- What sort of research design is utilized in the studies?
- What are the constructs found most significant in CAATTs adoption literature?
- When and where are the studies carried out?
- What are the most used research and analysis methods in the studies?
- What is the average sample size for quantitative researches?
- What types of CAATTs are used in audit activities?
- What are the intentions to use CAATTs to perform tasks in audit activities by the auditors?

1.3. Purpose of the Study

Main motivation behind this study is to identify the most prevailing factors that affect auditors in individual acceptance of CAATTs by creating and utilizing a CAATTs adoption model. In different terms, auditors' intention and perceptions are explored considering the components affecting their attitudes towards CAATTs. For this purpose, it is intended to appropriately put forth the present status of literature and develop a CAATTs adoption model to correctly estimate the main elements influencing use of CAATTs among auditors. The present condition of the literature gave that there were constrained examinations on auditors' adoption of CAATTs, and it introduced that there is no investigation thoroughly researching auditors' intention or perception to utilize CAATTs in Turkey. In order to fill this gap, this research aimed to explore the factors affecting auditors' intention to utilize CAATTs providing a technology acceptance model.

1.4. Significance of the Study

There are some previous studies on CAATTs acceptance. However, literature review provided that vast majority of them are explicit to only one country or utilize older

range of studies. In this respect, this paper provides a different approach by offering constructs from a wide range of literature.

Also, there is no study related to CAATTs' adoption in the Turkish context, as there is no exploration accessible on Turkish inspectors' day by day work and the utilization of CAATTs, or on the extension of that utilization and the motivations and limitations expressed by this expert group to utilize or not utilize CAATTs. Although there are studies in other countries, investigated tasks are not related with the Turkish reality.

There is still absence of data on the frequency of the CAATTs use among auditors and their skill on IT and about the manner in which firms address CAATTs' utilization. This research expects to fill those deficiencies by illustration the big picture of CAATTs among auditors.

In addition, a model based on the factors used in various studies is proposed following the comprehensive literature review.

This study can provide suggestions for successful implementation of CAATTs in institutions. In this way, auditors might recognize that a higher CAATTs use can improve effectiveness, viability, efficiency, security and lower the time spent and mistake event in each audit task.

The CAATTs acceptance model defined in this study may have effect on auditors' firms, so they may realize the efforts that can be made to keep away from the underutilization of CAATTs. This study may show the obstacles that auditors have with the utilization of CAATTs and firms notice these issues and prepare their future plans for CAATTs implementation in the light of these facts.

1.5. Research Methodology

In this study, different research methodologies are utilized to reach the desired objects of the study. A mixed method to research is used in this regard. Firstly, a descriptive technique is used to display the current situation of CAATTs acceptance literature in the literature review section. Then for the model proposition, a qualitative method via an expert view is used. For statistical analysis quantitative method is carried out. Lastly, in order to interpret the result and validate the model both quantitative and qualitative methods are utilized.

A deep review of literature is conducted in order to identify most significant constructs used in studies. Findings of the literature review are unified to offer an introductory CAATTs adoption model. An instrument to analyze factors which affect the adoption of CAATTs is then prepared. At the end, the final model and its associated statistical results are concluded. The conclusions of statistical findings are accompanied by literature reviews.

For the literature review part, firstly, research questions introduces. Parallel with the questions related keywords for search criteria are identified. Then search criteria is applied to selected databases. Results of the searches are kept regularly in spreadsheet in order to get the best descriptive statistics. The results investigated and statistical analysis based on PLS-SEM are carried out using, SPSS and Smart PLS software. Results of the statistical analysis and the final model are evaluated with literature review results.

1.6. Main Steps of the Research

The main stages of this thesis are shown below in Figure 1.

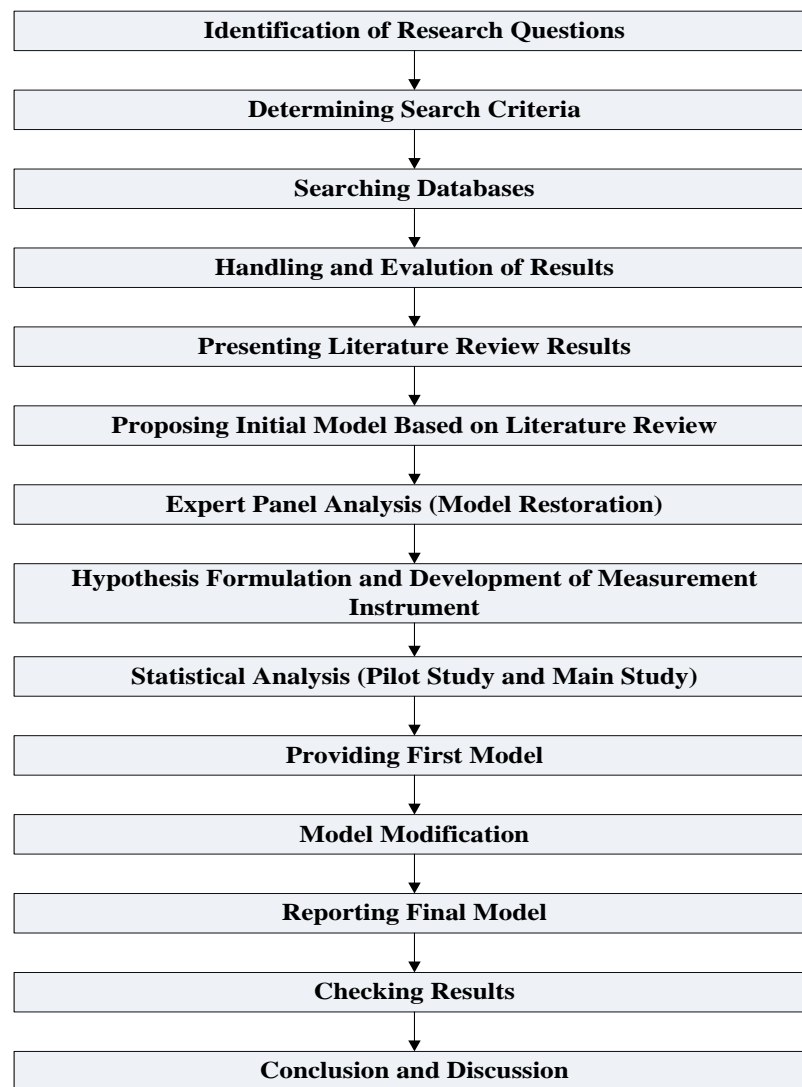


Figure 1 Main Steps of the Research

1.7 Rest of the Study

Remaining chapters of the study is designed as: In next chapter, literature review of CAATTs, technology acceptance models in the literature and associated CAATTs studies in the field are investigated. Results acquired from the literature are demonstrated. In chapter three, the research methodology is introduced with the first model proposal. Chapter four includes quantitative data analysis results captured from surveys and related findings. In chapter five, conclusions, discussions and directions for the future researches are presented.

CHAPTER 2

LITERATURE REVIEW

This chapter of the study is devoted to literature review. In this respect, firstly, general information about auditing, auditor and CAATT's in the literature are given to clarify subject of this study. Then, major models and theories on technology adoption area are introduced in order to get insight on factors influencing the technology acceptance decision of individuals. Lastly, CAATT's adoption studies reviewed systematically and process of review used in the study is displayed also.

2.1. Review of CAATTs

In this part general information on auditing, auditors, audit and IT relation and CAATTs like definition, types and benefits of CAATTs are given.

2.1.1 IT and Auditing in Organizations

Auditing is an analytical and administrative mechanism through which auditors catch frauds and illegal activities, and check for fulfillment, truthfulness, and variations from normal procedures. Auditing, explicitly IT, has turned into a basic piece of corporate governance and gives acceptable confirmation of risk assessment and management (Merhout & Havelka, 2008). An auditor's job is recognizing inner and outside causes of risk and their consequences for controls, to assess the sufficiency of assets, and evaluate their impacts on control systems (Janvrin, Bierstaker, & Lowe, 2008). In this manner, a generous comprehension of technical prerequisites reinforces the auditor's job in usage and legitimate utilization of audit tools. And, an auditor may help IT specialists to choose/build up a reliable system that can deliver profoundly solid data immediately. A reliable system is defined as the system which works without capital error, flaw, or breakdown during a predefined time period in a predetermined situation (Tsai, Chien, Hsu, & Leu, 2005). According to Zao et al. (2004) a reliable system should have four fundamental principles namely; *availability, security, integrity and maintainability*. These principles are defined as follows:

- **Availability:** The system is accessible for activity and use on occasion set out in service agreements.
- **Security:** The system is ensured against unapproved physical and legitimate access. Legitimate access is the capacity to read or control information through remote access.

- Integrity: System handling is finished, correct, timely and as per the institution's transaction approval and product delivery arrangement.
- Maintainability. The system can be updated without damaging the principles of integrity, security and availability.

Since the audit is a lengthy and resource-focused process, most organizations conduct periodic audits; however, because of resource limitations, they review only high risk business activities which form just a little portion of the all operations (Sueyoshi, Shang, & Chiang, 2009). Accessibility of CAATTs and numerous information and communications technology (ICT) instruments can make auditing more productive and fewer labor intensive (Razi & Madani, 2013). An effective audit activity in an institution, in return, increases the system reliability and quality. In other words, these two structures in an institution continuously improve each other and add value to the institution.

2.1.2 Types of Auditing

Although audit activities can be grouped under different topics according to their purpose, basis of organization, basis of auditors' status, these activities are commonly classified based on their purpose. In this manner audits can be grouped under four main titles such as; operational audit, financial statement audit, compliance audit and information system audit (Arens, Elder, & Mark, 2012; Başpınar, 2005; Bozkurt, 2015):

Operational Audit: An operational audit assesses the efficiency and effectiveness of the operating procedures and practices of any component of an enterprise. It measures the effectiveness and performance of business objectives on the basis of its goals. When an organizational audit is done, management usually receives recommendations to enhance operations. Operational audit involves analysis of organizational structure, system activities, production methods, advertising and any other field where the auditor is skilled. In this respect, operational audit is also considered as a consultancy service.

Financial Statement Audit: An audit of the financial statements is performed to decide whether the financial statements are reported according to the requirements stated. That is, financial audits are carried out to assess whether the financial statements represent a company's financial condition and operating results in compliance with generally agreed accounting standards and legislation. The auditor collects evidence to determine whether the financial statements are reasonably reported in compliance with the accounting principles and determine if the statements involve financial errors or other errors.

Compliance Audit: A compliance audit is performed to decide if the auditee meets specific procedures, rules and regulations defined by some greater authority. Processes / operations conducted by a corporation are reviewed in a compliance audit to ensure that they really comply with the laws, legislation, regulations and the policies of the organization. In this manner, organizations refers to auditing departments to learn whether the rules are complied with.

Information System Audit: Information systems auditing is the review and analysis of the IT infrastructure, practices and activities of an entity. Information systems auditing can be called the process of gathering and reviewing data to determine whether a computer system protects properties, preserves data integrity, enables institutional goals to be effectively accomplished and utilizes resources efficiently.

2.1.3 Types of Auditors

The auditor is the person who carries out audit activities, has sufficient professional knowledge and experience, acts independently, has the necessary moral qualifications and shows sufficient care in her work (Bozkurt, 2015). There are mainly three types of auditors who can be defined as followed (Arens et al., 2012; Başpınar, 2005; Bozkurt, 2015; Delaney & Whittington, 2009; D. Taylor & Glezen, 1995):

External/Independent Auditors:

External/Independent auditors are experts who provide professional audit services to their clients, working independently or employed in an audit firm. Since there is no an employee-employer relation between these auditors and the organization which is audited, they are mostly referred as external auditors.

Government Auditors:

Government auditors are the persons who work for and perform investigations on behalf of government agencies. They audit not only private agencies' operations, but government organizations as well. Such audits are carried out in compliance with rules, legislation and general policies.

Internal Auditors:

As the permanent employee of the organization, the persons who carry out internal audit activities within the organization are called internal auditors. Internal auditing is characterized as an autonomous, analytical and advisory practice aimed at adding value and enhancing the operations of an entity. This helps an enterprise achieve its goals by offering a structured, professional approach for evaluating and

enhancing the efficacy of risk mitigation, control and governance functions. The main objective of the internal auditors is to support the top management and boards in the effective management of the company on behalf of their stakeholders. Internal auditors should be unbiased and neutral. They are respected by their employers because they offer an unbiased and impartial view. They need extremely wide variety of skills and expertise for this reason. (Internal Auditor Institute (IIA), 2015)

In the scope of this study the term “auditor” refers to internal auditors. This study is carried among internal auditors, since they are most common auditors in the field.

2.1.4 Auditing in Turkey

Developments in the audit field in the international arena has been also followed in Turkey, and especially in recent years significant adjustments and institutional structures related to this subject have been created (Koloğlu, 2019). In this manner, this topic can be handled with respect to legal regulations related to auditing.

The regulations related to auditing in Turkey can be grouped under three main topics such as private sector, public sector and banking sector regulations.

Considering the real sector and its affiliates, auditing (especially internal audit) applications are not a legal obligation, except for exceptional institutions. Turkish Commercial Code No.6102 states that “for the purpose of internal audit, committees and commissions including members of the board of directors can be established”. But this statement does not include an obligation. On the other hand, in terms of institutions subject to Capital Markets Board of Turkey (CMB); it is obligatory to establish an "Audit Committee" in public enterprises.

In terms of the public sector applications. Public Financial Management and Control Law No.5018 regulates the auditing activities in detail. The chapters on internal auditing are set out in the fifth section of the law from article 63 to article 67. In the definition of Law No. 5018, it is emphasized that internal audits are consulting activities that provide value and contribution to the work carried out by the state administrations evaluating the efficient use of resources and providing reasonable assurance for guidance. Furthermore, according to this article, only internal auditors can assume the audit function. In this manner, auditing is a mandatory activity in public institutions.

If the subject is considered for the institutions subject to Banking Regulation and Supervisions Agency (BRSA); regulations on internal control, internal audit and risk management are more detailed and more clearly defined than other practices. The Banking Law No. 5411, which entered into force on 01.11.2005 and the “Regulation on Internal Systems and Internal Capital Adequacy Assessment Process of Banks” issued on the basis of this law, introduced obligations for the audit units to be

established by all banks in parallel with the previous regulations (Koloğlu, 2019). On the base of these regulations, necessary systems for auditing and the related activities like risk management, and internal control are defined as mandatory for all banks operating in the country.

Considering the sectors listed above, it is concluded that there are many regulations on the necessary of auditing in different economic units. Comparing the regulations in Turkey with the regulations which are internationally accepted, it is seen that Turkey has quickly adopt to changing conditions. The Sarbanes-Oxley Law is a regulation which occurred after the economic crises took place in Europe and America like Enron, Worldcom, highlighting the importance of corporate governance. This law introduced the importance of the principles of accuracy, integrity and transparency in many different areas. In this manner, as the many countries around the world Turkey also applicated these new principles changing the related regulations. In this manner, regulations related to Capital Markets Board of Turkey (CMB) and Banking Regulation and Supervisions Agency (BRSA) has been adopted rapidly (Elverici, 2016).

Another important international regulation is the Basel Regulations which emerged as a result of rapid developments in the banking sector and new searches in the field of auditing. Basel Regulations were adopted by the most of the developed countries. As parallel to these changing Turkey also adopted the new regulations to the Turkish Banking Sector.

However, considering the CAATTs use there are no any regulation or advices for use of CAATTs in auditing. Although the regulations in international area are followed quickly, there is no any offers how to apply the necessities of these changes. Moreover, use of CAATTs is not mandatory in Turkey in Public and Banking Sectors. But, it is not certain since there is not a strict regulation on private sector applications except for institutions subject to Capital Markets Board of Turkey (CMB). As it is stated in the 2.1.7 of this study, there are many countries which legally accepted the use of CAATTs in different stages of auditing.

2.1.5 Computer Assisted Audit Tools and Techniques (CAATTs)

CAATs can broadly be described as any use of technology to help complete an audit task (Braun & Davis, 2003). However, a later description is to restrain the use of the term to "different tools, technologies, and software that help auditors to direct control and affirmation tests, analysis and control of financial statement information, and continual monitoring and auditing activities" (Lin & Wang, 2011). As to point of this paper and taking after past studies' descriptions, CAATTs is characterized as any utilization of technology to help auditor perform an audit, like Utility Programs, Electronic Working Papers, Electronic Spreadsheets, Purpose-Written Programs, Test Data, Parallel Simulation, Integrated Test Facility (ITF), Generalized Audit Software (GAS) and Embedded Audit Modules (EAM) (Mansour, 2016). These nine types of

CAATTs are appeared in Table 1 with their individual depictions (Bierstaker et al., 2014; Braun & Davis, 2003; Jakšić, 2009).

Table 1 Types and Definitions of CAATTs

Types of CAATTs	Description
Utility Programs	They are not developed for audit purposes. They include general purpose information processing functions such as merging, sorting, copying, and printing. (excel, lotus, word etc.)
Electronic Spreadsheets	Electronic Spreadsheet includes PC applications which are normally utilized for information arrangement, examination and storage. They were created as an electronic impersonation of paper bookkeeping and auditing worksheets used by auditors.
Electronic Working Papers	Audit Electronic working papers are archives gathering and protecting all audit data got while the audit activity. These are utilized to support the audit activity done and to verify that the audit is conducted in accordance with the relevant audit standards.
Purpose-Written Programs	They are designed by the auditor himself or by an external programmer for more specific cases than generalized audit programs. As they are developed only for the original and different events encountered, they provide faster and more efficient results compared to general purpose programs (They include the applications developed by companies / institutions to perform or test their special functions within their own bodies).
Test Data	Fictitious-prepared data by auditor which will be handled by the checked systems. The assessment is found on a correlation between the consequences of the test information and the inspector's desires. The processing inside the audited system is a "black box".
Integrated Test Facility	Processing of Test Data in separated parts or modules inside the checked system. Auditor can see the aftereffects of the internal system controls via this technique.
Parallel Simulation	An application created by auditor, which is totally isolated from the users' side. The outcome of processed information got from real data are matched with the consequences of the system used by clients.
Embedded Audit Module	Auditor-created module which is executed inside a client's system. EAM assesses instant data by criteria's which are preliminary determined while it is handled. Consequences of EAM assessments can be built into a SCARF (System Control and Audit Review Files), which is transmitted to the auditors for more investigation.

Generalized Audit Software	They are independent applications, which assess extricated instant data and investigate them, examining predetermined criteria's. In particular, they are the tools intended for auditors to encourage and mechanizes testing of 100% of population, centering imitated items. Audit Command Language (ACL), Active Data and Interactive Data Extraction and Analysis (IDEA) can be counted as this types of CAATTs.
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2.1.6 Use and Benefits of CAATTs

CAATTs permit the auditor to freely get to the information put away on a system without dependence on the user, check the unwavering quality of used software, increment the correctness of audit tests and carry out audit tests more efficiently which will bring about a low cost audit in the long run. CAATTs likewise permit the auditor to save the time. In many cases, by supplanting manual testing methodology with CAATTs-based strategies, auditor can spare hours or even days on each audit. One may, for instance, use the CAATTs in two sheets, and in a couple of seconds identify any invoice which does not have a relevant order or goods receipts, instead of gathering a set of 25 invoices and waste a day moving through printed items to concurs with orders and transactions (3-way coordination). The use of CAATTs thus offers auditors various advantages while arranging and directing audits and reporting the results of the audit (Coderre, 2015). Although there are numerous advantages of CAATTs for both auditors and institutions, some of them can be categorized under topics as follows (Aksoy, 2002; Coderre, 2015; Furtuna & Ciucioi, 2019; Lin & Wang, 2011):

- Efficiency, productivity, quality increase and cost reduction
- New, interactive and creative audit tools that cope with high volume of data
- Stratify and validate data
- Independence and increase of control
- Creating added value and producing information
- Creating new audit areas
- Providing real-time data
- Recreating audit trails
- Providing independent reports
- Improving risk management methods

2.1.7 Adoption of CAATTs Worldwide

A number of countries have legally received CAATTs, for example, CAATTs audit databases are utilized to record audits in Australia. CAATTs are utilized for assembling, analyzing and testing data in countries like Belgium, Hungary, Denmark, Malaysia, USA and Switzerland. CAATTs are used in Canada for sampling during audit activity, planning audit schedule based on risk assessment, defining audit procedures and managing the notes related to the interviews. India utilizes CAATTs for information extraction and investigation. In order to carry out risk analysis of IT

and to check the consistency between digital accounting data and the associated records of the Bank of Korea, CAATTs are used in Korea. CAATTs are utilized in UK to make data analysis and get the resulting documentation. In South Africa, CAATTs are utilized for security analysis, audit planning and preparing audit related working papers.

2.2. Literature Review of Technology Adoption Models

This part of the study briefly introduces some of the leading technology acceptance model from related literature. These theories are as follows:

2.2.1 Diffusion of Innovation Theory (DOI)

Diffusion of Innovation Theory is based on sociology and actually has been utilized since the 1960s in investigating different kinds of novelty technologies (Tornatzky & Klein, 1982). Rogers, (1995) initially introduced diffusion of innovation theory in order to form the process of innovation-decision. According to Rogers (1995) there are four aspects affecting the spread of a new technology idea which are namely, the innovation, social system, time, and communication channels. The decision-making process of a person passes through five phases, namely, knowledge, persuasion, decision, implementation and confirmation. Individuals provide insight into innovation in the knowledge phase. Individuals take a favorable or negative approach to innovation in the persuasion step. Individuals decide to embrace or dismiss innovation in the decision phase. The fresh concept (use innovation) is implemented by people in the implementation phase. The final stage is the confirmation that people are seeking to strengthen a decision on innovation already taken (Rogers, 1995). The Diffusion of Innovation Theory is described based on five innovation features (Moore & Benbasat, 1991) as shown in Figure 2 such as those that follows:

- Relative advantages: “the degree to which an innovation is perceived as better than the idea it supersedes by a particular group of users”
- Complexity: “the degree to which an innovation is perceived as difficult to understand and use”
- Compatibility: “the degree to which an innovation is perceived as being consistent with the values, past experiences, and needs of potential adopters”
- Observability: “the degree to which a result of an innovation, are observable to others”
- Trialability: “ the degree to which an innovation may be experimented with before adoption”

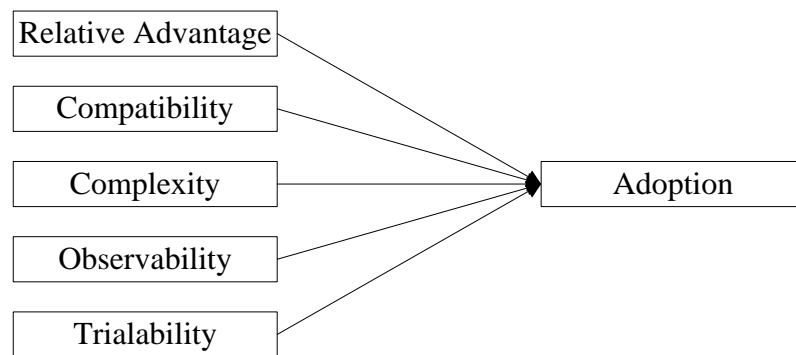


Figure 2 Diffusion of Innovation Theory

Moore & Benbasat (1991) brought the diffusion of innovation theory to the IS area and created a tool that can be used to forecast the adoption of technologies by users. Their final model includes three new variables, namely, results demonstrability, voluntariness to use and image. These are defined as follows:

- Results Demonstrability: “tangibility of the results of using the innovation”
- Voluntariness to use: “the degree to which use of the innovation is perceived as being voluntary, or of free will” or “the extent to which potential adopters perceive the adoption decision to be non-mandatory”
- Image: “the degree to which use of an innovation is perceived to enhance one's image or status in one's social system”

2.2.2 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was formulated by Fishbein and Ajzen in 1975. TRA is drawn from social psychology and the one of most principal and influential theories and has been utilized to foresee a wide range of behaviors as shown in Figure 3 (Venkatesh et al., 2003). According to the theory, behavioral beliefs influence attitude, and normative beliefs influence subjective norms or social norms. Attitude and subjective norms together influence intention. It is attempted to determine actual behavior with intention (Fishbein & Ajzen, 1975). TRA is an instrument used to increase further knowledge into how attitudes and beliefs are correlated with individual intentions to perform (Yucel, Gulbahar, & Yasemin, 2013). Constructs of this model are defined as follows (Fishbein & Ajzen, 1975):

- Attitude: “an individual’s positive or negative feelings (evaluative affect) about performing the target behavior”
- Subjective Norms: “the person’s perception that most people who are important to him to think he should or should not perform the behavior in question”
- Behavioral Intention: “Function of both attitudes toward a behavior and subjective norms toward that behavior which has been found to predict actual behavior”

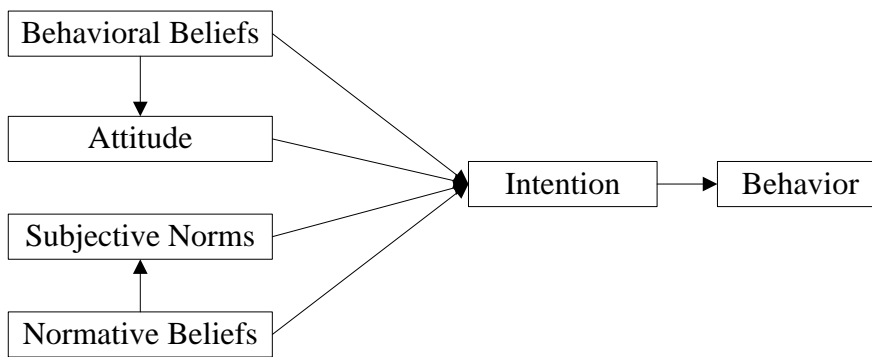


Figure 3 Theory of Reasoned Action (TRA)

Theory of Planned Behavior (TPB)

Ajzen's (1991) theory of the planned behavior is a widely recognized concept about the use of IT products in person. Ajzen (1991) amplified TRA by including the perceived behavioral control. According to this hypothesis, the intention is controlled by three elements namely perceived behavioral control, attitude toward behavior and subjective norm. Perceived behavioral control alludes to individuals' view of their capacity to execute a behavior given. The remaining two constructs (Attitude and Subjective Norms) are adopted from TRA and the new construct namely Perceived Behavioral Control is added and defined as follow (Ajzen, 1991; S. Taylor & Todd, 1995a):

- Perceived Behavioral Control: “the perceived ease or difficulty of performing the behavior” or “perceptions of internal and external constraints on behavior”

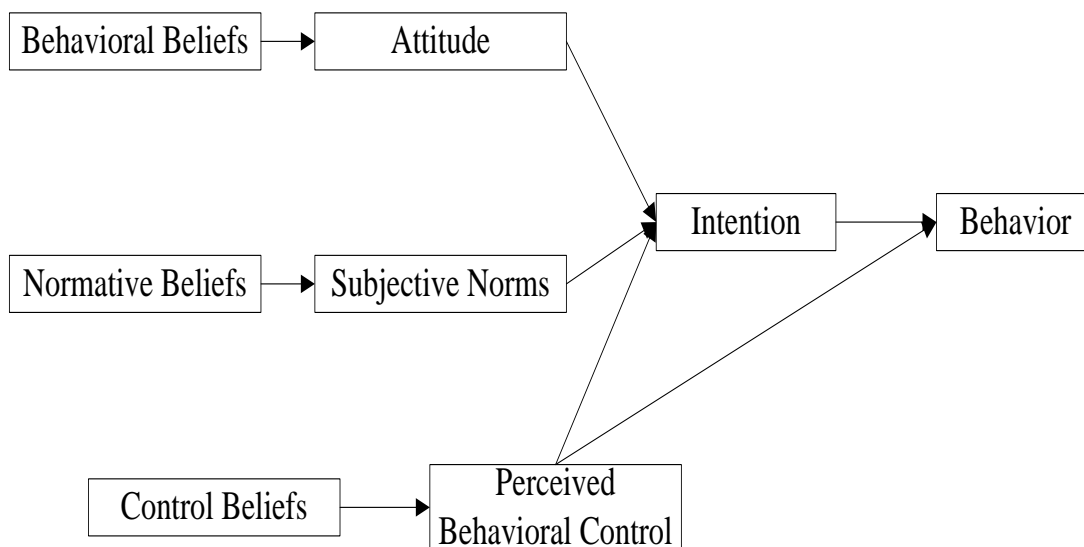


Figure 4 Theory of Planned Behavior

2.2.3 Technology Acceptance Model (TAM)

Davis (1989) offered The Technology Acceptance Model (TAM) which adopted from Fishbein and Ajzen's TRA. And he kept in mind that the end goal is to clarify the possible user's behavioral intention to make utilization of a new technology. In contrast to TRA, final version of the TAM does not include the attitude construct aiming to explain the behavioral intention better (Venkatesh et al., 2003). This model proposes that the adoption of an innovation is controlled by two fundamental elements, namely perceived usefulness and perceived ease of use as shown in Figure 5. For researchers, these variables are simple to comprehend and can be useful in the assessment of requirements and development phases. In the fields where technology is used extensively these two variables, perceived ease of use and perceived usefulness, are highly common so that the two primary variables can be commonly used to deal with the problem of technology adoption (Tung, Chang, & Chou, 2008). The new constructs introduced in this model are defined as follows (Davis, 1989):

- Perceived Ease of Use: “The degree to which a person believes that using a particular system would be free of effort”
- Perceived Usefulness: “The degree to which a person believes that using a particular system would enhance his or her job performance”

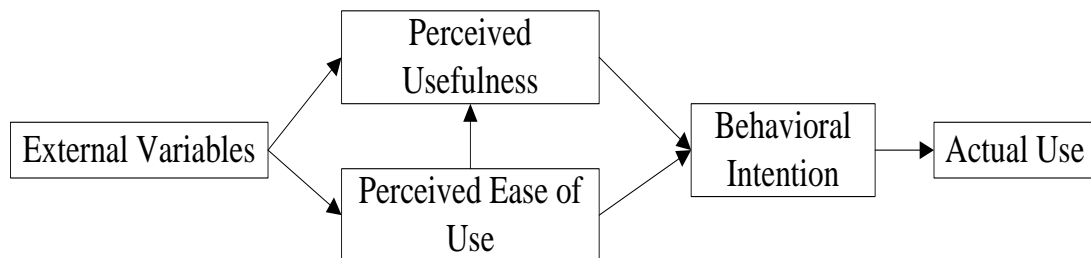


Figure 5 Technology Acceptance Model (TAM)

2.2.4 Technology Acceptance Model 2 (TAM 2)

Venkatesh and Davis (2000) improved the TAM and introduced Technology Acceptance Model 2 by adding new critical determinants to perceived benefit and behavioral intention, which are the main variables of the technology acceptance model as shown in Figure 6. Firstly, they anticipated determining the background of external variables which affect perceived usefulness. There were two types of outer elements. In this manner, subjective norm, imagination and voluntariness constructed the social influence elements. On the other hand, job relevance, result demonstrability, output quality, perceived ease of use and experience constructed the cognitive instruments side of the model. (Venkatesh & Davis, 2000). The new constructs in addition to past models which are introduced in this model are as follows (Venkatesh & Davis 2000):

- Job Relevance: “an individual's perception regarding the degree to which the

- target system is applicable to his or her job”
- Output Quality: “how well the system performs the job related tasks”

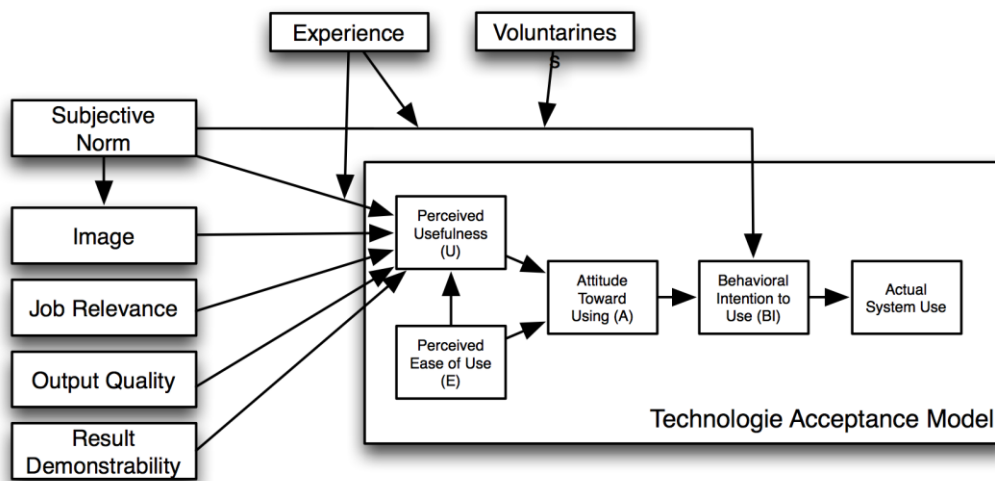


Figure 6 Technology Acceptance Model 2 (TAM 2)

2.2.5 Combined TAM and TPB (C-TAM-TPB) or Decomposed TPB

The main determinants of TPB, impact of social influence and control factors, which are not used to quantify the behavior in TAM have been joined together to shape the C-TAM-TPB. The construct, namely subjective norm and perceived behavioral control were included to TAM. The main reasons behind the idea are the recognition of their prescient utility in IT use to inquire about and their significance in social sciences. (Hair, Ringle, & Sarstedt, 2011; S. Taylor & Todd, 1995b). Taylor and Todd (1995a) recommend decaying attitudinal belief into two variables which are perceived usefulness (PU) and perceived ease of use (PEOU). These two variables have been observed to be reliably associated particularly with IT utilization. All the constructs are adapted from TRA and TPB (Venkatesh et al., 2003). Figure 7 shown below illustrates the Combined TAM and TPB (C-TAM-TPB) model.

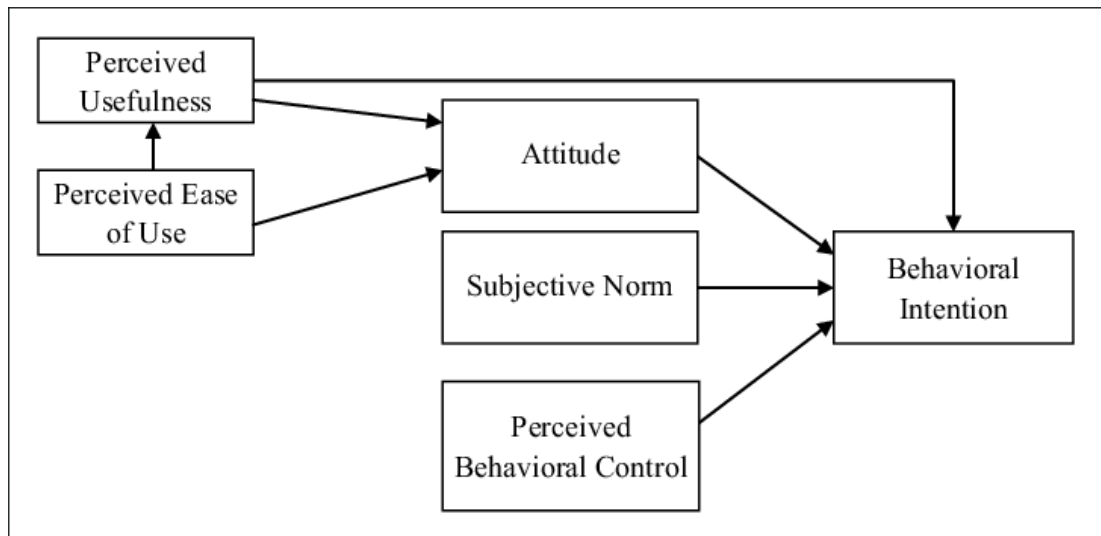


Figure 7 Combined TAM and TPB (C-TAM-TPB)

2.2.6 Unified Theory of Acceptance and Use of Technology (UTAUT)

This model is proposed by Venkatesh et al., (2003). It incorporates components crosswise over eight models (i.e.: SCT proposed by Bandura, 1986; TRA by Fishbein and Ajzen, 1975; TAM created by Davis, 1989; C-TAM-TPB proposed by Taylor and Todd, 1995; TPB by Ajzen, 1991; MM by Davis, Bagozzi, and Warshaw, 1992; and MPCU proposed by Thompson, Higgins, and Howell, 1991; the IDT created by Rogers, 1995), to assess client aim on CAATTs. According to writings, TRA, TAM, TPB, MM, C-TAM-TPB, MPCU, IDT, and SCT clarify in the vicinity of 50% of the change in user intention, while the UTAUT clarifies 70% of behavior intention for use (Venkatesh et al., 2003). According to Venkatesh et al. (2003), behavioral intention to accept an innovation by people is affected specifically by the accompanying four factors:

- Performance expectancy: “The conviction of a person that utilizing innovation apparatuses will help him or her to accomplish noteworthy rewards in employment execution”
- Effort expectancy: “The level of simplicity connected with utilization of the tools
- Social influence or perceived social influence: an individual's conviction about the esteem that others trust he or she ought to utilize the technology”
- Facilitating conditions: “the conviction that organizational and technical infrastructure exists to support utilization of the system”

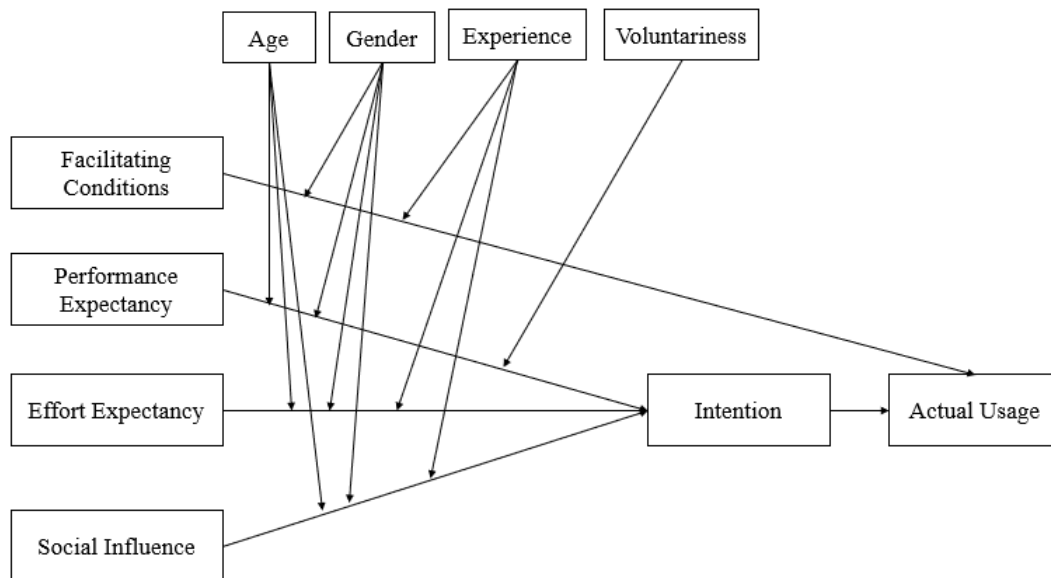


Figure 8 Unified Theory of Acceptance and Use of Technology (UTAUT)

2.2.7 Technology-Organization-Environment Framework (TOE)

TOE framework is created to address technological, organizational and environmental impact on firm's selection of technology. Technological context alludes to the technology qualities like relative advantage, compatibility, complexity, trainability. Next, organizational context alludes to the organization measures like the centralization, firm size, the nature of human asset, formalization and complexity of managerial structure, and availability of them. While in environment context, TOE grasps that association needs to lead its business inside its industry, rivals, providers and government (Depietro, Wiarda, & Fleischer, 1990).

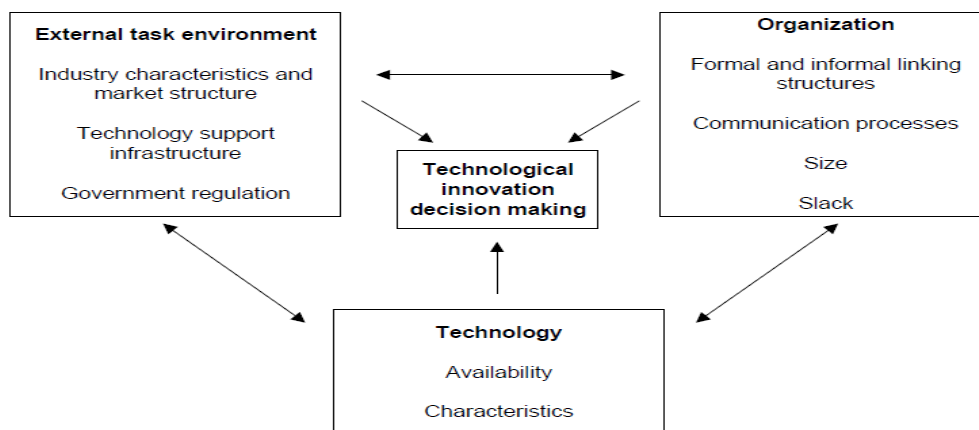


Figure 9 Technology-Organization-Environment Framework (TOE)

2.3. Systematic Review of CAATTs Adoption Literature

In this section, studies which are carried on investigation, acceptance, adoption and usage of CAATTs are reviewed and resulting findings are given in order to create a base for the aim of this investigation.

2.3.1 Identification of Research Criteria

In order to answer to the first research question “What is the current state of the technology acceptance of CAATTs in literature?” a meta-analysis is carried out with related search criteria which is appropriate to the scope of this study.

In the audit field, Computer Assisted Audit Tools and Techniques (CAATTs) and Computer Assisted Audit Tools (CAATs) are used interchangeably, thus, both terms are used (with OR Boolean operator). Also, as the most known type of CAATTs, Generalized Audit Software (GAS) is also included in the search with OR Boolean operator. Simultaneously, “technology acceptance” and “technology adoption” (with OR Boolean operator) are used to search the same fields. Finally, these phrases are connected with “AND” Boolean operator. Finally, six combinations of keywords were applied for searching title, abstract and keywords which are as follows.

- “CAATTs” is combined with “technology acceptance” by using AND Boolean operator
- “CAATTs” is combined with “technology adoption” by using AND Boolean operator
- “CAATs” is combined with “technology acceptance” by using AND Boolean operator
- “CAATs” is combined with “technology adoption” by using AND Boolean operator
- “GAS” is combined with “technology acceptance” by using AND Boolean operator
- “GAS” is combined with “technology adoption” by using AND Boolean operator

In order to get the best related result in the scope of this study, some restrictions are applied to search criteria. Regarding the time period, the search results are limited to timeline between 1995 and February 2019. Regarding the format, the document type includes only “articles” and “conference papers”. Finally, in terms of language, only the studies written in “English” are included.

2.3.2 Database Selection

In this study, Scopus, Elsevier, ScinceDirect and Metu library databases are used to carry out the review of the CAATTs adoption literature. Reason for selecting these databases is because of their broad spectrum of scholarly literature sources. Moreover,

it is simple to access these databases through METU Library. All databases are searched and the results doubled are removed.

2.3.3 Management of Research Results

In this phase, the outcomes originating from literature search are organized utilizing Microsoft Excel in order to interpret results better in the scope of this study. Spreadsheets included information such as title, citing, applied theory or research models, , name of journals, used construct, constructs found significant, document type, sample size, country of origin, year of publication, statistical analysis methods and tools utilized. After every one of the outcomes are recorded in spreadsheet, disposal procedure is carried out. In this respect, abstracts are reviewed and if it is considered as relevant to the study, full-texts are investigated. After assessment of full-text some studies are disposed and the remaining studies are investigated in more detailed.

2.3.4 Evaluation of Studies

At first, all the studies reached as a result of literature review are assessed considering abstracts and titles and those which are not appropriate with the point of this examination are eliminated. In subsequent stage, the whole texts are investigated and thinks about that do not pursue exact examination structure with quantitative or qualitative methods are dispensed from the study also. Moreover, studies are eliminated at the end of the full text review due to the reasons given below:

- Giving very limited information about the study
- Being not related to CAATTs adoption concept
- Being unfinished and baseless studies
- Not giving enough information in abstract and/or full text is not available in the related databases

In addition, studies not utilizing a hypothetical model for distinguishing persuasive factors in acceptance, utilization and reception of CAATTs are separated. It means, the studies using one or more theoretical models are included in this study with the exception of a few studies which do not mention about any model but reaching the results of theoretical models available in the literature.

Deep literature review revealed 50 available studies which can be used within the scope of this study. The studies selected for using in this study are presented in APPENDIX A with science citation index.

2.4. Assessment of Results Acquired from Literature Review

In this part of the study, descriptive statistics related to the results obtained from literature review are presented. In the accompanying sections related studies are

inspected regarding their conveyance crosswise over years, location, hypothetical foundation, sample properties, research methods, examination techniques, and most significant constructs. Related the results were visualized with graphs and charts to increase intelligibility.

2.4.1 Distribution of Studies with respect to Years

Considering the studies on CAATTs with respect to years, Figure 10 given below demonstrates the increasing trend in this field. As it is shown in the figure CAATTs adoption have been gaining importance since 2000s. However, it should be noted that this chart is based on 50 studies which are selected for the purpose of this study available online as of February, 2019.

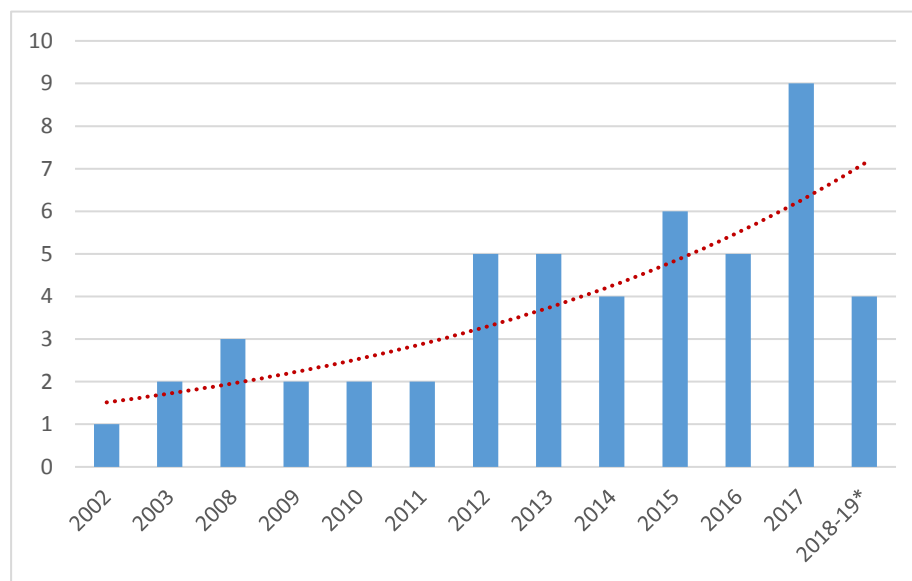


Figure 10 Number of Studies with Respect to Years

2.4.2 Distribution of Studies by Location

In this part of the study, geographical distribution of the CAATTs adoption studies are investigated. As it is seen in Figure 11 CAATTs adoption is widely examined in various countries all around the world. According to literature review, studies are carried on sixteen (16) different countries. In this respect USA has the lead which is followed by Malaysia, Portugal, Indonesia, Nigeria and so on. This shows that this issue is considered as important by various countries.

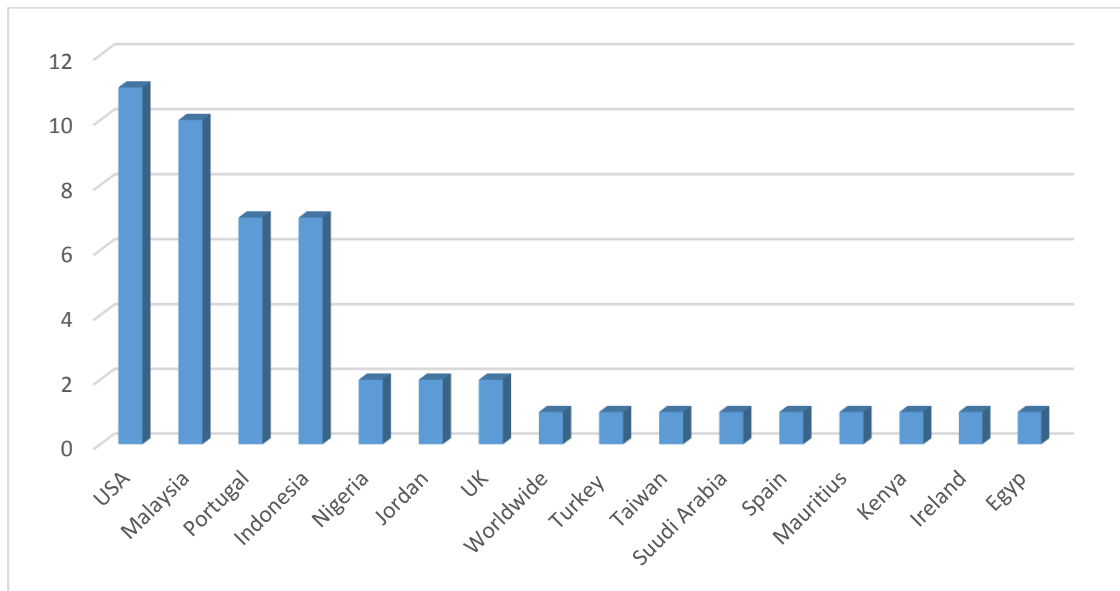


Figure 11 Geographical Distribution of Studies

As stated earlier, there are 50 studies in reviewed in the scope of this study and 37 out of 50 papers are articles and the remaining (13) are conference papers. In this manner, geographical distribution of articles are given below in Figure 12.

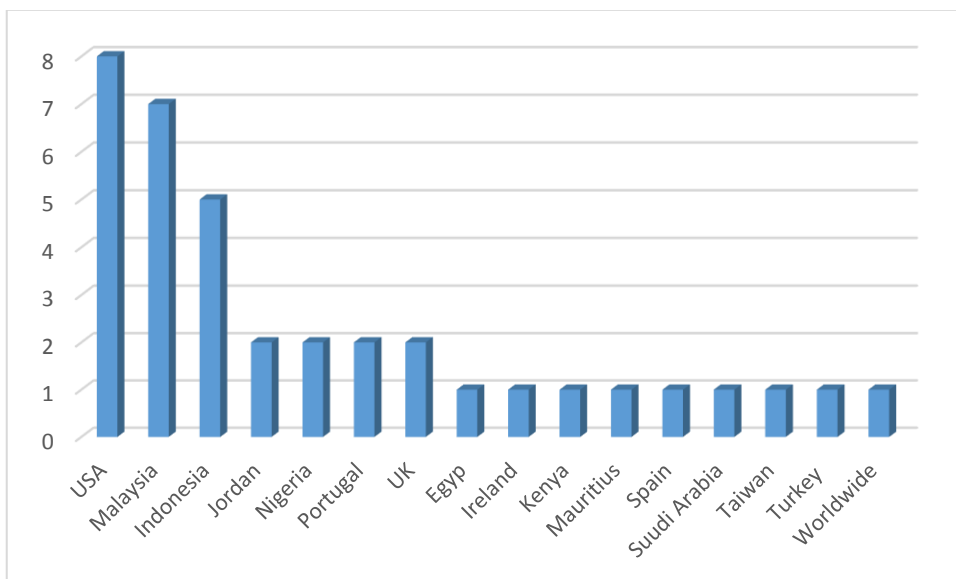


Figure 12 Geographical Distribution of Studies (articles only)

When the Figure 12 is investigated, it is seen that USA has still the lead but, this time it is followed by Malaysia, Indonesia, Jordan, Nigeria and so on. This situation shows that there is a change in the approaches of developed and developing countries on the issue. In order to see the changing trend on the subject, it is necessary to see how the

studies have changed according to the countries by years. Figures 13 and 14 show number of studies carried on CAATTs adoption with respect to years for developing and developed countries.

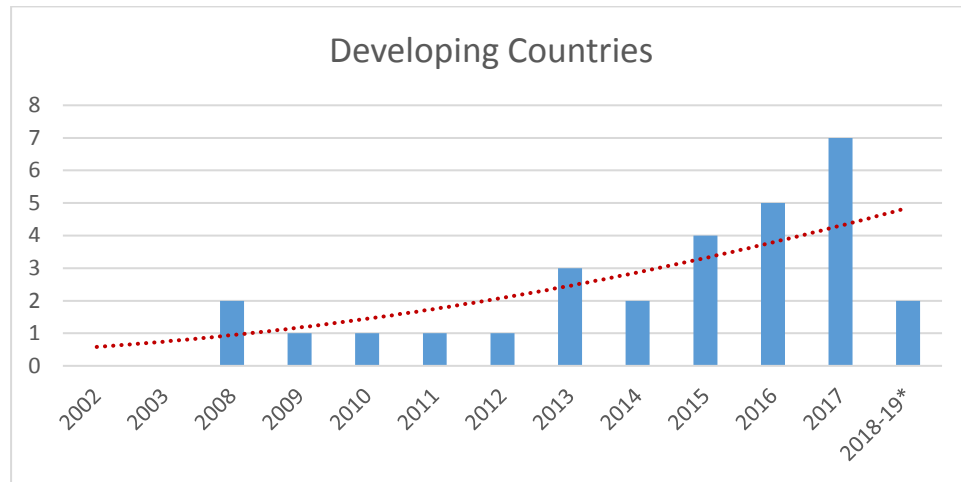


Figure 13 Number of the Studies in Developing Countries with Respect to Years

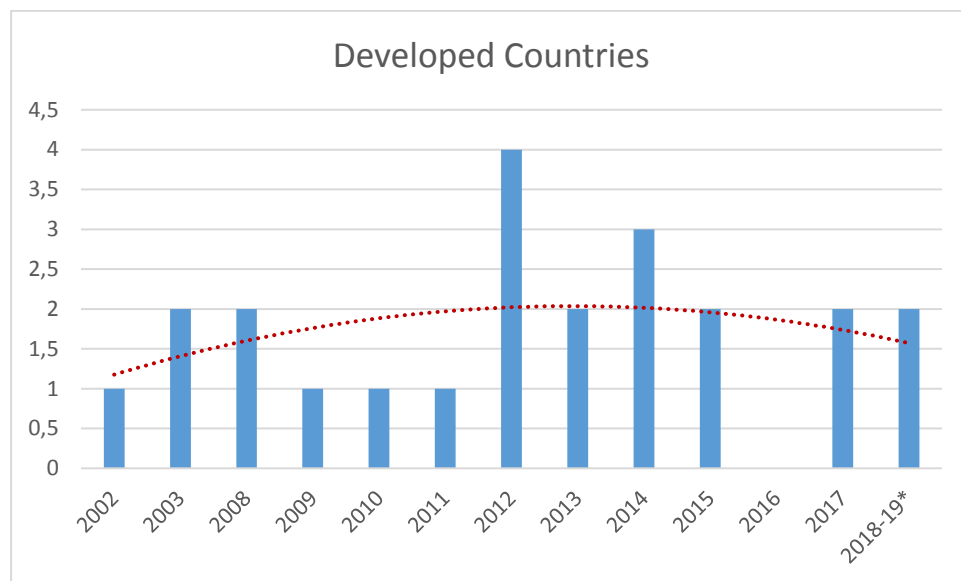


Figure 14 Number of the Studies in Developed Countries with Respect to Years

Figure 13 and 14 reveals that there is an increasing trend on CAATTs adoption studies in developing countries compared to developed ones. Although the number of the studies conducted in developed countries is coherent over the years, increasing trend for developing countries makes this study even more meaningful for the country in which the study was conducted.

2.4.3 Theoretical Background of Studies

The studies inspected inside this study use different theories or models as a theoretical background to investigate the factors affecting the CAATTs adoption of audit bodies. As shown in Figure 15, most of the studies uses the combination of the known theories in Technology Acceptance area, and some uses only one theory as basis for their investigation. Only three of the fifty studies included in this study do not use any theoretical models. They are defined as Descriptive Studies.

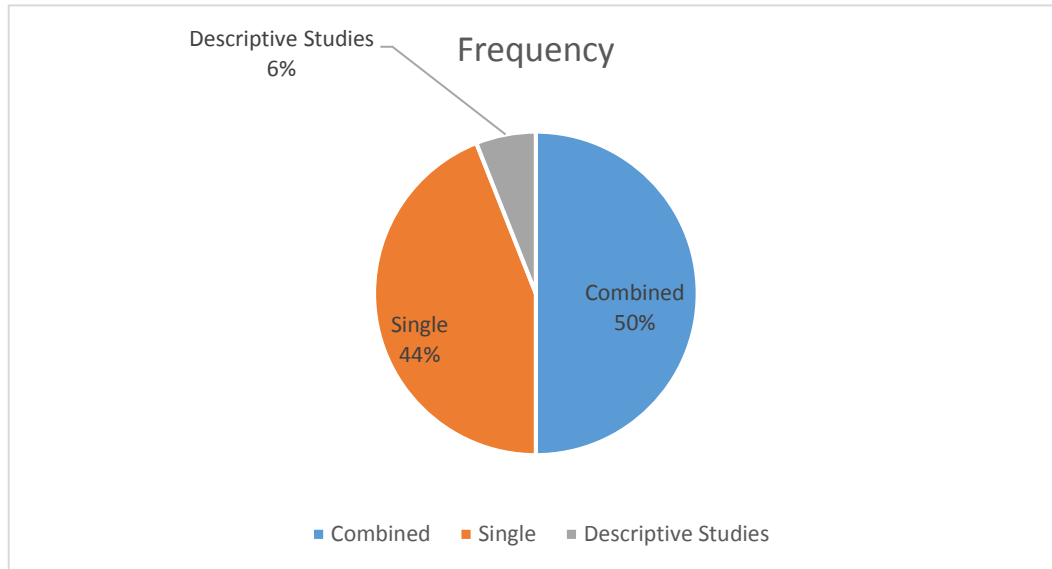


Figure 15 Structure of the Theoretical Backgrounds

In the fifty studies examined within the scope of this study, well known technology acceptance models are used seventy-five times. Figure 16 illustrates the most used base theories in this examinations.

As shown in Figure 16, most used theory on CAATTs adoption is Technology Acceptance Model (TAM). It is followed by UTAUT, Technology Organization Environment Framework (TOE), Diffusion of Innovation (DOI), Theory of Planned Behavior (TPB) and so on. The “Others” part in the graph means Descriptive Studies and some new model offers like I-TOE, Technology Readiness Index (TRI) and UTR-CTOE.

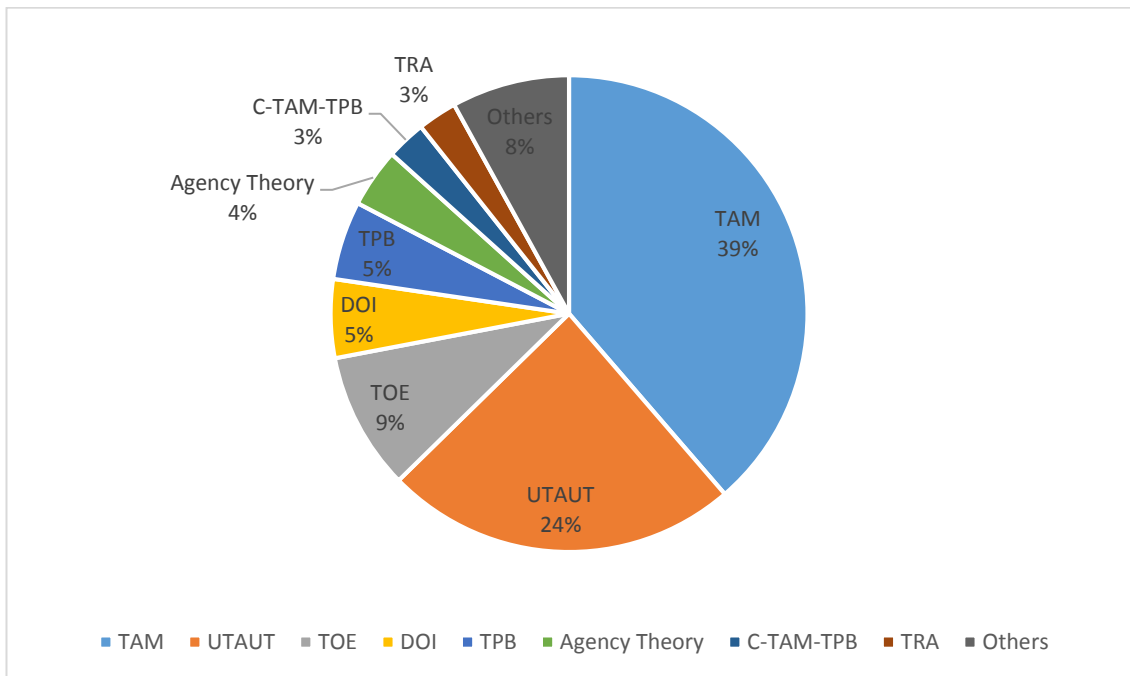


Figure 16 Most Used Theories

2.4.4 Research Method and Analysis Techniques Applied

The literature review on the CAATTs adoption area shows that the most of the papers utilizes the quantitative approach as the research method. In the 39 out of the 50 papers this method is used. Quantitative method is followed by qualitative and mixed methods with 6 and 5 respectively. The results of the research methods used in the studies are shown in Figure 17 below.

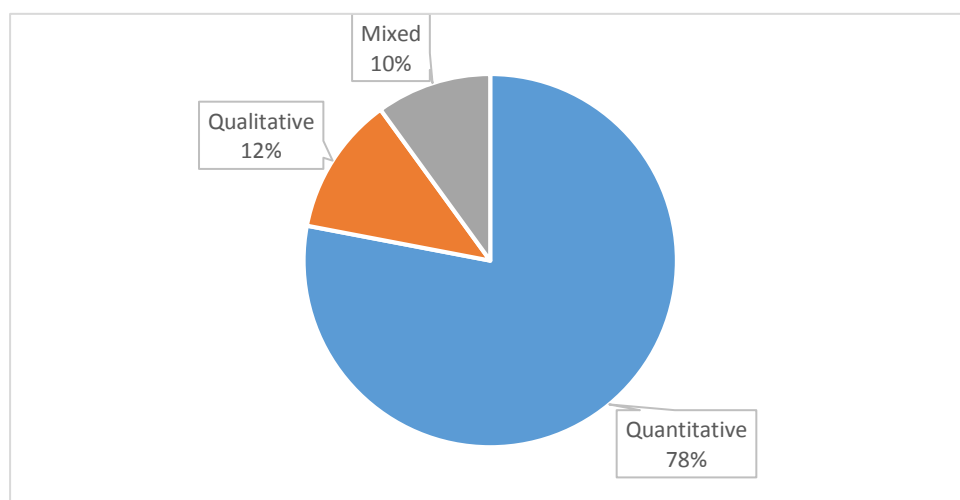


Figure 17 Research Methods Applied

In the studies investigated, after the data collection step a statistical analysis process takes place. In this process, some studies carries out deep analysis methods and some just give basic descriptive results about the examination. In the most of the studies, especially those using quantitative approach, the data is analyzed with Structural Equation Modelling (SEM). Regression Analysis and basic Descriptive Statistics follows this method respectively. There are also “Other” methods which include Data Tabulation, Data Coding for qualitative researches and Factor Analysis, Principle Component Analysis, Path Analysis, Pattern Matching Model and etc. for the qualitative researches. Figure 18 illustrates the data analysis methods.

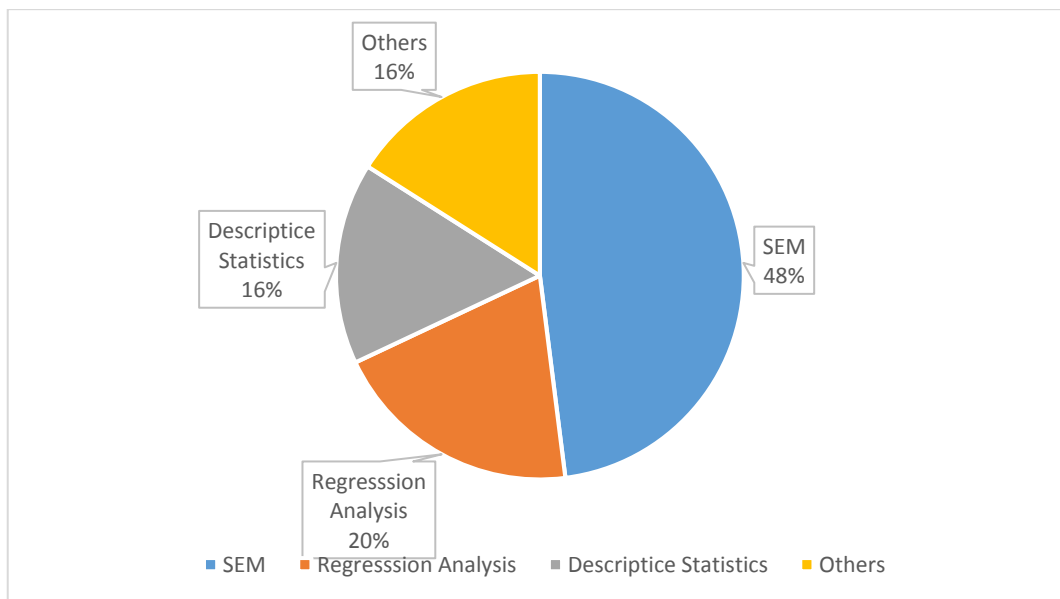


Figure 18 Data Analysis Methods

These data analysis methods are carried out by means of various statistical software. In some studies the used statistical software for analysis are mentioned. 36 out of the 50 studies includes this information, and their distribution is shown in Figure 19. Some studies uses more than one statistical tools in accordance with the aim of the investigation. As it is shown the most used software is the SPSS which is followed by SmartPLS and Nvivo. The “Others” part includes MS Excel, LISREL, VisualPLS and E-views respectively. At this point it should be noted that Nvivo software is used in only analysis of qualitative research methods in the literature.

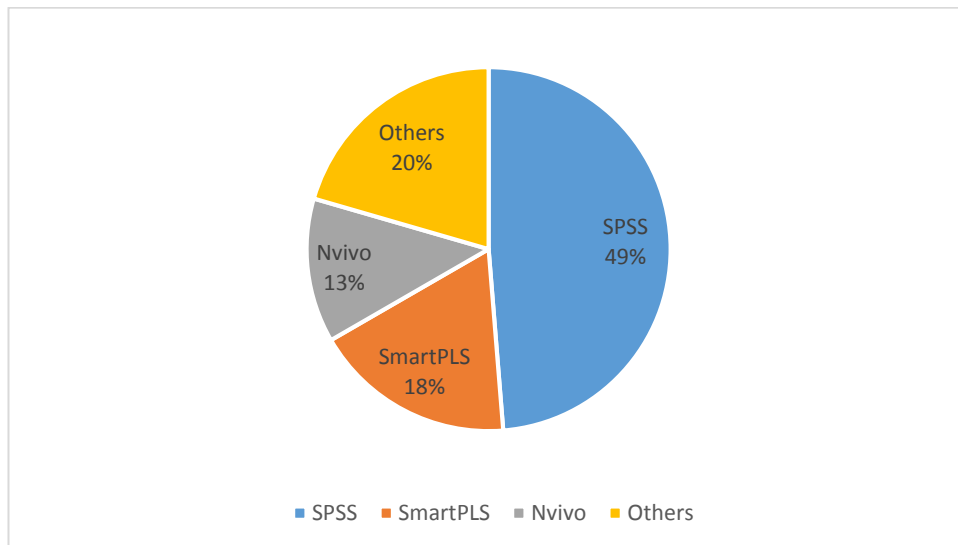


Figure 19 Software Used in Analysis

2.4.5 Properties of Samples

All sample data is available except one study. This means that there is information about sample size for 49 studies included into this study. When the sample size is examined, it is seen that the average sample size is 142 and the median is 112 for the quantitative researches, and they are 12.8 and 8 for qualitative studies respectively. The smallest sample size for the quantitative studies is 34 (Schafer & Eining, 2002) and the maximum sample size is 581 (Ramen, Jugurnath, & Ramhit, 2015). And in terms of qualitative and/or mixed studies, the smallest sample size is 4 (Ghani, Rosli, Ismail, & Saidin, 2017) and the maximum sample size is 38 (Vasarhelyi et al, 2012). All the studies based on CAATTs adoption are tested on auditors who are internal, external or statutory auditors. As a specific research field, this is not surprising since CAATTs are mainly utilized by auditors of any kind.

2.4.6 Explanatory Power of Studies

In the vast majority of studies how much of the variance on adoption of CAATTs is not stated. Only 13 out of the 50 studies give information about this subject. In these studies R-squared values are used to give the explanatory power of the study results. In this respect, the mean of R-squared values of 13 studies is 0.51 (%51) with minimum of 0.14 (Widuri, Handoko, & Prabowo, 2019) and maximum of 0.75 (Razi & Madani, 2013).

2.5. Analysis of the Constructs Used in Literature

In this part of the study, information about construct analysis is provided. In this respect, literature review results of CAATTs adoption studies are used, and then grouping process of the results obtained from literature is mentioned.

2.5.1 Determination of Constructs

In the extent of this study, 50 papers have been analyzed. In these papers there are 109 unique significant constructs which are utilized in their model. These constructs are available in APPENDIX B. All out number of the significant factors utilized in the models equivalent to 207. The constructs found to be more than one time as significant in these studies are presented in Table 2.

Table 2 Most Significant Factors & Frequency

Construct	Frequency
Perceived Usefulness	15
Performance Expectancy	15
Facilitating Conditions	14
Perceived Ease of Use	12
Effort expectancy	10
Social Influence	9
Training	7
Ease of Use	4
Management Support	4
Compatibility	3
Firm Size	3
Result Demonstrability	3
Voluntariness	3
Complexity	2
Computer Self Efficacy	2
Experience	2
Job Relevance	2
Output Quality	2
Peers Group Influence	2
Relative Advantage	2
Self-Efficacy	2
Top Management Support	2

2.5.2 Grouping Constructs

When the studies and related constructs included in in the scope of this study are investigated deeply it is seen that many of the factors are the part of other factors. Moreover, it is realized that many of the constructs have same meaning with constructs widely used in literature but, only with different names. In this respect, the constructs having same meaning are put into same groups in order to simplify the analysis of

results and determine the best constructs which is appropriate for the aim of this study. This stage of the study is carried out based on the meaning of the variables in literature. As a result of this process, 109 out of 207 constructs are grouped under 39 main constructs. The categorization results are given in APPENDIX C. The constructs found to be more than one time as significant as the result of grouping process are presented in Table 3.

Table 3 Grouped Constructs & Frequency

Construct	Frequency
Perceived Usefulness	33
Perceived Ease of Use	27
Facilitating Conditions	17
Management Support	15
Social Influence	14
Experience	11
Training	10
Cost	9
Peer Influence	8
Compatibility	5
Firm Size	5
Result Demonstrability	5
Self-Efficacy	5
Attitude	3
Behavioral Intention	3
Complexity	3
Job Relevance	3
Voluntariness	3
Availability	2
Firm Readiness	2
Output Quality	2
Perceived Behavioral Control	2
Professional Bodies Supports	2
Relative Advantage	2
Technical Infrastructure	2

As it is shown in Table 3 given above, the most frequent constructs found significant are “Perceived Usefulness”, “Perceived Ease of Use”, “Facilitating Conditions”, “Management Support”, “Social Influence” and so on. This result is consistent with the results obtained in section 2.4.2, since the TAM is the most used theory and it is followed by UTAUT in the CAATs adoption field and the most significant constructs like “Perceived Usefulness”, “Perceived Ease of Use”, “Facilitating Conditions”, “Social Influence” come from these theories, especially from TAM.

In this respect, it is meaningful to establish this study's constructs on the base of TAM by adding external variables from UTAUT and the other theories as the literature review results point out. Here, it is crucial to note that Venkatesh & Davis, (1996) states that "attitude" is not influential on the reflection of Perceived Usefulness and Perceived Ease of Use on the behavioral intention. Thus, "Attitude" factor is extracted from the model in the scope of this study. Moreover behavioral intention is the core construct of the TAM and it is determined by other factors, thus it is also excluded from the most significant factors.

2.5.3 Research Methodology

The research process is illustrated in Figure 20 below. In the first phase of the study, literature review is conducted. For this purpose, in the first phase, general information about auditing CAATTs are provided from literature. Afterwards, technology acceptance models in the IS literature are investigated to better understand the field. Then, a systematic review of CAATTs adoption literature review is carried out and related descriptive statistics are given. In the last part of this phase, most significant factors are revealed according to past studies in the field.

In the second phase, a model is proposed to determine the factors affecting the auditor's adoption of CAATTs. Initial model is tested via expert panel analysis using Delphi Method. After the expert panel, main model is constructed and related hypothesis are listed. Then a measurement instrument (questionnaire) is formed with its items from technology acceptance and CAATTs adoption literature. In order to test the reliability of the questionnaire, a pilot study is conducted. Lastly, data analysis method is introduced.

The third phase is data collection. Quantitative method is followed in this part and a questionnaire is distributed to target group. In this manner, questionnaire is given to auditors who work in different types of organizations. At the same time, qualitative data is collected from participants during the completion of the printed questionnaires.

In the fourth phase, the collected data is examined statistically and related hypothesis are tested. Firstly, preliminary analyses like missing value, outlier detection, normality and reliability are carried out and then, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are conducted. Finally structural equation model (SEM) is applied. Analysis results are given, necessary model modifications are done and final model is constructed. In this process SPSS and SmartPLS software are used to arrange data and get analysis.

The last part of the study is discussions and conclusions. In this part, findings of the study are introduced and results are checked with literature review results and qualitative findings obtained from domain experts and participants. Conclusion related to findings is drawn. Then the contributions of the study to literature and audit domain stated. Lastly, limitations of the study are stated with directions for the future studies

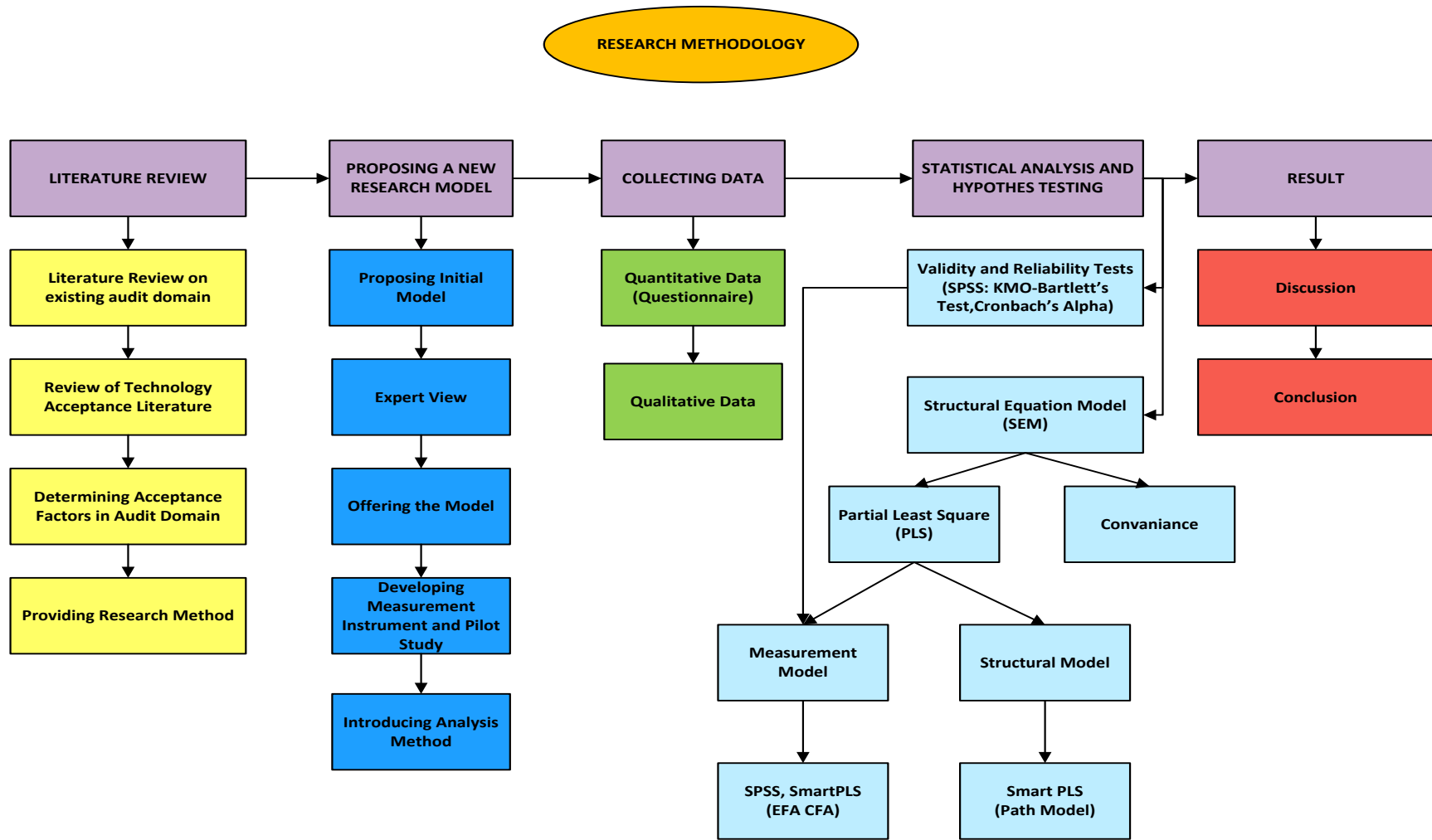


Figure 20 Research Methodology

CHAPTER 3

RESEARCH METHODOLOGY

In this part of the study, research methodology is mentioned to show the progress of the research. In this manner, firstly, an expert panel analysis is carried out to propose a research model on the bases of the results driven from the literature review part. After a model is proposed, its constructs are defined and related hypothesis which are used to test the model are listed. Then, the process of forming the measuring instrument is explained. Lastly, data analysis method used in this study is explained.

3.1. Initial Model Proposition

In the literature review section of this study CAATTs concept is investigated and then technology acceptance theories and their basic futures are introduced. Afterwards, in accordance with this study' purpose the studies related to auditors' adoption of CAATTs are investigated deeply. According to this investigation results, some factors found most significant in these studies are revealed. Considering the findings of Chapter 2 and its subsections a provisional model is proposed. This model is given in in Figure 21 below.

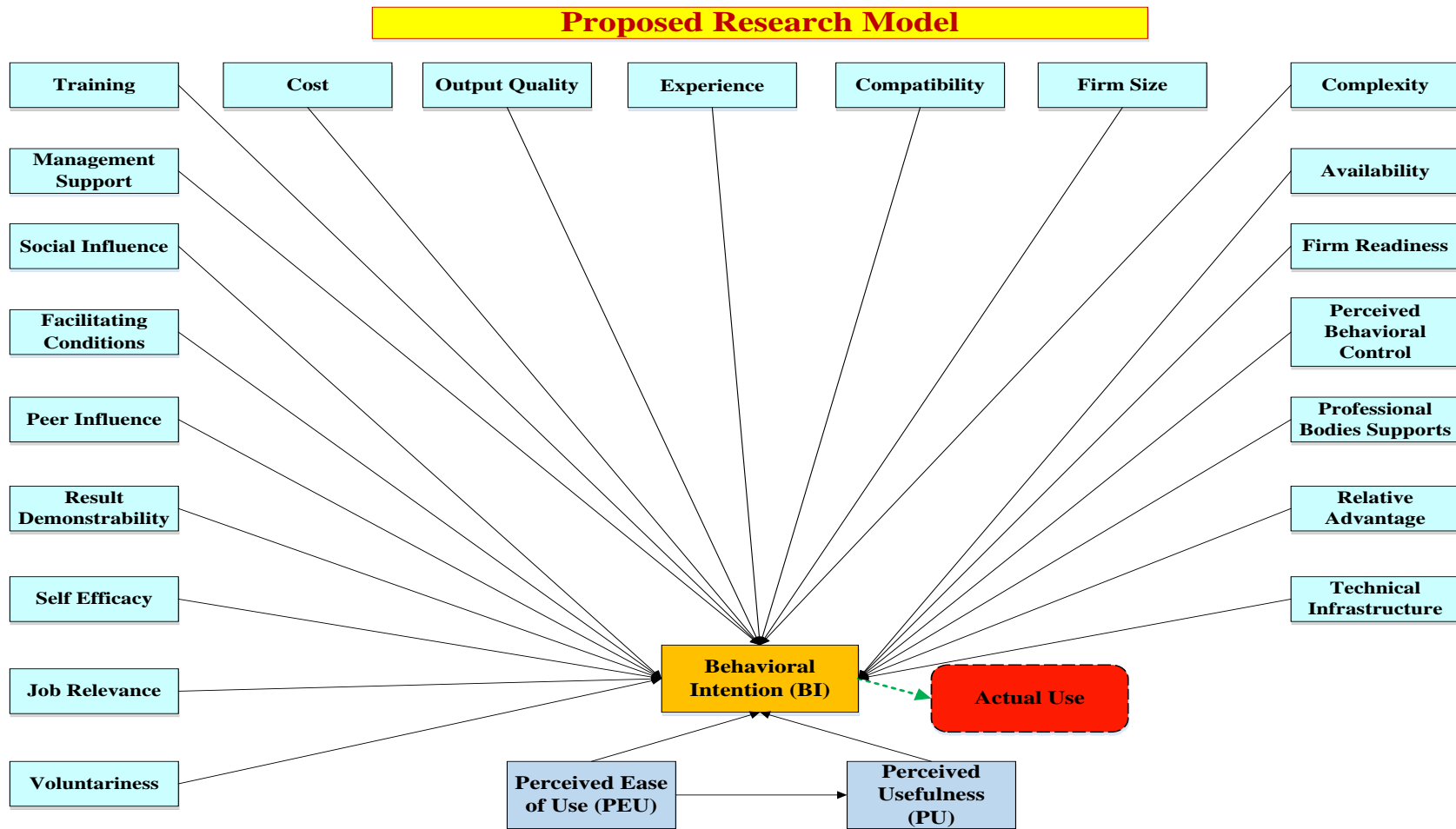


Figure 21 Proposed Model Emerging From Literature

3.2. Expert Panel Analysis

As stated in previous chapter the most used technology adoption model in the CAATTs adoption field is Technology Acceptance Model (TAM). Due to its widely acceptance in this domain, this study investigates factors influencing CAATTs adoption using TAM as corner stone and adding most significant and predictive external factors from literature. According to Venkatesh et al. (2003), at the first step of adoption process for a new technology ease of use plays a significant role. Mainly users do not prefer to struggle with difficulties while using a new system. In the next stage, users get used to the system, and this time, instead of ease of use, they are interested in the usefulness of the system. Thus perceived ease of use and perceived usefulness plays a critical role on technology adoption process of any kind of system or application.

Taking into account the findings obtained in the second part it can be conducted that perceived usefulness and perceived ease of use are the most meaningful factors found significant in CAATTs adoption studies. Together with these two constructs, there are 23 different factors which are found as significant more than 1 times in the studies.

In this study, making an analysis with so many variables does not provide an extra benefit to the study. It even creates difficulty in the analysis phase. In this respect, an expert panel opinion is needed to identify the most critical factors which are appropriate to aim of this study. Since the Technology Acceptance Model is the base of this study and external factors from literature are investigated, the constructs “perceived ease of use” and “perceived usefulness” are not included in the expert panel analysis. That is, 21 constructs are evaluated in this analysis.

The author of this thesis is also an expert in the field with more than ten years’ experience and reached experts in the audit field. This may enhance to make a more comprehensive evaluation and design a predictable model for CAATTs adoption. Expert panel consisted of ten members with minimum 6 years and maximum 22 years’ experience. The average experience of the members is 15.6. Two of those are external and eight of them are internal auditors.

The expert panel analysis is conducted using Delphi Method adopting it to the purpose of this study. Delphi is basically defined as method for evoking and refining group decisions (Dalkey, 1969). In the case of complex issues, costly interventions and unpredictable outcomes, the Delphi approach promotes organized group interaction to obtain consensus of expert opinion. Delphi is a basic method in terms of estimation. In this method, individuals/experts offer their responses to questions. A total of the reactions is then produced and fed back to the respondents, some of the time with the explanations behind the reactions. People are then given the alternative of reexamining their reactions based on the input got or they can rehash their previous reaction. The cycle of iteration and guided feedback continues until a predefined stopping point is achieved. (Grime & Wright, 2016).

Within the method stated above, a three phases of expert analysis is conducted with this group in order to specify the constructs that may have the maximum explanation power on CAATTs adoption by auditors. Firstly, the variables obtained from the literature are briefly defined and then it is asked to participants whether each variable may be significant or not on the acceptance of the CAATTs by the auditors. Answers are collected in the first phase just as agree (A) and not agree (NA). In the first phase, members are not informed about the incidence of the significance constructs in the literature in order to avoid any prejudice. In the second phase, participants are informed about the results of the first phase, and the frequencies of the constructs founded as significant in the literature and they are asked re-evaluate the results in the light of the information given on first phase. The results of the second phase are shared with the participants again and they are asked if they have anything to add. At the third phase, there is no change and all participants are agreed on the results. After the evaluation process, results are organized and some of them are eliminated to shape the framework of the model. Only the variables which are considered as significant by more than 5 participants are listed and used for proposition of the model. Table 4 demonstrates the results of the expert panel analysis comparing with the literature review results. All evaluation results of the expert panel analysis are given in APPENDIX D.

The main reason of carrying out expert analysis with the experienced auditors in the domain at this stage is the uniqueness of the research subject to this country. That is, although the technology acceptance models are applied in many different fields and different countries the main aim of his study is to determine the distinctive factors specific to this country. Considering that people working in this field will answer the research questions it is preferred to determine constructs that may mostly influence CAATTs adoption by auditors with the help of experts working at this field in the country.

Table 4 Results of the Expert Panel Analysis

Construct	Frequency in the Literature	# of Agreed Participants
Social Influence	14	9
Facilitating Conditions	17	8
Peer Influence	8	8
Self-Efficacy	5	8
Management Support	15	7
Training	10	7
Cost	9	7
Result Demonstrability	5	7
Job Relevance	3	6
Voluntariness	3	6

Construct	Frequency in the Literature	# of Agreed Participants
Output Quality	2	6

According to expert panel analysis results, the most significant factors are Facilitating Conditions, Social Influence, Management Support, Training and so on. These results are quietly consistent with the findings observed from literature review. In this manner, the model for the CAATTs adoption is given on Figure 22 below.

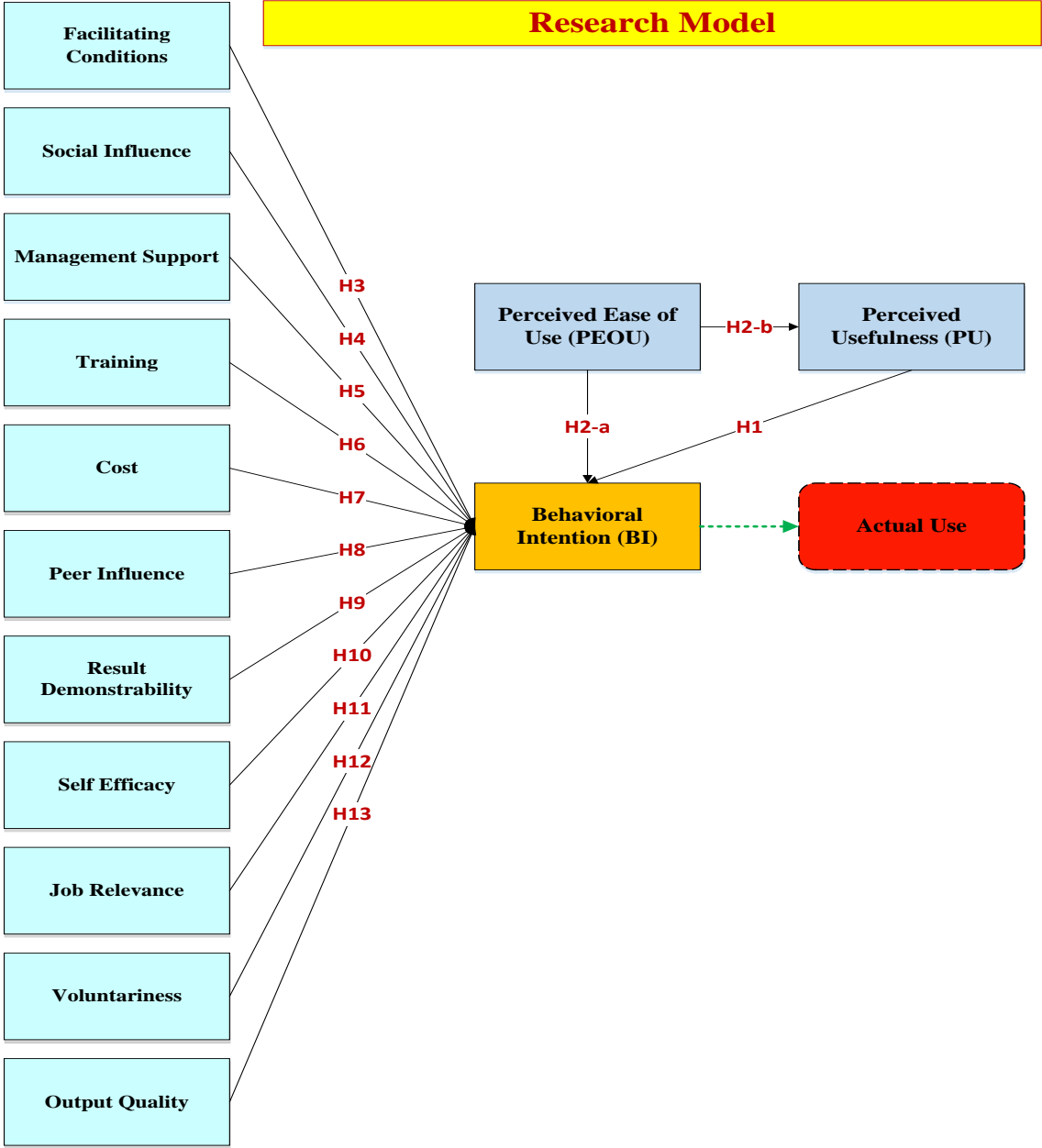


Figure 22 Research Model

Since the model is constructed based on the literature review results and mostly confirmed by expert panel analysis, it can be said that initial model can be investigated for the purposes of this study. Nevertheless, it should be kept in mind that the best results can be obtained after the quantitative analysis and corresponding alterations. Thus, the hypothesis which will be tested statistically are defined in next section of the study.

3.3. Hypothesis Formulation

The main aim of this study is to identify the factors affecting the CAATTs adoption by auditors, since one of the main problems in auditing field is the low level of CAATTs adoption. For this purpose, in previous section a model is proposed to reveal the most substantial factors on the CAATTs adoption of auditors. And in the next part of the study, related hypothesis to test the model are listed.

3.3.1 Perceived Usefulness

Perceived usefulness is one of the core components of the TAM and has an explanatory power for technology adoption process in many different fields. Within the context of the CAATTs adoption perceived usefulness means “the degree to which an auditor believes that using CAATTs would enhance his or her performance” (Davis, 1989). Thus, the hypothesis about the usefulness is formulated as follows:

H1: Perceived usefulness will positively affect the behavioral intention of the CAATTs users.

3.3.2 Perceived Ease of Use

Perceived ease of use is the other core components of the TAM and again has an explanatory power for technology adoption process in many different fields. It has a significant effect on behavioral intention of users (Chismar & Wiley-Patton, 2003). Moreover, according to Venkatesh et al. (2003) on perceived usefulness is directly affected by perceived ease of use, because easy systems reinforces the system’s efficiency and usefulness. Considering the CAATTs adoption field Perceived ease of use can be defined as “the degree to which an auditor believes that using CAATTs would be free of effort” (Davis, 1989). In this manner, two hypothesis about perceived ease of use (H2a and H2b) are defined as follows.

H2a: Perceived ease of use will positively affect the behavioral intention of the CAATTs users.

H2b: Perceived ease of use will positively affect the perceived usefulness of the CAATTs users.

3.3.3 Facilitating Conditions

Taylor and Todd (1995b) recognized the hypothetical cover by displaying facilitating conditions as a center part of perceived behavioral control. However, facilitating conditions is introduced to the literature by Venkatesk et al. (2003) as a direct determinant of intention. This construct comes from UTAUT and includes providing proper resources, technical support and guidance to users about the capabilities of the system used (Dowling, 2009). In this setting facilitating conditions refers to "The degree to which an auditor believes that an organizational and technical infrastructure exists to support use CAATTs"(Venkatesh et al., 2003). Thus, third hypothesis can be defined as follows:

H3: Facilitating conditions will positively affect the behavioral intention of the CAATTs users.

3.3.4 Social Influence

Social influence as an immediate determinant of behavioral intention mentioned as subjective norm, social factors and image in various theories. It means mainly perception of a user that the support and approval of the social environment can affect the adoption decision of a new system (Mansour, 2016). In the CAATTs adoption context Social influence can be defined as "the degree to which an individual perceives that important others believe he or she should use the new tool" (Venkatesh et al, 2003). In this manner, hypothesis about social influence can be formed as follows:

H4: Social influence will positively affect the behavioral intention of the CAATTs users.

3.3.5 Management Support

Top management support has been mostly found to be significant in the process of technology adoption in different institutions (Bradford & Florin, 2003; Mahzan & Lymer, 2009). Considering the CAATTs adoption context top management support alludes to "the level of top management association, heading and support given to CAATTs adoption in the organization" (Rosli, Yeow, & Eu-Gené, 2013). In this respect hypothesis 5 is provided as follows.

H5: Management support will positively affect the behavioral intention of the CAATTs users.

3.3.6 Training

Training is an important factor especially in complex systems since application and maintenance of these types of systems need significant amount of investment Bedard et al, 2003). Moreover, training makes user of the system trust themselves more than those who do not (Wu, Wang, & Lin, 2007). That is, training enhances system acceptance by

affecting users' viewpoints of their task as well as computer self-efficacy. (Bedard et al, 2003). Within the context of this study training is defined as “the amount of training provided to CAATTs users in the company” (Igbaria, Zinatelli, Cragg, & Cavaye, 1997). In this respect hypothesis 6 is defined as follows.

H6: Training will positively affect the behavioral intention of the CAATTs users.

3.3.7 Cost

Financial cost is a significant factor for all kinds of companies in today's world. The cost element is evaluated in different ways by individuals and organizations. When they bear the cost of a system or new technology individuals more care about this subject, whereas employees as a part of an organization cares less. Thus cost may play a great role in users' technology adoption. In the audit field, auditors also bear implementation cost of technology and this affects their performance (Venkatesh, Thong, & Xu, 2012). According to Dias and Marques, (2018) the reason for many auditors for not adopting specific kinds of CAATTs is cost. Also a great number of auditors use audit tools developed inside the organization beside the Microsoft Excel. This shows the cost concern of users on the subject. For this reason in the scope of this study cost is described as “amount of money that spent on implementation and usage of CAATTs by users or organizations” and hypothesis 7 is given as follows.

H7: High costs will negatively affect the behavioral intention of the CAATTs users.

3.3.8 Peer Influence

Peer influence had its root in "Social Influence" of UTAUT model. "Social impact" is an immediate determinant of behavioral intention and generally spoke to as "subjective norm" in other technology adoption models (Pedrosa, Costa, & Laureano, 2015). According to Rosli et al. (2013) peer support increases the acceptance of CAATTs by auditors. 2012 In the context of CAATTs adoption peer influence can be defined as “the level to which other peers or professional group recommendations, quality control and standards influence the decision of using a CAATTs”(Pedrosa et al., 2015). In this respect, hypothesis 6 is defined as follows.

H8: Peer influence will positively affect the behavioral intention of the CAATTs users.

3.3.9 Result Demonstrability

Even efficient systems may fail to gain user adoption if it is difficult for individuals to associate gains in their job performance specifically to using the system. This means that if the covariation between use and positive results is readily visible, individuals can be expected to establish more positive perceptions of the usefulness of a system (Venkatesh & Davis, 2000). That is, users tend to adopt new technologies when their implications

yield straight outcomes (Son, Park, Kim, & Chou, 2012). For the CAATTs adoption framework result demonstrability is defined as "tangibility of the results of using the CAATTs" (Moore & Benbasat, 1991). Thus, hypothesis 9 defined as follows.

H9: Result demonstrability will positively affect the behavioral intention of the CAATTs users.

3.3.10 Self Efficacy

Self-Efficacy or Computer Self Efficacy is the construct related with a person's belief on his/her ability to use information technology (Shihab, Meilatinova, Hidayanto, & Herkules, 2017). People who prone to the use of technology tend to be more confident and more willing to use the technology and previous studies shows the positive impact of self-efficacy on technology acceptance (Relating & Nel, 2011). In the scope of this study, self-efficacy is defined as "The degree to which an auditor believes that he or she has the ability to perform a specific task/job using the CAATTs" (Compeau & Higgins, 1995a, 1995b). As a result, hypothesis 10 is formed as follows.

H10: Self efficacy will positively affect the behavioral intention of the CAATTs users.

3.3.11 Job Relevance

Job relevance is introduced to literature by (Payne & Curtis, 2017) Venkatesh and Davis (2000) and it is used as a construct having positive effect on technology adoption process. Job relevance is a measure of the significance of the set of tasks that the system can support within one's work. In this study job relevance is designed as "The degree to which an auditor believes that the CAATTs is applicable to his or her job" (Venkatesh & Davis, 2000). In this regard, hypothesis about job relevance can be formed as follows.

H11: Job relevance will positively affect the behavioral intention of the CAATTs users.

3.3.12 Voluntariness

Voluntariness has a positive effect on behavioral intention and use. In non-mandatory situations it has greater impact on intention since it reduces the compulsion on users Venkatesh and Bala, (2008) states that voluntariness is a moderating factor for different constructs distinguishing mandatory and voluntary situations. However, this study is carried out in a country in which CAATTs usage is not statutory thus, voluntariness is used as an influential factor of behavioral intention. In this study voluntariness is defined as "the extent to which an auditor perceives the adoption decision to be non-mandatory" (Moore & Benbasat, 1991). Accordingly hypothesis 12 is designed as follows.

H12: Voluntariness will positively affect the behavioral intention of the CAATTs users.

3.3.13 Output Quality

According to Venkatesh & Davis (2000) output quality is factor affecting the adoption of new technologies. People generally interested in what tasks can be carried out using a system when they do their job, but they also take into consideration that how well the system does these duties. The relationship between output quality and adoption of technology has been shown empirically before and it is expected that (Davis et al. 1992) and it is expected that a user prefers the system which provide highest output quality. (Venkatesh & Davis, 2000). In the boundaries of CAATTs adoption literature output quality is defines as “The degree to which an auditor believes that the CAATTs performs his or her job tasks well (Venkatesh & Davis, 2000). Therefore, hypothesis 13 is given as below.

H13: Output quality will positively affect the behavioral intention of the CAATTs users.

3.4. Development of Measurement Instrument

In order to evaluate the effects of the construct revealed from literature in previous section, a questionnaire is designed. This questionnaire consists of three main parts. In the first part, it is aimed to collect demographic data about participants (auditors), like age, experience, level of education etc. The second part is designed to understand what types of CAATTs they use and for what purpose. The third part includes five-point Likert scales, ranging from “completely disagree” (1) to “completely agree” (5). This part includes questions which aim to measure the behavioral intention of participants on the use of CAATTs in audit task. Items in the third part of the questionnaire are gathered from technology acceptance and CAATTs adoption literature in accordance with the purpose of this study. The questionnaire is prepared in both Turkish and English in order to collect more data. In this process, the questions gathered and adopted from literature are translated to Turkish. In order to check the accuracy of the translation and to prevent misunderstandings the translation reviewed by an English teacher and then it is translated again to English by another English teacher. Moreover, translation results are rechecked by a group of English teachers and an IS expert. The resulting questionnaire items (in English) are given in Table 5 below with their references from literature. A voluntary participation form is provided to all participants before the questions. Then they are briefly informed about CAATTs types since the term includes many different types of software and techniques used, in audit and it is crucial to make the concept understandable to gather fair data in this study.

Table 5 Items of the Constructs and Literature

ITEM	QUESTION	LITERATURE
Perceived Usefulness		
PU1	“Using CAATTs in my audits would enable me to accomplish tasks more quickly.”	(Payne & Curtis,2017); (Bedard et al, 2003); (Davis, 1989); (Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
PU2	“Using CAATTs would improve my job performance.”	
PU3	“Using CAATTs in my job would increase my productivity.”	
PU4	“Using CAATTs would enhance my effectiveness on the job.”	
PU5	“Using CAATTs would make it easier to do my job.”	
PU6	“I would find CAATTs useful in my job.”	
Perceived Ease of Use		
PEOU1	“Learning to operate CAATTs would be easy for me.”	(Payne & Curtis,2017); (Bedard et al, 2003); (Davis, 1989); (Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
PEOU2	“I would find it easy to get CAATTs to do what I want it to do.”	
PEOU3	“My interaction with CAATTs would be clear and understandable.”	
PEOU4	“I would find CAATTs to be flexible to interact with.”	
PEOU5	“It would be easy for me to become skillful at using CAATTs.”	
PEOU6	“Overall, I would find CAATTs easy to use.”	
Facilitating Conditions		
FC1	“I have the resources necessary to use the CAATTs”	(Curtis & Payne, 2014); (Venkatesh et al, 2003); (Janvrin et al, 2008); (Mansour, 2016); (Gonzalez et al, 2012); (Bierstaker et al, 2014); (Zainol et al, 2017)
FC2	“I have the knowledge necessary to use the CAATTs”	
FC3	“The CAATTs is not compatible with other systems I use.”	
FC4	“A specific person (or group) is available for assistance with system difficulties.”	(Curtis & Payne, 2014)
FC5	“Specialized instruction concerning the system was available to me.”	
FC6	“I think that using the CAATTs fits well with the way I like to work.”	(Curtis & Payne, 2014)

ITEM	QUESTION	LITERATURE	
Social Influence			
SI1	“People who influence my behavior think that I should use the CAATTs.”	(Curtis & Payne, 2014); (Venkatesh et al, 2003); (Janvrin et al, 2008); (Zainol et al, 2017); (Mansour, 2016); (Pedrosa & Costa 2014); (Gonzalez et al, 2012); (Bierstaker et al, 2014)	
SI2	“People who are important to me think that I should use the CAATTs.”		
SI3	“The senior management of this business has been helpful in the use of the CAATTs.”		
SI4	“In general, the organization has supported the use of the CAATTs.”		
SI5	“People in my organization who use the CAATTs have more prestige than those who do not.”		
SI6	“If I were to use CAATTs, it would give me higher status in the organization.”		(Mahzan & Lymer 2008; (Kim et al, 2009)
SI7	“If I were to use CAATTs, I would have more prestige in the organization than people who have not yet using it.”		
Management Support			
MS1	“Top management believes the use of CAATTs is a good idea.”	(Veerankutty et al, 2018); (Li et al, 2018); (Gutierrez et al, 2015),	
MS2	“Top management is interested in CAATTs usage during the audit task.”		
MS3	“Top management supports the use of CAATTs in audit task.”		
MS4	“Management is supportive in financing/approving a purchase of an audit software.”	(Li et el, 2018)	
MS5	“Management is financially supportive when CAATTs maintenance is needed.”	(Li et al, 2018)	
MS6	“Top management is willing to take the risks involved in the adoption of CAATTs.”	(Rosli et al, 2013)	
MS7	“Top management provides adequate resources for CAATTs implementation.”	(Rosli et al, 2013); (Gutierrez et al, 2015)	
MS8	“Top management gives strong support for CAATTs usage in firm’s operation.”	(Rosli et al, 2013)	

ITEM	QUESTION	LITERATURE
Training		
TR1	“I have adequate training to use CAATTs.”	(Kim et al, 2009)
TR2	“My skills learned from (CAATTS) are helpful in how to use (CAATTS).”	(Li & Chang (2008)
TR3	“I can apply the skills I learned from (CAATTS) to the use of.”	(Li & Chang (2008)
TR4	“Specialized programs or consultant about training are available to me.”	Wu & Wang & Lin (2007)
TR5	“Specialized instruction and education concerning (CAATTS) is available to me.”	Wu & Wang & Lin (2007)
Cost		
C1	“My willingness to use CAATTs will depend on the perceived personal cost (time or money).”	(Handy et al, 2001)
C2	“I think the equipment required to deploy CAAATs is expensive.”	(Tung et al, 2008)
C3	“I think it costs a lot to learn CAATTs.”	(Tung et al, 2008)
C4	“CAATTs is not expensive taking into account its contributions to the company.”	(Tung et al, 2008)
Peer Influence		
PI1	“The advices about CAATTs for Audit purposes from professional bodies influence positively my CAATTs future acceptance.”	(Pedrosa et al, 2019); (Pedrosa & Costa 2014)
PI2	“My peers (other Auditors) behavior on CAATTs influences positively my CAATTs future acceptance.”	
PI3	“International statements accomplish influence my CAATTs usage.”	(Pedrosa et al, 2015); (Pedrosa & Costa 2014)
PI4	“New Supervision from Regulatory authorities influence my CAATTs usage.”	
PI5	“I would use the CAATTS because of the proportion of coworkers who use that technology.”	(Kim et al, 2009)
PI6	“I think my coworkers advise me to use CAATTs for auditing, which is very impressive.”	(Tavallae et al, 2017)
PI7	“I think my friends’ use of CAATTs for auditing encourages me to use CAATTs more.	
Result Demonstrability		
RD1	“I have no difficulty telling others about the results of using the CAATTs.”	(Venkatesh & Davis 2000);

ITEM	QUESTION	LITERATURE
RD2	“I believe I could communicate to others the consequences of using CAATTs.”	(Venkatesh & Bala, 2008)
RD3	“The results of using the CAATTs are apparent to me.”	(Kim et al, 2009); (Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
RD4	“I would have difficulty explaining why using the CAATTs may or may not be beneficial.”	(Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
Self-Efficacy		
	I could complete the job using a CAATTs . . .	
SE1	“If there was no one around to tell me what to do as I go.”	(Venkatesh et al, 2003); (Venkatesh & Bala 2008)
SE2	“If I could call someone for help if I got stuck.”	(Venkatesh et al, 2003); (Venkatesh & Bala 2008)
SE3	“If I had a lot of time to complete the job for which the software was provided.”	(Venkatesh et al, 2003)
SE4	“If I had just the built-in help facility for assistance.”	(Venkatesh et al, 2003); (Venkatesh & Bala 2008)
SE5	“If someone showed me how to do it first.”	(Venkatesh & Bala 2008)
SE6	“If I had used similar systems before this one to do the same job.”	
Job Relevance		
JR1	“In my job, usage of the CAATTs is important auditing.”	(Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
JR2	“In my job, usage of the CAATTs is relevant for auditing.”	
JR3	“The use of the CAATTs is pertinent to my various job-related tasks.”	
Voluntariness		
V1	“My use of the CAATTs is voluntary.”	(Gonzalez et al, 2012);
V2	“My supervisor does not require me to use the CAATT.”	

ITEM	QUESTION	LITERATURE
V3	“Although it might be helpful, using the CAATT is certainly not compulsory in my job.”	(Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
Output Quality		
OQ1	“The quality of the output I get from CAATTs usage is high.”	(Kim et al, 2009); (Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
OQ2	“I have no problem with the quality of the system’s output.”	(Venkatesh & Davis 2000); (Venkatesh & Bala 2008)
OQ3	“I rate the results from the system to be excellent.”	(Venkatesh & Bala 2008)
Behavioral Intention		
BI1	“Given the opportunity, I think that would use CAATTs.”	(Liébana-Cabanillas et al, 2015); (Mahzan & Lymer,2008); (Zainol, et al, 2017); (Mansour, 2016); (Curtis & Payne, 2014); (Gonzalez et al, 2012); (Bedard et al, 2003)
BI2	“I intend to use CAATTs when the opportunity arises.”	
BI3	“I am open to using CAATTs in the near future.”	
BI4	“I plan to use CAATTs in near future.”	
BI5	“I predict I would use CAATs at a time in future.”	

3.5. Study Setting

After developing measurement instrument, an appropriate questionnaire is prepared. The questionnaire is distributed to auditors working at different institutions from both public and private sector as internal auditor. Both Turkish and English version of the questionnaire are prepared but only Turkish version is used in the study due to the participants’ preferences. An online version of the questionnaire is prepared using Google Forms The online questionnaire link is sent via e-mail and the printed forms are distributed by hand it is also mentioned that the results of the printed forms will be gathered by hand or scanned form in PDF.

The study is carried out in Ankara, Turkey. Participants of the study are totally located in Ankara and İstanbul due to the fact that most of the auditors in the country works at institutions' headquarters which are located in these two cities. And they are the most reachable auditors in the scope of this study. One important reason to use printed questionnaires is to collect qualitative results which can be used in the discussion part of the study to understand the quantitative results better.

3.6. Pilot Study

A prior questionnaire is prepared using items given in Section 3.4 of the study to understand the effects of the constructs derived from literature on the acceptance of CAATTs by auditors. The aim of the pilot study is to check the reliability and understandability of the questions used in the measurement instrument, i.e. the questionnaire. For this reason it is conducted with a small sample and not all the reliability and validity tests are applied at this stage. In the pilot study, responses are gathered via convenience sampling. The online questionnaire is sent to 110 people and 85 valid questionnaires are used to test the reliability of the questionnaire. Thus the response rate for the pilot study is 77%.

Cronbach's Alpha (CA) values are used to test the reliability of the items in the questionnaire. According to (Gliem & Gliem, 2003) Cronbach's Alpha values for each construct should be more than 0.7 in order to sustain further statistical analyzes.

SPSS v22 is used at this part. After conducting necessary analysis, some items are removed in order to increase Cronbach's Alpha values of the main constructs. Table 6 given below shows the eliminated factors. Analysis results of the pilot study are given in APPENDIX E.

Table 6 Eliminated Items in the Pilot Study

Construct	Eliminated Item
Perceived Usefulness	PU1
Cost	C1, C4
Peer Influence	PI5
Results Demonstrability	RD3, RD4
Self-Efficacy	SE1
Job Relevance	JR2
Behavioral Intention	BI4, BI5

After eliminating the items, Cronbach's Alpha values for the main constructs are calculated. As it is seen in Table 7, all of them are above the 0.70 and fulfill the required condition mentioned above.

Table 7 Cronbach's Alpha Values of Pilot Study

Construct	Cronbach's Alpha
Perceived Usefulness	0,969
Perceived Ease of Use	0,921
Facilitating Conditions	0,841
Social Influence	0,887
Management Support	0,961
Training	0,853
Cost	0,856
Peer Influence	0,917
Results Demonstrability	0,942
Self-Efficacy	0,937
Job Relevance	0,849
Voluntariness	0,843
Output Quality	0,849
Behavioral Intention	0,949

The overall Cronbach's alpha value of the pilot study considering all construct is given in Table 8 below. Since the value is quite above the expected threshold, it can be said that the measurement instrument is appropriate to carry out the study.

Table 8 Reliability Statistics for the Pilot Study

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,961	,965	63

Demographics, working environment and the basic CAATTs use profiles of the participants related to pilot study is given in Table 9.

Table 9 Demographic and Working Profiles of Respondents for the Pilot Study

Age of Participants			
		Frequency	Percent
Valid	18-30	8	9,4
	31-40	39	45,9
	41-50	28	32,9

	51-60	10	11,8
	Total	85	100,0
Gender Profile of Participants			
		Frequency	Percent
Valid	Male	62	72,9
	Female	23	27,1
	Total	85	100,0
Education Level of Participants			
		Frequency	Percent
Valid	Bachelor's Degree	56	65,9
	Master's Degree or More	29	34,1
	Total	85	100,0
Size of Department in Which Participants Work (Person)			
		Frequency	Percent
Valid	<5	4	4,7
	5-10	9	10,6
	11-20	30	35,3
	21-50	34	40,0
	>50	8	9,4
	Total	85	100,0
Size of Firm/Organization in Which Participants Work (Person)			
		Frequency	Percent
Valid	11-49	3	3,5
	50-99	25	29,4
	500-999	1	1,2
	>1000	56	65,9
	Total	85	100,0
Experience in Auditing			
		Frequency	Percent
Valid	0	4	4,7
	0-2	4	4,7
	6-10	20	23,5
	11-15	23	27,1
	16-20	8	9,4
	>20	26	30,6
	Total	85	100,0

CAATTs Use			
		Frequency	Percent
Valid	Yes	83	97,6
	No	2	2,4
	Total	85	100,0
CAATTs Use Experience			
		Frequency	Percent
Valid	<1 Year	7	8,2
	1-2 Years	6	7,1
	3-5 Years	17	20,0
	5-10 Years	22	25,9
	>10 Years	33	38,8
	Total	85	100,0

3.7. Data Analysis Method

In this study structural equation modelling/partial least squares (SEM-PLS) is utilized as the statistical analysis method with the help of SPSS and SmartPLS software. The structural equation modelling technique is widely used in behavioral science, management information systems, and business research disciplines (Pedrosa & Costa, 2014). According to the literature review results provided in section 2.2.4 (Figure 18) it is the one of the most used method in CAATTs adoption studies. This is the first reason for selection of this method.

It is a second generation data analysis technique allowing to make analysis on complex models (Veerankutty, Ramayah, & Ali, 2018). However, in order to apply this model properly it is significant to choose the right type of SEM which is appropriate to the study purpose and the data available. There are two analysis types namely covariance and partial least squares, thus there are two types of SEM which are CB-SEM (Covariance Based – SEM) and PLS-SEM. Covariance Based SEM is appropriate for testing theories and making confirmations. On the other hand, in the PLS-SEM significances among the constructs of the model and variances are calculated. That is, it is more suitable for predicting key factors. (Hair et al., 2011). Since the main purpose of the study is to predict the key factors affecting the auditors' CAATTs adoption, PLS-SEM is more suitable for analysis. This is another reason for selection of this method.

One another reason for using PLS-SEM in this study is related to the sample characteristics like sample size and distribution of data. PLS is most suitable when the sample size is small and it is difficult to make assumptions on normality and interval scaled data (Birkinshaw, Morrison, & Hulland, 1995). The main powers of PLS covers stability of small to medium sample sizes and less data limitations like normality compared to covariance-based techniques (Wakefield, Leidner, & Garrison, 2008).

Thompson et al (1995) states that PLS is more appropriate for tiny amounts of data as it does not need normal distribution while covariance SEM require at least 150 data sets for analysis. On the other hand (Fabrigar, Wegener, MacCallum and Strahan, (1999) state that a sample of 200 is adequate to carry out the reliable Explanatory Factor Analysis (EFA). Considering the sample size of this study which is in these ranges, PLS-SEM is more suitable for the purpose of this study.

Moreover, PLS-SEM is a reliable multivariate analysis method and suitable for the analysis of latent components in structural equations. In a convenient study, assessment of models are tested on measurement model which includes validity and reliability analysis and structural model which tests the hypothesized relations (Veerankutty et al., 2018). At this point, PLS-SEM allows the researcher to make measurement and structural analysis simultaneously and unlike the covariance based method it is based on the ordinary least square estimation (Gonzalez, Sharma, & Galletta, 2012). These provide advantages to the researchers and shows the usefulness of the selected method in this study.

PLS-SEM models the all relationships at the same time and decreases the multicollinearity problem (Inkpen & Birkenshaw, 1994). In this process residual variance of latent variables are minimized (Pedrosa, Costa, & Aparicio, 2019). The path coefficients got from a PLS investigation are standardized regression coefficients, while the loadings of things on individual builds are factor loadings. Factor scores made utilizing these loadings are identical to weighted composite lists. In this way, PLS results can be easily understandable by considering them in the setting of regression and factor analysis (Birkinshaw et al., 1995) R2 values are also can be calculated to evaluate the variance of the internal variables (Compeau & Higgins, 1995b). These are the other reasons for selecting PLS-SEM model in this study.

PLS-SEM model includes two data analysis part as mentioned before. First part is the measurement model and the second part is the structural model. In the first part, reliability and validity of the model is measured. Then, if the measurement model is satisfactory, analysis is carried out via structural model to test the hypothesis and interpret the coefficients related to model constructs.

CHAPTER 4

DATA ANALYSIS AND RESULTS

In this section of the study, statistical data analysis and related results for the main study are given. As mentioned in previous section, Structural Equation Model with Partial Least Square method is used in the statistical analysis part of this study.

In order to conduct statistical analysis Microsoft Excel, IBM SPSS 22, SmartPLS and Microsoft Office Visio 2010 software are utilized. Excel is used to arrange data for other software. Measurement model and structural model analysis which include factor and path analysis are carried out via SPSS and Smart PLS. Visio is used to visualize the initial and final models. These software are preferred because they are user friendly and easy to use. They are also the most used software used in studies related to this field.

4.1. Data Analyses

Final version of the questionnaire used in the scope of this study is shaped after the pilot study. Then it is distributed to 355 auditors again as discussed in the sections 3.4 and 3.5. Answers are collected using sampling methods of convenience and snowball in a three months period. Data collection period takes a long time due to participants' resistance to fill out an online survey and difficulties of collecting paper based questionnaires from different locations. The final version of the questionnaire's English version is presented in APPENDIX F and its Turkish version in APPENDIX G. At the end of the process 221 answers are gathered from participants to in the statistical analysis of this research. The response rate for the main study is 62.2%.

In this section, the statistical analysis results for the main study are given. Firstly, preliminary analyses are introduced, then exploratory and confirmatory factor analysis results presented. Lastly, Hypothesis testing results for the final model are presented with model modification results.

4.2. Preliminary Analysis

This part of the study includes the preliminary analysis for main study data. Firstly descriptive statistics for data is given. Then the data is checked for missing values, outliers, normality and reliability to ensure the suitability for further analysis.

4.2.1 Missing Value Analysis

Among the 221 answers gathered from participants, there are some missing values. The missing values may be due to length of the survey, carelessness or unwillingness to answer questions by participants. Whatever the reason, this is an undesirable situation. According to Field (2013) there are some methods to handle this problem. Two most used techniques are listwise deletion in which the missing score is removed from the analysis and replacing the missing value with factor mean of the related variable. The answers having more than three missing values are deleted listwise. There are five answers having more than three missing so they are removed from analysis. Removed responds only come from the printed-form of the questionnaires There is no missing value for the online questionnaire since it is designed so that an item(s) which must be completed cannot be skipped and all the questions are prepared as must item After this elimination process, there are 216 questionnaires left to use in the study.

4.2.2 Outlier Checking

Outlier is defined as extreme values much below or above the values of the other variables or unusual combination of more than one variable which disturbs the statistical results (Pallant, 2013; Tabachnick, Fidell, & Ullman, 2007). Whatever the reason is this is an undesired situation and should be handled before continue to further statistical analyses. According to Walfish (2006) there are some methods to identify the outliers like box plot and trimmed mean. In box plots method, distribution of data is illustrated graphically. On the other hand, in trimmed mean method mean values are calculated ignoring the greatest and lowest values at two sides of the data. In this study, trimmed mean method is used to check possible outliers. In this manner, means and %5 trimmed means for all items are calculated and compared. Calculation results are presented in APPENDIX H. When the mean and %5 trimmed mean values for this study are investigated, it is seen that there is not extreme differences between these two scores. Thus, possible outliers in this data set is disregarded.

4.2.3 Data Distribution: Normality

In the statistical analysis normality implies a bell-shaped curve in which the highest observed scores accumulate in middle and lowest scores at the edges with decreasing frequencies (Gravetter & Wallnau, 2016; Huck, 2012). According to Tabachnick et al. (2007) Kolmogorov-Smirnov and Shapiro-Wilk tests and skewness and kurtosis values can be used to test the normality of data. Non-significant results ($p>0.05$) for Kolmogorov-Smirnov and Shapiro-Wilk tests indicated the data is possibly distributed normally and significant results ($p<0.05$) can be interpreted as the data might not be normal (Field, 2013). In terms of the skewness and kurtosis, values between $[-3, +3]$ implies a normal distribution. On the other hand West, Finch, Curran, (1995) states that a kurtosis value up to 7 is acceptable. In this study, Kolmogorov-Smirnov test statistics is 0.00 for all items indicating a non-normal distribution. Thus, skewness and kurtosis values are calculated and presented in APPENDIX I. According to these results, almost all items have desired

values except a few items (PU5 and BI3). This may disturb the normality assumption. However, as mentioned before this study uses PLS-SEM method and it is appropriate for non-normal data analyses. Thus, no action is needed to handle the normality issue.

4.2.4 Sample Characteristics

As stated before, totally 221 answers are gathered from participants and 216 of them are suitable (with 62.2% response rate) for the statistical analysis of this study. Demographics, working environment and the basic CAATTs use profiles of the participants related to main study are given in Table 10 below.

Table 10 Demographic and Working Profiles of Respondents for the Main Study

Age of Participants			
		Frequency	Percent
Valid	18-30	22	10,2
	31-40	96	44,4
	41-50	72	33,3
	51-60	26	12,0
	Total	216	100,0
Gender Profile of Participants			
		Frequency	Percent
Valid	Male	160	74,1
	Female	56	25,9
	Total	216	100,0
Education Level of Participants			
		Frequency	Percent
Valid	Bachelor's Degree	136	63,0
	Master's Degree or More	80	37,0
	Total	216	100,0
Size of Department in Which Participants Work (Person)			
		Frequency	Percent
Valid	<5	10	4,6
	5-10	24	11,1
	11-20	74	34,3
	21-50	90	41,7
	>50	18	8,3

	Total	216	100,0
Size of Firm/Organization in Which Participants Work (Person)			
		Frequency	Percent
Valid	11-49	6	2,8
	50-99	60	27,8
	500-999	4	1,9
	>1000	146	67,6
	Total	216	100,0
Experience in Auditing			
		Frequency	Percent
Valid	0	10	4,6
	0-2	10	4,6
	6-10	56	25,9
	11-15	56	25,9
	16-20	16	7,4
	>20	68	31,5
	Total	216	100,0
CAATTs Use			
		Frequency	Percent
Valid	Yes	212	98,1
	No	4	1,9
	Total	216	100,0
CAATTs Use Experience			
		Frequency	Percent
Valid	<1 Year	16	7,4
	1-2 Years	16	7,4
	3-5 Years	48	22,2
	5-10 Years	54	25,0
	>10 Years	82	38,0
	Total	216	100,0

When the CAATTs use habits of the respondents are investigated, it is seen that great proportion of the auditors still use basic tools like utility programs, electronic spread sheets and working papers as shown in Table 11 below.

Table 11 CAATTs Types Used

CAATTs Type	Responses		Percent of Cases
	N	Percent	
Utility Programs	198	91,7%	91,7%
Electronic Working Papers	122	56,5%	56,5%
Electronic Spreadsheet	142	65,7%	65,7%
Purpose-Written Audit Programs	60	27,8%	27,8%
Test Data	70	32,4%	32,4%
Integrated Test Facility	16	7,4%	7,4%
Parallel Simulation	14	6,5%	6,5%
Embedded Audit Module	12	5,6%	5,6%
Generalized Audit Software	28	13,0%	13,0%

Table 12 below shows the tasks executed by auditors using CAATTs. According to results, it can be said that there is a high intention to use CAATTs to perform many different tasks. However, it can also be said that findings are parallel to the CAATTs use types. Since most of the auditors uses basic tools, the tasks executed using CAATTs are also basic routines of auditors like speeding up business, reducing work load and costs and creating working papers.

Table 12 CAATTs Use Purposes

CAATTs Purpose	Responses		Percent of Cases
	N	Percent	
To assess the risks of fraud	54	3,3%	25,0%
To identify journal entries and other modifications to be checked	138	8,4%	63,9%
To check exactness of electronic documents	124	7,5%	57,4%
To re-perform operations (i.e., aging of accounts receivable, rediscount etc.)	70	4,2%	32,4%
To choose test sample from key electronic records	80	4,8%	37,0%

To classify/sort transactions with explicit qualities	118	7,1%	54,6%
To test a whole population/data rather than a sample selection	56	3,4%	25,9%
To get proof about control adequacy	84	5,1%	38,9%
To assess stock presence and completeness	98	5,9%	45,4%
To create working papers	140	8,5%	64,8%
To recognize surprising and unforeseen relationship or exchanges	90	5,4%	41,7%
To identify top or base records in a database	64	3,9%	29,6%
To match information crosswise over documents	104	6,3%	48,1%
To utilize huge data to electronically test a repeated operations or different procedures	62	3,8%	28,7%
To execute analytical substantive operations and methods	72	4,4%	33,3%
To speed up business	160	9,7%	74,1%
To reduce workload and cost	118	7,1%	54,6%
To get competitive advantage	20	1,2%	9,3%

4.2.5 Reliability

In order to test the internal consistency of the measurement item a reliability analysis is carried out. Checking the Cronbach's alpha is one of the most used method in reliability analysis (Huck, 2012). It is a value between [0-1] and scores close to 1 means more reliability. On the other hand, Cronbach's Alpha values for each construct should be more than 0.7 in order to sustain further statistical analyzes (Gliem & Gliem, 2003; Hair et al., 2011). Cronbach's alpha value for all items and summary statistics are is given in Table 13 and Table 14 below respectively, and the whole reliability statistics are provided in APPENDIX J.

Table 13 Reliability Statistics of the Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,960	,964	63

Table 14 Reliability Analysis Case Processing Summary

		N	%
Cases	Valid	216	100,0
	Excluded ^a	0	0,0
	Total	216	100,0
a. Listwise deletion based on all variables in the procedure.			

According to the tables above, CA value is 0,960 which is above the 0.70. According to Gliem and Gliem (2003), a CA value greater than 0.90 is considered as “excellent” value. Thus it can be said that the reliability of the instrument is satisfied. However, there are some items (C2, C3, V1, V2 and V3) which cause a very little increase on the overall CA value, but they are kept in the model to be evaluated later.

4.3. Exploratory Factor Analysis (EFA)

The objective of the EFA is to determine the factor structure or model by deciding the number of factors presented for a dataset. In order to carry out EFA it is preferred to check the sample size firstly. In this respect, it is desired that there are minimum ten cases for each construct used in the measurement instrument (Pallant, 2013). On the other hand a sample of 200 is adequate to carry out a reliable Explanatory Factor Analysis (Fabrigar et al., 1999). Taking together these construct, there are 14 constructs and 216 cases. That means cases ratio (15.4) is over the ten and both conditions are met for this study.

Anti-image correlation matrix (AIC) is also checked in this part of the study. Measuring of Sample Adequacy (MSA) values which are located on the diagonals of the AIC show the strength of the correlations between items. In order to sustain desired correlation, MSA values should exceed the threshold value of 0.50. Table 15 below shows the AIC test results of this study considering the MSA values.

Table 15 AIC-MSA Values

Item	AIC-MSA	Item	AIC-MSA
PU2	,717 ^a	TR1	,665 ^a
PU3	,779 ^a	TR2	,794 ^a
PU4	,716 ^a	TR3	,794 ^a
PU5	,738 ^a	TR4	,559 ^a
PU6	,741 ^a	TR5	,726 ^a
PEOU1	,763 ^a	C2	,256^a
PEOU2	,743 ^a	C3	,348^a

Item	AIC-MSA	Item	AIC-MSA
PEOU3	,810 ^a	PI1	,681 ^a
PEOU4	,740 ^a	PI2	,661 ^a
PEOU5	,582 ^a	PI3	,768 ^a
PEOU6	,859 ^a	PI4	,706 ^a
FC1	,598 ^a	PI6	,668 ^a
FC2	,739 ^a	PI7	,845 ^a
FC3	,684 ^a	RD1	,795 ^a
FC4	,742 ^a	RD2	,793 ^a
FC5	,774 ^a	SE2	,705 ^a
FC6	,843 ^a	SE3	,676 ^a
SI1	,743 ^a	SE4	,649 ^a
SI2	,708 ^a	SE5	,616 ^a
SI3	,618 ^a	SE6	,751 ^a
SI4	,587 ^a	JR1	,740 ^a
SI5	,650 ^a	JR3	,743 ^a
SI6	,615 ^a	V1	,401^a
SI7	,775 ^a	V2	,267^a
MS1	,688 ^a	V3	,360^a
MS2	,717 ^a	OQ1	,716 ^a
MS3	,850 ^a	OQ2	,626 ^a
MS4	,670 ^a	OQ3	,645 ^a
MS5	,649 ^a	BI1	,741 ^a
MS6	,696 ^a	BI2	,829 ^a
MS7	,753 ^a	BI3	,755 ^a
MS8	,779 ^a		

As it is shown in Table 12, except the items C2, C3, V1, V2 and V3, all remaining items meet the necessary condition for MSA value. In this respect these five items are removed from the analysis. Removal of these items resulted in the exclusion of constructs “Cost” and “Voluntariness” from the model, since there is no item in the instrument related to these constructs.

After checking the AIC-MSA values, Kaiser-Meyer-Olkin (KMO) and Bartlett's test is applied in order to test the adequacy of the sampling. KMO value should be more than 0.5 and Bartlett's test statistic should be smaller than 0.05 to continue the statistical analysis. Table 16 illustrates the test results. As it is seen the KMO value (0.757) is higher than 0.5 and Bartlett's test significance value is 0.00 and it is smaller than the threshold of 0.05 for this test. That is, the data is suitable for further analyses.

Table 16 KMO and Bartlett's Test Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Adequacy.	Measure of Sampling	,757
Bartlett's Test of Sphericity	Approx. Chi-Square	5688,753
	df	1653
	Sig.	,000

According to results given above, it can be conducted that the data set is usable for the EFA. SPSS v22 is used in this part of the study with "Maximum Likelihood" estimation and "Varimax with Kaiser Normalization" rotation method. Resulting "Rotated Factor Matrix" is given in Table 17.

Table 17 EFA Results

Rotated Factor Matrix^a

	Factor										
	1	2	3	4	5	6	7	8	9	10	11
MS7	0,951										
MS8	0,926										
MS4	0,913										
MS5	0,900										
MS6	0,836										
MS2	0,784										
MS3	0,743										
MS1	0,738										
PU3		0,868									
PU4		0,857									
PU6		0,842									
PU2		0,834									
PU5		0,813									
PI4			0,799								
PI3			0,737								

PI1	0,675							
PI2	0,660							
PI7	0,610							
PI6	0,526							
OQ2		0,684						
JR3		0,648						
OQ1		0,638						
JR1		0,630						
OQ3		0,581						
PEOU1			0,769					
PEOU5			0,726					
PEOU3			0,678					
PEOU4			0,663					
PEOU6			0,656					
PEOU2			0,640					
SE4				0,901				
SE3				0,833				
SE2				0,781				
SE5				0,759				
SE6				0,685				
TR2					0,788			
TR1					0,732			
TR3					0,646			
FC5						0,649		
FC2						0,558		
FC3						0,525		
FC6						0,512		
FC1						0,505		
FC4						0,485		
SI6							0,909	
SI5							0,803	
SI7							0,704	
SI1							0,573	
SI3							0,558	
SI2							0,555	
SI4							0,503	
BI2								0,771
BI1								0,686
BI3								0,676

	BI	FC	JQ	MS	PEOU	PI	PU	RD	SE	SI	TR
FC1		0,664									
FC2		0,787									
FC3		0,742									
FC4		0,608									
FC5		0,716									
FC6		0,807									
JR1			0,961								
JR3			0,894								
MS1				0,905							
MS2				0,929							
MS3				0,898							
MS4				0,894							
MS5				0,872							
MS6				0,796							
MS7				0,881							
MS8				0,856							
OQ1			0,900								
OQ2			0,880								
OQ3			0,820								
PEOU1					0,860						
PEOU2					0,852						
PEOU3					0,880						
PEOU4					0,834						
PEOU5					0,812						
PEOU6					0,835						
PI1						0,802					
PI2						0,836					
PI3						0,848					
PI4						0,915					
PI6						0,772					
PI7						0,868					
PU2							0,952				
PU3							0,955				
PU4							0,945				
PU5							0,910				
PU6							0,938				
RD1								0,971			

	BI	FC	JQ	MS	PEOU	PI	PU	RD	SE	SI	TR
RD2								0,967			
SE2									0,888		
SE3									0,909		
SE4									0,938		
SE5									0,831		
SE6									0,854		
SI1										0,847	
SI2										0,877	
SI3										0,717	
SI4										0,744	
SI5										0,738	
SI6										0,702	
SI7										0,803	
TR1											0,811
TR2											0,926
TR3											0,919
TR4											0,497
TR5											0,582

After removing two items, factor loadings are calculated again. Final values are given in Table 19. There is no loading value below the threshold.

Table 19 Final Factor Loadings of Items

	BI	FC	JQ	MS	PEOU	PI	PU	RD	SE	SI	TR
BI1	0,948										
BI2	0,963										
BI3	0,955										
FC1		0,694									
FC2		0,821									
FC3		0,716									
FC4		0,628									
FC5		0,718									
FC6		0,839									
JR1			0,834								
JR3			0,764								
MS1				0,920							
MS2				0,923							

	BI	FC	JQ	MS	PEOU	PI	PU	RD	SE	SI	TR
MS3				0,894							
MS4				0,887							
MS5				0,871							
MS6				0,838							
MS7				0,910							
MS8				0,882							
OQ1			0,857								
OQ2			0,881								
OQ3			0,770								
PEOU1					0,857						
PEOU2					0,842						
PEOU3					0,869						
PEOU4					0,827						
PEOU5					0,864						
PEOU6					0,843						
PI1						0,773					
PI2						0,823					
PI3						0,855					
PI4						0,919					
PI6						0,747					
PI7						0,858					
PU2							0,949				
PU3							0,956				
PU4							0,942				
PU5							0,894				
PU6							0,934				
RD1								0,963			
RD2								0,960			
SE2									0,897		
SE3									0,892		
SE4									0,931		
SE5									0,800		
SE6									0,831		
SI1										0,838	
SI2										0,887	
SI3										0,679	
SI4										0,720	

	BI	FC	JQ	MS	PEOU	PI	PU	RD	SE	SI	TR
SI5										0,710	
SI6										0,661	
SI7										0,785	
TR1											0,853
TR2											0,965
TR3											0,960

After checking and making the necessary adjustments, composite reliability is tested. Composite reliability reveals how well the items measure the related construct/factor. Moreover, it can be a better predictor of reliability compared to Cronbach Alpha (Peterson & Kim, 2013). CR values should be above 0.6 and preferably higher than 0.70. Table 20 shows the related CR values and as it is seen all of them are fairly above 0.70.

Table 20 Composite Reliability Values

	Cronbach's Alpha	Composite Reliability
BI	0,952	0,969
FC	0,844	0,867
MS	0,965	0,968
JQ	0,881	0,913
PEOU	0,924	0,940
PI	0,909	0,930
PU	0,964	0,972
RD	0,918	0,961
SE	0,920	0,940
SI	0,884	0,904
TR	0,923	0,948

Lastly, AVE values are checked. AVE value for each construct should be higher than 0.05 to provide convergent validity. As it is seen in Table 21 below, all constructs meet this condition.

Table 21 AVE Values

	Average Variance Extracted (AVE)
BI	0,912
FC	0,526
MS	0,794

	Average Variance Extracted (AVE)
JQ	0,677
PEOU	0,724
PI	0,691
PU	0,875
RD	0,925
SE	0,759
SI	0,575
TR	0,860

Considering Cronbach Alpha (CA), Factor Loadings, Composite Reliability (CR) and Average Variance Extracted (AVE) together, it can be said that the necessities for the convergent validity of the data and the instrument are satisfied.

4.4.2 Discriminant Validity

The discriminant validity is used to show that all constructs in a model are significantly different from each other and it is calculated as taking the square root of AVE values (Gefen & Straub, 2005). Discriminant validity is checked via evaluating the correlation between factors. In order to satisfy the discriminant validity, square root of AVE values should be above all of the correlation coefficients for that construct. Fornell-Larcker Criterion is used to test the discriminant validity via SmartPLS 3.0. The table 22 shows the related statistics. The diagonal of the matrix gives the square root of AVE values. As it is seen all values located on diagonal line is higher than the related correlation values. Thus, the discriminant validity requirement is met.

Table 22 Discriminant Validity Values

	BI	FC	MS	OQ	PEOU	PI	PU	RD	SE	SI	TR
BI	0,955										
FC	0,384	0,725									
MS	0,228	0,490	0,891								
OQ	0,655	0,553	0,327	0,823							
PEOU	0,570	0,601	0,187	0,587	0,851						
PI	0,684	0,587	0,271	0,673	0,644	0,831					
PU	0,631	0,369	0,180	0,605	0,589	0,522	0,935				
RD	0,551	0,585	0,311	0,598	0,641	0,650	0,456	0,962			
SE	0,595	0,353	0,291	0,371	0,440	0,540	0,402	0,483	0,871		
SI	0,312	0,661	0,675	0,511	0,468	0,515	0,288	0,552	0,388	0,758	
TR	0,466	0,685	0,373	0,545	0,592	0,567	0,317	0,621	0,283	0,488	0,927

4.5. Structural Model

Providing the convergent and discriminant validity of the measurement model, PLS algorithm is run to get the path analysis results. The path coefficients and the R2 were identified with the PLS-Algorithm. Figure 23 below shows the PLS algorithm results for the initial model.

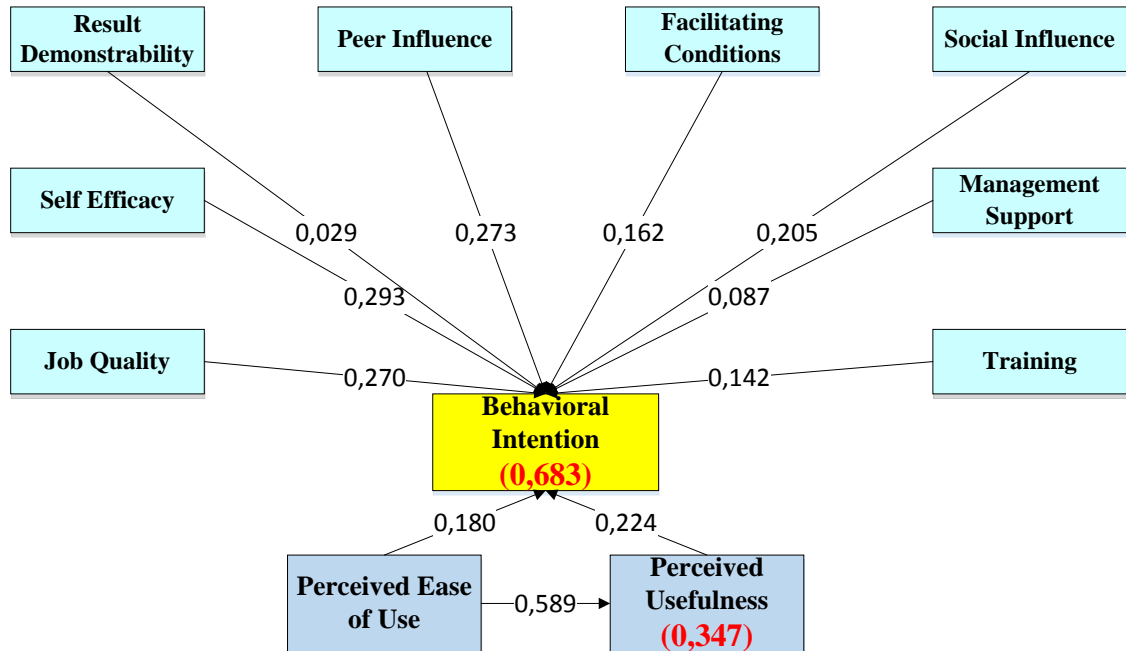


Figure 23 Path Analysis of the Initial Model

As it is seen in the Figure 23 numbers on arrows shows the path coefficients meaning positive or negative relations among the items. R square value for the initial model is 68.3% which implies the total explained variance. And the adjusted R square value is 66.6 %.

Then, the bootstrapping algorithm is run with 5000 subsamples in order to get the t-values showing the significance levels of the relations between latent variables in the initial model and to test the hypothesis by using the path model analysis.

Table 23 Structural Model Analysis Results for the Initial Model

Relation	Path Coefficient	T Statistics	P Values	Hypothesis Test
FC -> BI	0,162	1,873	0,061*	Supported
MS -> BI	0,087	1,260	0,208	Not Supported
JQ -> BI	0,270	3,304	0,001***	Supported
PEOU -> BI	0,180	2,636	0,008***	Supported
PEOU -> PU	0,589	10,145	0,000***	Supported
PI -> BI	0,273	3,570	0,000***	Supported
PU -> BI	0,224	2,756	0,000***	Supported
RD -> BI	0,029	0,435	0,663	Not Supported
SE -> BI	0,293	5,926	0,000***	Supported
SI -> BI	0,205	2,422	0,015**	Supported
TR -> BI	0,142	2,106	0,035**	Supported

*p<0.1; **p<0.05; ***p<0.01

According to the Table 23 given above factors of Perceived Usefulness, Perceived Ease of Use, Peer Influence, Self-Efficacy, Social Influence, Training, Job Quality (Combination of Job Relevance and Output Quality) Facilitating Conditions and have significant effect on behavioral intention of auditors toward the CAATTs use. Also Perceived Ease of Use have a significant effect on Perceived Usefulness. On the other hand, factors of Management Support and Result Demonstrability are insignificant on the use of CAATTs.

4.6. Model Modification

In order to improve the model which is constructed taking the TAM as the base and adding external variables from literature, inter-factors relationships affecting the CAATTs adoption are also investigated. In this manner, the new relationships in accordance with the literature are added to model and tested each time in order to identify the relations among the constructs of the initial model and to improve the model further. In this respects the Table 24 summarizes the added relations to model and their statistical results.

Table 24 Added Relations to the Model

Relation	P Values	State
FC -> PEOU	0,004***	Supported
FC -> PU	0,421	Not Supported
JQ -> PEOU	0,044**	Supported
JQ -> PU	0,000***	Supported
MS -> PEOU	0,049**	Supported

Relation	P Values	State
MS -> PI	0,000***	Supported
MS -> PU	0,350	Not Supported
MS -> SI	0,000***	Supported
PI -> PEOU	0,000***	Supported
PI -> PU	0,058*	Supported
RD -> JQ	0,000***	Supported
RD -> PEOU	0,001***	Supported
RD -> PU	0,000***	Supported
SE -> PEOU	0,033**	Supported
SE -> PU	0,042**	Supported
SI -> PEOU	0,565	Not Supported
SI -> PU	0,044**	Supported
TR -> JQ	0,000***	Supported
TR -> PEOU	0,000***	Supported
TR -> PU	0,109	Not Supported
TR -> RD	0,000***	Supported
TR -> SE	0,000***	Supported

*p<0.1; **p<0.05; ***p<0.01

4.7. Final Model

After adding the relations, final path coefficients are obtained for the final model which is shown in Figure 24 below. The final model introduced in figure includes only significant relations in order not to make visualization more complex.

The final model reflects the factors affecting the adoption of CAATTs and their inter-relationships. When the final model is investigated it is seen that, facilitating conditions directly affects behavioral intention and perceived ease of use. Job quality affects behavioral intention, perceived usefulness and perceived ease of use and affected by result demonstrability and training. Management support has not a direct effect on behavioral intention, but it affects perceived ease of use, peer influence and social influence. Perceived ease of use directly affects behavioral intention and perceived usefulness. Peer Influence directly affects behavioral intention and it has effects on perceived ease of use and perceived usefulness. Perceived usefulness directly affects the behavioral intention. Result demonstrability directly affects the behavioral intention and has effects on job quality, perceived ease of use and perceived usefulness. Self-efficacy directly affect the behavioral intention and has effects on perceived ease of use and perceived usefulness. Social influence has direct effect on behavioral intention and perceived usefulness. And

lastly, training directly affects the behavioral intention and has effects on job quality, perceived ease of use, result demonstrability and self-efficacy.

R square value of the final model is 68.1% and it is almost same with the initial model. However, final model includes more variables and inter variable relations. Thus the final model is more preferable.

When the explanatory power is compared with the literature it is seen R square value of the final model offered in this study is higher than the average R square value obtained from the literature review, which is 51% as it is given in section 2.4.6 of the study.

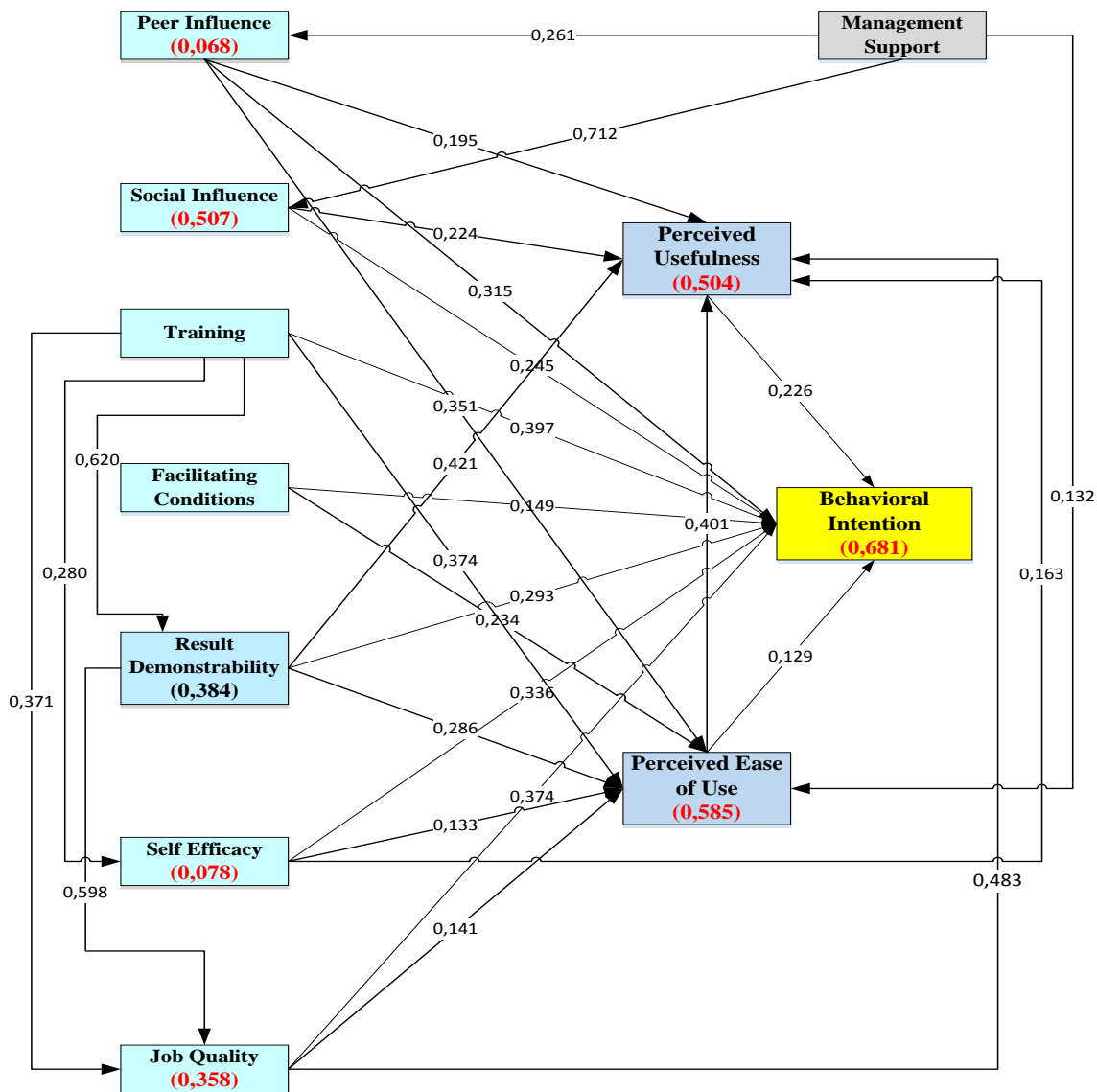


Figure 24 Final Path Model for CAATTs Acceptance

CHAPTER 5

DISCUSSION AND CONCLUSION

In this chapter, findings of the study are introduced and discussed within the scope of the CAATTs adoption literature. Also, as mentioned section 3.5 of this study, qualitative results gathered from participants are used to check the quantitative results. In the remaining part of the study, conclusions, limitations of the study and suggestions for future studies are presented.

5.1. Discussion

In the literature there are some studies searching for the factors which affect the auditors' intention to use Computer Assisted Audit Tools and Techniques (CAATTs); however most of them rely on just one or two technology adoption frameworks. And, the studies conducted in the field includes 4-5 constructs on average to investigate the subject (Samaradiwakara & Gunawardena, 2014). Moreover, most of the studies are conducted to reveal the reasons of specific types of CAATTs use. Since, definition of CAATTs, as used in this study, includes many types of technology in auditing, such a restricted approaches may fail to understand the auditors' behavioral intention to use technology in their jobs. Furthermore, most of the studies are carried on to explore the reason for CAATTs "use", but, CAATTs use is not mandatory in many countries. Thus, searching for behavioral intention may be more meaningful in this field, especially for the country in which this study is conducted. In this manner, this study investigates the factors affecting auditors' behavioral intention to use CAATTs without restricting any type and uses quite a large variable sets compared to the literature.

The main purpose of this study is trying to explain the factors affecting the behavioral intention of the auditors' to use CAATTs and to show the relations between those factors. In the scope of this study, the original TAM is used as the core of the investigation due to its widely usage in the field and without any prejudices, all significant factors gathered from literature are included to first proposed model. Then, in order to get most specific results and adopt the model to Turkish context, an expert panel analysis is conducted and revealed results are constructed the base of the study. In this respect, perceived usefulness, perceived ease of use, Social Influence, Facilitating Conditions, Peer Influence, Self-Efficacy, Management Support, Training, Cost, Result Demonstrability, Job Relevance, Voluntariness and Output Quality are defined as the most influential factors.

After defining the potential factors, the relations of them to behavioral intention are hypothesized and a measurement instrument (questionnaire) is designed to test the relations. Then, a pilot study is conducted to guarantee the reliability of the instrument. Proposed hypotheses are tested via quantitative analysis based on the questionnaire results. After gathering the analysis results, some additional relations are added to model to clarify the connection between factors and to improve the explanatory power of the model during the SEM analysis. Table 25 summarizes results of hypothesis tests and new relations added to model. H7 and H11 cannot be tested, since the all items for the “Cost” and “Voluntariness” constructs are eliminated before the structural model analysis.

Table 25 All Relations in the Final Model

Relation	Hypotheses	State
PU -> BI	H1	Supported
PEOU -> BI	H2-a	Supported
PEOU -> PU	H2-b	Supported
FC -> BI	H3	Supported
SI -> BI	H4	Supported
MS -> BI	H5	Not Supported
TR -> BI	H6	Supported
PI -> BI	H8	Supported
RD -> BI	H9	Supported
SE -> BI	H10	Supported
JQ -> BI	H11 and 13	Supported
FC -> PEOU	New	Supported
FC -> PU	New	Not Supported
JQ -> PEOU	New	Supported
JQ -> PU	New	Supported
MS -> PEOU	New	Supported
MS -> PI	New	Supported
MS -> PU	New	Not Supported
MS -> SI	New	Supported
PI -> PEOU	New	Supported
PI -> PU	New	Supported
RD -> JQ	New	Supported
RD -> PEOU	New	Supported
RD -> PU	New	Supported
SE -> PEOU	New	Supported
SE -> PU	New	Supported
SI -> PEOU	New	Not Supported
SI -> PU	New	Supported

Relation	Hypotheses	State
TR -> JQ	New	Supported
TR -> PEOU	New	Supported
TR -> PU	New	Not Supported
TR -> RD	New	Supported
TR -> SE	New	Supported

According to results of the empirical analysis, perceived ease of use has significant effects on both perceived usefulness and behavioral intention with p value of 0.00 and 0.0043 respectively. And perceived usefulness has also positive and significant effect on behavioral intention with p value of 0.005. These results are consistent with the literature review results (Dharma, Sandhyaduhita, Pinem, & Hidayanto, 2017; Kim, Mannino, & Nieschwietz, 2009; Purwantoro, Purwandari, & Shihab, 2016; Shihab et al., 2017; Widuri, Sari, Wicaksono, Sun, & Sari, 2017). This implies that when the CAATTs are easy to use, it increases the behavioral intention to use them and perception of usefulness of these tools and techniques.

Facilitating conditions is also positive and significant effect on behavioral intention with p value of 0.060. It also has same effect on perceived ease of use with p value of 0.004. Findings are compatible with literature results (Janvrin et al., 2008; Nurmazilah Mahzan & Lymer, 2008; Zainol et al., 2017). This means that more the facilitating conditions provided to auditors they are more likely to use CAATTs and better facilitating conditions increases the auditors' perception on ease of CAATTs use.

According to results, social influence affects the behavioral intention positively with the p value of 0.004 which is also consistent with the literature results (Ebimobowei, Ogbonna, & Enebraye, 2013; Nurmazilah Mahzan & Lymer, 2008; Pedrosa & Costa, 2012). Social influence has also positive influence on perceived usefulness. One of the respondents stated that "...before trying to use a new technology, I mostly consider the ideas of the people around me on that technology, and their opinion affect my perception of usefulness even it is not useful". This statement shows that perceived usefulness is also affected from social environment.

According to the findings of the empirical investigations, management support has no direct influence on behavioral intention. This condition is not consisted with literature review results. (Kim et al., 2009; Purwantoro et al., 2016; Rosli, Yeow, Siew, & Yeow, 2012). On the other hand management support has effects on perceived ease of use, peer influence and social influence. This situation may be reasonable since most of the participants stated that most of their daily activity is just business and managers of them are also their peer and form the great portion of their social life.

Training is another influencing factor in both literature (Braun & Davis, 2003; Pedrosa & Costa, 2012; Rosli et al., 2013).and this research. According to findings training has a positive effect on behavioral intention with p value of 0.000. Moreover it has significant

effect on job quality, perceived ease of use, result demonstrability and self-efficacy. Increased trainings has positive effect on self-efficacy and perceived ease of use (Purwanto et al., 2016; Rosli et al., 2013). Most of the participants state that as the trainings on technology use in their job increases, they are more aware of what they are doing and what they can do with new tools. This means that, training increases the self-efficacy, and make auditors more confident on their job results.

Peer influence is also tested for its effect on behavioral intention to use CAATTs by auditors and found significant with the p value of 0.000 (Pedrosa et al., 2019). Peer influence has also positive effect on perceived usefulness and perceived ease of use. It is not surprising since, most of the participants stated that “if any of my colleague use a technology actively, it means it is useful and it not should be difficult to use, since we are working at same place and doing same job”. The statement clearly shows that peer influence is highly effective on behavioral intention of auditors.

Result demonstrability has also positive and significant effect on behavioral intention to use CAATTs with the p value of 0.000. It is consistent with the literature (Bonsón & Borrero, 2011; Shihab et al., 2017). Moreover it has also positive effect on job quality, perceived ease of use and perceived usefulness. These relations are meaningful when the qualitative results obtained from participants are considered. Some of the participants states that when the results of the using audit tools are tangible to them, they would be more willing to use CAATTs. They also stated that result demonstrability is closely related to job relevance, output quality and perceived usefulness.

When the job quality -combination of job relevance and output quality- is considered, it is seen that it has a positively significant effect on behavioral intention with the p value of 0.000. It also has positive and significant effect on perceived usefulness and perceived ease of use. One of the respondents states that “if one tool is relevant to my work and useful, I think that I will get good results using that tool in the auditing, and I would be less worried about the audit report I presented to my manager”. This means that if the technology used by auditors are relevant to their job and they are expect qualified results from using that technology they are more willing to use it.

Self-Efficacy is found as significant in acceptance of CAATTs by auditors with the p value of 0.000. Results of the quantitative study is compatible with the literature results (Purwanto et al., 2016; Shihab et al., 2017). Self-efficacy is also positive and significant effects on perceived usefulness and perceived ease of use (p values are 0.042 and 0.033 respectively). One of the respondents states that “self-efficacy is the main reason while deciding to use a new technological tool which may be useful in my job”. This means self-efficacy is a direct determinant when an auditor decide whether or not to use a new technology.

5.2. Conclusion

The results of this study reveals that perceived usefulness, perceived ease of use, social influence, facilitating conditions, peer influence, self-efficacy, training, result demonstrability, job quality (job relevance, output quality) are the most influential factors on behavioral intention of CAATTs adoption by auditors But there is no significant relation between management support and behavioral intention of auditors to use CAATTs. In this manner it shows that the Technology Acceptance Model, as the base of this study, is still has a high explanatory power in this field. This may be related to results of the CAATTs use types and purposes given in previous sections. Since the most of the auditors in Turkey still use basic types of CAATTs like utility programs, electronic working papers, electronic spreadsheets and etc. technology acceptance model shows its advantage in basic technology adoption period.

This study also shows that there are many inter relations between main factors of the model as stated in Table 21. This means that, acceptance of technology by auditors is influenced from different constructs and the relations between these constructs affect the final acceptance of CAATTs. Thus, these factors should be carefully investigated before an execution decision of any types of CAATTs.

Moreover, explanatory power of the study is above the literature average. This study has an R square of 68.1% which is quite above those of literature average, 0.50%.

5.3. Contribution of Study

Increasing technology use in all aspects of the life has made it inevitable to stay out this changing environment for auditors. In this manner use of technology plays a vital role in auditing field. However, use of CAATTs, especially advanced types, is still low level. There are some previous studies on CAATTs acceptance. However, literature review provided that vast majority of them are explicit to only one country or utilize older range of studies. In this respect, this paper provides a different approach by offering constructs from a wide range of literature.

Also, there is no study related to CAATTs' adoption in the Turkish context, as there is no exploration accessible on Turkish inspectors' day by day work and the utilization of CAATTs, or on the extension of that utilization and the motivations and limitations expressed by this expert group to utilize or not utilize CAATTs. Although, there are studies in other countries, investigated factors were not tested with the Turkish reality. In this respect, this study contributes to literature by offering a new adoption model.

On the other hand, external variables added to TAM in the scope of this study show that there are many factors affecting the use of CAATTs by auditors. Although the complexity of the CAATTs used by auditors is low, this model primarily aimed to define the factors affecting the behavioral intention of the auditors on the CAATTs use, thus it may be a

good guide for adoption of more complicated CAATTs like embedded modules, test facilities and Generalized Audit Software in the future.

In this way this study also can be a lodestar for decision makers and managers while they invest in auditing technologies.

5.4. Limitations and Future Research

There are some limitations for this study. The first limitation is related to the participants. This study is conducted with 216 participants and all of them are internal auditors. In this manner, this study reflects the internal auditors' opinion on the acceptance of CAATTs. Thus, it may be useful for future to include the external and governmental auditors in the scope of the studies to get better insight about the CAATTs usage intentions of the auditors.

Second limitation is associated with the firm/organization size. Most of the participants come from big firms with more than thousand workers. Thus the effect of the CAATTs adoption cannot be measured in this study. CAATTs adoption and implementation decisions may vary according to firm size and it may be useful to check this subject in future studied.

Third limitation is that, although some constructs (cost and voluntariness) are proposed initially, but they are eliminated until the structural model analysis. Since they are widely used in the related literature, it is advised that future research evaluate these constructs in this field.

Moreover, this study is carried out in a country in which the use of CAATTs is not mandatory as discussed in 2.1.4 part of this study. However, there still might be private sector organizations, not considered within this study, in which CAATTs use is mandated by managers. Thus mandatory and voluntary conditions for CAATTs use might be evaluated in future researches.

Lastly, the relation between CAATTs use types and/or purposes are not investigated due to the time limitations. There are many types of CAATTs which range from basic to advanced tools and techniques and many purposes to use CAATTs. In this respect, it would be beneficial to evaluate factors affecting CAATTs adoption according to these different CAATTs types and purpose of use in the future studies.

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APPENDICES

APPENDIX A

PAPERS USED IN THE STUDY

Title	Citation
“Adopting generalized audit software: an Indonesian perspective”	Widuri et al, 2016
“Adoption of Audit Technology in Audit Firms”	Rosli et al, 2013
“Adoption of Computer Assisted Audit Tools and Techniques (CAATTs) by Internal Auditors: Current issues in the UK”	Mahzan & Lymer, 2008
“Adoption of Information Technology in Public Accounting Firm”	Widuri et al, 2019
“An analysis of attributes that impact adoption of audit software: an empirical study in Saudi Arabia”	Razi & Madani, 2013
“An Evaluation on Factors Effecting Auditors’ Information Technologies in the Accounting Audit”	Uyar et al, 2015
“Analysis of the factors affecting the adoption and use of continuous audit tools and techniques comparison between the public and private sector”	Bonsón & Borrero, 2011
“Antecedents of intention-to-use of e-audit system: a case of the Audit Board of the Republic of Indonesia”	Dharma et al, 2017
“Application of Computer-Assisted Audit Tools and Techniques (CAATTs) in Audit Firms”	Ghani et al, 2017
“Auditor Acceptance of Computer-Assisted Audit Techniques”	Janvrin et al, 2008
“Auditor’s Adoption of Technology: A Study of Domain Experts”	Schafer & Eining, 2002
“Auditors’ Usage of Computer Assisted Audit Tools and Techniques: Empirical Evidence from Nigeria”	Ebimobowei et al, 2013

Title	Citation
“Built-In Functions and Features of Data Analysis Software: Predictors of Optimal Deployment for Continuous Audit Assurance”	Tijani, 2017
“Computer Assisted Audit Tools and Techniques in Real World: CAATT's Applications and Approaches in Context”	Pedrosa & Costa, 2012
“Computer-assisted audit tools and techniques: Analysis and perspectives”	Braun & Davis, 2003
“Determinants adoption of computer-assisted auditing tools (CAATs)”	Pedrosa et al, 2019
“Determinants of CAATT acceptance: Insights from public accounting firms in Indonesia”	Shihab at al, 2017
“Determinants of Computer Assisted Audit Techniques (Caats) Adoption. A Study in Small And Medium Practices in Malaysia”	Zainol et al, 2017
“Determinants Of Internet Adoption in Malaysian Audit Firms”	Kok et al, 2011
“E-Audit System Acceptance in the Public Sector: An Indonesian Perspective”	Purwantoro et al, 2015
“Examining motivations to adopt Computer Assisted Audit Tools and Techniques (CAATTs): Cases of UK Internal Auditors”	Mahzan & Lymer, 2009
“Examining the adoption of computer-assisted audit tools and techniques: Cases of generalized audit software use by internal auditors”	Mahzan & Lymer, 2014
“Examining the determinants of computer-assisted audit techniques acceptance from internal auditors' viewpoints”	Huang et al, 2008
“Exploring The Use of Computer Assisted Audit Techniques And Its Impact to The Transparency and Accountability of Financial Statements”	Widuri & Sari, 2017
“Factors Affecting Adoption of Computer Assisted Audit Techniques and Tools (Caats) Among External Auditors in Jordan”	Mohammad et al, 2017
“Factors Affecting the Adoption of Computer Assisted Audit Techniques in Audit Process: Findings from Jordan”	Mansour, 2016
“Factors Associated with Auditors' Intention to Train on Optional Technology”	Payne & Crtis, 2017
“Factors Influencing Usage Level of Computer Assisted Audit Techniques (Caats) By Internal Auditors in Malaysia”	Shamsuddin et al, 2015

Title	Citation
“Financial Auditing and Surveys: how are financial auditors using information technology? An approach using Expert Interviews”	Pedrosa & Costa, 2012
“Information technology acceptance in the internal audit profession: Impact of technology features and complexity”	Kim et al, 2009
“Information Technology Governance on Audit Technology Performance among Malaysian Public Sector Auditors”	Veerankutty et al, 2018
“IT Adoption by Internal Auditors in Malaysian Public Sector: A Preliminary Finding”	Ahmi, 2016
“Learning new uses of technology while on an audit engagement: Contextualizing general models to advance pragmatic understanding”	Diaz & Loraas, 2010
“Modeling voluntary CAAT utilization decisions in auditing”	Mary & Elizabeth, 2014
“Motivations and limitations on the use of Information Technology on statutory auditors’ work: an exploratory study”	Pedrosa et al, 2015
“Perception of Internal Auditor on the Use of Generalized Audit Software The Study of Indonesian Listed Company”	Widuri et al, 2017
“Statutory auditor’s profile and computer assisted audit tools and techniques’ acceptance: indicators on firms and peers’ influence”	Pedrosa & Costa, 2014
“Technological, Organizational and Environmental Aspects of Audit Technology Acceptance”	Rosli et al, 2016
“The Acceptance and Adoption of Continuous Auditing by Internal Auditors: A Micro Analysis”	Vasarhelyi et al, 2012
“The antecedents of the use of continuous auditing in the internal auditing context”	Gonzalez et al, 2012
“The effect of training on auditors' acceptance of an electronic work system”	Bedard et al, 2003
“The Intention to use E-Audit Technology: An Integration of the Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM)”	Murtagh et al, 2012
“The use of computer-assisted audit tools and techniques by Portuguese internal auditors”	Dias & Marques, 2018
“The use of generalized audit software by Egyptian external auditors The effect of audit software features”	Kim et al, 2016

Title	Citation
“The utilization of generalized audit software (GAS) by external auditors”	Ahmi & Kent, 2012
“Understanding Intention to Use Computer Assisted Audit Tools and Techniques (CAATTs) Using UTAUT Model: Perspectives of Auditors in Kenya National Audit Office (KENAO)”	Mariaka & Oboko, 2010
“Understanding usage and value of audit analytics for internal auditors: An organizational approach”	Li et al, 2017
“Use of information technology on statutory auditors' work: New profiles beyond Spreadsheets' users”	Pesrosa et al, 2015
“UTR-CTOE: A New Paradigm Explaining CAATs Adoption”	Ramen et al, 2015
“What factors influence auditors' use of computer-assisted audit techniques?”	Bierstaker et al, 2014

APPENDIX B

LIST OF MOST SIGNIFICANT CONSTRUCTS

No	Construct	Frequency
1	Perceived Usefulness	15
2	Performance Expectancy	15
3	Facilitating Conditions	14
4	Perceived Ease of Use	12
5	Effort expectancy	10
6	Social Influence	9
7	Training	7
8	Ease of Use	4
9	Management Support	4
10	Compatibility	3
11	Firm Size	3
12	Result Demonstrability	3
13	Voluntariness	3
14	Complexity	2
15	Computer Self Efficacy	2
16	Experience	2
17	Job Relevance	2
18	Output Quality	2
19	Peers Group Influence	2
20	Relative Advantage	2
21	Self Efficacy	2
22	Top Management Support	2
23	Adoption Risk	1
24	Age of Audit Partners	1
25	Attitude	1
26	Audit Profession	1
27	Auditee Influence	1
28	Auditing	1
29	Auditors' Attitudes toward GAS	1
30	Availability of Financial Resources	1
31	Behavioral Intention	1
32	Budget	1
33	Budget Pressure	1

No	Construct	Frequency
34	Capital Budget	1
35	Client	1
36	Client's Size and Industry	1
37	Clients' Nature of Operation	1
38	Clients' Needs and Expectations.	1
39	Company Readiness	1
40	Compatibility with the client's existing IT platform	1
41	Competency of Firm's Employees	1
42	Confidence in Memory	1
43	Cost	1
44	Cost and Resources	1
45	Cost-benefit	1
46	Discomfort feeling on new technologies	1
47	Effect of Externalities	1
48	Effective IT Strategy	1
49	Expertise on DAE Tools	1
50	Extent of Organizational Pressures	1
51	External Influence	1
52	Financial Resources	1
53	Firm Dimension (FD)	1
54	Firm influence	1
55	Firm Policy and Support	1
56	Firm's Readiness	1
57	Fitness to Task	1
58	Formal Learning	1
59	Formal Training	1
60	Gender	1
61	General Attitudes towards the Software	1
62	Innovativeness	1
63	Intentions to Use the Technology (BI)	1
64	IT Skills of Auditor	1
65	IT Usage by External Auditors and auditee	1
66	Learning Costs	1
67	Motivation	1
68	Number of Auditors	1
69	Number of Available Tools	1
70	Number of CIA (Peer Influence)	1
71	On-going Maintenance and Trainings to Audit firms' Employees	1
72	Optimism	1
73	Organizational Support	1
74	Organizational Values	1

No	Construct	Frequency
75	Organizational Resources and Support	1
76	Other Auditors in Organization	1
77	Outcome Expectations	1
78	Partners' Expertise	1
79	Perceived Behavioral Control	1
80	Perceived Benefits	1
81	Perceptions of Control Over its Use	1
82	Perceptions of the Expectation to use the E-Audit Technology	1
83	Perceptions of the Usefulness of the Technology	1
84	Personal Experience	1
85	Personal Knowledge	1
86	Position in the Firm	1
87	Professional Accounting Bodies Supports	1
88	Professional experience (PE)	1
89	Professional Influence	1
90	Quality Technical Support	1
91	Regulator/professional body support.	1
92	Result Demonstration	1
93	Size	1
94	Social Conditions	1
95	Social Factors	1
96	Standards	1
97	Subjective Norm	1
98	Support	1
99	Support from Management	1
100	System Quality	1
101	Task Experience	1
102	Technical Infrastructure	1
103	Technological and IT Availability	1
104	Technological Competence	1
105	Technological Complexity	1
106	Top Management Commitment	1
107	Top Management Influence	1
108	Trial period	1
109	User Friendly	1

APPENDIX C

LIST OF GROUPED CONSTRUCTS

Construct	Meaning
'Age of Audit Partners'	'Age'
'Discomfort feeling on new technologies'	'Anxiety'
'Attitude'	'Attitude'
'Auditors' Attitudes toward GAS'	'Attitude'
'General Attitudes towards the Software'	'Attitude'
'Number of Available Tools '	'Availability'
'Technological and IT Availability'	'Availability'
'Behavioral Intention'	'Behavioral Intention'
'Intentions to Use the Technology (BI)'	'Behavioral Intention'
'Perceptions of the Expectation to use the E-Audit Technology'	'Behavioral Intention'
'Clients' Nature of Operation'	'Compatibility'
'Compatibility'	'Compatibility'
'Compatibility with the client's existing IT platform'	'Compatibility'
'Complexity'	'Complexity'
'Technological Complexity'	'Complexity'
'Availability of Financial Resources'	'Cost'
'Budget'	'Cost'
'Budget Pressure'	'Cost'
'Capital Budget'	'Cost'
'Cost'	'Cost'
'Cost and Resources'	'Cost'
'Cost-benefit'	'Cost'
'Financial Resources '	'Cost'
'Learning Costs'	'Cost'
'Audit Profession'	'Experience'
'Auditing'	'Experience'
'Experience'	'Experience'
'Expertise on DAE Tools'	'Experience'
'IT Skills of Auditor'	'Experience'
'Partners' Expertise'	'Experience'

Construct	Meaning
'Personal Experience'	'Experience'
'Personal Knowledge'	'Experience'
'Professional experience (PE)'	'Experience'
'Task Experience'	'Experience'
'Effective IT Strategy'	'Facilitating Conditions'
'Extent of Organizational Pressures'	'Facilitating Conditions'
'Facilitating Conditions'	'Facilitating Conditions'
'Quality Technical Support'	'Facilitating Conditions'
'Firm Dimension (FD)'	'Firm Dimention'
'Company Readiness'	'Firm Readiness'
'Firm's Readiness'	'Firm Readiness'
'Client's Size and Industry'	'Firm Size'
'Firm Size'	'Firm Size'
'Size'	'Firm Size'
'Gender'	'Gender'
'Innovativeness'	'Innovativeness'
'Fitness to Task'	'Job Relevance'
'Job Relevance'	'Job Relevance'
'Firm influence'	'Management Support'
D	'Management Support'
'Management Support'	'Management Support'
'Organizational Resources and Support'	'Management Support'
'Organizational Support'	'Management Support'
'Organizational Values'	'Management Support'
'Support'	'Management Support'
'Support from Management'	'Management Support'
'Top Management Commitment'	'Management Support'
'Top Management Influence'	'Management Support'
'Top Management Support'	'Management Support'
'Motivation'	'Motivation'
'Number of Auditors'	'Number of Auditors'
'Optimism'	'Optimism'
'Client'	'Others'
'Output Quality'	'Output Quality'
'Auditee Influence'	'Peer Influence'
'Competency of Firm's Employees'	'Peer Influence'
'IT Usage by External Auditors and Auditee'	'Peer Influence'
'Number of CIA (Peer Influence)'	'Peer Influence'
'Other Auditors in Organization'	'Peer Influence'

Construct	Meaning
'Peers Group Influence'	'Peer Influence'
'Professional Influence'	'Peer Influence'
'Perceived Behavioral Control'	'Perceived Behavioral Control'
'Perceptions of Control Over its Use'	'Perceived Behavioral Control'
'Ease of Use'	'Perceived Ease of Use'
'Effort expectancy'	'Perceived Ease of Use'
'Perceived Ease of Use'	'Perceived Ease of Use'
'User Friendly'	'Perceived Ease of Use'
'Outcome Expectations'	'Perceived Usefulness'
'Perceived Benefits'	'Perceived Usefulness'
'Perceived Usefulness'	'Perceived Usefulness'
'Perceptions of the Usefulness of the Technology'	'Perceived Usefulness'
'Performance Expectancy'	'Perceived Usefulness'
'Position in the Firm'	'Position in the Firm'
'Professional Accounting Bodies Supports '	'Professional Bodies Supports '
'Regulator/professional body support.'	'Professional Bodies Supports '
'Relative Advantage'	'Relative Advantage'
'Clients' Needs and Expectations. '	'Result Demonstrability'
'Result Demonstrability'	'Result Demonstrability'
'Result Demonstration'	'Result Demonstrability'
'Adoption Risk'	'Risk'
'Computer Self Efficacy'	'Self Efficacy'
'Confidence in Memory'	'Self Efficacy'
'Self Efficacy'	'Self Efficacy'
'Effect of Externalities'	'Social Influence'
'External Influence'	'Social Influence'
'Social Conditions'	'Social Influence'
'Social Factors'	'Social Influence'
'Social Influence'	'Social Influence'
'Subjective Norm'	'Social Influence'
'Standards'	'Standards'
'System Quality'	'Technical Infrastructure'
'Technical Infrastructure'	'Technical Infrastructure'
'Technological Competence'	'Technological Competence'
'Formal Learning'	'Training'

Construct	Meaning
'Formal Training'	'Training'
'On-going Maintenance and Trainings to Audit firms' Employees'	'Training'
'Training'	'Training'
'Trial period'	'Trialability'
'Voluntariness'	'Voluntariness'

APPENDIX D

EXPERT PANEL ANALYSIS RESULTS (FIRST PHASE)

Construct	Frequency in the Literature	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	# of Agreed Participants
Facilitating Conditions	17	A	NA	A	A	A	A	A	A	A	A	9
Social Influence	14	A	A	A	A	A	NA	A	A	A	A	9
Management Support	15	A	A	NA	A	A	A	NA	A	A	A	8
Training	10	A	A	A	A	A	A	NA	NA	NA	A	7
Cost	9	A	A	NA	NA	A	A	A	NA	A	A	7
Peer Influence	8	A	A	A	A	A	A	NA	NA	NA	A	7
Result Demonstrability	5	A	A	NA	A	A	NA	A	A	NA	A	7
Self Efficacy	5	A	NA	NA	A	A	A	A	NA	A	A	7
Experience	11	A	A	A	NA	A	A	NA	A	NA	A	7
Job Relevance	3	A	A	NA	NA	A	A	A	NA	A	NA	6
Voluntariness	3	NA	NA	NA	A	A	A	A	NA	A	A	6
Output Quality	2	A	NA	A	A	NA	A	A	NA	A	NA	6
Compatibility	5	NA	A	A	NA	A	A	NA	NA	NA	A	5
Firm Size	5	NA	A	A	NA	A	A	NA	NA	NA	NA	4
Complexity	3	NA	A	A	NA	A	NA	NA	NA	NA	A	4

Construct	Frequency in the Literature	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	# of Agreed Participants
Firm Readiness	2	N A	A	A	NA	N A	A	N A	N A	N A	NA	3
Professional Bodies Supports	2	N A	A	N A	NA	A	A	N A	N A	N A	NA	3
Relative Advantage	2	N A	A	A	NA	N A	N A	N A	N A	N A	A	3
Technical Infrastructure	2	A	N A	N A	NA	N A	A	N A	N A	N A	NA	2
Availability	2	N A	A	N A	NA	A	N A	N A	N A	N A	NA	2
Perceived Behavioral Control	2	N A	N A	A	NA	N A	N A	N A	N A	N A	NA	1

EXPERT PANEL ANALYSIS RESULTS (SECOND PHASE)

Construct	Frequency in the Literature	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	# of Agreed Participants
Social Influence	14	A	A	A	A	A	N A	A	A	A	A	9
Facilitating Conditions	17	A	N A	A	N A	A	A	A	A	A	A	8
Peer Influence	8	A	A	A	A	A	A	NA	N A	A	A	8
Self Efficacy	5	A	N A	N A	A	A	A	A	A	A	A	8
Management Support	15	A	A	N A	A	N A	A	NA	A	A	A	7
Training	10	A	A	A	A	A	A	NA	N A	N A	A	7
Cost	9	A	A	N A	N A	A	A	A	N A	A	A	7
Result Demonstrability	5	A	A	N A	A	A	N A	A	A	N A	A	7

Construct	Frequency in the Literature	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	# of Agreed Participants
Job Relevance	3	A	A	N A	N A	A	A	A	N A	A	NA	6
Voluntariness	3	N A	N A	N A	A	A	A	A	N A	A	A	6
Output Quality	2	A	N A	A	A	N A	A	A	N A	A	NA	6
Experience	11	A	N A	A	N A	A	A	NA	A	N A	NA	5
Compatibility	5	N A	A	A	N A	A	A	NA	N A	N A	A	5
Firm Size	5	N A	A	A	A	A	A	NA	N A	N A	NA	5
Complexity	3	N A	A	N A	N A	A	N A	NA	N A	N A	A	3
Firm Readiness	2	N A	A	A	N A	N A	A	NA	N A	N A	NA	3
Professional Bodies Supports	2	N A	A	N A	N A	A	A	NA	N A	N A	NA	3
Relative Advantage	2	N A	A	N A	N A	N A	N A	NA	N A	N A	A	2
Technical Infrastructure	2	A	N A	N A	N A	N A	A	NA	N A	N A	NA	2
Availability	2	N A	A	N A	N A	A	N A	NA	N A	N A	NA	2
Perceived Behavioral Control	2	N A	N A	A	N A	N A	N A	NA	N A	N A	NA	1

APPENDIX E

RELIABILITY ANALYSIS RESULTS OF THE PILOT STUDY

Reliability Statistics - Perceived Usefulness					
Initial Values					
Cronbach's Alpha	0,958				
N of Items	6				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PU1	22,65	11,326	,724	,558	,969
PU2	22,59	11,221	,930	,868	,943
PU3	22,54	11,156	,923	,877	,944
PU4	22,59	11,578	,894	,838	,947
PU5	22,58	11,438	,877	,778	,949
PU6	22,53	11,371	,897	,845	,947
Action	PU1 is eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,969				
N of Items	5				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PU2	18,14	7,242	,924	,855	,960
PU3	18,09	7,134	,935	,877	,958
PU4	18,14	7,456	,912	,837	,962
PU5	18,13	7,400	,874	,772	,968
PU6	18,08	7,291	,913	,845	,962

Reliability Statistics - Perceived Ease of Use					
Initial Values					
Cronbach's Alpha	0,921				
N of Items	6				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PEOU1	20,01	12,393	,794	,654	,904
PEOU2	19,86	12,766	,778	,633	,906
PEOU3	20,06	11,937	,798	,667	,904
PEOU4	20,15	12,941	,739	,597	,911
PEOU5	19,99	12,583	,758	,629	,909
PEOU6	20,28	12,134	,782	,646	,906
Action	No change				

Reliability Statistics - Facilitating Conditions					
Initial Values					
Cronbach's Alpha	0,841				
N of Items	6				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
FC1	17,94	12,770	,576	,457	,823
FC2	17,84	12,568	,715	,566	,797
FC3	17,80	13,305	,627	,426	,815
FC4	18,14	12,575	,598	,444	,819
FC5	18,31	11,405	,702	,551	,797
FC6	17,39	13,193	,516	,290	,834
Action	No change				

Reliability Statistics - Social Influence					
Initial Values					
Cronbach's Alpha	0,887				
N of Items	7				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SI1	20,78	27,747	,678	,808	,872
SI2	20,76	27,158	,725	,830	,867
SI3	21,18	27,266	,618	,574	,878
SI4	21,04	25,868	,695	,518	,868
SI5	21,25	24,712	,716	,835	,866
SI6	21,29	24,948	,659	,824	,875
SI7	21,09	26,872	,714	,658	,867
Action	No change				

Reliability Statistics - Management Support					
Initial Values					
Cronbach's Alpha	0,961				
N of Items	8				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
MS1	22,39	48,740	,816	,831	,957
MS2	22,46	47,466	,842	,850	,956
MS3	22,46	48,442	,799	,817	,958
MS4	22,73	46,866	,894	,840	,952
MS5	22,74	47,480	,871	,840	,954
MS6	22,98	48,118	,792	,755	,959
MS7	22,87	46,685	,902	,919	,952
MS8	22,88	48,057	,875	,886	,954
Action	No change				

Reliability Statistics - Training					
Initial Values					
Cronbach's Alpha	0,853				
N of Items	5				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TR1	13,92	10,648	,701	,623	,813
TR2	13,61	10,717	,730	,748	,806
TR3	13,48	11,086	,704	,650	,813
TR4	14,25	11,331	,565	,589	,850
TR5	14,20	11,186	,635	,614	,830
Action	No change				

Reliability Statistics - Cost					
Initial Values					
Cronbach's Alpha	0,635				
N of Items	4				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
C1	10,00	4,857	,462	,229	,531
C2	10,33	4,319	,580	,585	,434
C3	10,65	4,755	,510	,565	,496
C4	9,68	6,410	,143	,107	,734
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
C1	6,13	3,828	,368	,144	,856
C2	6,46	2,775	,694	,585	,471
C3	6,78	3,080	,640	,561	,549
Action	C4 and C1 are eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,856				
N of Items	2				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
C2	2,91	1,039	,749	,561	-
C3	3,22	1,152	,749	,561	-

Reliability Statistics - Peer Influence					
Initial Values					
Cronbach's Alpha	0,910				
N of Items	7				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PI1	23,75	17,736	,686	,673	,901
PI2	23,80	17,781	,706	,717	,900
PI3	23,91	16,753	,769	,691	,892
PI4	23,78	16,795	,846	,788	,885
PI5	24,07	17,185	,576	,445	,917
PI6	24,00	16,929	,735	,657	,896
PI7	23,92	16,600	,837	,751	,885
Action	PI5 is eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,917				
N of Items	6				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PI1	19,95	12,545	,714	,672	,909
PI2	20,00	12,524	,749	,713	,905
PI3	20,11	11,834	,773	,689	,902
PI4	19,98	11,785	,872	,788	,888
PI6	20,20	12,210	,694	,645	,913
PI7	20,12	11,891	,805	,724	,897

Reliability Statistics - Results Demonstrability					
Initial Values					
Cronbach's Alpha	0,569				
N of Items	4				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RD1	10,78	3,914	,614	,804	,272
RD2	10,68	3,886	,672	,817	,233
RD3	10,62	4,238	,652	,581	,284
RD4	11,86	6,694	-,152	,052	,917
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RD1	7,99	2,845	,866	,800	,855
RD2	7,89	2,929	,889	,817	,833
RD3	7,84	3,520	,756	,576	,942
Action	RD4 and RD3 are eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,942				
N of Items	2				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RD1	3,96	0,892	,891	,793	
RD2	3,87	0,971	,891	,793	

Reliability Statistics - Self-Efficacy					
Initial Values					
Cronbach's Alpha	0,773				
N of Items	6				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SE1	19,93	18,304	-,355	,203	,937
SE2	18,41	10,650	,784	,729	,673
SE3	18,26	10,670	,775	,816	,675
SE4	18,41	10,340	,848	,847	,656
SE5	18,48	9,919	,752	,662	,671
SE6	18,27	10,604	,766	,655	,676
Action	SE1 is eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,937				
N of Items	5				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SE2	15,99	12,178	,825	,728	,924
SE3	15,84	11,925	,870	,800	,916
SE4	15,99	11,750	,908	,847	,909
SE5	16,06	11,461	,779	,659	,936
SE6	15,85	12,179	,798	,655	,929

Reliability Statistics - Job Relevance					
Initial Values					
Cronbach's Alpha	0,833				
N of Items	3				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
JR1	8,11	3,143	,774	,619	,697
JR2	8,27	3,057	,618	,398	,849
JR3	8,16	3,068	,700	,558	,761
Action	JR2 is eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,849				
N of Items	2				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
JR1	4,11	0,953	,741	,549	-
JR3	4,16	0,806	,741	,549	-

Reliability Statistics - Voluntariness					
Initial Values					
Cronbach's Alpha	0,843				
N of Items	3				
	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
V1	6,80	5,495	,677	,482	,812
V2	6,59	5,317	,772	,595	,725
V3	6,92	5,124	,684	,492	,809
Action	No change				

Reliability Statistics - Output Quality					
Initial Values					
Cronbach's Alpha	0,849				
N of Items	3				
	Scale Mean if Deleted	Scale Variance if Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OQ1	7,78	1,866	,741	,558	,768
OQ2	7,84	1,925	,745	,562	,763
OQ3	7,92	2,172	,672	,452	,832
Action	No change				

Reliability Statistics - Behavioral Intention					
Initial Values					
Cronbach's Alpha	0,922				
N of Items	5				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
BI1	17,02	9,261	,825	,791	,901
BI2	17,04	8,868	,864	,860	,892
BI3	17,05	9,212	,841	,806	,898
BI4	17,51	8,705	,691	,626	,933
BI5	17,22	8,890	,816	,745	,901
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
BI1	12,79	5,240	,854	,782	,849
BI2	12,80	5,043	,859	,826	,844
BI3	12,81	5,250	,854	,805	,849
BI4	13,27	5,128	,611	,376	,949
Action	BI4 and BI5 are eliminated to increase Cronbach's Alpha				
Final Values					
Cronbach's Alpha	0,949				
N of Items	3				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
BI1	8,84	2,401	,879	,774	,936
BI2	8,85	2,226	,908	,825	,915
BI3	8,86	2,385	,893	,803	,925

APPENDIX F

QUESTIONNAIRE (ENGLISH)

PARTICIPATION FORM AND CAATT's ADOPTION MODEL QUESTIONNAIRE

Purpose of the Study

The purpose of this study is to reveal the factors affecting the Acceptance or Adoption of CAATTs by auditors. After exploring the factors it is intended to develop a model which is able to predict the most important factors affecting the adoption of CAATTs by auditors.

If you agree to join the research please fill out the followings. The questionnaire is composed of three parts and it is expected to take about 10 minutes to complete.

You need to know:

Participation is completely voluntary, and one can stop survey at any time. There is no any question demanding information related to your identity and all the answers will be kept anonymously.

Your comments on the research subject and the questionnaire is important for the purpose of this study and will add value to the research. Thus, please state your questions or advices by e-mail or give at the related part at the end of the questionnaire

Thank you in advance for your participation.

Researcher: Doğan Doğanay

E-mail: dodoganay@gmail.com

Telephone: 0(312) 303 40 27

I have read the above information and agree to voluntarily participate in this research.

About CAATTs

In the scope of this study,

CAATTs can be defined as any utilization of technology (computer software and techniques) that auditors can use to support their daily audit tasks like Electronic Spreadsheets, Electronic Working Papers, Test Data, Integrated Test Facility (ITF), Parallel Simulation, Embedded Audit Modules and Generalized Audit Software (GAS). CAATTs use covers tools to create working papers, data analysis and extraction, tools to support substantive tests, software to forecast data attitude (data mining) and to do statistical investigations (such as sampling and regression). It might likewise covers cooperative methodologies for auditing strategies.

Personal Information

The questions below are related to your personal information. Please check the box for the appropriate choices.

Age:

- 0-18
- 18-30
- 31-40
- 41-50
- 51-60
- More than 60

Gender:

- Male
- Female

Education Level:

- Primary school
- Secondary school
- High school
- Two-year degree
- Bachelor's degree
- Master's degree or more

Size of Your Department:

- Less than Five
- 5-10
- 11-20
- 21-50
- More than 50

Size of Your Firm:

- Less than 10 Employees
- 11-59 Employees
- 50 99 Employees
- 100-499 Employees
- 500 999 Employees
- More than 1000 Employees

Experience

- 0-2
- 2-5
- 6-10
- 11-15
- 16-20
- More than 21

CAATTs Use

The questions below are related to the CAATTs use and its usage in your work. Please check the box for the appropriate choices. For the questions you can check more than one choices.

Do you use CAATTs?

Please check only one choice.

- Yes
- No

How long do you use CAATTs?

Please check only one choice.

- Less than 1 year
- 1 to 2 years
- 3 to 5 years
- 5 to 10 years
- More than 10 years

What types of CAATTs do you use?

You can check more than one choice.

- Utility Programs

- Electronic Working Papers
- Electronic Spreadsheet
- Purpose-Written Audit Programs
- Test Data
- Integrated Test Facility
- Parallel Simulation
- Embedded Audit Module
- Generalized Audit Software

For what purposes do you use CAATTs?

You can check more than one choice

- To assess the risks of fraud
- To identify journal entries and other modifications to be checked
- To check exactness of electronic documents
- To re-perform operations (i.e., aging of accounts receivable, rediscount etc.)
- To choose test sample from key electronic records
- To classify/sort transactions with explicit qualities
- To test a whole population/data rather than a sample selection
- To get proof about control adequacy
- To assess stock presence and completeness
- To create working papers
- To recognize surprising and unforeseen relationship or exchanges
- To identify top or base records in a database
- To match information crosswise over documents
- To utilize huge data to electronically test a repeated operations or different procedures.
- To execute analytical substantive operations and methods
- To speed up business
- To reduce workload and cost
- To get competitive advantage
- Others _____

About the Options and Intention to Use CAATTs

Questions below are prepared to understand your behavioral intention to use CAATTs. Answers are scaled from 1 to 5, and related scale is given below.

5- Completely Agree, 4- Agree, 3- Neutral, 2- Disagree, 1- Completely Disagree
Please check the box which is closest to your opinion.

QUESTION	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
Perceived Usefulness					
“Using CAATTs would improve my job performance.”	5	4	3	2	1
“Using CAATTs in my job would increase my productivity.”	5	4	3	2	1
“Using CAATTs would enhance my effectiveness on the job.”	5	4	3	2	1
“Using CAATTs would make it easier to do my job.”	5	4	3	2	1
“I would find CAATTs useful in my job.”	5	4	3	2	1
Perceived Ease of Use					
“Learning to operate CAATTs would be easy for me.”	5	4	3	2	1
“I would find it easy to get CAATTs to do what I want it to do.”	5	4	3	2	1
“My interaction with CAATTs would be clear and understandable.”	5	4	3	2	1
“I would find CAATTs to be flexible to interact with.”	5	4	3	2	1
“It would be easy for me to become skillful at using CAATTs.”	5	4	3	2	1
“Overall, I would find CAATTs easy to use. “	5	4	3	2	1
Facilitating Conditions					
“I have the resources necessary to use the CAATTs.”	5	4	3	2	1
“I have the knowledge necessary to use the CAATTs.”	5	4	3	2	1
“The CAATTs is not compatible with other systems I use.”	5	4	3	2	1
“A specific person (or group) is available for assistance with system difficulties.”	5	4	3	2	1
“Specialized instruction concerning the system was available to me.”	5	4	3	2	1
“I think that using the CAATTs fits well with the way I like to work.”	5	4	3	2	1
Social Influence					
“People who influence my behavior think that I should use the CAATTs.”	5	4	3	2	1
“People who are important to me think that I should use the CAATTs.”	5	4	3	2	1
“The senior management of this business has been helpful in the use of the CAATTs.”	5	4	3	2	1

QUESTION	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
“In general, the organization has supported the use of the CAATTs.”	5	4	3	2	1
“People in my organization who use the CAATTs have more prestige than those who do not.”	5	4	3	2	1
“If I were to use CAATTs, it would give me higher status in the organization.”	5	4	3	2	1
“If I were to use CAATTs, I would have more prestige in the organization than people who have not yet using it.”	5	4	3	2	1
Management Support					
“Top management believes the use of CAATTs is a good idea.”	5	4	3	2	1
“Top management is interested in CAATTs usage during the audit task.”	5	4	3	2	1
“Top management supports the use of CAATTs in audit task.”	5	4	3	2	1
“Management is supportive in financing/approving a purchase of an audit software.”	5	4	3	2	1
“Management is financially supportive when CAATTs maintenance is needed.”	5	4	3	2	1
“Top management is willing to take the risks involved in the adoption of CAATTs.”	5	4	3	2	1
“Top management provides adequate resources for CAATTs implementation.”	5	4	3	2	1
“Top management gives strong support for CAATTs usage in firm’s operation.”	5	4	3	2	1
Training					
“I have adequate training to use CAATTs.”	5	4	3	2	1
“My skills learned from (CAATTs) are helpful in how to use (CAATTs).”	5	4	3	2	1
“I can apply the skills I learned from (CAATTs) to the use of.”	5	4	3	2	1
“Specialized programs or consultant about training are available to me.”	5	4	3	2	1
“Specialized instruction and education concerning (CAATTs) is available to me.”	5	4	3	2	1

QUESTION	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
Cost					
“I think the equipment required to deploy CAAATs is expensive.”	5	4	3	2	1
“I think it costs a lot to learn CAATTs.”	5	4	3	2	1
Peer Influence					
“The advices about CAATTs for Audit purposes from professional bodies influence positively my CAATTs future acceptance.”	5	4	3	2	1
“My peers (other Auditors) behavior on CAATTs influences positively my CAATTs future acceptance.”	5	4	3	2	1
“International statements accomplish influence my CAATTs usage.”	5	4	3	2	1
“New Supervision from Regulatory authorities influence my CAATTs usage”.	5	4	3	2	1
“I think my coworkers advise me to use CAATTs for auditing, which is very impressive.”	5	4	3	2	1
“I think my friends’ use of CAATTs for auditing encourages me to use CAATTs more.”	5	4	3	2	1
Result Demonstrability					
“I have no difficulty telling others about the results of using the CAATTs.”	5	4	3	2	1
“I believe I could communicate to others the consequences of using CAATTs.”	5	4	3	2	1
Self Efficacy					
I could complete the job using CAATTs . . .	5	4	3	2	1
“If there was no one around to tell me what to do as I go.	5	4	3	2	1
“If I could call someone for help if I got stuck.”	5	4	3	2	1
“If I had a lot of time to complete the job for which the software was provided.”	5	4	3	2	1
“If I had just the built-in help facility for assistance.	5	4	3	2	1
“If someone showed me how to do it first.”	5	4	3	2	1
“If I had used similar systems before this one to do the same job.	5	4	3	2	1

QUESTION	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
Job Relevance					
“In my job, usage of the CAATTs is important auditing.”	5	4	3	2	1
“The use of the CAATTs is pertinent to my various job-related tasks.”	5	4	3	2	1
Voluntariness					
“My use of the CAATTs is voluntary.”	5	4	3	2	1
“My supervisor does not require me to use the CAATT.”	5	4	3	2	1
“Although it might be helpful, using the CAATT is certainly not compulsory in my job.”	5	4	3	2	1
Output Quality					
“The quality of the output I get from CAATTs usage is high.”	5	4	3	2	1
“I have no problem with the quality of the system’s output.”	5	4	3	2	1
“I rate the results from the system to be excellent.”	5	4	3	2	1
Behavioral Intention					
“Given the opportunity, I think that would use CAATTs.”	5	4	3	2	1
“I intend to use CAATTs when the opportunity arises.”	5	4	3	2	1
“I am open to using CAATTs in the near future.”	5	4	3	2	1

Please write down your comments about the questionnaire or CAATTs

Thanks for your participation.

APPENDIX G

QUESTIONNAIRE (TURKISH)

KATILIM FORMU VE BDDAT KABUL MODELİ ANKETİ

Amaç:

Bu çalışmanın amacı, Bilgisayar Destekli Denetim Araç ve Tekniklerinin (BDDAT) denetçiler tarafından kabul edilmesi ve kullanılmasını etkileyen faktörleri ortaya koymaktır. Faktörleri araştırdıktan sonra, BDDAT'lerin denetçiler tarafından benimsenmesini etkileyen en önemli faktörleri tahmin edebilecek bir model geliştirilmesi amaçlanmaktadır.

Araştırmaya katılmayı kabul ediyorsanız, lütfen aşağıdakileri doldurunuz. Bu anket üç bölümden oluşmakta ve tamamlanmasının yaklaşık 10 dakika sürmesi beklenmektedir.

Bilinmesi Gerekenler:

Katılım tamamen isteğe bağlıdır ve istediğiniz zaman anketi doldurmayı bırakabilirsiniz. Kimliğinizle ilgili bilgi isteyen herhangi bir soru yoktur ve tüm cevaplar isimsiz olarak tutulacaktır.

Araştırma konusu ve anket hakkındaki yorumlarınız bu çalışmanın amacı için önemlidir ve araştırmaya değer katacaktır. Bu nedenle, lütfen sorularınızı veya önerilerinizi e-posta ile iletin veya anketin sonunda ilgili bölümde belirtin.

Katılımınız için şimdiden teşekkür ederiz.

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Yukarıdaki bilgileri okudum ve bu araştırmaya gönüllü olarak katılmayı kabul ediyorum

Bilgisayar Destekli Denetim Araç ve Teknikleri (BDDAT)

Bu çalışma kapsamında Bilgisayar Destekli Denetim Araç ve Teknikleri (BDDAT), Elektronik Tablolar, Elektronik Çalışma Kağıtları, Test Verileri, Entegre Test Araçları (ETA), Paralel Simülasyon, Gömülü Denetim Modülleri ve Genelleştirilmiş Denetim Yazılımı (GDY) gibi denetçilerin günlük denetim görevlerini desteklemek için kullanabilecekleri her türlü teknolojinin (bilgisayar yazılımı ve teknikleri) kullanımı olarak tanımlanabilir. BDDAT çalışma kağıtları üretmeye yarayan araçlar, veri çekme ve veri analizleri, temel testleri destekleyen araçlar, veri davranışını öngören yazılımlar (veri madenciliği) ve istatistiksel analiz araçlarını (örnekleme ve regresyon gibi) içerir. Ayrıca denetim prosedürleri açısından bunların birlikte kullanımını da kapsar.

Kişisel Bilgiler

Aşağıdaki sorular kişisel bilgilerinizle ilgilidir. Lütfen size en uygun olan cevap için kutuyu işaretleyin.

Yaş:

- 0-18
- 18-30
- 31-40
- 41-50
- 51-60
- 60 ve Üzeri

Cinsiyet:

- Erkek
- Kadın

Eğitim Düzeyi:

- İlkokul
- Orta Okul
- Lise
- Ön Lisans
- Lisans
- Yüksek Lisans ve Üzeri

Biriminizin Büyüklüğü (Çalışan Sayısı):

- <5
- 5-10
- 11-20
- 21-50

50 ve Üzeri

Firmanızın Büyüklüğü (Çalışan Sayısı):

<10

11-50 Çalışan

51-100 Çalışan

101-500 Çalışan

501-1000 Çalışan

1001 ve Üzeri Çalışan

Mesleki Tecrübe

0-2

2-5

6-10

11-15

16-20

20 ve Üzeri Yıl

BDDAT Kullanımı

Aşağıdaki sorular Bilgisayar Destekli Denetim araç ve Teknikleri (BDDAT)'nin kullanımını ile ilgilidir. Lütfen size en uygun olan cevaplar için kutuyu işaretleyin.

BDDAT kullanıyor musunuz?

Lütfen yalnızca bir seçeneği işaretleyin.

Evet

Hayır

Ne kadar süredir BDDAT kullanıyorsunuz?

Lütfen yalnızca bir seçeneği işaretleyin.

1 Yıldan Az

1-2 Yıldır

3-5 Yıldır

5-10 Yıldır

10 Yıldan Fazla

Ne tür BDDAT kullanıyorsunuz?

Birden fazla seçeneği işaretleyebilirsiniz.

- Yararlı Programlar
- Elektronik Tablolar
- Elektronik Çalışma Kağıtları
- Özel Amaçlı Denetim Programları
- Test Verileri
- Entegre Test Araçları
- Paralel Simülasyon
- Bütünleştirilmiş Denetim Modülleri
- Genelleştirilmiş Denetim Yazılımı (GDY)

Hangi amaçlarla BDDAT kullanıyorsunuz?

Birden fazla seçeneği işaretleyebilirsiniz.

- Dolandırıcılık risklerini değerlendirmek
- Muhasebe kayıtları ve kontrol edilecek diğer düzenlemeleri belirlemek
- Elektronik dosyaların doğruluğunu kontrol etmek
- Doğruluklarını test etmek için işlemleri yeniden gerçekleştirmek (Reeskont işlemleri vb.)
- Kritik elektronik dosyalardan örnek işlemler seçmek
- Belirli özelliklere sahip işlemleri seçmek/sıralamak
- Örneklem seçmek yerine tüm popülasyonu/veriyi test etmek
- Kontrol etkinliği hakkında kanıt edinmek
- Envanter varlığını ve bütünlüğünü kontrol etmek
- Çalışma kağıtları hazırlamak
- Olağandışı veya beklenmedik ilişki ve işlemleri tespit etmek
- Veri tabanındaki en yüksek veya en düşük değere sahip kayıtları belirlemek
- Farklı dosyalardaki verileri eşleştirmek
- Tekrarlanan işlemleri veya süreçleri kontrol etmek amacıyla büyük verileri kullanmak
- Temel analitik işlemler veya hesaplamaları yapmak
- İş hızını artırmak
- İş yükünü ve maliyeti azaltmak
- Rekabet üstünlüğü sağlamak
- Diğer _____

BDDAT ile ilgili Tutum ve Görüşler

Aşağıdaki sorular BDDAT kullanma konusundaki davranışsal **niyetinizi** anlamak için hazırlanmıştır. Cevaplar 1'den 5'e kadar şu şekilde ölçeklendirilmiştir:

- 5- Kesinlikle Katılıyorum, 4- Katılıyorum, 3- Kararsızım, 2- Katılmıyorum, 1- Kesinlikle Katılmıyorum
Lütfen size en uygun olan seçeneği işaretleyin.

SORU	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
Algılanan Fayda					
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmam iş performansımı artırır	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini işimde kullanmak verimliliğimi artırır	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmak işteki etkinliğimi artırır	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanarak işlerimi daha kolay yapabilirim	5	4	3	2	1
Genel olarak, Bilgisayar Destekli Denetim Araç ve Teknikleri faydalıdır.	5	4	3	2	1
Algılanan Kullanım Kolaylığı					
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmayı öğrenmek benim için kolay olur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini ihtiyaç duyduğum şekilde kullanabileceğimi düşünüyorum	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri ile etkileşimim açık ve anlaşılır olur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri ile etkileşimim esnek olur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanma konusunda uzmanlaşmak benim için kolay olur	5	4	3	2	1
Genel olarak, Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımı kolaydır	5	4	3	2	1
Kolaylaştırıcı Koşullar					

SORU	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmak için gerekli kaynaklara sahibim	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmak için gerekli bilgiye sahibim	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri kullandığım diğer sistemlerle uyumludur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri ile ilgili karşılaşacağım güçlükler konusunda yardımcı olabilecek kişiler mevcuttur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımı ile ilgili özel talimatlar benim için mevcuttur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmanın sevdiğim çalışma şekline uygun olduğunu düşünüyorum.	5	4	3	2	1
Sosyal Etki					
Benim davranışlarım üzerinde etkisi olan insanlar/çevrem Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmam gerektiğini düşünür	5	4	3	2	1
Benim için önemli olan insanlar Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmam gerektiğini düşünür	5	4	3	2	1
Bu kurumun üst yönetimi Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımında yardımcı olur.	5	4	3	2	1
Kuruluşumda Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanan kişiler, kullanmayanlardan daha fazla prestije sahiptir.	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanıyor olmam, kurumda bana daha yüksek statü kazandır.	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanıyor olsaydım, kurumumda henüz kullanmayan insanlardan daha fazla prestije sahip olurum.	5	4	3	2	1
Genel olarak, kurumum Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımını destekler	5	4	3	2	1
Yönetim Desteği					
Üst yönetim, Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmanın iyi bir fikir olduğuna inanmaktadır	5	4	3	2	1

SORU	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
Üst yönetim, denetim görevinde Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımını benimser	5	4	3	2	1
Üst yönetim, denetim görevi sırasında Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımını destekler	5	4	3	2	1
Yönetim, bir denetim yazılımı satın alımını finanse etme / onaylama konusunda destekleyicidir	5	4	3	2	1
Yönetim Bilgisayar Destekli Denetim Araç ve Tekniklerin bakımı gerektiğinde finansal olarak destekleyicidir.	5	4	3	2	1
Üst Yönetim, Bilgisayar Destekli Denetim Araç ve Tekniklerine uyum sürecinde oluşabilecek riskleri üstlenir	5	4	3	2	1
Üst yönetim, Bilgisayar Destekli Denetim Araç ve Tekniklerin uygulanması için yeterli kaynakları sağlar	5	4	3	2	1
Üst yönetim, Bilgisayar Destekli Denetim Araç ve Tekniklerin kurumda kullanımını için güçlü destek verir	5	4	3	2	1
Eğitim					
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmak için yeterli eğitimim var	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerinden edindiğim geçmiş tecrübelerim yeni Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmama yardımcı olur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri kullanımından öğrendiğim becerileri işime uygulayabilirim	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri konusunda eğitim verecek uzman veya danışmanlar mevcuttur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Teknikleri eğitimi için sistem içinde uygulamalar vardır	5	4	3	2	1
Maliyet					
Bilgisayar Destekli Denetim Araç ve Tekniklerini uygulamak için gerekli olan ekipman/yazılımın pahalı olduğunu düşünüyorum.	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini öğrenmenin çok maliyetli olduğunu düşünüyorum.	5	4	3	2	1

SORU	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
Akran/Meslektaş Etkisi					
Bilgisayar Destekli Denetim Araç ve Tekniklerine yönelik profesyonel kuruluşların tavsiyeleri, Bilgisayar Destekli Denetim Araç ve Tekniklerini gelecekte kullanmamı olumlu yönde etkiler	5	4	3	2	1
Diğer denetçilerin/meslektaşlarımla Bilgisayar Destekli Denetim Araç ve Teknikleri konusundaki tutumları, benim gelecekte Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmamı olumlu yönde etkiler	5	4	3	2	1
Uluslararası standartlar Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmamı etkiler.	5	4	3	2	1
Düzenleyici/Denetleyici makamlarca yapılan yeni denetimler Bilgisayar Destekli Denetim Araç ve Tekniklerin kullanımımı etkiler	5	4	3	2	1
İş arkadaşlarımla denetim sırasında Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmamı tavsiye etmelerinin çok etkileyici olduğunu düşünüyorum.	5	4	3	2	1
Arkadaşlarımla Bilgisayar Destekli Denetim Araç ve Tekniklerini denetimlerde kullanmasının beni Bilgisayar Destekli Denetim Araç ve Tekniklerini daha fazla kullanmam konusunda teşvik edeceğini düşünüyorum.	5	4	3	2	1
Sonuç Gösterilebilirliği					
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmanın sonuçlarını başkalarına anlatmakta zorluk çekmem	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmanın sonuçlarını başkalarına anlatabileceğimi düşünüyorum.	5	4	3	2	1
Öz Yeterlik					
Aşağıdaki koşullarda işimi Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanarak daha kolay tamamlayabilirim...					
sıkıntı yaşadığımda yardım için birilerini arayabilirsem	5	4	3	2	1
işini tamamlamak için yeterince zamanım olursa	5	4	3	2	1
yardım için ulaşılabilir dahili yardım imkanım olursa.	5	4	3	2	1
birisi bana başlangıçta ne yapacağımı gösterirse	5	4	3	2	1

SORU	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
aynı işi yapmak için bundan önce benzer sistemler kullanmış olsaydım.	5	4	3	2	1
İş Alaka Düzeyi					
İşimde, Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımı denetim açısından önemlidir.	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımı işime dair pek çok konuyla ilgilidir	5	4	3	2	1
Gönüllülük					
Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmam isteğime bağlıdır.	5	4	3	2	1
Yöneticim Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmam konusunda beni zorlamaz	5	4	3	2	1
Yararlı olmasına rağmen, mesleğimde Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmak zorunlu değildir.	5	4	3	2	1
Çıktı Kalitesi					
Bilgisayar Destekli Denetim Araç ve Tekniklerin kullanımından aldığım çıktının/sonucun kalitesi oldukça yüksek olur	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerinin sunduğu ürün kalitesiyle ilgili bir sorunum olmaz	5	4	3	2	1
Bilgisayar Destekli Denetim Araç ve Tekniklerinin kullanımından aldığım sonuçları mükemmel buluyorum.	5	4	3	2	1
Davranış Niyeti					
Fırsat verilirse Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmayı düşünürüm.	5	4	3	2	1
Fırsat oluştuğunda Bilgisayar Destekli Denetim Araç ve Tekniklerini kullanmayı isterim.	5	4	3	2	1
Bilgisayar destekli denetim araç ve tekniklerini yakın gelecekte kullanmaya açığım.	5	4	3	2	1

Lütfen anket veya Bilgisayar Destekli Denetim Araç ve Teknikleri hakkındaki yorumlarınızı belirtiniz.

Katılımınız için teşekkürler

APPENDIX H

MEAN AND 5% TRIMMEDMEAN VALUES

ITEM	N	Mean	%5 Trimmed Mean
PU2	216	4,51	4,59
PU3	216	4,55	4,64
PU4	216	4,51	4,58
PU5	216	4,52	4,60
PU6	216	4,56	4,65
PEOU1	216	4,06	4,09
PEOU2	216	4,21	4,26
PEOU3	216	4,01	4,09
PEOU4	216	3,92	3,92
PEOU5	216	4,08	4,13
PEOU6	216	3,79	3,82
FC1	216	3,54	3,56
FC2	216	3,65	3,68
FC3	216	3,68	3,70
FC4	216	3,34	3,36
FC5	216	3,18	3,20
FC6	216	4,09	4,20
SI1	216	3,79	3,83
SI2	216	3,80	3,85
SI3	216	3,39	3,43
SI4	216	3,53	3,58
SI5	216	3,32	3,35
SI6	216	3,27	3,30
SI7	216	3,47	3,49
MS1	216	3,54	3,58
MS2	216	3,47	3,52
MS3	216	3,47	3,52
MS4	216	3,20	3,22
MS5	216	3,19	3,21

ITEM	N	Mean	%5 Trimmed Mean
MS6	216	2,95	2,95
MS7	216	3,06	3,07
MS8	216	3,05	3,05
TR1	216	3,45	3,48
TR2	216	3,75	3,83
TR3	216	3,88	3,95
TR4	216	3,12	3,13
TR5	216	3,16	3,18
C2	216	3,22	3,25
C3	216	2,91	2,90
PI1	216	4,12	4,18
PI2	216	4,07	4,12
PI3	216	3,96	4,01
PI4	216	4,09	4,14
PI6	216	3,87	3,92
PI7	216	3,95	4,00
RD1	216	3,87	3,94
RD2	216	3,96	4,03
SE2	216	3,94	4,03
SE3	216	4,09	4,18
SE4	216	3,94	4,01
SE5	216	3,87	3,96
SE6	216	4,08	4,17
JR1	216	4,16	4,24
JR3	216	4,11	4,20
V1	216	3,35	3,39
V2	216	3,56	3,63
V3	216	3,24	3,26
OQ1	216	3,99	4,01
OQ2	216	3,93	3,93
OQ3	216	3,85	3,83
BI1	216	4,44	4,51
BI2	216	4,42	4,51
BI3	216	4,41	4,48

APPENDIX I

NORMALITY TEST RESULTS

Construct	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
PU2	216	-1,809	,166	2,536	,330
PU3	216	-1,964	,166	2,323	,330
PU4	216	-1,289	,166	1,401	,330
PU5	216	-1,793	,166	3,098	,330
PU6	216	-1,088	,166	2,550	,330
PEOU1	216	-,374	,166	-,744	,330
PEOU2	216	-,952	,166	1,877	,330
PEOU3	216	-1,021	,166	1,817	,330
PEOU4	216	-,048	,166	-,972	,330
PEOU5	216	-,521	,166	-,353	,330
PEOU6	216	-,013	,166	-,388	,330
FC1	216	-,041	,166	-,585	,330
FC2	216	-,383	,166	,196	,330
FC3	216	,069	,166	-,654	,330
FC4	216	-,168	,166	-,311	,330
FC5	216	-,125	,166	-,878	,330
FC6	216	-1,352	,166	2,541	,330
SI1	216	-,358	,166	-,149	,330
SI2	216	-,410	,166	-,179	,330
SI3	216	-,479	,166	-,240	,330
SI4	216	-,353	,166	-,751	,330
SI5	216	-,161	,166	-,888	,330
SI6	216	-,074	,166	-1,094	,330
SI7	216	-,278	,166	-,444	,330
MS1	216	-,311	,166	-,449	,330
MS2	216	-,394	,166	-,517	,330
MS3	216	-,478	,166	-,273	,330
MS4	216	-,388	,166	-,457	,330

MS5	216	-,288	,166	-,617	,330
MS6	216	-,126	,166	-,644	,330
MS7	216	-,182	,166	-,617	,330
MS8	216	-,306	,166	-,456	,330
TR1	216	-,449	,166	-,567	,330
TR2	216	-,877	,166	,790	,330
TR3	216	-,898	,166	,792	,330
TR4	216	-,165	,166	-,528	,330
TR5	216	-,348	,166	-,393	,330
C2	216	-,408	,166	-,482	,330
C3	216	-,104	,166	-,323	,330
PI1	216	-,717	,166	,558	,330
PI2	216	-,602	,166	,397	,330
PI3	216	-,550	,166	,441	,330
PI4	216	-,845	,166	1,783	,330
PI6	216	-,722	,166	,639	,330
PI7	216	-,640	,166	,950	,330
RD1	216	-,670	,166	,260	,330
RD2	216	-,724	,166	,209	,330
SE2	216	-1,064	,166	1,964	,330
SE3	216	-1,138	,166	1,716	,330
SE4	216	-,794	,166	,898	,330
SE5	216	-,853	,166	,143	,330
SE6	216	-,924	,166	,876	,330
JR1	216	-1,225	,166	1,987	,330
JR3	216	-1,098	,166	1,085	,330
V1	216	-,363	,166	-,924	,330
V2	216	-,614	,166	-,491	,330
V3	216	-,161	,166	-1,140	,330
OQ1	216	-,288	,166	-,679	,330
OQ2	216	-,017	,166	-,974	,330
OQ3	216	,198	,166	-1,166	,330
BI1	216	-1,526	,166	2,958	,330
BI2	216	-1,545	,166	2,719	,330
BI3	216	-1,430	,166	3,009	,330

APPENDIX J

RELIABILITY RESULTS FOR ALL ITEMS (CA)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PU2	233,94	997,405	,519	,959
PU3	233,91	996,147	,527	,959
PU4	233,93	1000,357	,473	,959
PU5	233,95	996,961	,517	,959
PU6	233,88	1001,042	,438	,959
PEOU1	234,37	990,970	,568	,959
PEOU2	234,23	990,788	,609	,959
PEOU3	234,42	983,997	,657	,959
PEOU4	234,49	994,241	,535	,959
PEOU5	234,38	989,750	,577	,959
PEOU6	234,72	989,155	,547	,959
FC1	235,00	995,503	,392	,959
FC2	234,85	986,681	,616	,959
FC3	234,80	990,417	,541	,959
FC4	235,18	984,518	,539	,959
FC5	235,29	981,471	,547	,959
FC6	234,35	981,472	,668	,959
SI1	234,67	980,409	,702	,958
SI2	234,64	980,232	,705	,958
SI3	235,14	981,658	,558	,959
SI4	235,03	982,559	,510	,959
SI5	235,14	979,938	,514	,959
SI6	235,19	979,758	,500	,959
SI7	234,95	978,619	,669	,958
MS1	234,94	976,970	,628	,959
MS2	234,99	973,254	,648	,959
MS3	235,01	981,855	,559	,959
MS4	235,26	981,809	,538	,959
MS5	235,26	985,291	,486	,959
MS6	235,42	975,064	,610	,959
MS7	235,32	978,830	,552	,959
MS8	235,36	984,335	,507	,959

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TR1	235,00	983,295	,547	,959
TR2	234,71	979,792	,637	,959
TR3	234,59	980,658	,686	,958
TR4	235,25	991,151	,411	,959
TR5	235,22	987,818	,497	,959
C2	235,25	1012,249	,092	,961
C3	235,58	1007,188	,172	,960
PI1	234,34	992,640	,574	,959
PI2	234,42	989,012	,643	,959
PI3	234,51	991,319	,552	,959
PI4	234,36	988,377	,663	,959
PI6	234,55	987,130	,628	,959
PI7	234,47	987,525	,655	,959
RD1	234,63	976,587	,718	,958
RD2	234,49	979,319	,700	,958
SE2	234,51	990,262	,516	,959
SE3	234,36	991,879	,505	,959
SE4	234,52	992,168	,499	,959
SE5	234,62	989,108	,431	,959
SE6	234,43	989,573	,511	,959
JR1	234,33	978,730	,702	,958
JR3	234,45	982,819	,586	,959
V1	235,09	1002,406	,195	,961
V2	234,88	1005,767	,160	,961
V3	235,21	1023,356	-,060	,962
OQ1	234,51	991,795	,534	,959
OQ2	234,49	992,977	,574	,959
OQ3	234,57	988,931	,636	,959
BI1	234,00	992,415	,552	,959
BI2	234,03	989,543	,583	,959
BI3	234,05	992,091	,583	,959