QATAR UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

THE RELATIONSHIP BETWEEN INFORMATION TECHNOLOGY COMPETENCE AND ENTREPRENEURIAL PERFORMANCE: THE CASE OF QATAR

BY

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A Project Submitted to

the College of Business and Economics

in Partial Fulfillment of the Requirements for the Degree of

Master of Business Administration

June 2022

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ABSTRACT

MAUJI, NASRINA I., Masters : June 2022, Master of Business Administration

Title: The Relationship between Information Technology Competence and Entrepreneurial Performance: The Case of Qatar

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Information and communication technologies have revolutionized how business is conducted in the twenty-first century. Information and communication technologies are the intricate bundles of IT resources which facilitate entrepreneurs' efforts to coordinate business activities competently through the utilization of these IT-based resources. This review aims to explore how entrepreneurial traits affect technology acceptance and use. Additionally, it aims to comprehend the connection between entrepreneurial performance and information technology. A proposed framework that guides the research method was built based on the integrated Task-technology Fit (TTF) and Technology Acceptance Model (TAM). The model postulates that perceived usefulness, perceived ease of use and task technology fit predict an entrepreneur's technology acceptance behavior. Additionally, the model presupposes an association between task-technology fit and entrepreneurial performance.

The results of this study found that entrepreneurial traits including, working with uncertainties in decision making process, the ability to be creative and innovative, decisiveness, the need for achievement and willingness to take advantage of new opportunities to have a positive effect on task-technology fit, making entrepreneurial traits an important factor in future discussions relating to technology acceptance and entrepreneurial performance. Additionally, findings in this study revealed that task-technology fit is an important indicator of entrepreneurial performance and behavioral intentions, with R^2 values 0.733 and 0.794 respectively. The one-way ANOVA test

performed to investigate the effects of educational qualifications on adoption and usage of information technologies found that entrepreneurial traits (n^2= 0.070), task characteristics (n^2= 0.037) and behavioral intentions (n^2= 0.070) are affected by the level of education an entrepreneur holds.

The findings of this study established that educated entrepreneurs in Qatar can navigate the complexities of information technologies, making the concept perceived of ease of use immaterial. Additionally, this study discovered that highly educated entrepreneurs are more inclined to embrace information technologies to improve their entrepreneurial success, implying that programs that foster a tech-friendly environment during the formal schooling years may be a critical catalyst for widespread technology use.

Keywords: entrepreneurial traits, information technology, performance, technology acceptance

DEDICATION

I dedicate this research to my mother, my hero, the constant pillar of support throughout my life. She is a great inspiration to me and without her endless encouragement and push for tenacity, I would never have completed my graduate studies.

ACKNOWLEDGMENTS

I would like to express my gratitude to Prof. Emad A. Abu-Shanab for his unwavering support during my graduation thesis. His assistance with my research design and methodology were immeasurable. Thank you for your patience and for challenging me to do my best. I look forward to future collaborations on research papers with you.

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CHAPTER 1: INTRODUCTION

1.1. Background Information

Entrepreneurship is a crucial element of economic development in any country. Through entrepreneurial decisions, an entrepreneur functions as a driver of economic activity (Dhaliwal, 2016). The belief that multinational corporations' control international business in the global economy could not be further from the truth. The larger and more open the global economy becomes, the greater the dominance of entrepreneurs and hence, small, and medium-sized businesses (Naisbitt, 1994).

While academic definitions of entrepreneurship vary and encompass a range of entrepreneurial activities, Scarborough and Jeffrey (2016) define an entrepreneur as someone who establishes a new business venture despite risk and uncertainty with the goal of achieving reward in the form of growth and profit. Similarly, Burns (2016) describes an entrepreneur as an agent of change who discovers and capitalizes on profit opportunities through innovation, taking calculated risks, and reallocating resources to areas with a higher rate of return. In both instances, entrepreneurs are essentially defined primarily by their behaviors. While entrepreneurial skills are acquired from different contexts, a significant portion of the existing literature supports calls for advanced education and entrepreneurship training for venture success. However, there has been debate on whether or not an entrepreneur's education level determines entrepreneurial success.

The unparalleled digital revolution has altered the practice of entrepreneurship globally (Giones and Brem, 2017). Nowadays, entrepreneurship has become global in nature. Duening et al., (2021) argue that disruptive technologies can occur anywhere on the globe and are instantly disseminated and driven to markets worldwide by the Internet. As such, global connectivity advancements that enable quick communication

from virtually everywhere position technology as a critical actor in the entrepreneurial field. Burns (2016) contends that innovations in information technology and mobile technologies, especially mobile applications, has lowered entrepreneurs' costs of conducting business and facilitated routes to market at the touch of a button. Similarly, Fowosire et al. (2017) stress that technological advancement, innovation, and entrepreneurship are inextricably linked. Numerous ways in which information and communication technologies facilitate entrepreneurship include increasing entrepreneurs' ability to develop disruptive business models and processes, accelerating the dissemination of information, and expanding entrepreneurs' access to regional and international markets (Alderete, 2017).

1.2. Purpose of the Research

The major objective of this research is to advance our understanding of how the adoption of information technology, including communication technologies, might benefit entrepreneurial success. Further, it aims to ascertain whether entrepreneurial traits can accelerate the adoption of information technologies. Understanding the significance of entrepreneurial traits in information technology adoption is critical for determining whether information technology can boost entrepreneurial performance in general. Finally, this study seeks to shed light on the role that education plays in the adoption of information technologies and entrepreneurial performance.

To this study, the term ‘information technologies’ include computers including laptops and tablets, the Internet, wireless networks, business-related software, hardware, videoconferencing, social networking, and information technology applications that allow users to access, alter, retrieve, store and transmit digital information. Applicable paradigms from previous research that demonstrate the relationship between entrepreneurship and technology adoption and utilization are

included in this review. This study will address the following research questions:

1. RQ1: What are the major entrepreneurship traits influencing the behavioral intentions and use of information technologies in Qatar?
2. RQ2: Does the adoption of information technologies enhance entrepreneurial performance?
3. RQ3: Do educational qualifications affect behavioral intentions to use information technologies to enhance entrepreneurial performance.

1.3. Scope of the Study

The scope of this study comprises individuals above the age of 18 in Qatar who are entrepreneurs, including those who have previously pursued or are now pursuing entrepreneurial studies. The purpose of this study is to reflect on the data collected on eight constructs (perceived usefulness, perceived ease of use, entrepreneurial traits, task characteristics, technology characteristics, task-technology fit, behavioral intentions, and entrepreneurial performance) in order to determine whether the adoption of information technologies improves entrepreneurial performance and to highlight the major entrepreneurial traits that influence behavioral intentions and information technology use.

1.4. Motivation behind the Study

Entrepreneurship is lauded as a means of advancing and sustaining economies worldwide. In 2011, Enterprise Qatar was founded (by Amiri order No 17 of 2011) as a government body authorized to cultivate SMEs and entrepreneurship (Oxford Business Group, 2021). Over the last decade, the development of several business incubators, co-working office spaces, and government-supported legal, financial, and marketing services demonstrates the state's commitment toward supporting entrepreneurship. As Qatar plans to establish three special economic zones that will

benefit entrepreneurs and SMEs through incentives and exemptions, the government is encouraging locals to establish businesses throughout the different economic sectors.

While the majority of entrepreneurship research focuses on the firm-creation process, there are gaps in our understanding of the internal process that drives individuals to that decision. Therefore, this study examines the effect of educational qualifications on behavioral intentions to use information technologies to enhance entrepreneurial performance.

1.5. Benefits of the Study

The current body of literature demonstrated a research deficit in the area of entrepreneurship and the role of information technologies play in enhancing entrepreneurial performance in Qatar.

Thus, this study hypothesizes that task-technology fit (consisting of 3 independent variables namely task characteristics, technology characteristics and entrepreneurial traits) together with behavioral intentions (consisting of 3 independent variables namely task-technology fit, perceived usefulness and perceived ease of use) affect entrepreneurial performance (consisting of 3 items including an entrepreneur’s capacity to develop new business models, identify new market opportunities, and increase an organization's financial benefits).

By understanding how information technologies affect entrepreneurial performance, entrepreneurs can work on embracing technologies that can improve performance to sustain competitive advantage. Additionally, policy makers can grasp the insights of entrepreneurs to develop and introduce policies that can accelerate the entrepreneurial filed in Qatar.

1.6. Structure of the Study

This study constructed and evaluated a conceptual model based on the

aforementioned rationales. The following section (Chapter 2) of this study provides a literature review, which is a written summary of scholarly sources on entrepreneurship and information technology. Additionally, it provides a snapshot of current knowledge, enabling further identification of research gaps.

Chapter 3 (Research Methodology) discusses the primary determinants of the proposed hypotheses and the formulated conceptual model. The method used to undertake this study, including the sampling process and data collection methods are similarly reviewed in this section.

Chapter 4 (Data Analysis) is the most critical section of this study because it summarizes the collected data. This section entails the interpretation of data collected using statistical and logical reasoning in order to comprehend, evaluate relationships, and generate conclusions about the hypotheses.

Chapter 5 (Discussion and Implications) details the study's most significant findings. This part clearly interprets and contextualizes the findings considering prior knowledge about the research problem under investigation, as well as fresh insights regarding the study.

Chapter 6 (Conclusions) summarizes the overall findings and provides key takeaways of this study. Additionally, this section addresses the findings' implications for managerial practice, theory and future research, emphasizing the study's broader significance.

CHAPTER 2: LITERATURE REVIEW

The subsequent sections will analyze literature on entrepreneurship traits and behavioral intentions, followed by an examination of the impact that these traits play in determining acceptance of information technology. The concluding component of the literature review will examine the probable connection between information technologies and entrepreneurial performance and the role of education in entrepreneurship.

2.1. Entrepreneurship Traits and Behavioral Intentions

There is a rich literature around the major entrepreneurship traits influencing the behavioral intentions of individuals. Many of these are reflected in the trait theories of entrepreneurship (Kuratko and Hodgetts, 2003). At the core of these theories is the view of entrepreneurship as an imperative production factor, along with land, labor and capital, meaning that businesses must look to accumulate sufficient entrepreneurial characteristics in their workforce in order to ensure effective outcomes in this area (Hanif and Iqbal, 2010).

In particular, specific personality traits, including charisma, control focus, risk taking, self-discipline and self-efficacy, have been identified as important predictors of entrepreneurial intentions, and subsequent behaviors (Greene, 2017). These traits have been observed in multiple individuals as being largely inherent and key predictors of their tendency to be entrepreneurial in their careers. Other critical traits including intelligence and inspiration, which many entrepreneurs tend to display throughout their careers, resulting in high levels of intentions to be entrepreneurial (Burns, 2018). In a bid to contextualize the concept of entrepreneurial success, Makhbul (2011) identifies unique qualities, including decision-making skills, self-confidence, independence, and innovativeness in addition to effective communication. Many of these traits also

become self-reinforcing in their importance, given the tendency of society to anthropomorphize entrepreneurial businesses depending on the traits of key entrepreneurs who support the success of said businesses.

At the same time, the literature also highlights the acquisition of entrepreneurial capabilities through experience as being key to driving behavioral intentions, with the associated social development of relevant traits. This can be linked to the theory of the entrepreneurial event, which holds that the behavioral intentions of entrepreneurs generally result from the dynamic processes undertaken by an entrepreneur, and the nature of opportunities in the external environment (Krueger et al, 2000). Under this theory, behavioral intentions are thus influenced by the alignment between the entrepreneur's traits and the range of potential opportunities in the environment, depending on the ability of an entrepreneur to exploit said opportunities based on their traits and stabilities (Cuervo et al, 2007). This theory hence holds that behavioral intentions are influenced not just by traits but also by the opportunity, and what the entrepreneur is able to make of it (Nabi et al, 2017). As such, entrepreneurial traits must be seen in relation to their environment, and the environment in which they were cultivated within the entrepreneur.

Such arguments in turn indicate that entrepreneurial traits, whilst important drivers of success, are not the most important aspects of success. Indeed, there is a strong thread in the literature that entrepreneurs achieve success primarily through their environment, with their inherent traits playing less of a role (Mellor et al, 2009). For example, Al Uzaizi (2017) argues that all people are born with entrepreneurial traits such as vision and creativity, and their early environment and upbringing influences how these develop into full capabilities over time. Such arguments are reflected in evidence that most successful entrepreneurs did not succeed immediately, but instead

had to learn and develop over time in order to achieve success (Kumar 2008). As such, resilience and learning traits are also key elements in a successful entrepreneur, and the resulting performance of their ventures and undertakings. This places an important weight on the function of the external environment in assisting individuals in developing their entrepreneurial traits and associated behavioral intentions, making it important to focus studies on specific countries, regions, and cultures so as to account for the impact of environmental influences.

Finally, literature also highlights the important role of external institutions in supporting behavioral intentions towards entrepreneurship. This particularly involves the ability of entrepreneurs to engage with related parties, such as investors, suppliers or business incubation organizations set up by governments to support growth and innovation (Al-Mubaraki and Busler, 2013). Unfortunately, these relationships are often complex and challenging to develop and maintain. This is because many external parties, and the governments that influence the business environment, can be increasingly focused on using policy to harness entrepreneurs and their firms and resources for their own ends (John and Lawton, 2018). As such, this can result in efforts to promote entrepreneurship and economic development, or to direct entrepreneurial efforts towards specific requirements, particularly in the case of developing nations looking to build a more secure business and economic base (Armanios et al, 2017). This in turn emphasizes the important role of political and social traits, including the ability of entrepreneurs to engage with investors, partners, and governments in order to achieve success in their efforts. As such, entrepreneurs may need to possess traits that extend beyond their business and opportunity, and span wider political and social concerns, in order to support continued behavioral intentions to innovate (Becker-Ritterspach et al, 2017).

2.2. Entrepreneurial Traits and Information Technology

The technology acceptance model (TAM) continues to be a key theory used to rationalize the drivers of information technology adoption. This theory holds that the adoption of new technology is driven by the perceived ease of use and perceived usefulness of said technology, with these factors combining to influence the behavioral intentions towards the technology (Lai, 2017). As such, when applied to entrepreneurial traits, this will focus on the extent to which information technology can be used easily by entrepreneurs, and the extent to which it provides value when managing and growing a business, which in turn links to the visionary nature of the entrepreneur and their ability to see technology as part of their business future (Dickel and Schrape, 2017). In addition, the disruptive nature of the entrepreneur is also important in the adoption of information technology, particularly given the potential for the IT to support a disruption to traditional business models and approaches (Wagner-Lawlor, 2017).

Further insight around information technology adoption is found in the theory of planned behavior (TPB). This theory holds that people will evaluate their adoption behavior based on their own attitudes around the behavior, the social norms of the behavior and the perceived ease of undertaking the behavior (Ajzen and Fishbein, 2005). As such, this view of information technology adoption focuses heavily on the attitudes of the entrepreneur, including the extent to which they are forward thinking and view technology as key to their entrepreneurial success. At the same time, it also links to their view of society and the acceptability of using technology within an entrepreneurial venture in a given social context, including how the adoption will influence the ways in which people transact with entrepreneurial ventures and their technologies (Tavares, 2013).

The final, and potentially most relevant, theory in this area is the innovation

diffusion theory. Under this theory, technologies represent innovations that can be adopted based on "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995). As a result of this, as with the behavioral intentions of entrepreneurs, their participation in social systems play key roles in driving information technology adoption, driven in turn by the collective views and traits of the members of this community. This in turn indicates that entrepreneurial traits towards IT systems not only influences the tendency of these individual entrepreneurs to adopt IT systems and develop their competences, but also the adoption behaviors of their wider networks. In some cases, such as electric vehicle technology, these systems have played a strong role in wider technology adoption technology, and its acceptability in the population as a whole (Kim et al, 2010).

Further to this, the innovation diffusion theory also holds that technologies are adapted in stages. This is driven by the concept of the diffusion curve, which separates the early adopters from the later adopters and the wider majority (Rogers, 1995). As such, the influence of entrepreneurial traits on adoption behaviors can also vary depending on the newness of the technology. Some entrepreneurs will be highly visionary early adopters, with aggressive and risk-taking traits, who thus adopt information technologies very early in their development cycle. (Newman et al, 2014). In contrast, others may be more risk averse adopters who wait until a technology is established. At the same time, some entrepreneurs may take a more 'bounded' approach to adoption, embracing information technology in stages as the business and its employees and customer become used to the new technology and its impacts on the business model (Fleming, 2019).

The value of the innovation diffusion theory can be seen in its application to specific information technologies. For example, social media technologies have been

adopted rapidly by some entrepreneurs, particularly those who deal well with uncertainty; have a high need for autonomy; and constantly seek out new opportunities (Brandstatter, 2011). In contrast, mid-stage adopters tended to embrace the established visual storytelling aspect of social media sites like Instagram, with adoption driven by their desire to share their creative passions and visions (DeMers, 2017). Further to this, later adopters were shown to use social media as a means to engage and network with their customers, based on the value they ascribed to relationships as a core trait in their entrepreneurial make up (Virtanen et al, 2017). Other analysis has also focused on social media technology as a low-risk channel to found and spread a business, with some entrepreneurs adopting the technology as a way to try out business ideas without committing to a full-time entrepreneurial strategy (Morris et al, 2018). This hence shows the range of drivers of technology adoption, and the associated variety of traits driving it.

2.3. Information Technologies and Entrepreneurial Performance

When considering the magnitude at which information technologies adoption enhances entrepreneurial performance, the literature indicates there is a strong array of channels through which this can occur. In particular, Davidson and Vaast (2010) demonstrated that the adoption of information technology tended to play a robust role in supporting the entrepreneurial orientation of entrepreneurs, opening them up to more opportunities and providing ways to exploit these. This was especially relevant when compared to entrepreneurs who did not adopt these technologies, and thus lacked the necessary capabilities to compete. Such impacts have been shown to be particularly relevant for millennials and generation Z ages groups, who have grown up with these technologies and thus expect them to be at the heart of new entrepreneurial offerings (Daykin, 2018).

This is further established through analysis of how information technologies can facilitate the undertaking of opening a new venture and delivering an entrepreneurial vision. Information technology can be a significant factor in the process of planning and launching a venture, with Liu (2019) noting that many of the new ventures established over the past few years were driven by the use of information technologies. This is especially true in the case underdeveloped nations, where institutional frameworks for entrepreneurship may be lacking, and information technologies can provide access to networks and resources that are vital to enable new innovations and entrepreneurial ventures (Effah, 2016). Information technology can also help overcome specific barriers. For example, Dy et al (2017) showed that internet technologies are key in enabling female entrepreneurs to overcome social barriers to success, and thus realizing their entrepreneurial potential.

In addition to support entrepreneurial orientation and the initial business launch process, information technology adoption is also important in competing. This not only refers to the adoption of information technologies, but also the development of the capabilities needed to integrate them into a business model. Indeed, Bradley (2010) argues that many entrepreneurial businesses have adopted information technologies, but struggled to understand them fully, or to exploit them to their full potential. Such an argument is rooted in observations around the extent to which many entrepreneurial ventures look to adopt innovative technologies early in their life cycle, but fail to harness them properly, thus contributing to the failure of many of these businesses. This is further aligned with the arguments of Nambisan (2017) that information technologies cannot simply be used to try and improve or reinvent an existing business, but rather than entrepreneurs must develop the necessary technological capabilities to adapt their ventures to the technologies they rely on. As such, this establishes a strong theoretical

relationship between information technology competence and entrepreneurial performance.

The flexible and diverse nature of information technology also supports it value to the entrepreneur. In particular, Janssen et al (2018) proposed the emergence of a new 'bricolage' approach to entrepreneurship, where entrepreneurs assemble collections of diverse resources into a new form of value creation. In this case, information technologies can be critical in supporting creative and networking aspects of the process, enabling specific new strategies for achieving entrepreneurial goals in this area. This can be seen in the discussion of 'bottom of the pyramid' entrepreneurship by de Bruin et al (2017). In this paper, the authors argue that it is challenging to achieve bottom of the pyramid entrepreneurship due to the difficulties creating scale economies. As such, information technologies can help to bridge multiple markets and segments and provide a multiplying effect that makes the process viable and effective.

At the same time, the investments in information technology, and the associated infrastructure, by entrepreneurs can encourage wider adoption of information technologies by customers. This can hence maximize the positive economic outcomes for entrepreneurs, customers and societies, in turn generating more opportunities and enhancing the public image of the entrepreneur and their business (Tarafdar et al, 2012). Such examples highlight the specific enabling power of information technology for entrepreneurs across certain contexts, and the importance of information technology competences in exploiting opportunities in this regard.

2.4. Education Levels and Entrepreneurship

The debate on whether or not educational qualifications determine entrepreneurial success has been explored by many researchers. According to Mahmood *et al*. (2021), university entrepreneurship education is essential because it

helps build core competencies, including knowledge of relevant business policies, business strategies and tactics, and ways of handling market challenges. The authors' findings align with Kolstad and Wiig's (2011) conclusion that formal education is essential in building core competencies that facilitate successful entrepreneurship and business management.

A more nuanced comprehension of the relationship between formal education level and entrepreneurship can be analyzed from individual skills and attributes of successful entrepreneurs. Wei *et al*. (2019) narrowed down on the possible link between entrepreneurship education and students' perception of innovation. Using a social cognitive theoretical framework, the authors discovered that acquired entrepreneurial skills directly contribute towards the students' innovative ability, awareness, and personality.

Notably, successful entrepreneurs acquire skills from multiple sources, including inborn personalities, home education, formal learning, scientific progress, and practice experience, among others. However, irrespective of the motivating factors or the source of the necessary skills, formal training and education is essential to business success. Research by Hunady *et al*. (2018) discovered a positive correlation between university education and successful start-ups and concluded that higher education is needed in facilitating business management success among entrepreneurs. The pursuit of advanced education to the PhD levels has been associated with better knowledge and familiarity with entrepreneurship skills. Research findings by Hodzic (2016) investigated cross-discipline entrepreneurial training on the graduates' employability and acquisition of start-up management skills. The researcher noted that PhD-prepared graduates excelled more in their business ventures compared to those who did not have the same education levels. From this study, Hodzic (2016)

emphasized the need to acquire advanced knowledge on entrepreneurship. While some people may naturally have the entrepreneurial potential, Gerry *et al*. (2008) observed that higher education helps nurture such potential to increase the realization of business success.

However, having a bachelor's degree, master's training, diploma, or other post-graduate qualifications is not the absolute path to entrepreneurial success. A conference report by Umihanic *et al*. (2017) develops a unique approach to the realization of entrepreneurial success among young start-up owners. In their findings, the authors noted that nonformal education plays a more essential role in preparing successful entrepreneurs. Specifically, the authors noted that young people should not only focus on formal education qualifications in starting new ventures. Instead, they should explore the available informal avenues to acquiring the necessary skills for successful start-up management.

2.5. Integrated TAM-TFF Model

Dishaw and Strong (1999) are credited with linking together the TAM and TTF constructs (model in Appendix A), in a combined theoretical and empirical study which gathered data directly from computer analysts in major Fortune 500 companies. Dishaw and Strong (1999) evidenced that by linking together the TAM and TTF they were able to determine greater predictive capacity of whether or not end-users would be willing to engage with novel technology and new technology projects. A key limitation of the paper is that it did use a small population sample, and focused on industry experts, which led to a subsequent empirical paper carried out by Dishaw, Strong and Bandy (2002) who wanted to concentrate more on the humanistic features of technology engagement.

Dishaw et al., (2002) astutely observed that "companies spend a lot of money

on software, much of which is underutilized", and so they were motivated to understand the human factors which might prompt end-users to make greater use of technology. With reference to an empirical population sample of 100 students, they discovered that self-belief in the capacity to engage with technology was an important determining factor which would motivate engagement with new software or technology systems.

Over the last two decades, there have been radical developments in technology, which have led several other authors to conduct empirical studies which apply the TAM-TTF in a range of situations. Yen et al., (2010) evaluated users' intention to adopt wireless technology in an organizational environment, and found that consistent with prior empirical studies, where technology is perceived as being fit for purpose and, in essence, helps employees to achieve their work more effectively, then there was much greater willingness to engage with technology. Admittedly this study was only carried out in an organizational context, and with an organization that clearly already invested heavily in technological development. A later evaluation by Chang et al., (2016) of users' willingness to utilize wearable technology found that where technology is considered to help users and be relatively easy or intuitive to use, then users were more likely to engage. An unanticipated finding here was that users appeared to be more interested in technology than the aesthetic appeal of the wearable technology.

Finally, Wu and Chen (2017) conducted an empirical study into the willingness of users to continue to engage with Massive Open Online courses (MOOCs). They found that perceived usefulness and individual user attitude were the most likely indicators of continued use under the TAM-TTF model, with ease-of-use having much less influence.

CHAPTER 3: RESEARCH METHODOLOGY

The aim of this chapter is to describe the research procedures and methods utilized in this study to identify the primary entrepreneurial characteristics that influence behavioral intentions for use of information and technology systems in Qatar, as well as to determine whether the adoption of information and technology systems improves entrepreneurial performance. Thus, this chapter discusses the proposed model, the research hypotheses, the study design, the data gathering approach, the sampling technique, and statistical analysis.

3.1. Proposed model and research hypotheses

Two prominent models outlining information technology usage and related behaviors have evolved in the management information systems literature during the last decade. The technology acceptance model (TAM) and the task–technology fit model (TTF) establish a critical theoretical foundation for investigating the elements that impact the use of technology and its relationship to user performance (Dishaw & Strong, 1999). Each model offers a distinct, yet complementary, viewpoint on utilization behavior. Proposed by Davis (1989), TAM centers on users' attitudes toward accepting technology based on perceived usefulness and perceived ease of use. TAM has been widely utilized to determine a person’s attitude toward technology use, which is then used to predict acceptance and utilization of information technology (Wixom & Todd, 2005). TTF is concerned with the alignment of user task requirements and accessible information technology functionality (Goodhue & Thompson, 1995). The TTF model is relatively straightforward and implies that a greater match between technology and task results in improved performance (Goodhue, 1995; Zigurs & Buckland, 1998). While each of these models has great explanatory value on its own,

combining elements from both models may offer a more all-inclusive picture of the link between technological acceptability and entrepreneurial performance.

This study adopts an extended view of the integrated TTF model and TAM proposed by Dishaw & Strong (1999). The TTF model is extended with two additional variables related to entrepreneurship including entrepreneurial traits and entrepreneurial performance. The proposed integrated TAM-TTF model adopts the entrepreneur's perception on the utilization and evaluation of information technologies and examines outcomes including acceptance and performance. The TAM-TTF model proposed for use in this study is illustrated in Figure 1 entitled 'Proposed TAM-TTF Model'.

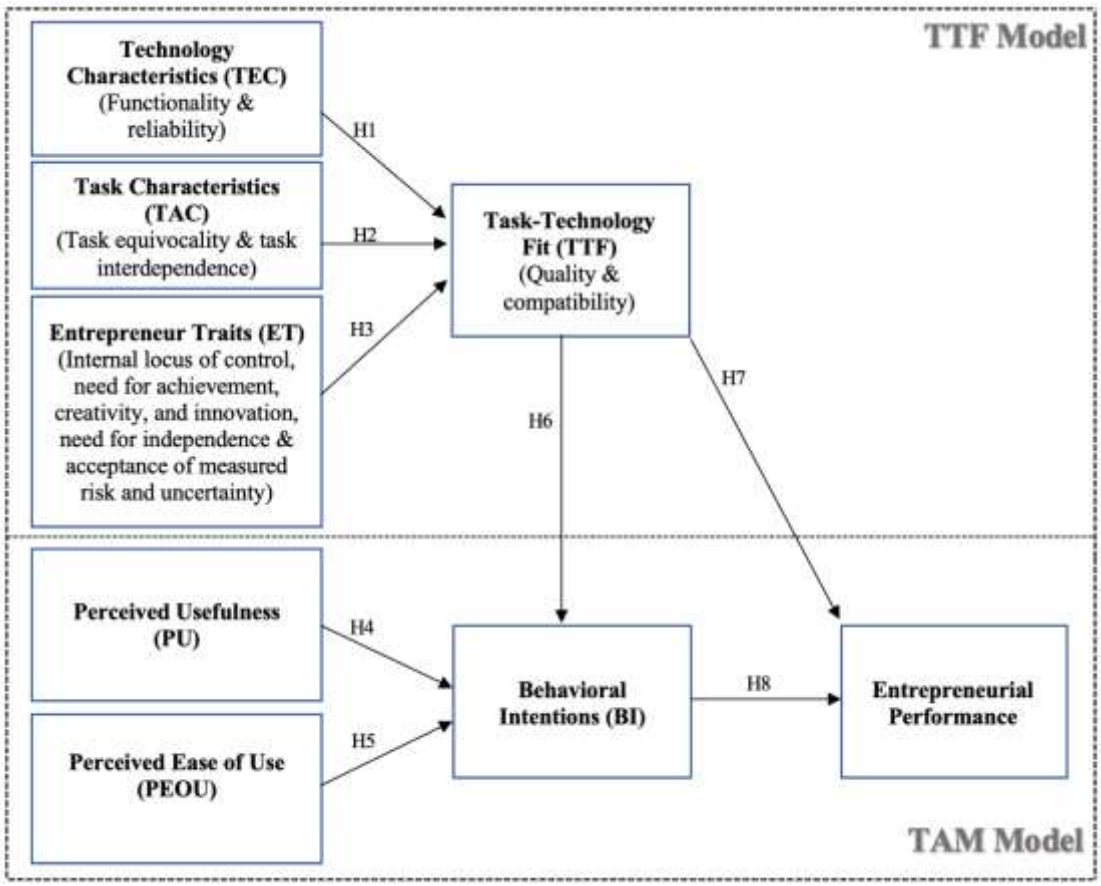

Figure 1: Proposed TAM-TTF model.

3.1.1. Technology Characteristics (TEC)

Technology encompasses all aspects of computer systems, comprising hardware and software, and including user support services such as help desks and related training. Technology characteristics refer to the level at which technology can perform a user's tasks (Goodhue & Thompson, 1995). As such, the extent to which information technologies aid entrepreneurs in accomplishing their portfolio of tasks is quantified in this study using metrics including compatibility, timeliness, and system reliability. Therefore, this study hypothesizes the following:

H1: There exists a significant and positive relationship between properties of information technologies and task-technology fit.

3.1.2. Task Characteristics (TAC)

Tasks are commonly defined as the processes undertaken by a system's user to convert inputs to outputs (Fry & Slocum, 1984). The task characteristics that are considered in this study and as outlined by TTF are those that make entrepreneurs rely more comprehensively on specific components of information technologies (Goodhue & Thompson, 1995). Therefore, this identified overcoming ill-defined challenges, solving problems that span several business functions and resolving business problems that demand solutions to novel questions as tasks that entrepreneurs typically perform. As a result, this study makes the following hypotheses:

H2: There exists a significant and positive relationship between task needs of entrepreneurs and task-technology fit.

3.1.3. Entrepreneur Traits (ET)

According to the researchers, an entrepreneur is an individual who is likely to be drawn to continually ever-changing micro and macro environments and the uniqueness of new challenges in the context of a business venture (Kerr et al., 2018).

The applicability of an information system for a particular job has a significant impact on users' attitudes regarding its utilization. This association exists because the better the match, the more likely users will acquire a favorable opinion toward the system. A commonly added construct in the TFF model is individual abilities (Goodhue & Thompson 1995). While individual abilities can encompass a wide variety of likely paradigms, including computer self-efficacy, this study argues that individuals who exhibit entrepreneurial traits are adept at interacting with and determining a fit between their tasks and technology. While there is a wealth of literature on the major entrepreneurial traits that affect a person's behavioral intentions, this study uses the ability to be creative and innovative, the willingness to take calculated risks, decisiveness, a strong desire for achievement, and a willingness to seize new opportunities (Burns, 2018; Kerr et al., 2018) as parameters to define an entrepreneur. The study, therefore, hypothesizes the following:

H3: There exists a significant and positive relationship between entrepreneurial traits and task-technology fit.

3.1.4. Perceived Usefulness (PU)

Perceived usefulness, as defined by Davis et al. (1989), is the extent to which a person believes that utilizing a given information system can improve performance. The paradigm was deemed crucial in information system research because it has a considerable effect on intended usage (Davis et al., 1989; Chang et al, 2009). In this study, the term perceived usefulness relates to a system's ability to provide entrepreneurs with accurate, timely, relevant, reliable, and legitimate information. As a result, the following hypothesis was developed:

H4: There exists a significant and positive relationship between perceived usefulness and entrepreneurs' behavioral intention towards information technologies.

3.1.5. Perceived Ease of Use (PEOU)

Perceived ease of use relates to a person's perception of how easy it is to utilize a particular technology. A user of an information system is prone to adopting a technology that is simple to operate (Davis et al., 1989). Several studies carried out by researchers (Loo et al., 2009; Teo & Noyes, 2011; Sentosa & Mat, 2012) confirmed that perceived ease of use influenced attitude and behavioral intention to utilize an information system. Therefore, this study hypothesizes:

H5: There exists a significant and positive relationship between perceived ease of use and entrepreneurs' behavioral intention towards information technologies.

3.1.6. Task-Technology Fit (TTF)

Successful information systems, according to Goodhue and Thompson (1995), must consider both the task for which the technology is being utilized and the task's compatibility with the technology. As such, task-technology fit refers to the matching of a technology's capabilities to the demands of a task (Dwyer, 2007). Contrary to the technology acceptance model (TAM), which places a premium on utilizing ideas about "perceived utility" and "perceived ease of use" to forecast and rationalize users' adoption of information technology systems, task-technology fit is extensively utilized as an explanation of technology utilization (Davis et al., 1989). Several studies have established the positive correlation between task-technology fit and information technologies usage (Dishaw & Strong, 1999; Klopping & McKinney, 2004). However, the relationship between task-technology fit and entrepreneurial performance, on the other hand, is unknown. Accordingly, the following hypotheses are proposed:

H6: There exists a significant and positive relationship between task-technology fit and entrepreneurs' behavioral intentions towards information technologies.

H7: Task-technology fit will have a significant and positive effect on entrepreneurial performance.

3.1.7. Behavioral Intentions (BI)

Behavioral intentions have been described as the degree to which a person has consciously decided whether or not to do a given specific behavior in the future (Aarts et al.,1998). Given that information technologies have been shown to support the entrepreneurial orientation of entrepreneurs by expanding their opportunities and providing means to capitalize on them (Davidson & Vaast 2010), behavioral intentions to use such technologies are certain to have a significant impact on an entrepreneur's performance. The purpose of this study is to ascertain whether an entrepreneur's behavioral intentions to use information technologies has an effect on performance. As a result, the following is hypothesized:

H8: There exists a significant positive relationship between entrepreneurs' behavioral intentions towards information technologies and entrepreneurial performance.

3.1.8. Entrepreneurial Performance (EP)

Typically, entrepreneurship has been connected with market development (Littunen, 2000), innovation (Schumpeter, 1993) and economic growth with a given country (Carree & Thurik, 2003). Accordingly, such a perspective on entrepreneurship measures success in terms of organizational performance measurements such as survival, revenue, earnings, personnel growth, share of the market, and returns on investment (Chandler & Hanks, 1998). Therefore, this study defines entrepreneurial performance as the capacity to develop new business models, identify new market opportunities, and increase an organization's financial benefits.

3.2. Research Approach and Design

This study was designed to identify the major entrepreneurial traits influencing the behavioral intentions to use of information technologies in Qatar. The study also aimed to evaluate if the adoption of information technologies improved entrepreneurial performance. This study used a quantitative technique to address the research themes. An empirical test was conducted using a survey. The goal of this study was to collect data and test associated hypotheses from individuals in Qatar who are entrepreneurs, are now pursuing entrepreneurial studies, or have previously pursued entrepreneurial studies.

The survey was approved by Qatar University Institutional Review Board (QU-IRB) under the reference QU-IRB 1613-E/21 (see Appendix B). The survey included three major sections written in the Arabic and English languages. The survey was initially drafted in English (see Appendix C) before being translated into Arabic with the help of a certified translator. The Arabic version (see Appendix D) of the survey was then translated into English with the assistance of a second independent certified translator to ensure the translation was consistent. The method of translation used in this study is based on the backward translation process as described by Brislin (1976).

A consent form was included in the first section of the survey to obtain individual respondents' consent to participate in the study and to clearly outline all conditions, risks, and responsibilities of the respondents and the researcher, including ethical guidelines and approvals. The second section of the survey assessed demographic data such as age, education, gender, nationality, and prior experience with information technologies. Demographic information was collected and measured using a nominal scale. The final segment contained 26 items that assessed eight different constructs. The survey used a five-point Likert scale, with 1 indicating complete

disagreement and 5 indicating complete agreement.

In line with the TAM & TTF models, the survey included items of perceived usefulness (PU), perceived ease of use (PEOU), behavioral intention (BI), technology characteristics (TEC), task characteristics (TAC), and task-technology fit (Davis et al., 1989; Goodhue & Thompson 1995). Additionally, a review of pertinent literature in the field of entrepreneurship identified additional significant factors that influence behavioral intentions, including internal locus of control, creativity and innovation, decisiveness, a need for achievement, and the willingness to take calculated risks, which this study has labeled 'Entrepreneurial Traits (ET)'. Finally, the study included items assessing whether information technologies can aid in the development of new business models, the identification of new market opportunities, and the enhancement of financial rewards, which the report refers to as 'Entrepreneurial performance (EP)'.

To sum up, the survey utlized in this study included three items measuring perceived usefulness (PU), three items measuring perceived ease of use (PEOU), three items measuring task characteristics (TAC), three items measuring technology characteristics (TEC), three items measuring task-technology fit (TTF), five items measuring entrepreneurial traits (ET), three items measuring behavioral intentions (BI), and three items entrepreneurial performance (EP).

3.3. Sample and Data Collection

Purposive sampling was employed to produce the sample for the research being discussed. This methodology, which falls under the category of non-probability sampling techniques, selects sample members based on their understanding, relationships, and experience with regard to a study issue (Freedman et al., 2007). In this study, the sample members who were given access to complete the entire survey were entrepreneurs or individuals who were undertaking or had previously undertaken

entrepreneurship studies.

The data collection process utilized an online survey, in which all instrument contents were uploaded to a data collection platform and online invites to partake in the study were emailed to possible respondents. Participants were able to undertake the survey only after providing consent and indicating that they were either entrepreneurs or were now enrolled in or had previously completed entrepreneurship studies. All participants were informed of the study's goal, as well as their right to withdraw from the survey at any point during the data gathering procedure. There were no monetary or in-kind incentives offered. The paper-based questionnaire took around 15 minutes to complete.

The data gathering period lasted eight weeks, from November 30th, 2021 to January 25th, 2022. The data collection period was designed to generate a sample size of more than 260 usable surveys, whereas most statistical sources advise a sample size of 20 times the number of constructs (20*8=160 surveys) or ten times the number of survey items (10*26=260 surveys) if structural equation modeling (SEM) is utilized in the analysis. Finally, the inclusion of different generations aimed to ensure a representative sample of the Qatari population and to enable comparisons between age groups while providing room for future research.

3.4. Data Sources

This study adopted a quantitative approach to be able to test the hypotheses. As a result, both primary and secondary sources of data were used. The study reviewed secondary materials such as scholarly journal articles, entrepreneurship related books, government publications, and websites. Primary sources provide firsthand information about the subject of study; thus, this study acquired primary data using an online survey distributed to participants. The key purpose for using an online survey was to preserve

the participants' confidentiality. Additionally, this kind of data collection method is relatively inexpensive to manage and generates sufficient data for analysis.

3.5. Validity of the Questionnaire

The survey was reviewed and approved by Qatar University Institutional Review Board (QU-IRB) under the reference QU-IRB 1613-E/21 (see Appendix B). The approval is critical for ensuring the survey's validity and integrity, as well as for safeguarding the rights and welfare of individuals who participate in study, both in advance and on a recurring basis.

3.6. Statistical Methods

While several statistical software packages are accessible today, this study utilized SPSS and SmartPLS. Descriptive statistics were run to present the collected data in a meaningful way and to prepare it for analysis. This study calculated measures of frequency (based on the demographic data collected), measures of central tendency and measures of variability. The purpose of running descriptive statistics was to offer a concise depiction of the data collected and to illustrate the findings.

Additionally, this study used inferential statistical methods to test the proposed hypotheses and to draw conclusions about the relationship between information technologies usage and entrepreneurs in Qatar. The SEM technique was used to test the overall model while ANOVA tests were run to explore the role of education on behavioral intentions to use information technologies to enhance entrepreneurial performance.

CHAPTER 4: DATA ANALYSIS AND DISCUSSION

The purpose of this chapter is to process, evaluate, interpret, and summarize gathered data using analytical and logical reasoning in order to establish relationships between variables in the conceptual model presented in chapter 3. Through an online survey of entrepreneurs and individuals who have or are undertaking entrepreneurship studies, and with a sample size of 261 usable surveys, subsequent structural equation modeling in SmartPLS identified important factors that lead to enhanced entrepreneurial performance.

4.1. Demographic Profiles of Participants

The two research objectives indicated in the study's introductory section are addressed using a variety of data analysis techniques via the SPSS statistical software. 158 (60.5%) of these responders were male, while 103 (39.5%) were female. Participants ranged from 18-24 years (6.5%) to 40 years or older (8.8%). Most of the participants (84.7%) fell under the 24-40 years age group. In terms of years of experience with information technologies, a majority (66.7%) of the participants fell into the experience category of more than five years while 30.3% under the 3-5 years category. Finally, an overwhelming majority (72.4) of participants in this study held a bachelor's degrees' while 16.9% held postgraduate qualifications.

Table 1. Age Frequencies (n=261)

Participants Age Groups			
	Frequency	Percent	Cumulative Percent
18-24 years	17	6.5	6.5
25-40 years	221	84.7	91.2
More than 40 years	23	8.8	100
Total	261	100	

Table 2. Gender Frequencies (n=261)

Participants Gender			
	Frequency	Percent	Cumulative Percent
Male	158	60.5	60.5
Female	103	39.5	100
Total	261	100	

Table 3. Education Qualifications Frequencies (n=261)

Educational Qualifications			
	Frequency	Percent	Cumulative Percent
Secondary or Diploma Certificate	28	10.7	10.7
Bachelor	189	72.4	83.1
Graduate	44	16.9	100
Total	261	100	

Table 4. Nationality Frequencies (n=261)

Nationality			
	Frequency	Percent	Cumulative Percent
Qatari	126	48.3	48.3
Non-Qatari	135	51.7	100
Total	261	100	

Table 5. Experience Frequencies (n=261)

Duration of the Participant's Use of Information Technologies			
	Frequency	Percent	Cumulative Percent
Never	2	0.8	0.8
Less than 2 years	6	2.3	3.1
3-5 years	79	30.3	33.3
More than 5 years	174	66.7	100
Total	261	100	

4.2 Descriptive Statistics

Individual descriptive statistics were calculated for each construct, including measures of central tendency including mean and standard deviation. Accordingly, all

items had a mean value between 4.1456 and 4.4789. The standard deviations for all items were less than 1.0, with the greatest value of 0.79534 for an item in the task characteristics construct (TAC1) and the lowest value of 0.54467 for an item in the behavioral intentions construct (BI2). Given that this is the most frequently used measure of dispersion, values smaller than 1 suggest that the dataset is clustered around the mean.

Table 6. Descriptive Statistics Results

Perceived Usefulness (PU)	Mean	SD
Information technologies enable entrepreneurs to play their role in a business.	4.4138	0.55922
Overall, information technologies enhance the effectiveness of managing a business.	4.4215	0.58717
Overall, information technologies are useful for managing a business.	4.4253	0.59418
Perceived Ease of Use (PEOU)	Mean	SD
Entrepreneurs can easily learn how to use information technologies.	4.3985	0.64019
In general, information technologies are easy to use.	4.3908	0.65085
It is easy for entrepreneurs to become skillful at using information technologies.	4.4138	0.6484
Task Characteristics (TAC)	Mean	SD
Entrepreneurs always deal with ill-defined business problems.	4.1456	0.79534
Entrepreneurs often deal with problems that involve more than one business function.	4.3218	0.69328
Entrepreneurs frequently work on business problems that require answering new questions.	4.1916	0.7453
Technology Characteristics (TEC)	Mean	SD
Information technologies always provide up-to-date data necessary for decision-making.	4.2682	0.68844
Information technologies are always up and available to meet daily operations of the business.	4.3142	0.59562
Information technologies are scalable to meet daily business needs.	4.2567	0.69004
Task-Technology Fit (TTF)	Mean	SD
Functionalities of information technologies help entrepreneurs meet daily business objectives.	4.3678	0.56395

Task-Technology Fit (TTF)	Mean	SD
Using information technologies make it easy for entrepreneurs to identify business opportunities.	4.3027	0.64774
Information technologies are compatible with daily entrepreneurial tasks.	4.3678	0.56395
Entrepreneurial Traits (ET)	Mean	SD
Entrepreneurs take risks and work with uncertainties in their decision-making process.	4.2912	0.72289
Entrepreneurs have the ability to be creative and innovative.	4.4368	0.59552
Entrepreneurs are decisive.	4.2835	0.70987
Entrepreneurs have a high need for achievement.	4.4521	0.64644
Entrepreneurs are willing to take advantage of new opportunities.	4.3065	0.67219
Behavioral Intentions (BI)	Mean	SD
As an entrepreneur, I will use information technologies.	4.4636	0.55783
I will recommend other entrepreneurs to make regular use of information technologies.	4.4789	0.54467
As an entrepreneur, I plan to use information technologies frequently.	4.4674	0.55806
Entrepreneurial Performance (EP)	Mean	SD
Information technologies help in creating new business models.	4.3908	0.56887
Information technologies help in spotting new market opportunities.	4.3295	0.63143
Information technologies open opportunities to increase financial benefits.	4.3103	0.65593

4.3 Reliability Analysis

In order to inspect the reliability of the multiple-question Likert scale utilized by this study, the Cronbach Alpha's test was applied. Cronbach's alpha is a statistic frequently cited by authors to indicate the suitability of tests and scales developed or adopted for research initiatives (Taber, 2017). Cronbach's alpha mathematically depicts all potential item combinations for evaluating a single test's consistency (Barbera et al., 2021). A typical rule of thumb is that a value of 0.6-0.7 suggests an acceptable degree of reliability. Similarly, value of 0.8 or above indicates a very good level of reliability (Hulin et al., 2001). Internal reliability was determined to be adequate for all

dimensions in this study, with alpha values ranging from 0.844 (TAC) to 0.966 (BI), which are all greater than the acceptable threshold of 0.60.

Table 7. Cronbach Alpha

Construct	Number of Items	Cronbach's Alpha
Perceived Usefulness (PU)	3	0.953
Perceived Ease of Use (PEOU)	3	0.949
Task Characteristics (TAC)	3	0.847
Technology Characteristics (TEC)	3	0.899
Task-Technology Fit (TTF)	3	0.912
Entrepreneurial Traits (ET)	5	0.875
Behavioral Intentions (BI)	3	0.966
Entrepreneurial Performance (EP)	3	0.923

4.4 Relational Analysis

Correlation matrix tests were employed to assess the research model and hypotheses in this study. Using the Pearson's correlation matrix method, this study measured the statistical relationship between the dependent variables (behavioral intentions and entrepreneurial performance) to the rest of the variables. Undertaking this analysis yielded valuable information about the size and the direction of the correlation.

Table 8. Pearson's Correlation Matrix

Variable	PU	PEOU	TAC	TEC	TTF	ET	BI
Perceived Usefulness	1						
Perceived Ease of Use	.588**	1					
Task Characteristics	.463**	.546**	1				
Technology Characteristics	.753**	.655**	.521**	1			
Task Technology Fit	**.796****	**.593****	**.492****	**.849****	**1**		
Entrepreneurial Traits	.507**	.491**	.638**	.397**	.462**	1	
Behavioral Intentions	**.823****	**.595****	**.453****	**.697****	**.789****	**.548****	**1**

Variable	PU	PEOU	TAC	TEC	TTF	ET	BI
Entrepreneurial Performance	**.847****	**.592****	**.498****	**.815****	**.856****	**.489****	**.825****

**. Correlation is significant at the 0.01 level (2-tailed).

According to the analysis, the most predictive variable for entrepreneurial performance is task-technology fit (beta = 0.856) followed by perceived ease of use of information technologies (beta = 0.847) and behavioral intentions (beta=0.825). In comparison, the association between entrepreneurial traits and entrepreneurial performance is the least predictive, with a beta value of 0.489, followed by task characteristics at 0.498. Likewise, the most predictive variable for behavioral intentions is perceived usefulness (beta=0.823), followed by task-technology fit (beta=0.789). Moreover, task characteristics (beta=0.453) and entrepreneurial traits (beta=0.548) were discovered as the least predictors of behavioral intentions to use information technologies. Finally, technology characteristics (beta=0.849) was the most predictive variable for task-technology fit, whereas entrepreneurial traits (beta=0.462), has the least association.

4.5 Structural Equation Modeling

Developed by Ringle et al. (2005), the SmartPLS software was used to test and determine causal relationships hypothesized in the conceptual model. The major purpose for the analysis was to determine the path coefficients sizes and significance of the endogenous (dependent) variables.

4.5.1 Measurement Model Assessment

This stage's primary objective is to evaluate the reliability and validity of the structural measurement model through the use of the PLS algorithm. The constructs in this study’s research model are reflective. Convergent and discriminant validity were applied to evaluate the measurement's quality. Convergent validity was examined for

reliability using indicator loadings of 0.7 and higher which is considered acceptable (Hulland, 1999). This study found the outer indicator loadings to range from 0.738 (item ET1) to 0.974 (item BI3), significantly beyond the acceptable threshold. Additionally, the average of extracted variance (AVE) for each construct was examined, the findings of which are provided in Table 10. The AVE is a measure of convergent validity that compares the variation estimated by a construct to the variance owing to measurement error. Chin (1998) proposed a criterion of acceptance of 0.5. The results of this study range from 0.667 to 0.938, which is within the acceptable range.

Table 9. Summary Results of the Outer Model

Variable	Indicator	Outer Loading	Composite Reliability	Average Variance Extracted (AVE)
Task Characteristics (TAC)	TAC1	0.871	0.907	0.765
	TAC2	0.864		
	TAC3	0.888		
Technology Characteristics (TEC)	TEC1	0.916	0.937	0.850
	TEC2	0.930		
	TEC3	0.891		
Entrepreneurial Traits (ET)	ET1	0.738	0.909	0.667
	ET2	0.854		
	ET3	0.824		
	ET4	0.837		
	ET5	0.826		
Task Technology Fit (TTF)	TTF1	0.944	0.944	0.850
	TTF2	0.906		
	TTF3	0.915		
Perceived Usefulness (PU)	PU1	0.947	0.970	0.914
	PU2	0.973		
	PU3	0.949		
Perceived Ease of Use (PEOU)	PEOU1	0.949	0.967	0.908
	PEOU2	0.968		
	PEOU3	0.941		
Behavioral Intentions (BI)	BI1	0.968	0.978	0.936
	BI2	0.961		
	BI3	0.974		

Variable	Indicator	Outer Loading	Composite Reliability	Average Variance Extracted (AVE)
Entrepreneurial Performance (EP)	EP1	0.923	0.951	0.867
	EP2	0.940		
	EP3	0.930		

Discriminant validity was analyzed using the cross loadings method and the Fornell-Larcker criterion approach in order to determine the distinctiveness of the constructs in used in the study. This was done to demonstrate that the study's constructs have their own distinct identities and are not overly connected with one another. When using the cross-loading analysis approach, the rule of thumb is that an item should have a larger loading on its own parent construct than on the other constructs (Chin 2010).

Table 10. Cross Loadings

Variable	BI	EP	ET	PEOU	PU	TAC	TTF	TEC
BI1	**0.968**	0.816	0.576	0.592	0.798	0.466	0.765	0.695
BI2	**0.961**	0.764	0.516	0.565	0.774	0.419	0.751	0.656
BI3	**0.974**	0.815	0.554	0.573	0.817	0.423	0.777	0.672
EP1	0.78	**0.923**	0.492	0.58	0.79	0.468	0.819	0.744
EP2	0.757	**0.940**	0.456	0.57	0.76	0.471	0.822	0.798
EP3	0.770	**0.930**	0.478	0.514	0.817	0.454	0.753	0.732
ET1	0.317	0.27	**0.738**	0.355	0.27	0.579	0.304	0.278
ET2	0.512	0.43	**0.854**	0.487	0.44	0.494	0.436	0.359
ET3	0.377	0.325	**0.824**	0.377	0.358	0.554	0.32	0.285
ET4	0.499	0.455	**0.837**	0.428	0.505	0.499	0.387	0.348
ET5	0.553	0.54	**0.826**	0.368	0.517	0.463	0.463	0.363
PEOU1	0.600	0.609	0.450	**0.949**	0.599	0.515	0.561	0.624
PEOU2	0.549	0.552	0.469	**0.968**	0.534	0.526	0.578	0.643
PEOU3	0.553	0.541	0.502	**0.941**	0.549	0.53	0.559	0.61
PU1	0.778	0.818	0.540	0.563	**0.947**	0.407	0.777	0.706
PU2	0.778	0.812	0.500	0.56	**0.973**	0.456	0.755	0.714
PU3	0.804	0.799	0.469	0.567	**0.949**	0.458	0.76	0.738
TAC1	0.332	0.444	0.499	0.54	0.349	**0.871**	0.481	0.521
TAC2	0.437	0.412	0.603	0.468	0.437	**0.864**	0.401	0.413
TAC3	0.426	0.451	0.542	0.421	0.434	**0.888**	0.405	0.423
TEC1	0.646	0.748	0.399	0.654	0.716	0.549	0.763	**0.916**

Variable	BI	EP	ET	PEOU	PU	TAC	TTF	TEC
TEC2	0.641	0.733	0.400	0.639	0.701	0.470	0.784	**0.930**
TEC3	0.622	0.749	0.310	0.505	0.643	0.412	0.777	**0.891**
TTF1	0.738	0.772	0.444	0.567	0.757	0.436	**0.944**	0.783
TTF2	0.702	0.819	0.388	0.523	0.662	0.459	**0.906**	0.772
TTF3	0.745	0.781	0.490	0.553	0.790	0.471	**0.915**	0.794

Likewise, Fornell and Larcker (1981) suggested that the square root of the AVE in individual variable might be utilized to demonstrate discriminant validity, provided that the value is greater than the other correlation values between the variables. Based on the results in Table 11, all items loaded in this study exhibited the distinctiveness and unique explanatory powers. Similarly, information presented in Table 12 shows that the square root of the AVE for each variable in this study is greater than the correlation between scales.

Table 11. Fornell-Larcker Discrimination Validity Criterion

Variable	BI	EP	ET	PEOU	PU	TAC	TTF	TEC
Behavioral Intentions	**0.967**							
Entrepreneurial Performance	0.826	**0.931**						
Entrepreneurial Traits	0.568	0.510	**0.817**					
Perceived Ease of Use	0.596	0.597	0.496	**0.953**				
Perceived Usefulness	0.823	0.847	0.525	0.59	**0.956**			
Task Characteristics	0.451	0.499	0.623	0.549	0.461	**0.874**		
Task Technology Fit	0.790	0.858	0.478	0.594	0.799	0.494	**0.922**	
Technology Characteristics	0.697	0.815	0.405	0.657	0.753	0.522	0.849	**0.912**

4.5.2 Structural Model and Hypothesis Testing

Based on the conceptual framework that has been discussed in Chapter 3 of this

study, a path modeling estimation was built using SmartPLS. The findings of the PLS-SEM analysis are illustrated in Figure 2. Notably, the figure depicts the variances of distinct endogenous variables as well as path coefficients that account for the strengths and effects of the variables. Regarding indicator reliability, a threshold value of 0.4 is recommended for the outer loadings of all the exogenous variables (Hair et al, 2013). Based on our initial analysis of the PLS-SEM estimation diagram, all indicators are acceptable based on their range of 0.738 (ET1) to 0.974 (BI3).

A further analysis of the path coefficients in PLS-SEM estimation diagram verifies that technology characteristics (0.794) has the strongest effect on task-technology fit, followed by entrepreneurial traits (0.175). In contrast task characteristics are found to have a negative effect. Additionally, perceived usefulness (0.496) is observed to have the strongest effect on behavioral intentions, followed by task-technology fit (0.329) and perceived ease of use (0.108). Finally, task-technology fit (0.546) is observed to have the strongest effect on entrepreneurial performance, followed by behavioral intentions (0.394).

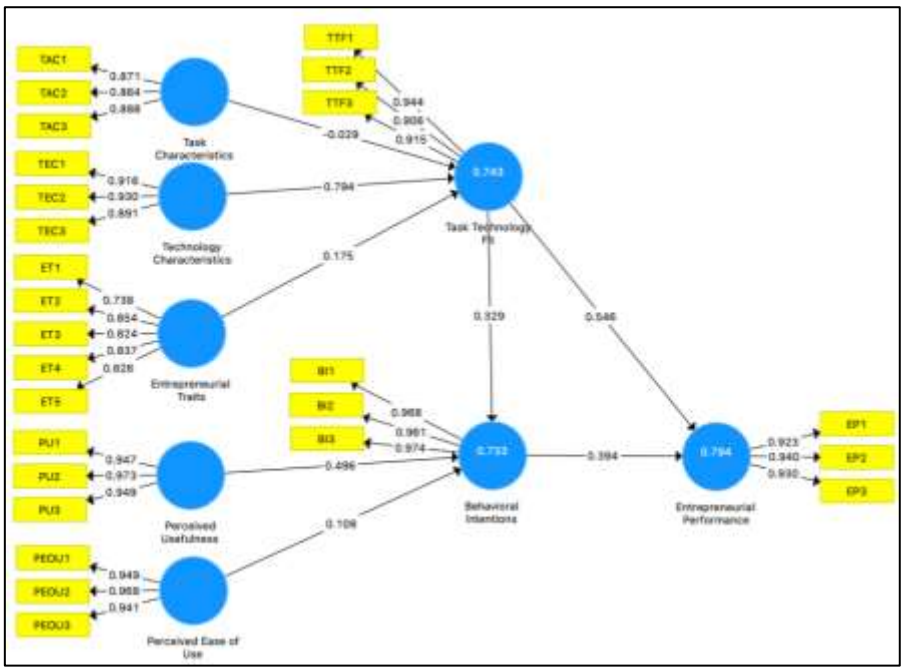

Figure 2. PLS-SEM Estimation diagram.

4.5.3 Coefficient of Determination (R^2)

The R^2 coefficient of determination was determined in this study using the SmartPLS statistical software. The summary of the results is illustrated in Table 12. Based our research model, this study has three endogenous (dependent) variables including task-technology fit, behavioral intentions, and entrepreneurial performance. The exogenous (independent) variables in this study include task characteristics, technology characteristics, entrepreneurial traits, perceived usefulness, and perceived ease of use.

This study hypothesized that task characteristics, technology characteristics and entrepreneurial traits will have significant and positive relationships with task technology fit. The R^2 and adjusted R^2 values were determined as 0.743 and 0.740 respectively. This statistic indicates that the independent variables account for 74% of the variation in the dependent variable (task-technology fit).

This study hypothesized that perceived usefulness, perceived ease of use and task-technology fit will have significant and positive and significant relationships with behavioral intentions. The R^2 and adjusted R^2 values were determined as 0.733 and 0.730 correspondingly This statistic indicates that 73% of the variation in behavioral intentions to use information technologies is explained by the latent variables.

Finally, this study hypothesized that behavioral intentions and task-technology fit will significantly and positively affect entrepreneurial performance. The values of R^2 and adjusted R^2 were determined to be 0.793 and 0.792 respectively. The adjusted R^2 indicates that 79.2% of the variation in entrepreneurial performance in explained by task-technology fit and behavioral intentions to use information technologies.

Table 12. Coefficients of Determination

Dependent/Endogenous Variables	R^2	Adjusted R^2	Result
Behavioral Intentions	0.733	0.730	Strong
Entrepreneurial Performance	0.794	0.792	Strong
Task Technology Fit	0.743	0.740	Strong

R^2 denotes the coefficient of determination

4.5.4 Predictive Relevance (Q^2)

To further test the predictive validity of the research model, this study estimated the predictive relevance Q^2 using the blindfolding technique. As a general rule, a value $Q^2 > 0.5$ is considered a predictive model (Chin 2010). Similarly, Hair et al., 2017 suggested that Q^2 values that are greater than zero suggest that a model has predictive relevance for endogenous variables being studies. The study yields a Q^2 of 0.678 (behavioral intentions), 0.679 (entrepreneurial performance) and 0.623 (task-technology fit) when an omission distance of 7 was used. These values indicate that the path's predictive relevance is highly predictive for all the endogenous variables.

Table 13. Predictive Relevance (Q^2)

Variables	SSO	SSE	Q^2 (=1-SSE/SSO)
Behavioral Intentions	783	252.036	0.678
Entrepreneurial Performance	783	251.065	0.679
Entrepreneurial Traits	1305	1305	
Perceived Ease of Use	783	783	
Perceived Usefulness	783	783	
Task Characteristics	783	783	
Task Technology Fit	783	295.106	0.623
Technology Characteristics	783	783	

4.4.5 Effect Size (f^2)

The f^2 values which show the effect of an exogenous variable on an endogenous variable's R^2 value were calculated and presented in Table 14. Cohen (1988) proposed

f^2 values of (0.02), (0.15), (0.35) respectively correspond to a small, medium, and high size effects. Accordingly, the results indicate that technology characteristics (1.757) has the strongest effect on task-technology fit, followed by entrepreneurial traits (0.072). In contrast task characteristics are found to have no effect on task-technology fit. Similarly, perceived usefulness (0.315) is observed to have the strongest effect on behavioral intentions, followed by task-technology fit (0.138) and perceived ease of use (0.108). Finally, task-technology fit (0.544) is observed to have the strongest effect on behavioral intentions, followed by behavioral intentions (0.283).

Table 14. f^2 Values

Variables	BI	EP	ET	PEOU	PU	TAC	TTF	TEC
Perceived Usefulness	**0.315**							
Task Technology Fit	0.138	**0.544**						
Perceived Ease of Use	0.027							
Behavioral Intentions		**0.283**						
Entrepreneurial Performance								
Entrepreneurial Traits							0.072	
Task Characteristics							(0.002)	
Technology Characteristics							**1.757**	

To determine the structural path significance of both the inner and outer models, this study generated t-statistics using the bootstrapping approach. The bootstrap result is a good approximation of data normalcy. Using a two-tailed t-test with a 5% significance level, this study deemed path coefficient to be significant when the t-

statistic is greater than 1.96. The bootstrapping results are illustrated in Figure 3 and summarized in Table 15. In the case of our study, the relationships between perceived ease of use and behavioral intentions (1.486) and task characteristics and task-technology fit (0.577) are insignificant.

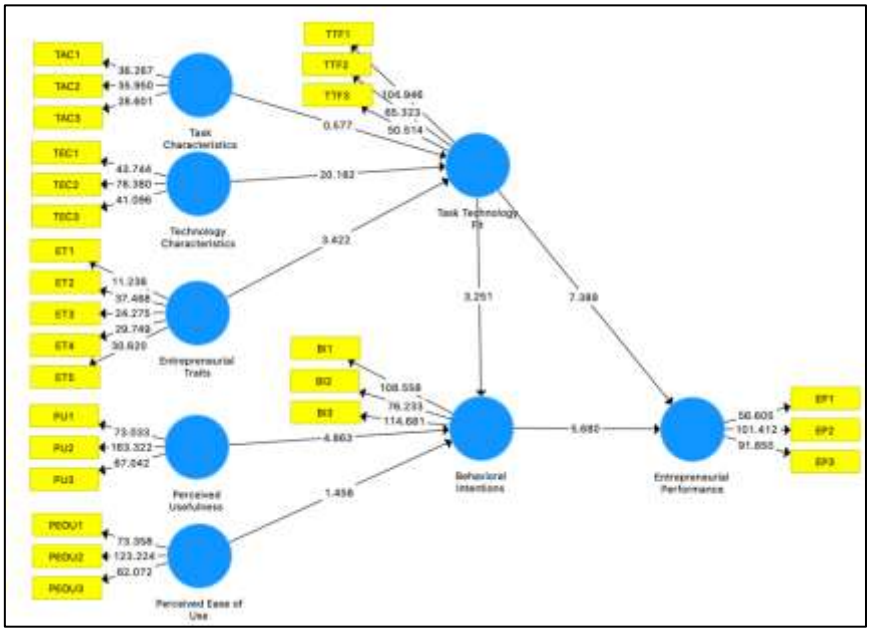

Figure 3. Structural path significance in bootstrapping.

Table 15. Summary of Path Coefficients

Construct	Standard beta	*t* value	p value	Decision
Behavioral Intentions -> Entrepreneurial Performance	0.394	5.714	0.000	Supported**
Entrepreneurial Traits -> Task Technology Fit	0.175	3.211	0.001	Supported
Perceived Ease of Use -> Behavioral Intentions	0.108	1.413	0.158	Not Supported
Perceived Usefulness -> Behavioral Intentions	0.496	4.791	0.000	Supported**
Task Characteristics -> Task Technology Fit	-0.029	0.571	0.568	Not Supported
Task Technology Fit -> Behavioral Intentions	0.329	3.282	0.001	Supported
Task Technology Fit -> Entrepreneurial Performance	0.546	7.432	0.000	Supported**
Technology Characteristics -> Task Technology Fit	0.794	20.899	0.000	Supported**

*p<0.05, **p<0.001

Table 16. Hypotheses Results

Hypotheses	Results
H1: There exists a significant and positive relationship between properties of information technologies and task-technology fit.	Supported, Accepted.
H2: There exists a significant positive relationship between task needs of entrepreneurs and task-technology fit.	Not supported, Rejected.
H3: There exists a significant positive relationship between entrepreneurial traits and task-technology fit.	Supported, Accepted.
H4: There exists a significant positive relationship between perceived usefulness and entrepreneurs' behavioral intention towards information technologies	Supported, Accepted.
H5: There exists a positive relationship between perceived ease of use and entrepreneurs' behavioral intention towards information technologies.	Not Supported, Rejected.
H6: There exists a significant relationship between task-technology fit and entrepreneurs' behavioral intentions towards information technologies.	Supported, Accepted.
H7: Task-technology fit will have a significant and positive effect on entrepreneurial performance.	Supported, Accepted.
H8: There exists a significant positive relationship between entrepreneurs' behavioral intentions towards information technologies and entrepreneurial performance.	Supported, Accepted.

4.6 ANOVA Tests

To gain a different perspective, this study examined if an entrepreneur's educational background influences behavioral intentions to use technology and, hence, entrepreneurial performance. Past literature has frequently discovered a positive relationship between levels of education and entrepreneurship (Reynolds, 1997; Delmar & Davidsson, 2000). Considering the concept of opportunity cost, meaning individuals with higher educational qualifications may have a larger chance of success and achievement of personal goals as employees and just as entrepreneurs (Gimeno et al., 1997), this study compared the mean levels of groups holding different education levels. As such, the one-way ANOVA test was conducted using SPPS to assess if there are any statistically significant differences in the mean values of groups with different educational qualifications (secondary certificate, bachelor's degree, and postgraduate

degree). In this study, educational qualification is defined as a discrete quantitative variable with a fixed value range. The results of the analysis found statistically significant differences in the mean values of task characteristics (TAC), entrepreneurial traits (ET) and behavioral intentions (BI) as presented in Table 17. These findings support the following conclusions:

- Mean value of task characteristics is significantly different for at least one of the groups ($F_{2,258} = 4.897$, $p = 0.008$).
- Mean value of entrepreneurial traits is significantly different for at least one the groups ($F_{2,258} = 9.370$, $p = 0.000$).
- Mean value of behavioral intentions to use information technologies is significantly different for at least one the groups ($F_{2,258} = 5.648$, $p = 0.004$).

To determine the how far apart the sample means are from each other, this study examined the Eta-squared (denoted as n^2) values, which are provided in Table 18. Eta-squared values whereby $n^2 = 0.01$ suggest a small effect; $n^2 = 0.06$ indicates a medium effect; and $n^2 = 0.14$ indicates a strong effect. Based on the findings of this study educational qualifications have medium effect on entrepreneurial traits and small effect on task characteristics and behavioral intentions to use information technologies.

Table 17. ANOVA

Variable		df	Sum of Squares	Mean Square	F	Sig.
Perceived Usefulness	Between Groups	2	0.831	0.415	1.353	0.260
	Within Groups	258	79.201	0.307		
	Total	260	80.032			
Perceived Ease of Use	Between Groups	2	0.083	0.041	0.108	0.897
	Within Groups	258	98.610	0.382		
	Total	260	98.693			

Variable		df	Sum of Squares	Mean Square	F	Sig.
Task Characteristics	Between Groups	2	4.034	2.017	4.897	**0.008**
	Within Groups	258	106.261	0.412		
	Total	260	110.295			
Technology Characteristics	Between Groups	2	0.219	0.109	0.306	0.737
	Within Groups	258	92.287	0.358		
	Total	260	92.506			
Task-Technology Fit	Between Groups	2	0.281	0.140	0.477	0.621
	Within Groups	258	75.981	0.294		
	Total	260	76.261			
Entrepreneurial Traits	Between Groups	2	5.250	2.625	9.370	**0.000**
	Within Groups	258	72.278	0.280		
	Total	260	77.528			
Behavioral Intentions	Between Groups	2	3.128	1.564	5.648	**0.004**
	Within Groups	258	71.442	0.277		
	Total	260	74.570			
Entrepreneurial Performance	Between Groups	2	0.153	0.076	0.228	0.796
	Within Groups	258	86.265	0.334		
	Total	260	86.417			

Table 18: ANOVA Size Effects

Variable	Eta-squared - Point Estimate	Effect Size
Entrepreneurial Traits	0.070	Medium
Task Characteristics	0.037	Small
Behavioral Intentions	0.042	Small

Finally, post hoc analysis using the Tukey HSD approach was performed to determine which specific groups were distinct from one another. The results of the analysis are presented in Table 19.

Table 19: Post Hoc Analysis – Tukey HSD

Dependent Variable	(I) Educational Qualifications	(J) Educational Qualifications	Mean Difference (I-J)	Std. Error	Sig.
Task Characteristics	Secondary	Bachelor	-.40608*	0.12996	0.006
		Graduate	-0.33550	0.15515	0.080
	Bachelor	Secondary	.40608*	0.12996	0.006
		Graduate	0.07059	0.10742	0.789
	Graduate	Secondary	0.33550	0.15515	0.080
		Bachelor	-0.07059	0.10742	0.789
Entrepreneurial Traits	Secondary	Bachelor	-.39180*	0.10718	0.001
		Graduate	-.54416*	0.12795	0.000
	Bachelor	Secondary	.39180*	0.10718	0.001
		Graduate	-0.15236	0.08860	0.200
	Graduate	Secondary	.54416*	0.12795	0.000
		Bachelor	0.15236	0.08860	0.200
Behavioral Intentions	Secondary	Bachelor	0.12831	0.10656	0.452
		Graduate	-0.16126	0.12721	0.415
	Bachelor	Secondary	-0.12831	0.10656	0.452
		Graduate	-.28956*	0.08808	0.003
	Graduate	Secondary	0.16126	0.12721	0.415
		Bachelor	.28956*	0.08808	0.003

*. The mean difference is significant at the level 0.05.

Based on the Tukey HSD results, significance values have been generated for the mean differences between the following groups with different educational qualifications:

- Bachelor's degree holders (p=0.006) believe that task characteristics (specific to entrepreneurs) create a heavier reliance on information technology systems and are therefore good predictors of task-technology fit statistically significantly more than the secondary & diploma certificate holders.

- Bachelor's degree holders (p=0.001) and postgraduate degree holders (p=0.000) believe that individuals with entrepreneurial traits are proficient at finding a fit between their tasks and technology and as such the traits are good predictors of task-technology fit statistically significantly more than the secondary & diploma certificate holders.
- Postgraduate degree holders (P=0.003) believe and are more likely to use information technology systems to enhance entrepreneurial performance statistically significantly more than the bachelor's degree holders.

CHAPTER 6: CONCLUSION

This study used the technology acceptance model (TAM) and the task-technology fit (TTF) model to analyze the effects of technology use on entrepreneurial performance. Considering existing literature on entrepreneurial traits, the task-technology fit model was modified to add entrepreneurial traits as construct. As such, this study surveyed a sample of adults over the age of 18 who have been entrepreneurs or have studied entrepreneurship to ascertain their perspectives of entrepreneurial performance and technology adoption in Qatar.

The purpose of this study was to address three research questions: the first concerned the role of entrepreneurial traits and their influence on behavioral intentions and use of information technologies in Qatar; the second concerned the effect of information technology adoption on entrepreneurial performance; and the last is concerned with how the level of education qualification can affect entrepreneurship.

Excluding perceived ease of use (PEOU) and task characteristics (TAC), the findings suggested that all other hypothesized predictors of entrepreneurial performance (EP) were significant. This verifies that entrepreneurial traits positively and significantly influence task-technology fit and thereby an entrepreneur's behavioral intentions to use information technologies.

While several studies highlight the theoretical importance of perceived ease of use as a predictor of behavioral intentions, this study demonstrated that it was not statistically significant ($p=0.158$). This is consistent with Taherdoost (2018), who stated that TAM may be limited when technology acceptance and use satisfy emotional requirements in addition to completing tasks or procedures. Similarly, it was determined that task characteristics had no statistically significant effect on task-technology fit ($p=0.568$). This suggests that the entrepreneurial tasks characteristics

specified in this study do not drive an entrepreneur to increase his or her reliance on information technologies.

Our second research question sought to ascertain entrepreneurs' perspectives regarding the impact of information technologies on entrepreneurial performance. The analysis of the path coefficients in PLS-SEM estimation diagram confirmed that perceived usefulness (0.496) and task-technology fit (0.329) have the strongest effects on behavioral intentions to use information technologies. More importantly, task-technology fit (0.546) was observed to have the strongest effect on entrepreneurial performance, followed by behavioral intentions (0.394). These findings align with previous studies confirming the positive relationship between task-technology fit and actual information technologies utilization (Dishaw & Strong, 1999; Klopping & McKinney, 2004), and demonstrate that when technological capabilities match the demands of a task, entrepreneurial performance is enhanced.

Our final research question sought to ascertain if educational qualifications affect behavioral intentions to use information technologies to enhance entrepreneurial performance. Results based on ANOVA tests ($p<0.05$) found that postgraduate degree holders ($P=0.003$) are more likely to use information technologies to enhance entrepreneurial performance statistically significantly more than the bachelor's degree holders.

6.1. Implications for Research

The main justification for merging the TAM and TFF models is that they reflect two distinct sides of an individual user's information technology usage decision. While TAM focuses on user beliefs and attitudes, TTF deliberates a rational approach, focusing on enhanced job performance regardless of the user's attitude toward information technology (Goodhue 1995). Combining TAM and TFF resulted in a more

accurate model for predicting behavioral intentions to utilize information technologies. This is in line with previous studies carried out by Dishaw et al. (2002). Further, the integrated model's superiority is demonstrated by its strong R^2 values.

However, as the integrated model is modified to include entrepreneurial traits as a construct, the results of this study partially supported the TAM premise and supported our extension (the role entrepreneurial traits) on the TTF model. Results supported the role of technology characteristics, entrepreneurial traits, perceived usefulness, and task-technology fit in predicting behavioral intentions to use information technologies to enhance entrepreneurial performance. The results also confirmed the task-technology fit to be a good predictor of entrepreneurial performance. However, the roles of task characteristics and perceived ease of use were not supported.

The survey (Arabic and English) used in this study yielded high values of Cronbach's alpha supporting the validity and suitability of the statements used to research the relationship between information technologies and entrepreneurship in emerging economies in the MENA region context. The failure of task characteristics in this study means that tasks specific to entrepreneurs vary from those in other regions.

When it comes to behavioral intents to use information technologies to increase entrepreneurial performance, graduates have greater attitudes (based on mean values) than bachelor's degree holders and certificate holders. This study lends credence to the assertion that highly educated entrepreneurs are more likely to embrace information technologies as a means of enhancing their performance.

6.2. Implications for Practice

Entrepreneurship is a process that results in the formation of SMEs and has been widely recognized as a means of economic growth and employement creation,

particularly in emerging economies (Benjamin & Rebecca, 2009). The study can assist entrepreneurs in addressing synergy-related concerns in the context of information technologies usage and entrepreneurship and initiatives they can take to improve performance, which will ultimately contribute to employment, innovation, sustainable resource utilization and export participation. This study highlights that entrepreneurial performance is significantly influenced by task-technology fit, indicating importance of matching technology's capabilities to the demands of a tasks that entrepreneurs undertake in Qatar.

Additionally, this study demonstrates that educated entrepreneurs in Qatar can navigate the complexity inherent in information technologies, rendering the concept of ease of use irrelevant. More importantly, it demonstrates how entrepreneurs in technologically advanced societies such as Qatar are willing to embrace and leverage the use of information technologies to enhance entrepreneurial performance.

6.3. Recommendations

This study distinctly identified highly educated individuals as the generation of entrepreneurs willing to embrace information technologies to enhance their entrepreneurial performance. As such, education is critical for technology acceptance. Changing the narrative implies that policymakers in the education sector must develop programs that foster a tech-friendly environment and conduct support programs that promote acceptance of technology as it evolves throughout formal schooling years. Policies must prioritize young potential entrepreneurs who already exhibit entrepreneurial traits to facilitate their access to technological education options that will later serve as the foundation for their enhanced entrepreneurial performance.

6.4. Limitations and Future Work

While this study adds to the body of knowledge and existing literature, it is not without limits. While the sample size was sufficient to draw practical findings, it cannot be considered representative of all Qatari entrepreneurs. As such, a bigger sample size would validate the study's findings and serve as a starting point for further research on the factors impacting information technologies use in the context of entrepreneurship in Qatar.

It is critical to consider the substantial body of research that supports the significance of task characteristics as a significant predictor of task-technology fit and perceived usefulness as a significant predictor of behavioral intention. This study was unable to substantiate their roles. New studies duplicating and expanding on this study's findings may verify and extend existing findings. Such research must validate that the findings are applicable to the Qatari environment.

Likewise, since task-technology influences behavioral intentions to use information technologies and entrepreneurial performance outcomes, entrepreneurial traits should not be overlooked in future discussions related to technology competency and entrepreneurship. Additionally, it would be interesting to observe whether comparable results would be obtained if a similar study were conducted using only female entrepreneurs as a sample.

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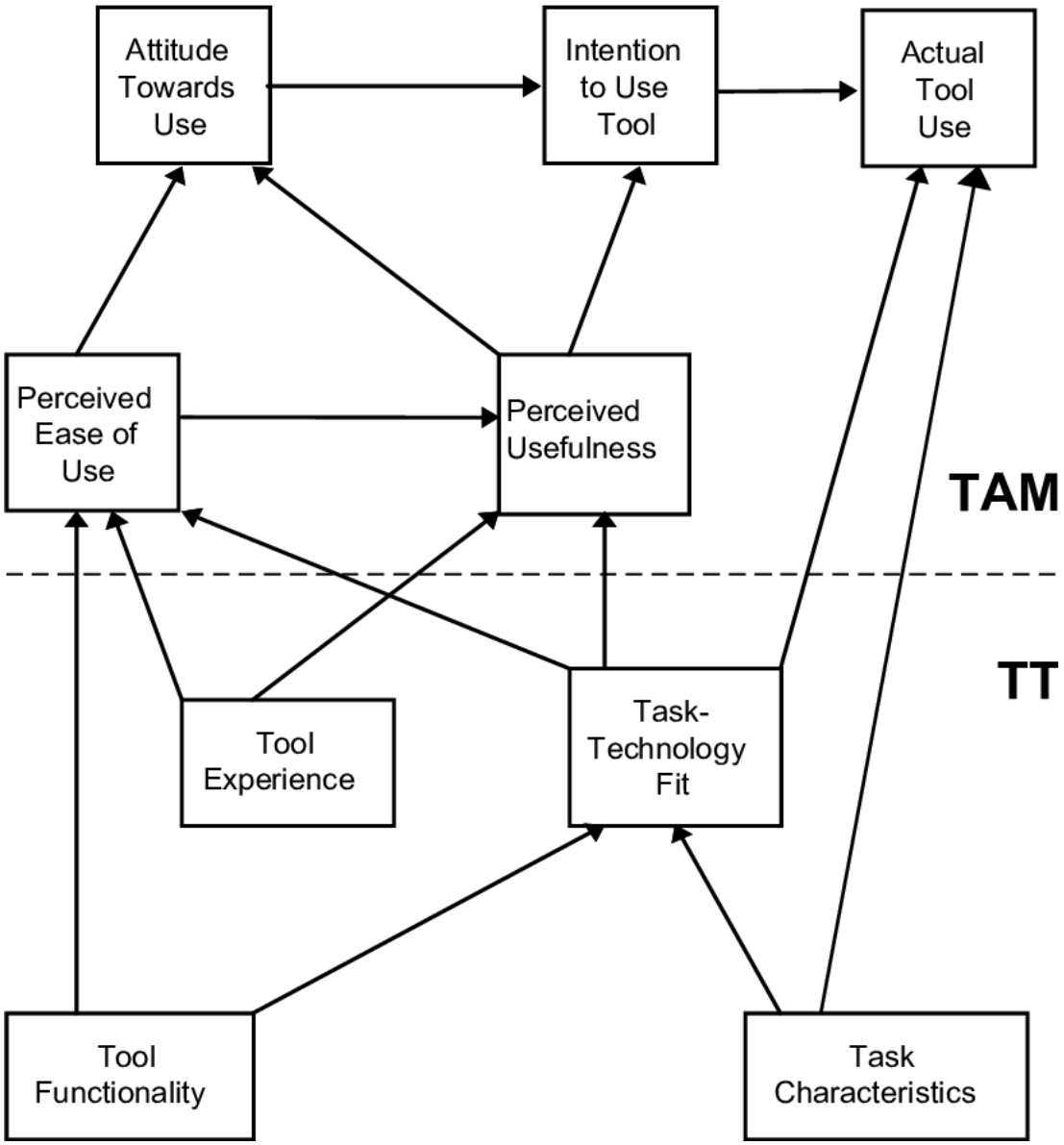
APPENDIX A: DISHAW & STRONG MODEL



(Dishaw & Strong, 1999)

APPENDIX B: QU-IRB APPROVAL

Qatar University Institutional Review Board QU-IRB

QU-IRB Registration: IRB-QU-2020-006, QU-IRB, Assurance: IRB-A-QU-2019-0009

DATE:	October 14, 2021
TO:	Nasrina Mauji
FROM:	Qatar University Institutional Review Board (QU-IRB)
PROJECT TITLE:	1807004-1The Relationship between Information Technology Competence and Entrepreneurial Performance: The Case of Qatar.
QU-IRB REFERENCE #:	QU-IRB 1613-E/21
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	October 14, 2021
REVIEW CATEGORY:	Exemption category # 2

Thank you for your submission of New Project materials for this project. The Qatar University Institutional Review Board (QU-IRB) has determined this project is EXEMPT FROM IRB REVIEW according to Qatar Ministry of Public Health regulations. Please note that exempted proposals do not require renewals however, any changes/modifications to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

We will retain a copy of this correspondence within our records.

Documents Reviewed:

- Application Form - QU-IRB Check List.pdf (UPLOADED: 09/19/2021)
- Consent Form - English_Consent_Form_Ammended.docx (UPLOADED: 10/4/2021)
- Consent Form - Arabic_Consent_Form_Ammended.docx (UPLOADED: 10/4/2021)
- Proposal - Graduation_Project_Draft_2.docx (UPLOADED: 09/19/2021)
- Qatar University - IRB Application - Qatar University - IRB Application (UPLOADED: 10/4/2021)
- Questionnaire/Survey - English_Questionnaire_Ammended.docx (UPLOADED: 10/4/2021)
- Questionnaire/Survey - Arabic_Questionnaire_Ammended.docx (UPLOADED: 10/4/2021)

If you have any questions, please contact QU-IRB at 4403 5307 or qu-irb@qu.edu.qa. Please include your project title and reference number in all correspondence with this committee.

Best wishes,

Dr. Mohamed Emara
Chairperson, QU-IRB

Institutional Review Board
(IRB)
Office Of Academic Research

- 1 -

This letter has been issued in accordance with all applicable regulations, and a copy is retained within Qatar University's records.

Qatar University-Institutional Review Board (QU-IRB), P.O. Box 2713 Doha, Qatar
Tel +974 4403-5307 (GMT +3hrs) email: QU-IRB@qu.edu.qa

APPENDIX C: ONLINE SURVEY (ENGLISH)

The Relationship between Information Technology Competency and Entrepreneurial Performance: The Case of Qatar

Dear Respondent

We would like to invite you to participate in this research study titled 'The Relationship between Information Technology Competency and Entrepreneurial Performance: The Case of Qatar.' This research is being undertaken as part of my graduate project for the MBA program at Qatar University's College of Business and Economics. The research will explore how the adoption of information technology, including communication technologies, might benefit entrepreneurial success. Further, it aims to ascertain whether entrepreneurial traits can accelerate the adoption of information technologies. Its objective is to add to the growing body of knowledge about the relationship between entrepreneurship and information technologies. Qatar University Institutional Review Board approved this research study with the approval number QU-IRB 1613-E/21. If you have any questions related to ethical compliance of the study, you may contact the IRB committee at QU-IRB@qu.edu.qa.

The questionnaire contains three sections: the first section introduces the research topic and the second includes simple demographic questions and use information technologies. Finally, 26 items measuring the research model's eight constructs are addressed. This questionnaire should take no more than ten minutes to complete. Respondents contribute significantly to the disciplines of entrepreneurship and information technology by participating in the study. Participation is entirely optional and carries no financial cost or gain. Respondents may withdraw from the survey or any portio of it at any time without providing an explanation. Most importantly, unwillingness to participate in the study and/or withdrawal from the study will not in any way interfere with the student-instructor relationship or affect student's course grades assessment. Similarly, participation in the study will not i any way interfere with the student-instructor relationship or affect students' course grades assessment If participants supply their e-mail addresses, the study's results will be made available to them upon completion.

This study is open to both males and females over the age of 18, with an emphasis on entrepreneurs or persons who are now undertaking or have previously undertaken entrepreneurial studies. Participants may withdraw from the study at any moment without providing an explanation and may skip any question. Participants are not asked to disclose any personally identifiable information, and the survey will be fully anonymous. All data collected will be treated as strictly confidential. The data collected will be transmitted anonymously via a secure network. The data will be saved on a secure password-protected laptop that will be accessible only to the researcher. After three years, all data will be permanently deleted. By clicking on the questionnaire link provided, you give your full informed consent to participate in this study.

Kindly feel free to contact me or my supervisor to for any concerns or questions related to this study on the following contact details.

Research team:

Nasrina Issa Mauji (Graduate Student, ni1807595@student.qu.edu.qa)
Dr. Emad Abu Shanab (Supervisor, eabushanab@qu.edu.qa)

* Required

1. Are you an entrepreneur or undertaking/undertaken studies in entrepreneurship? *

Mark only one oval.

- ◯ Yes
- ◯ No (Since the survey has entrepreneurship related elements, further participation is not recommended). Thank you for your participation.

Demographics

2. Age: *

Mark only one oval.

- ◯ 18-24 years
- ◯ 25-40 years
- ◯ More than 40 years

3. Gender: *

Mark only one oval.

- ◯ Male
- ◯ Female

4. Education: *

Mark only one oval.

- ◯ Secondary or Diploma Certificate
- ◯ Bachelor
- ◯ Graduate

5. Nationality: *

Mark only one oval.

- ◯ Qatari
- ◯ Non-Qatari

6. How long have you been using ANY of the following information technology systems including hardware (such as laptops and tablet), business related software and communication and videoconferencing technologies including Microsoft Teams, LinkedIn, Twitter, Zoom Meetings, Dropbox, Keynote Presentation, Google Drive, Skype, Shopify, SEMrush, Google Analytics, Boomerang, Facebook, Instagram? *

Mark only one oval.

- ◯ Never
- ◯ Less than 2 years
- ◯ 3 - 5 years
- ◯ More than 5 years

Perceived Usefulness

7. Information technologies enable entrepreneurs to play their role in a business. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

8. Overall, information technologies enhance the effectiveness of managing a business. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

9. Overall, information technologies are useful for managing a business. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Perceived Ease of Use

10. Entrepreneurs can easily learn how to use information technologies. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

11. In general, information technologies are easy to use. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

12. It is easy for entrepreneurs to become skilful at using information technologies. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Task Characteristics

13. Entrepreneurs always deal with ill-defined business problems. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

14. Entrepreneurs often deal with problems that involve more than one business function. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

15. Entrepreneurs frequently work on business problems that require answering new questio *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Technology Characteristics

16. Information technologies always provide up-to-date data necessary for decision-making

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

17. Information technologies are always up and available to meet daily operations of the business. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

18. Information technologies are scalable to meet daily business needs. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Task-Technology Fit

19. Functionalities of information technologies help entrepreneurs meet daily business objectives. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

20. Using information technologies make it easy for entrepreneurs to identify business opportunities. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

21. Information technologies are compatible with daily entrepreneurial tasks. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Entrepreneurial Traits

22. Entrepreneurs take risks and work with uncertainties in their decision-making process. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

23. Entrepreneurs have the ability to be creative and innovative. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

24. Entrepreneurs are decisive. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

25. Entrepreneurs have a high need for achievement. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

26. Entrepreneurs are willing to take advantage of new opportunities. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Behavioral Intention

27. As an entrepreneur, I will use information technologies. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

28. I will recommend other entrepreneurs to make regular use of information technologies. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

29. As an entrepreneur, I plan to use information technologies frequently. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

Entrepreneurial Performance

30. Information technologies help in creating new business models. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

31. Information technologies help in spotting new market opportunities. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

32. Information technologies open opportunities to increase financial benefits. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

APPENDIX D: ONLINE SURVEY (ARABIC)

لعلاقة بين كفاءة تقنية المعلومات وأداء ريادة الأعمال: الحالة لقطرية.

زيزنا المستجيب للدراسة

عوك للمشاركة في هذه الدراسة البحثية بعنوان "العلاقة بين كفاءة تكنولوجيا المعلومات وأداء ريادة الأعمال: الحالة القطرية". هذا البحث جزء من لزوع التخرج لبرنامج ماجستير إدارة الأعمال في كلية الإدارة والاقتصاد بجامعة قطر. يهتم البحث بكيفية الاستفادة من تكنولوجيا المعلومات، بما ي ذلك تكنولوجيا الاتصال، لزيادة فرص نجاح ريادة الأعمال. علاوة على ذلك، فإنه يهدف إلى التأكد مما إذا كانت السمات المرتبطة بريادة الأعمال كن أن تسرع من تبني واستخدام تكنولوجيا المعلومات، حيث ان هدفها هو البناء على المحتوى المتنامي حول العلاقة بين ريادة الأعمال وتكنولوجيا معلومات. وافق مجلس المراجعة المؤسسية بجامعة قطر على هذه الدراسة البحثية برقم الموافقة QU-IRB 1613-E/21. إذا كانت لديك أي أسئلة علق بالامتثال الأخلاقي للدراسة، فيمكنك الاتصال بلجنة IRB على QU-IRB@qu.edu.qa.

تنوي الاستبيان على ثلاثة أقسام: القسم الأول يقدم موضوع البحث والثاني يتضمن أسئلة ديموغرافية بسيطة وأسئلة تتعلق باستخدام تكنولوجيا معلومات. أخيرًا، تم ادراج 26 فقرة تقيس المتغيرات الثمانية لنموذج البحث. ليس من المتوقع أن تستغرق تعبئة هذا الاستبيان أكثر من عشر دقائق. تساهم مشاركتكم في هذه الدراسة بشكل كبير في فهم العلاقة بين ريادة الأعمال وتكنولوجيا المعلومات، مع العلم بأن المشاركة اختيارية تمامًا ولا تمل أي تكلفة أو مكاسب مالية. ويجوز لكم الانسحاب من الاستطلاع أو أي جزء منه في أي وقت دون تقديم تفسير. والأهم من ذلك، أن عدم الرغبة ي المشاركة في الدراسة و / أو الانسحاب من الدراسة لن يتعارض بأي شكل من الأشكال مع العلاقة بين الطالب والمدرس أو يؤثر على تقييم جات المقرر الدراسي للطالب. وبالمثل، لن تتعارض المشاركة في الدراسة بأي حال من الأحوال مع العلاقة بين الطالب والمدرس أو تؤثر على ييم درجات الطلاب في المقرر الدراسي. إذا قدم المشاركون عناوين بريدهم الإلكتروني، فسيتم توفير نتائج الدراسة لهم عند الانتهاء.

ة الدراسة مفتوحة لكل من الذكور والإناث الذين تزيد اعمارهم عن 18 عامًا، مع التركيز على رواد الأعمال أو الأشخاص الذين يجرون الآن أو بق لهم إجراء دراسات أو اخذ مسافات في ريادة الأعمال. ويمكن للمشاركين الانسحاب من الدراسة في أي لحظة دون تقديم تفسير ويمكنهم تخطي ي سؤال. ولا يُطلب من المشاركين الكشف عن أي معلومات شخصية، وسيكون الاستطلاع مجهول الهوية بالكامل. كما سيتم التعامل مع جميع يانات التي يتم جمعها بسرية تامة. وتأكيداً على ذلك، سيتم إرسال البيانات التي يتم جمعها بشكل مجهول عبر شبكة آمنة. كما سيتم حفظ البيانات لى جهاز كمبيوتر محمول آمن محمي بكلمة مرور ولا يمكن الوصول إليه إلا من قبل الباحث. بعد ثلاث سنوات، سيتم حذف جميع البيانات نهائيًا. ن خلال النقر على رابط الاستبيان المبين أدناه، فإنك تعطي موافقتك المستنيرة الكاملة على المشاركة في هذه الدراسة.

تتردد في الاتصال بي أو بمشرفي لأي مخاوف أو أسئلة تتعلق بهذه الدراسة على تفاصيل الاتصال التالية.

يق البحث:

نسرين عيسى موجي (طالبة دراسات عليا، ni1807595@student.qu.edu.qa)

د. عماد أبو شنب (مشرف، eabushanab@qu.edu.qa)

* Required

1. * هل أنت رائد أعمال أو قمت بإجراء دراسات أو اخذ مسافات في ريادة الأعمال؟

- ( ) نعم
- ( ) لا (بما أن الاستبيان يحتوي على عناصر متعلقة بريادة الأعمال، فلا يوصى بمزيد من المشاركة). أشكركم على مشاركتكم.

التركيبة السكانية

2. العمر: *

- 18- 24 عام
- 25-40 عام
- اكثر من 40 عام

3. الجنس: *

- انثى

4. التعليم: *

- شهادة ثانوية او دبلوم
- بكالوريوس
- دراسات عليا

5. الجنسية: *

- قطري
- غير قطري

6. ملذ متى وأنت تستخدم أيًا من أنظمة تكنولوجيا المعلومات التالية بما في ذلك أجهزة الكمبيوتر المحمولة والأجهزة اللوحية، والبرامج Zoomو Twitterو LinkedInو Microsoft Teams المتعلقة بالأعمال وتكنولوجيا الاتصالات ومؤتمرات الفيديو بما في ذلك Meetingsو Dropboxو Keynote Presentationو Google Driveو Skype، Shopify، SEMrush، Google Analytics، Boomerang، Facebook، Instagram؟ *

- لم استخدمها ابدا
- اقل من عامين
- أعوام 5 -3
- أكثر من 5 أعوام

الفائدة من الاستخدام

7. * يتمكن تكنولوجيا المعلومات رواد الأعمال من لعب دورهم في قطاع الأعمال

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

8. * بشكل عام، تعزز تكنولوجيا المعلومات فعالية إدارة الأعمال

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

9. بشكل عام، تعد تكنولوجيا المعلومات مفيدة لإدارة الأعمال *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

سهولة الاستخدام

10. يمكن لرواد الأعمال تعلم كيفية استخدام تكنولوجيا المعلومات بسهولة *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

11. بشكل عام، تعتبر تكنولوجيا المعلومات سهلة الاستخدام *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

12. من السهل على رواد الأعمال أن يصبحوا ماهرين في استخدام تكنولوجيا المعلومات *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

خصائص المهمات

13. يتعامل رواد الأعمال دائمًا مع مشاكل العمل غير المحددة *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

14. يتعامل رواد الأعمال غالباً مع المشكلات التي تنطوي على أكثر من وظيفة عمل واحدة *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

15. يعمل رواد الأعمال بشكل متكرر على حل مشاكل العمل التي تتطلب الإجابة عن أسئلة جديدة *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

خصائص التكنولوجيا

16. توفر تكنولوجيا المعلومات دائمًا بيانات محدثة ضرورية لاتخاذ القرار. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

17. تكون تكنولوجيا المعلومات دائمًا متاحة لتلبية العمليات اليومية للأعمال. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

18. تكنولوجيا المعلومات قابلة للتطوير لتلبية احتياجات العمل اليومية. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

المواءمة بين التكنولوجيا والمهمات

19. تساعد وظائف تكنولوجيا المعلومات رواد الأعمال على تحقيق أهداف العمل اليومية. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

20. * يساعد استخدام تكنولوجيا المعلومات رواد الأعمال على تحديد فرص العمل.

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

21. * تتوافق تكنولوجيا المعلومات مع مهام ريادة الأعمال اليومية.

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

سمات ريادة الأعمال

22. * يتحمل رواد الأعمال المخاطر ويواجهون غموضا في عملية اتخاذ القرار.

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

23. * رواد الأعمال لديهم القدرة على الإبداع والابتكار.

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

24. رواد الأعمال حاسمون *

	1	2	3	4	5	
موافق بشدة	◯	◯	◯	◯	◯	غير موافق بشدة

25. رواد الأعمال لديهم حاجة كبيرة للإنجاز *

	1	2	3	4	5	
موافق بشدة	◯	◯	◯	◯	◯	غير موافق بشدة

26. رواد الأعمال على استعداد للاستفادة من الفرص الجديدة *

	1	2	3	4	5	
موافق بشدة	◯	◯	◯	◯	◯	غير موافق بشدة

النوايا السلوكية

27. كرائد أعمال، سأستخدم تكنولوجيا المعلومات. *

	1	2	3	4	5	
موافق بشدة	◯	◯	◯	◯	◯	غير موافق بشدة

28. سأوصي رواد الأعمال الآخرين باستخدام تكنولوجيا المعلومات ومواصلة ذلك مستقبلا. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

29. كرائد أعمال، أخطط لاستخدام تكنولوجيا المعلومات بشكل متكرر. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

أداء ريادة الأعمال

30. تساعد تكنولوجيا المعلومات في إنشاء نماذج أعمال جديدة (مبتكرة). *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

31. تساعد تكنولوجيا المعلومات في اكتشاف فرص السوق الجديدة. *

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة

32. تتيح تكنولوجيا المعلومات فرصًا لزيادة الفائدة المالية.

	1	2	3	4	5	
غير موافق بشدة	◯	◯	◯	◯	◯	موافق بشدة