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DEPARTMENT OF BUSINESS ADMINISTRATION



**ANALYSIS OF THE RELATIONSHIP BETWEEN THE
ADOPTION TO ICTS AND THE INTERNATIONALIZATION
OF SMES IN NORTHERN IRAQ**

MASTERS DEGREE

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ABSTRACT

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TO ICTs AND THE INTERNATIONALIZATION OF SMEs IN
NORTHERN IRAQ
MASTER THESIS
BRİNDAR MALO KHAWAJA
BOLU ABANT İZZET BAYSAL UNIVERSITY
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The primary purpose of this study is to examine the relationships between the adoption of information and communication technologies (ICTs) and the internationalization of small and medium-sized enterprises (SMEs) in Northern Iraq. The data is obtained from the managers of SMEs, particularly those working within the service sector, through a survey; the sample comprises 278 returned responses from managers. The study data was analyzed using SPSS v-26 to test the hypotheses. The regression analysis is used to test the study hypotheses, and the results suggest that using ICTs in business activities positively influenced the internationalization of SMEs via improving international position and international experience. Results indicated that the adoption to ICTs in SMEs activities and ICTs usage related to human capital skills have influenced the internationalization of SMEs, particularly the international position and international experience. Furthermore, as an external resource, the government supports for adoption to ICTs of SMEs, which is favorably related to their ICTs usage capacities, and significantly influenced the internationalization of SMEs, particularly the international experience of SMEs.

KEYWORDS: ICTs (Information and Communication Technologies), Internationalization of SMEs (Small and Medium-sized Enterprises), Emerging Economies, Northern Iraq.

ÖZET

KUZEY IRAK'TAKİ KOBİ'LERİN BİT'LERİNİ BENİMSEMESİ VE ULUSLARARASILAŞMASI ARASINDAKİ İLİŞKİNİN ANALİZİ

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Bu çalışmanın temel amacı, Kuzey Irak'ta bilgi ve iletişim teknolojilerinin (BİT) benimsenmesi ile küçük ve orta ölçekli işletmelerin (KOBİ) uluslararasılaşması arasındaki ilişkileri incelemektir. Veriler, özellikle hizmet sektöründe çalışanlar olmak üzere KOBİ'lerin yöneticilerinden anket yoluyla elde edilmekte; örnek, yöneticilerden gelen 278 yanıt içermektedir. Çalışma verileri, hipotezleri test etmek için SPSS v-26 kullanılarak analiz edildi. Regresyon analizi, çalışma hipotezlerini test etmek için kullanılır ve sonuçlar, BİT'lerin ticari faaliyetlerde kullanılmasının, uluslararası konumu ve uluslararası deneyimi geliştirerek KOBİ'lerin uluslararasılaşmasını olumlu yönde etkilediğini göstermektedir. Sonuç olarak, KOBİ'lerin faaliyetlerinde BİT'in benimsenmesinin, büyük ölçüde insan sermayesi becerileriyle ilişkili kullanım yeteneklerine dayalı olarak, KOBİ'lerin uluslararasılaşmasını, özellikle uluslararası konumlarını ve uluslararası deneyimlerini etkilediğini göstermiştir. Ayrıca, bir dış kaynak olarak hükümet, KOBİ'lerin BİT kullanım kapasiteleriyle olumlu bir şekilde ilişkili olan ve KOBİ'lerin uluslararasılaşmasını, özellikle de KOBİ'lerin “uluslararası deneyimlerini önemli ölçüde etkileyen, KOBİ'lerin BİT'lerinin benimsenmesini desteklemektedir.

ANAHTAR KELİMELE: ICT'ler (Bilgi ve İletişim Teknolojisi), KOBİ'lerin uluslararasılaşması, Gelişmekte Olan Ekonomiler, Kuzey Irak

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LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviation Explanation

APEC	: Asia-Pacific Economic Cooperation
B2C	: Business to Consumer
CIP	: Capital Improvement Program
CRM	: Customer Relationship Management
DIT	: Department of Information Technology
ERP	: Enterprise Resource Planning
EU	: European Union
FDI	: Foreign Direct Investment
G20	: Group of Twenty is an Intergovernmental Forum Comprising 19 Countries and the European Union (EU)
GCC	: Gulf Cooperation Council
GDP	: Gross Domestic Product
ICT	: Information and Communications Technology
IT	: Information Technology
KM	: Knowledge Management
KMO	: Kaiser-Meyer-Olkin
OECD	: Organization for Economic Coordination and Development
PCA	: Principal Component Analysis
R&D	: Research and Development
SEM	: Structural Equation Modeling
SMEs	: Small and Mid-size Enterprises
SMMEs	: Small, Medium, and Micro Enterprises
SPSS	: Statistical Package for the Social Sciences
SWOT	: Strengths, Weaknesses, Opportunities and Threats
UK	: United Kingdom
URL	: Uniform Resource Locator
US	: United States
VIF	: Variance Inflation Factor
WSIS	: World Summit on the Information Society

Symbol Explanation

%	: Percentage
\$	: US Dollar
R²	: R Square

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INTRODUCTION

Adopting information and communication technologies (ICTs) is vital because SMEs are under intense pressure and experiencing constant transformations that can be difficult due to various factors that can be addressed at the required speed (Alam et al., 2022; Ziemba, 2016). However, the rapid development of technology and customer needs requires a sufficient balance of research and development programs to respond better and faster than competitors. Consequently, complex environmental features must expect changes through companies, mainly SMEs that need to stay in this exploratory presence of their external environment, which is the core of strategic attention that follows to avoid potential threats and seize possible opportunities (Elliot, 2011).

In this context, technological innovations affect economic and social development simultaneously; however, there is a deficiency in accurately determining the adoption of ICTs and its effects on the internationalization of SMEs (Kergroach, 2020). Thus, there is a research gap that needs more studies on that. In addition, the researcher could not confront with such a similar empirical study regarding Iraq or Northern Iraq in the relevant literature. Instead, businesses have undertaken international trade and cross-border activities for centuries; however, accelerated globalization has created a new and vicious business environment, internationalizing large firms and small businesses (Rana, 2020; Sandberg, 2012).

Based on that, ICTs impact the current business environment. Businesses are under pressure to adjust and keep up with shifting consumer preferences. For instance, ICTs are more present in lives than ever before when we consider the rapid technological advancements, such as the widespread availability of broadband internet access, intelligent devices that are inexpensive and more capable with each iteration, and the ubiquity of contemporary communication opportunities (Ferro et al., 2010). The effects of this existence move beyond users and consumers; it significantly affects how businesses do their business. In this

regard, using ICTs is no longer a choice for businesses; however, it is a strategic factor for the internationalization of SMEs.

Over the past three decades, SMEs have been critical actors in national economies, they are dynamic and flexible, and their role in job creation is crucial. Moreover, because of the internationalization of economies and the acceleration of globalization processes, many SMEs were trying to take advantage of new environmental conditions, that is, opportunities for internationalization; thus, many began to enter international markets (Castagna et al., 2020; Daszkiewicz & Wach, 2012).

This study focuses on the adoption to ICTs and the internationalization of SMEs in Northern Iraq, particularly in the service sector. SMEs rarely handle their investments and operations more cautiously due to their limited financial resources than large corporations. The topic of this study was chosen to approach the issues raised from a particular perspective and focus on a smaller group of the service sector in northern Iraq. SMEs were also selected because of the exciting considerations that must be made in their decision-making processes, as the world economy has also witnessed successive technological developments, trade, and investment liberalization. As a result, the world has become a small village, and one of the main features of these transformations is the increasing awareness of countries for the importance of the role of SMEs in building and revitalizing the wheel of the economy as a distinctive fabric (Abdullah & Zain, 2011).

Moreover, the degree of internationalization of SMEs, regularly marketing their products outside the borders of the country, is far from that of a multinational corporation that has branches in different parts of the world, and the majority of enterprises that attempt to internationalize go through different stages of international commitment, gradually gaining experience in foreign markets (Denicolai, Zucchella & Magnani, 2021). Based on that mentioned above, the study attempts to reach two purposes, and the first is to reveal SMEs in the service sector and their efforts to adopt and use ICTs by looking at their ICTs skills in Northern Iraq. The second is to provide unique information to businesses in the service sector that want to integrate ICTs into their operations better. Finally, empirical data are obtained using a survey to measure the adoption of ICTs and the internationalization of SMEs within the service sector in Northern Iraq.

The regression analysis is applied to test the study hypotheses, and the value of the coefficient of determination (R^2) implies the change in the internationalization of SMEs (international position and international experience) due to the change in the adoption to ICTs through the use of ICTs in business activities, and government supports for adapting ICTs. Consequently, (49.6%) of the change in the international position experience of SMEs is due to the independent variables represented in the adoption to ICTs. Moreover, (17.6%) of the change in the international experience of SMEs is due to the independent variables represented in the adoption to ICTs.

The result suggested that using ICTs in business activities positively influenced the internationalization of SMEs (their international position and international experience). Results indicated that the usage of ICTs in business activities based on the usage abilities is favorably related to human capital skills, which positively and significantly influenced the international position and international experience of SMEs. Furthermore, the government supports (external resources) for adapting ICTs are favorably related to the ICTs usage capacities of firms, which significantly influenced the international position and international experience of SMEs.

This study comprises an introduction in the first chapter and the other four Chapters. The second chapter addresses the theoretical aspects of ICTs in the economy and the internationalization of SMEs. It deals with the importance of SMEs in the economy, generally in the world, Iraq, and Northern Iraq. It also covers the significance of ICTs on the internationalization of SMEs. In addition, it addresses the relationship between the adoption of ICTs and the internationalization of SMEs, and conceptual study models are employed. The third chapter includes the methodology of the study. It also addresses the research design, the questionnaire components, and the data collection methods used in the study to evaluate the hypotheses. Furthermore, it includes the study population, samples, data sources, and scale measurement.

Chapter four examines empirical data on the relationship between the adoption to ICTs and the internationalization of SMEs in Northern Iraq and tests the study hypotheses based on the survey responses from SMEs in the service sector in Northern Iraq. The first part of the data analysis assesses the general

information about the usage of ICTs and managers' perceptions regarding the relationship between the adoption of ICTs and SMEs' internationalization in Northern Iraq. Chapter five includes the study's conclusions, highlighting the management implications, explaining the limits encountered, and concluding with recommendations for future research.

Background of the Study

Information resources and technology have become a privileged position in the global economy after economic ideas revolved around natural and productive resources as an engine of the global economy and as a base for the wheel around that (Ziemba, 2016; Chege et al., 2020). The economic development cycles revolve, especially after the emergence of the industrial revolution, but with the rapid technological progress and the emergence of ICTs (Daszkiewicz, Wach, 2012). That shortened the distances between countries and reduced time across the world's continents, reducing the time and spatial gaps, all of which support the internationalization of SMEs (Abdullah & Zain, 2011).

Political and economic blocs have resulted in significant changes and advancements that have forced entrepreneurs and politicians to support the SME sector's steady expansion in developed and emerging nations. ICTs have also helped increase and improve information value in economic development, particularly in recent years (Ziemba, 2016). The ICTs revolution has given rise to the concept of communications, connecting every organization with every other organization electronically through a network of the global community that transcends geographical and natural boundaries using telephones, television, personal computers, satellites, satellite dishes, microwaves, etc. (Abdullah et al., 2020; Arvanitis, 2005).

Therefore, technical advancement is a factor in the growth of the economy and society. One component may be minor or unimportant in one region while being crucial in another due to regional variances. As might be expected, some aspects, including quality and compatibility, have an influence that cannot be quantified (Bell et al., 2003). Additionally, the economic environment is favorable, and the significant development of multinational corporations during a specified period has increased production capacity and had competitive difficulties. As a result, many multinational firms have expanded into developing

nations in pursuit of more essential markets. As a result, the nature of international trade began to alter, and following the signing of various accords, import restrictions in wealthy nations were gradually lowered (Cline, 2010).

Even until the mid-1980s, many developing nations remained excluded from this growing international specialization, but several factors, such as the success of the Asian Tigers and outside pressure to liberalize trade, have caused this exclusion to grow. As a result, an increasing tendency for integration and globalization has resulted (Raynard & Forstater, 2002).

Due to these developments, SMEs are now a significant, diverse, and important sector in both mature market economies and economies in transition. For instance, the G-8 meeting in Denver in 1997 highlighted how the SME sector significantly contributed to employment and economic dynamism in the most industrialized countries and emphasized how this experience could be applied to the sustainable development of developing countries, which resulted in the formal recognition of this role (Basly, 2007; Denicolai et al., 2021). These findings lead at the international level to advise on economic liberalization, deregulation, and democracy as the most important means of eradicating poverty and inequality in developing countries. The growth of the private sector, in which SMEs play a key role, is crucial to achieving these goals (Gherghina et al., 2020; Hubner, 2000).

Managers and economists in developed market economies are changing the way they think and how they view the prospects for economic success in response to these changes. Economic theory has resurrected the idea that entrepreneurs are the primary driver of economic progress, and the cult of entrepreneurship has been growing at business schools worldwide (Armawan et al., 2022). The need for conventional economies of scale of large organizations has diminished due to financial advantages from the market, innovative flexibility, increased capacity to adapt, and improved attention to consumer requirements. The proportion of SMEs in firms and the number of people they employ have increased in many advanced economies. They have also been recognized as early adopters of cutting-edge management strategies and technology (Cline, 2010; Hubner, 2000).

Significance of the Study

The study's significance is embodied in showing the importance of internationalization as a result of adopting ICTs to discovering new markets for locally produced products and services and achieving a solid competitive position by studying foreign markets and identifying the internationalization opportunities available to them, how to work on seizing and developing them to achieve the goals of the institution (Nurfarida et al., 2022; Öz, Sahin, Çallı, & Coşkun, 2022). However, the researcher could not confront with such a similar empirical study regarding Iraq or Northern Iraq in the relevant literature. As a result, the study's findings may be helpful to businesses in Iraq since they may be used by SMEs leaders to create practical internationalization projects that will increase their bottom lines. For instance, in the early 2000s, the strategies used by Iraqi firms when adopting ICTs, particularly SMEs leaders' efforts to grow their companies' operations abroad, contributed to the recognition of the significance of SMEs (Francioni et al., 2013).

Internationalization is also essential for knowledge-related motives. For instance, internationalization decisions are usually made by SMEs managers or owners who have international experience and management ability (Ratten et al., 2007). For example, research on German SMEs demonstrated that they decide to internationalize their product to foreign markets because they have strong R&D and company resources (Rammer & Schmiele, 2008; OECD, 2009).

Long-term disruptions in supply and demand. Due to the local nature of demand and the lack of entry obstacles, several sectors—retail, hotels, restaurants, entertainment, and construction—have a rising number of SMEs. For instance, 60–70% of OECD SMEs operate in these industries, which makes them more susceptible to the crisis. SMEs in supply chains represent SME owners and more prominent corporate clients, making them an essential component of the economy in almost every culture. Keeping these companies in place and enhancing their ability to revitalize their operations rapidly would be a starting point for the economy (Ali, Li, Ahmed, Ali & Khan, 2021).

Abdullah and Zain (2011) revealed that social ties/ networks and supply chain links play an essential role in supporting the internationalization of SMEs by establishing linkages between home and host countries and arranging export

opportunities. Furthermore, the importance and challenges of considering the internationalization tactics that SME leaders employ in today's global markets are managerially pertinent. The findings of this study might also supplement studies already conducted by the government, and policymakers might utilize them to create initiatives to aid Iraqi SMEs in their internationalization.

Statement of the Problem

The core purpose of information systems is to monitor appropriate data in accordance with an effective selection process to be best addressed by the decision-maker. As a result, evolution and progress in all fields have become dependent on ICTs. This is especially true for businesses requiring sound and accurate ICT information resources at all levels. However, given the competitive realities SMEs face, presenting it as ready-made and reliable information is complex (Paul, Lal, 2018).

Businesses have always been significant in resolving the global unemployment problem and growth slowdown. Promoting the SMEs community as a crucial element in overcoming mass unemployment and combating poverty started at the onset of restoring their nation's industrial field. It is commonly known that Germany and South Korea have both had prior experience in this area (Kume et al., 2009).

According to Soellner (2014), SMEs currently create 60% of all jobs and about 50% of the gross added value in the state of Wuettenberg's industrial location. South Korea allows it to monitor the same development and appreciates the SMEs it currently provides (Lee, 2016). Politicians' new strategy for solving the country's economic issues is to advance the interests of those in Iraq and the north. Due to the decline in oil prices on the global market, insurgency costs, and the civil war, Iraq went insolvent and was forced to borrow money from foreign organizations to pay public employee salaries.

The main obstacles and dangers the SMEs community faces make it difficult to participate in initiatives to boost employment and revenue effectively. Based on that, the study will look at how SMEs have changed through time in Erbil, the country's capital, and other regions in the north of Iraq. Additionally, an effort has been made to measure the advancements made in the subject, so the problem of the study is embodied in the question of to what extent the adoption of ICTs supports the internationalization of SMEs in Northern Iraq.

Operational Definitions

Information and communication technologies (ICTs) is an expanded term for information technology (IT) that emphasizes the role of unified communications and the integration of communications (telephone lines and wireless signals), computers, and the software needed by organizations, centralized applications, storage, and audio and visual objects that enable users to access information and store information that has been understood and processed (Phutela & Dwivedi, 2019).

Using a single cable system or interconnection system, ICTs can also refer to the integration of audio, video, and telephone networks with computer networks. An integrated system of cables, signal delivery, and administration is needed to connect the telephone network to the computer network, as there is a significant economic incentive. Every communication equipment, including radio, television, mobile phones, computers, networks, satellite systems, and several services and tools, such as video conferencing and remote learning, are included under the general term ICT (Paul & Lal, 2018).

ICT also includes analog technology, paper communication, and any communication mode. Small and Medium Enterprises (SMEs) are companies in which revenue, asset value, or the number of employees does not exceed certain limits. The definition of SMEs varies from country to country and from one economic organization to another (Li, Qian, and Qian, 2012). In this regard, SMEs obtain a competitive edge by utilizing readily available resources and selling their goods internationally (Asare & Fei, 2015; Cannone & Ughetto, 2014).

Internationalization refers to international business activities that undergo a multifaceted process called internationalization, which cannot have a particular direction or arrangement and are both internal and external (Halilem, Amara & Landry, 2014). The benefits of SMEs to any economy can be easily seen and include job creation at a relatively low capital cost, a means of reducing income disparities, and the development of a pool of skilled and semi-skilled workers (Karabulut, 2013).

CHAPTER ONE

1. LITERATURE REVIEW

This chapter addresses the theoretical aspects of ICTs in the economy and the internationalization of SMEs. The chapter, therefore, deals with the importance of SMEs in the economy, generally in the world, Iraq, and Northern Iraq. It also covers the significance of ICTs on the internationalization of SMEs. In addition, it addresses the relationship between the adoption of ICTs and the internationalization of SMEs. Furthermore, it employs theories and conceptual study models.

1.1 Theoretical Aspects of ICTs

The adoption of ICTs can be a fundamental factor in developing enterprises in a country's economy, such as Iraq and Northern Iraq. ICTs, both in businesses and the policymaking arena, have been recognized for their potential to open up new opportunities for enterprise development at various levels ranging from firms to industries and national levels and especially for the internationalization of SMEs (Fong, 2009; OECD, 2013). At the company level, ICTs can facilitate communications and coordinate operations within or between companies in the supply chain (Jin, 2006; Ziemba, 2016).

Similarly, technologies can improve management decision-making by promoting the distinction between information. The results may be in economies of scale, reduced fixed costs, increased productivity, and improved competitiveness (Bourlakis, Bourlakis, 2006; Pilat, 2004). Furthermore, ICTs can promote effective market performance or management at the industry level (OECD, 2006). As a result, all these efficiencies and access improvements at the national level will be pooled through economic growth or sustainability and welfare gains (Phutela, Dwivedi, 2019).

Since ICT refers to comprehensive technical tools used to acquire, process, store, and share digital data, in terms of generating economic growth and greater competitiveness, their fast development in recent years has made them vital for businesses and even governments (OECD, 2009). Available evidence shows that

ICTs have the potential to transform traditional corporate transactions and create new ones by changing the process by which transactions are made, creating new products and services, and creating new markets in time, space, and information that did not exist before. In addition, the ICT force enables business networks within and between businesses and geographies to grow (Bayero, Daneji, 2016).

This offers a forum for exchanging knowledge, choices, and chances for collaboration and tech transfer. For example, ICTs for SMEs may increase productivity, save expenses, and broaden the market both domestically and internationally. Because of this, investing in ICTs in the SMEs sector helps businesses become more productive, competitive, and network-ready to take advantage of new job prospects (Gherghina et al., 2020).

James (2000) mentioned that the United States and the European Union increased the use of ICTs in SMEs, mainly between 1992 and 2010, compared to the previous two decades; The total growth in the 15 European Union countries slowed growth during the same period. In this context, such as researchers (Elliot, 2011; Ferro et al., 2010) attribute this disparity to two key factors: increased investment in the 1990s and a significant expansion of the market services sector in the first half of the 2002s. As a result, their research serves as a benchmark for the importance of ICTs and the service industry as economic drivers of growth. Similarly, Paul and Lal (2018) studied the G-20 countries in their research and claimed that ICT infrastructure development and economic growth are linked.

ICTs help growth in established nations and developing and emerging markets, demonstrating ICT's importance as a macroeconomic growth driver regardless of the countries' development level, where ICTs infrastructure development and economic growth are linked. On a lesser scale, the extant literature also promotes ICTs use at the corporate level (Tarute and Gatautis, 2014). Raban et al. (2011) explore how information technology pushes organizations' information management capacities to new heights, resulting in improved process management and operational performance. These technologies may help businesses innovate and increase their competitiveness by developing new goods and services and enhancing existing operations (Del Gaudio, Porzio, Sampagnaro & Verdoliva, 2021).

Arvanitis (2004) shows favorable corporate efficiency in research done in Switzerland and believes that ICTs and human capital have a complementary impact, which means that focusing on these two aspects together improves company performance beyond the individual benefits of each. In this context, Lee et al. (2010) provide a model that connects ICTs adoption, restructuring of business processes, and company performance. They also conclude that ICTs adoption allows business process optimization, which leads to increased corporate company performance. Furthermore, these studies substantially use company operational and financial success. Furthermore, research highlights ICT's transformational effect on intangible and intermediate performance metrics (Customization, Hitt, 2000). As a result, it is reasonable to predict that ICTs will become more widely available and continue to be critical for businesses seeking to maintain and extend their competitive edge (Öz, Sahin et al., 2022; Shank et al., 2004).

1.1.1 ICTs Usage and Stage Classification

The literature demonstrates how taxonomies recognize and group various technological approaches (Lung et al., 2005) and analyses business's benefits in light of using ICTs tools and strategies they implement. Companies are categorized into four groups based on tool distinction factors and usage intensity: guideposts, exploiters, explorers, and latecomers. The benchmarks are people that use a wide range of tools for a wide range of tasks, whereas those who use the laggards use applications. Programs that use various strategies are among the many diverse programs that fall under exploiters. For example, few applicants are accepted as explorers, and those who do not meet the requirements in both categories are rejected (Bayero, Daneji, 2016).

ICT utilization in the company may be done similarly. Guideposts employ various ICTs tools and believe them essential for various company tasks. For example, if the data reveals that these enterprises outperform the competition, they can set an example for the rest of the sector to employ ICTs in more diversified and intensive ways—the utilization and advantages for businesses (Chege et al., 2020; Paul, Lal, 2018).

According to earlier literature, ICTs have altered the competitive landscape and industry structures. Second, it has given enterprises that have

integrated ICTs into their operations a competitive edge. Third, it has an impact on how businesses operate. To meet the challenges in their business environment, these developments force SMEs to embrace ICTs activities (Denicolai et al., 2021; Ongori, 2008). A broad category of technologies is used for information processing and storage (Rao, 2004). In this context, Kotelnikov (2007) also provided a thorough overview of cell phones for more sophisticated and is linked to the upcoming ICTs development, from basic techniques to more sophisticated ones. SMEs that have access to the internet can employ more sophisticated communication technologies like email, file sharing, and website creation, while those in the manufacturing industry choose to use more sophisticated information technology (IT) tools, like software. However, ICT use seems advantageous for businesses (Tan et al., 2010).

Kotelnikov (2007) emphasized that employees can use technologies quickly by adopting more sophisticated ICT capabilities. International marketplaces are just two of the many variables that influence adoption. For example, the usage of ICTs tools, which include computers and software, is often referred to as Internet-based ICTs adoption in this study. Adoption specifically refers to the choice to interact with stakeholders via Internet-based ICTs for communication and business purposes. Despite the potential benefits of these technologies, there remains debate about whether and how using ICTs and e-commerce enhances company performance. Investment is necessary for SMEs to use ICT tools. In addition to possible gains in skills and creativity, acquisition and change also carry risks and costs that must be considered. Despite the potential to benefit from SMEs being highlighted by multiple studies, well-known companies are entering countries where SMEs represent the majority (European Commission, 2005; Kume et al., 2009). In addition, it can be difficult for SMEs to launch and maintain an online business because doing so requires direct spending on software and hardware purchases and indirect costs for organizational adjustments and training. While much research demonstrates that using ICT enhances business success, some studies have shown no correlation between using computers and business performance (Alam, Noor, 2009).

A study of Canadian industrial enterprises (plants) with ten or more employees was undertaken, excluding food processing facilities. Statistics

Canada's Business Register statistics show that industries with substantial productivity increases are more likely to adopt more advanced ICTs. Additionally, between 1988 and 1997, ICT users outpaced non-users regarding productivity and profitability, particularly when employing communication technologies like intra- and inter-company computer networks (Ongori & Migiro, 2010).

1.1.2 Significance of ICTs in Business

Using ICTs in business processes or transactions can offer many advantages. For example, ICTs adoption has been shown to enhance knowledge management and information flow within organizations, lower transaction costs, and speed up and reliably conduct transactions through usage. It was also discovered that ICTs tools might be both current and potential clients (OECD, 2013). For many SMEs, it is essential to succeed and survive; selling their goods in foreign markets allows SMEs to compete with large corporations, and according to Bell et al. (2003), ICTs can be a base for SMEs to build their business strategies emphasizing cost- and time-copy benefits. Alam et al. (2022) highlighted that it helps open new markets and accomplishes low-cost communication for SMEs.

SMEs improve a nation's economic competitiveness; as a result, these factors contribute to society's well-being by creating money and jobs. Therefore, governments are interested in promoting SMEs' use of and access to ICTs (Mutula, Brakel, 2006). Utilizing ICTs internally reduces operations and speeds up business and customer activities. ICTs are beneficial for improving external communication and service quality for current and prospective customers (Rosemary, Craig, 2004). In conclusion, they could spur innovation among SMEs and create a step change in their competitiveness.

Moreover, as economies integrate ICTs advancements more deeply, SMEs will likely gain from domestic and foreign business (Ongori, Migiro, 2010). As an effective tool, ICTs should promote services in different sectors, including education, communication, cooperation, information collection and analysis, and identification and mitigation of the problem, as they are essential for creating skills and knowledge and providing channels for cooperation with international institutions (Drent, Meelissen, 2008). Analysis of ICTs and SMEs only began to reveal computers' significant effects on business productivity levels in the 1990s.

Results also demonstrated excellent output from essential businesses. Similar results were also found when examining the various ICTs' effects on productivity (OECD, 2008).

For instance, the findings were further supported in research by Brynjolfsson and Hitt (2000), highlighting the need for supplementary variables such as administrative restructuring and boosting staff skill levels to enhance productivity due to investments in ICTs. However, few studies study how ICTs affect small enterprises in developing countries, partly due to data difficulties. For example, Tarute and Gatautis (2014) revealed that businesses using more sophisticated ICTs have, on average, higher labor productivity and faster growth rates for SMEs engaged in manufacturing in India. Furthermore, surveyed 59 Indian SME factories produced electric and electronic goods, most of which employed under 50 people IT-using businesses were shown to have more volumes.

Furthermore, there is evidence connecting ICTs use with SME export performance. ICTs are not made feasible by investing only in technology; instead, they are combined with other technologies and, especially, with the essential skills—businesses of the concept with key. ICT use might now, on the one hand, increase the competitiveness of SMEs owing to links. Additionally, ICTs might help bigger firms be more adaptable in restructuring an organization (Wolf, 2001; Gherghina et al., 2020).

1.1.3 Advantages of ICTs for Companies Operating in a Global Economy

It is impossible to overstate SMEs' importance to many countries' economies. SMEs contribute to domestic production in most developed countries and have long been an essential source of labor and production in emerging countries. This category is innovative in adopting business practices adapted to changing business habits. For example, SMEs currently employ more than 59 percent of the workforce in the UK for most job growth (OECD, 2013).

In all of Europe's enterprises, the typical SME employs 6.8 people. SMEs are crucial in shaping national policy by promoting entrepreneurship and company growth. They are an essential connection in promoting rising local and national levels of innovation. In Hong Kong, 98% of firms are small and medium-sized

enterprises (SMEs). For instance, in Asia-Pacific, SMEs account for between 30 and 60% of domestic output and between 40 and 80% of the workforce. Although the distribution differs between nations, most employment today is found in services, where most companies are small businesses (Lawrence, 2002). However, because of the significant increase in sectors where small enterprises have a comparative advantage, SMEs continue to create jobs (Ali et al., 2021).

SMEs are crucial for the economy but also have a significant social influence. For instance, SMEs generally cater to specialized markets, exhibiting particular social and cultural qualities. Compared to large corporations, SMEs typically reflect society's more unique and individualistic aspects. Due to their greater independence and entrepreneurial spirit, which reflect positive societal values, SMEs are seen as a vital source of social stability (Lawrence, 2002); however, SMEs confront several obstacles in their quest to compete in a significant position in the global economy effectively.

However, SMEs, particularly small enterprises, face the additional issue of having insufficient financial, technological, and human resources (Wymer, Regan, 2005). If they can be used easily, affordably, and without costly expert support, information technology and the direct use of information can be vital for this category of organizations. ICTs are a critical component that supports corporate growth and improves productivity and efficiency in this area. ICTs also play a more prominent role in SMEs' ability to increase productivity, reduce costs, and foster flexibility. Additionally, SMEs have started to see the importance of participating in this, the necessity of conducting business worldwide, and the opportunity to overcome obstacles like distance (Alam, Noor, 2009).

In the Asia-Pacific Economic Cooperation (APEC), SMEs comprise 95% of all businesses and 35% of all regional exports. In addition, new information and commerce technologies have made it possible for small businesses to use global tools that make it easier to look for accessible goods and potential suppliers. It also helps businesses with marketing and advertising needs (Alam et al., 2005).

1.2 Theoretical Aspects of SMEs

Many countries' main national and regional development actors are SMEs. However, there is much research on the importance of SMEs in a country's

economy. Many countries are implementing to support SMEs in various programs and policies. In this context, the definition of SMEs in the European Union has changed. As a result, several programs have been implemented to improve innovation and entrepreneurship in SMEs (Berry, 2007; Castagna et al., 2020).

Therefore, institutions working on SME cases created several definitions. First, depending on a country's economic size, the definitional limit for SMEs often varies. So, rather than having a legal connotation, the term "SME" has an economic one. Most nations acknowledge that one standard indicator of what constitutes SMEs is their workforce. The definition of SMEs and the requirements for their scale are contentious issues regarding the standards for measuring the size of SMEs and the quantity (Gherghina et al., 2020; Price et al., 2018).

According to some researchers and institutions, the number of employees is more important; for enterprises, turnover is more critical in SMEs' definition. For example, the World Bank defines SMEs as micro-scale; less than 50 employees are considered small and medium-sized, and companies have 50-200 employees (Steyn, Spencer & Pebane, 2014). As a result, in May 2003, the Committee adopted a Recommendation on the Definition of SMEs and replaced the Recommendation of January 2005. The review considers economic developments since 1996 and lessons learned from implementing the definition (Jawad, 2013; Kljaji, Borstnar & Pucihar, 2021).

The definition of the new SMEs is an essential step towards improving their business environment and aims to enhance entrepreneurship, investment, and growth. This definition has been revised after intense consultations with stakeholders, proving that listening to SMEs is the key to successfully implementing Lisbon's goals and European Union standards. Table 2.1 below displays the definition of SMEs in 1996 and 2005.

Table 2.1. The Criteria for the EU Definition of SMEs in 1996 and 2005.

SMEs Category	Employment	Turnover (million\$)		Balance sheet (million\$)	
		1996	2005	1996	2005
Medium	250	40	50	27	43
Small	50	7	10	5	10
Micro	10	**	2	**	2

Source: by the Researcher

The new EU definition of SMEs includes those with less than 250 employees (EC, 2003). This group is also divided into micro companies (less than ten employees), small institutions (with employees between 10-49), and medium enterprises (with employees between 50-249). Small, Medium, and Micro Enterprises (SMMEs) are sometimes used instead of SMEs. The international symposium on sustainable development has rearranged EU statistics. By enterprise scope, Eurostat defines SMEs as 1-9 employees micro-scale, 10-49 employees on are small scale, 50-249 medium-sized, and 250-499 are large-scale (Ali et al., 2021; Porter, 2003).

1.2.1 Importance of SMEs in the World Economy

SMEs significantly influence economic activity and are the engine of economic growth. For instance, three out of every 25 persons (12%) were far from a job in European society in 1985. Hence, research was done to expand employment in Europe considerably. The study outcomes show that SMEs are one of the solutions to achieve this increase. It is noted that SMEs, which became more transparent in resolving employment problems, have also gained importance in Europe after the 1970s. It can be seen that SMEs constitute a large percentage of the total companies; however, SMEs are believed to have superior properties to large institutions during this time. Moreover, the role of SMEs has increased in creating job opportunities and gradually enabling international competition in many countries. In the 1970s, the context of the economic crisis was effective in such a situation (OECD, 2009). On the other hand, when the economies of developing and developed countries are investigated, the SMEs index shows the importance of this sector. Moreover, although SMEs show structural differences

from one country to another, the fact that these companies do not change is that these companies contribute significantly to the economies of countries around the world (Yılmaz, 2004).

Table 2.2. SMEs in USA, Germany, Japan, France, UK, South Korea, India, and Turkey

	USA	Germany	Japan	France	UK	South-Korea	India	Turkey
SMEs in total Enterprises (%)	97.2	99.8	99.4	99.9	96	97.8	98.6	99.5
SMEs in total employment (%)	50.4	64	81.4	49.4	36	61.9	63.2	61.1
SMEs in total Investment (%)	38	44	40	45	29.5	35.7	27.8	65.5
SMEs in total Value Added (%)	36.2	49	52	54	25.1	34.5	50	37.7
SMEs in total Export (%)	32	31.1	38	23	22.2	20.2	40	8
SMEs in total Credits (%)	42.7	35	50	48	27.2	46.8	15.3	4

Source: YILMAZ, B. (2004). Kobi'lerin Finansman Sorunlarına Bir Çözüm Önerisi: —Risk Sermayesi Finansman Modeli, DİĞ Ticaret Dergisi, DTM Yayını, Yıl: 9, Sayı: 33).

SMEs, performing an essential role in the growth and change of the economy, face international competition and are forced to compete in international markets. The internationalization of SMEs has attracted significant interest from researchers in scientific literature and remains one of the core areas. SMEs constitute the fundamental source of materials, ideas, processes, and services that large enterprises may not want to do. Aiming to take the cost advantage of scale economies, large companies have been implementing a product manufacturing policy for a long time due to significant investments in machinery, tools, devices, and human resources (Williams, Krumay, Schallmo & Scornavacca, 2022). However, SMEs do not face problems such as maintaining large-scale investments. However, SMEs may find great potential for further

international expansion because their economies are small and have a more flexible structure than large companies (Castagna et al., 2020).

SMEs are still crucial in prosperous and industrialized nations and emerging nations. Policies to boost small company employment were tried in industrialized nations in the 21st century, and some of these policies created and competed with small enterprises, resulting in changes in production, sales, and management. For instance, tiny programs not merely concerned with boosting employment boosted dynamic lifestyles and adventure in industrialized nations. Despite these difficulties, in all countries, it is possible to majority that SMEs make up about 99 percent of enterprises. Despite changing from country to country, SMEs account for 40-80 percent of employment and 30-70 percent of the national product (OECD, 2008).

Additionally, 5% of SMEs work for big businesses. This ratio establishes small enterprises' advantage over large ones. The fact that SMEs are in a position to drive improvements to industries and technology is one of the SMEs' minor but essential traits. SMEs are, therefore, widely dispersed within organizations that do innovative research. SMEs' opportunities will increase due to lower ICT costs, resulting in better product delivery worldwide. The contribution of SMEs to employment is also essential. The idea of developing SMEs projects and organizing projects in the scene of growth and development was introduced early in the late 1940s with the introduction of targeted policies (grants, supported credits, private tax treatment, etc.) and the establishment of governments for small businesses or project support SME agencies (for example, SMEs project agencies are funded from the public sector in 1948 in Japan, 1953 in the United States of America, 1954 in India, 1966 in Tanzania, and 1976 in Turkey) (OECD, 2008, 2009).

The size and significance of the SMEs sector vary from country to country, as they do with all other aspects of the economy. Over the past few decades, industrialized countries have begun to increasingly recognize the importance of SMEs, which has become more evident to developing nations since the 1970s. SMEs are essential for practically all economies worldwide, especially those in emerging nations (Berry, 2007).

In emerging nations, SMEs are of tremendous interest. There are most likely two primary causes for this. The first is the conviction that a successful anti-poverty program can be developed for SMEs. The second is the idea that SMEs are one of the building elements of revolution and long-term growth. These two factors are related since the majority of research from throughout the world indicates a correlation between growth and a reduction in absolute poverty. The development of SMEs aids growth, which very certainly also aids in reducing poverty (Warner, 2001, p.61).

SMEs considerably aid the establishment of a stable economic environment and growth. The growth of SMEs must be promoted if sustained economic development is to be achieved. They mainly require financial and consulting services to assist them in carrying out their everyday company operations or overcoming obstacles they face during the startup period (Flayyih et al., 2019; Güttler, 2001, p.89).

In addition to having capital and income-focused in more extraordinary businesses, developing nations that lack large sector SMEs also frequently lack the middle ground in their corporate size structure and have a working elite capable of negotiating for much higher wages than anywhere else in the economy. A huge SMEs sector is created as a result of the fact that large businesses use nearly all of the economy's capital stock (often as a result of capital market faults), leaving little capital available to be divided among numerous employees who are not employed by large organizations (Wolff, Pett, 2000).

Balanced wages in the small enterprise sector are meager, and capital incomes are low there, too. In short, income is distributed very unevenly. When the SME sector is large, radical capitalization and labor income distribution are avoided (Berry, 2007; Kazem, 2015). Moreover, SMEs contribute to job creation, income generation, and export earnings in developing countries. However, in order to harness the potential of SMEs for development and poverty reduction, governments of countries in transition and governments of developing countries, development partners, and SMEs themselves need to deal with several challenges (OECD, 2004, 2013):

1. SMEs/local private sector must expand through the Second International Symposium on Sustainable Development, 8-9 June 2010.
2. Creating new and innovative companies.
3. Graduating as many informal institutions as possible to the formal sector.
4. SMEs must become more competitive and productive in their domestic base.
5. At least one proportion of these nationally competitive SMEs must achieve competitiveness.
6. That will allow it to incorporate trade (exports and internationalization) into international value chains and investment, including linkages with FDI.

Despite the need for all businesses to adapt quickly to the increased instability and uncertainty, SMEs have been particularly vulnerable to the crisis. In this regard, some factors increase the potential repercussions of the crisis on SMEs compared to large companies.

For instance, demand has dropped dramatically since the Covid-19 pandemic. According to about 15 surveys in OECD countries, more than half of SMEs are already facing substantial revenue losses, with many having buffers that might help them survive just a few months. In Portugal, 37% of SMEs reported a more than 50% decrease in production. At the start of the outbreak in China, two-thirds of SMEs reported having enough cash to cover fixed costs for no more than two months. In the US, small businesses had only 27 days of cash flow. These factors have left SMEs in a challenging position, with many facing the threat of permanent closure.

Furthermore, in some countries, SME management teams do not have the resources that large corporations have in the core functional areas of managing commercial stresses and responding to a pandemic. This flaw shows SMEs' incapacity to modify supplier chains and production procedures. Consequently, SMEs frequently receive input from supply chains growing longer, more complicated, and more international (Gomathi, Gopinathan, 2019). The epidemic has, however, disrupted these supply channels, leaving many SMEs without the funding to continue operating. The steps to stop the disease spread also interfered with SMEs' production processes. Therefore, small business factories are not built

for physical separation, and businesses frequently lack the knowledge and resources to restructure their operations swiftly (Castagna et al., 2020; Gherghina et al., 2020).

1.2.2 SMEs in the North Part of Iraq

The government in the northern region of Iraq has adopted the concept of a market economy to boost economic growth and quantitatively reduce rural poverty. Iraq's central government and northern Iraq have been obliged to substantially reduce public investment and partially freeze public sector employee salaries and pay due to the fall in oil income. The authority in northern Iraq was forced to adopt a new economic policy platform because of rising unemployment, a decline in living standards, an increase in poverty, and discontent among the vast majority of the population (Flayyih et al., 2019). This platform was based on a free-market orientation and full use of the entrepreneurial potential that can be a critical factor in determining growth and employment for the region. To encourage the entrepreneurial sphere of SMEs, the northern part of Iraq policymakers introduced good intentions with Investment Law No. (4) of 2006. The Investment Law has been introduced with the firm belief that SMEs should be allowed to take a central role in busting the economy since it has always been a more robust employer of the unemployed than large firms (Urwin, Buscha, 2012).

This new strategy seems to attempt to emulate successful models in the SME sphere implemented by developed nations, such as those completed by Germany and South Korea. Since the northern part of Iraq authority has mainly supported it, the operationalization of SMEs for Erbil city as a whole, a comparison between SMEs and prominent entrepreneurs in the northern part of Iraq indicates that SMEs created relatively more employment opportunities and capital investment than their counterparts as the prominent entrepreneurs between the years 2006 and 2015.

Despite the SMEs in the area's modest economic success, their efficacy is greatly valued, and business scholars consider their contribution to growth and employment still admirable. Therefore, authorities in the north of Iraq should have created more complex tactics to encourage the SMEs sector to quickly grow and enhance their productivity to generate growth and battle the community's pervasive unemployment (OECD, 2008).

1.2.3 Competitiveness and Development of SMEs in Iraq and Northern Iraq

There are several studies on SMEs and ICTs adoption, and they are well-deserved. SMEs are the engine that drives the global economy and increases GDP in emerging economies. In most countries, informal companies account for more than 50 percent of overall employment and GDP (Teima et al., 2010). SMEs account for around 99 percent of some regions of developing countries and 70 percent of overall employment while contributing 50 percent to 60 percent of added value production (OECD, 2017).

In this regard, De Kian et al. (2011) claimed that SMEs accounted for 85 percent of between 2002 and 2010, based on a comprehensive study assessing 27 EU member states as well as 108 other countries participating in the Competitiveness and Innovation Framework Program of the European Commission (CIP). Current EU figures show that SMEs employ 66.7 percent of the non-financial business economy's workforce and generate 56.2 percent of total value added (Eurostat, 2019).

As seen in Figure 2.1, north Iraq's statistics are similar to OECD and EU averages. According to data from the Iraqis statistical institute, SMEs account for 73.5% of employment and 62% of overall economic revenue. Their importance for north Iraq may also be seen in the data on international commerce, where they account for 41.1% of all exports. Figure 2.1 shows north Iraq statistics, which show ubiquitous computer and internet access and an increasing trend in website ownership (including social media accounts) between 2011 and 2019.

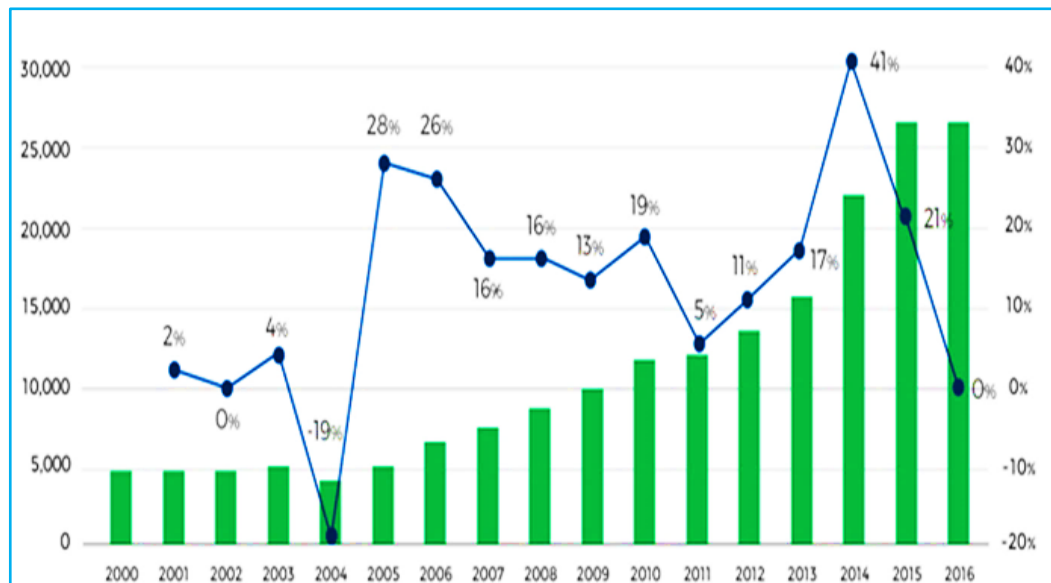


Figure 2.1: SME Statistics for Northern Iraq (Iraq, 2016).

The results aligned with the prior investigation, indicating enterprises have difficulty accessing skills rather than materials. As a result, among north Iraq SMEs, how well enterprises can use the technology accessible to them arises as a critical problem. Academic studies can provide helpful information on the situation in northern Iraq.

Hale and Bilal (2008) point out that ICTs are utilized mainly for routine work in longitudinal research in north Iraq SMEs, but their longitudinal findings show a rise in ICTs adoption with more complex applications and ICTs staff. Mardikyan (2010) examined the ICTs usage of Iraq SMEs in north Iraq and showed they knew the technology. They recognize the value of ICTs and concentrate on practical applications that help them save money, and mention the specialized industries in which organizations operate as a factor in ICTs utilization.

Meanwhile, Avin (2017) claimed that ICTs and Iraq's import and export volumes have a helpful link and advocate strategic trade alliances with nations that have advanced to high levels of ICTs development. Wright, Bisson, and Duffy (2013) described SMEs in northern Iraq as followers instead of creators. They emphasize dependence on people with specific knowledge and a lack of confidence in the methods and procedures of knowledge management. Indeed, the lack of efficient knowledge management techniques (OECD, 2009). Senior managers in SMEs in northern Iraq do not prioritize the transfer of information

and even place obstacles to prevent knowledge from leaving their companies. As a result, the owners of SMEs in northern Iraq face significant obstacles to innovation (OECD, 2013).

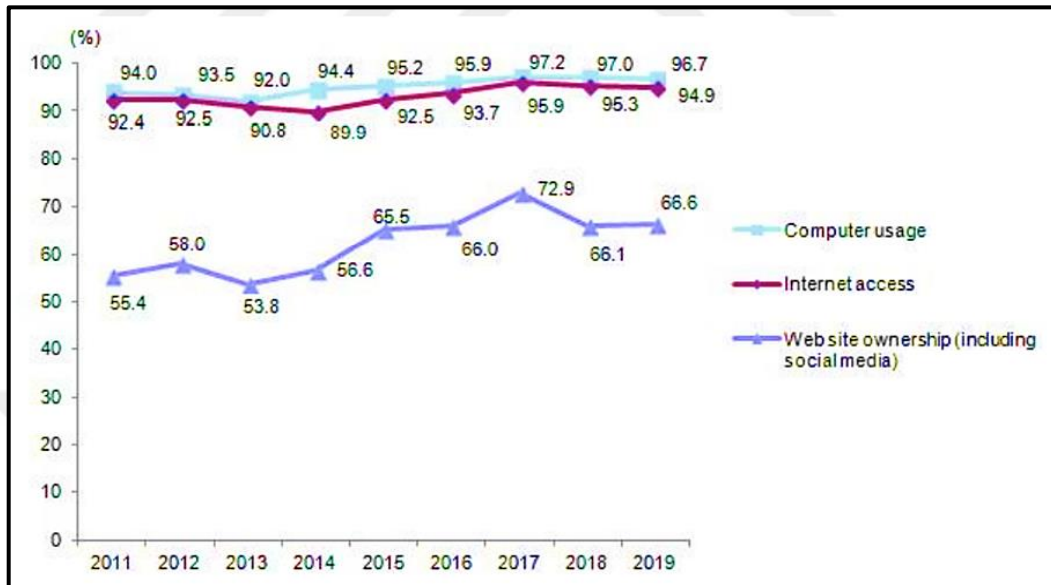


Figure 2.2. Computer, Internet, and Website use in North Iraq by SMEs (Iraq, 2019)

Ako et al. (2018) suggest that internal impediments such as low resources, poor personnel skills, and inadequate training negatively impact business innovativeness in research based on data from the north Iraq hotel sector. They mention that transformative leadership may effectively combat negative causes and reduce their impact. To summarise, the research demonstrates the importance of SMEs for a country's overall growth. They are the engines of economic development and job creation. Existing research on north Iraq SMEs, however, paints a complicated picture. Despite advances toward more sophisticated ICTs applications, they encounter internal and external hurdles to innovation, and their knowledge management weaknesses relegate them to followers rather than innovators. The research also implies that the northern part of Iraq's SMEs confronts challenges connected to skills access, making their limitations essential to be examined from the viewpoint of the digital divide.

When it comes to the use and adoption of e-commerce, cultural issues are important. For example, most consumers purchase goods directly from reputable retailers to maximize product value and minimize product quality uncertainty. People enjoy speaking to one another face-to-face, hearing their voices, catching

one another's eyes, and touching. The degree to which business partnerships are successful might vary greatly depending on their nature and quantity (Gomathi, Gopinathan, 2019).

A sense of community is created, and social connection is strengthened when the parties have strong personal links and have been associated for a long time. In the context of e-commerce, trust issues are a significant concern. It can be challenging to build trust in an utterly impersonal online environment. In Iraq's northern region and numerous others in the developing world, relationships with family members, regular face-to-face contact, and interaction help build and strengthen unbiased applications.

In addition, industrialized countries have devised ways to widen the basis for trust. This is the cornerstone of the trust that supports global e-commerce. E-companies are disadvantaged in weak legal and jurisdictional structures due to perceived or actual instability, such as in the northern part of Iraq and much of the developing world. For individuals used to in-person transactions, purchasing products, merchants some getting used to. However, familiarity with the other winning business talks and having a satisfying personal relationship with each party (as well as a lasting business relationship). For example, there is apprehension that internet retailers may purchase defective goods and cover up refunds received, which undermines consumer confidence in goods and online retailers. For example, in Lawrence's (2002) study, respondents mentioned that their preferred buying online does not compare to going to an actual store where you can see what you are buying and make sure it is what you want. However, the enduring practices were all contradictory with undercut due to e-commerce-related corporate processes created for goods sales.

1.3 Theoretical Aspects of Internationalization of SMEs

In recent years, various SMEs have realized that business activities within one market in one country do not guarantee survival due to the intensity of competition between the SMEs and the inability to defend the ordinary market share because barriers to entry have vanished. Thus, the development and continuity of the business are through thinking about diversifying markets and trying to be present in more than one market in more than one country (Ramdani et al., 2021). The decision to go global is dynamic, as firms follow specific

patterns as they move beyond their boundaries (Cho and Lee, 2018). Since the 1970s, various researchers such as Johanson and Vahlne (2007), Johanson and Mattson (1988), and Mattson and Oviatt (1988) have investigated the internationalization phenomena from various academic angles to elucidate the causes, difficulties, levels, and effects of internationalization (Francioni et al., 2012).

However, there is a research gap in SMEs internationalization in favor of focusing on the ICTs and the internationalization of SMEs (Zucchella, Siano, 2014). Researchers have paid much attention to the success of large companies but have not paid as much attention to the difficulties and opportunities SMEs face in global markets (Markatou, 2012). Internationalization has become a requirement rather than an option for SMEs due to their high levels of competitiveness on the world stage rather than gradually developing their participation in foreign trade as many SMEs in emerging countries have advanced in their operations (Kumar, 2012; Oviatt & McDougall, 1994).

During the last three decades, SMEs have been significant players in national economies. They are dynamic and flexible, and their role in job creation is crucial. Consequently, due to the internationalization of economies and accelerating globalization processes a decade ago, many SMEs have been trying to take advantage of new environmental conditions, i.e., chances for internationalization. Thus, many have started entering new markets (Dar and Mishra, 2019).

The internationalization of SMEs has been among the most researched in international marketing in the past 40 years. In the previous decades, multinational companies obtained significant interest from researchers and specialists in international business, especially regarding their penetration into international markets, the internationalization of their activities, and their benefits on economies (Madaleno et al., 2018). The interest in the internationalization of SMEs has recently begun, thanks to the rapid changes in the global economy. The wide spread of globalization and the characteristics of these institutions distinguish them from large companies, small companies, and multinationals (Dar & Mishra, 2019).

The exclusive focus of internationalization, since the export practice is conceptually incorrect, carries with it the risk of misorientation of public policies oriented towards a holistic approach resulting from the joint consideration of three schools of thought, which have combined to contribute to the emergence of a unified theory of internationalization of SMEs (Schweizer, 2012).

According to Julien (2008), internationalization is a process that regularly enables a company to market its products in foreign markets. It becomes clear that SMEs do not enter international markets randomly or in an ill-considered way but must be practiced with the experience gained through the exploitation of a market with characteristics that are geographically and psychologically close to the domestic market or by intermediaries or agents. Successive stages gradually allow the enterprise to gain experience in foreign markets (Rodriguez et al., 2010).

1.3.1 Economic Significance of SMEs

Promoting economic growth through wealth and job creation is the only method to end poverty permanently. SMEs are a vital source of income, incubators for new businesses, and an employer in emerging nations. World Summit on the Information Society (WSIS) Report, February 2003, the fact that SMEs make up over 95% of the economy on average demonstrates the importance of SMEs to a sample of Asia-Pacific countries' national economies. However, the contributions of SMEs to employment and the nation's GDP are by no means insignificant. Nearly 140 million SMEs in 130 countries employed 65% of the workforce as of July 2006 (OECD, 2013).

SMEs are also an engine of innovation and economic progress. The pace of SME production and destruction determines that profitable market prospects accelerate the construction rate. This elevates the nation in general and promotes income growth. Consequently, people will increase their spending as their income rises, creating new markets and opportunities that will encourage the further development of SMEs (Saad et al., 2021; Schweizer, 2012).

In contrast to global organizations, most SMEs are domestically owned businesses. Therefore, their success directly benefits the nation. Economic growth is produced by this reinforcing dynamic. Economic growth is fueled by innovation's self-perpetuating cycle. The knowledge of SMEs about their products and industries grows along with the number of SMEs (Sadiq et al., 2022). They

can improve the product or process thanks to their knowledge, which gives them a competitive advantage and increases their profitability. Once again, the profitability of SMEs in seizing market opportunities will push more people to start their SMEs to take advantage of this opportunity (Julien, 2008).

In addition, SMEs' growth might aid in achieving other development objectives. For example, SMEs might offer products and services in essential areas that can support the less fortunate, such as health and education. For instance, efforts to promote female entrepreneurship contribute to greater gender equality by giving women a means of support (García-Cabrera et al., 2016).

Regarding the role of SMEs within the new economy, mainly at the level of the European Union, the economic significance of the services sector is widely acknowledged. According to Eurostat (2008), the non-financial business economy of the EU-27 consisted of roughly 19 million firms in total in 2004. As a result, they created more jobs and offered a broader range to increase profits. Innovation is a significant factor influencing SMEs' growth, which could provide goods and services and more effective existing methods and market entry (European Commission, 2008).

Even though all SMEs, by definition, have less than 250 employees, they are incredibly different. For example, SMEs could be conventional, family-based businesses ingrained in regional business contexts or dynamic, adaptable, and innovative businesses (Armawan et al., 2022). A small business is not a streamlined version of a bigger one. Instead, more extensive and smaller businesses differ from one another's reactions to the management approach; crucially, how they engage in competitive business abilities is frequently insufficient to expand the company to a much larger scale (Ramdani et al., 2021). Additional phases of business development call for, among other things, new technologies, the ability to put them into practice, and new hires with improved monetary investments. SMEs could use ICTs to help them expand and innovate more. For instance, e-business removes, enabling businesses the expansive in Europe with, in fact, the entire build-out stores (European Commission, 2008).

However, given that their small and medium-sized businesses investing in ICTs are few, one explanation for this predicament may be that people are

skeptical of ICTs with e-business, which may or may not be reliable. Thus, promoting the use of ICTs in SMEs is crucial, strengthening technical and managerial capacities and making them appropriate (European Commission, 2008). Therefore, supporting SMEs is crucial, and they should take the appropriate steps to encourage SMEs groups to implement programs to improve member companies' e-business proficiency (Eikebrokk & Olsen, 2007).

1.3.2 Theories of Internationalization of SMEs

Many different processes for SMEs to internationalize have been identified by researchers (Freeman 2002). Various researchers have put forth several schools of thought in this context, including traditional and contemporary models, such as the eclectic model, foreign direct investment (FDI), stage model, born global approach, and the network method (Battaglia et al., 2006). According to the eclectic model developed by Dunning in 1988 and quoted by Ruzzier in 2006, a company must first meet three fundamental requirements to begin the internationalization process: ownership advantage, internalization advantage, and location advantage. In other words, a company investing in a foreign market must have both competitive and internationalization advantages and the host country's superior geographical benefits (Battaglia et al., 2006).

Further, the Foreign Direct Investment (FDI) theory explains how assessments of the ideal economic transaction cost govern a firm's internationalization operations, such as the choice of market location and entry strategies (Buckley & Casson, 1993). Two separate models of internationalization are included in a different school of thought (stage model): the Uppsala internationalization model and models related to innovation (I-models). Both models outline the stages of internationalization, with the Uppsala model gaining the most traction. According to the Uppsala model, internationalization enhances a firm's global engagement due to learning (Ruzzier, 2006; Battaglia et al., 2006). However, I-model viewed the different stages of learning as an innovation of new concepts (Battaglia et al., 2006). As Ruzzier (2006) indicated, the I-model, which regards internationalization as a sequential innovation, focuses on the learning sequence in adopting an innovation. A fresh approach to expanding firms internationally has just been developed. In this situation, one may consider the network strategy and born global approach to internationalization. The network

approach states that companies expand internationally by connecting with other network members. It focuses on the interactions among companies producing, transferring, and utilizing goods and services in a given industry (Coviello & Munro, 1997).

Moreover, the internationalization process, especially by high-tech and rapidly evolving high-tech enterprises. This vision framework emphasizes that companies enter foreign markets immediately rather than slowly internationalizing (Harveston, 2000). After reviewing the models above, this study focuses on the Uppsala internationalization model. The Uppsala model, which covers networking aspects of internationalization and describes how organizations go through an incremental, sequential learning process with increasing commitment, is more thorough and practical. In addition, long-term relationships are increasingly successful for SMEs to expand their knowledge (Park et al., 2010).

1.3.3 Internationalization and its Impact on SMEs

SMEs have been critical to developing national economies during the past three decades. SMEs adapt to dynamics and readily cope with uncertain and dangerous economic conditions. However, continued trade liberalization will increase global competition despite the global financial crisis (Schweizer, 2012). Ongoing internationalization processes present globalization opportunities as well as risks for SMEs. Opportunities abound in exporting skills, new market entrants, and international collaboration. However, due to risk, regionally or domestically focused SMEs may also encounter an increase in possible overseas competitors in their market (Gomathi and Gopinathan, 2019; Rodriguez et al., 2010).

According to the SMEs viewpoint, the desire to increase a company's competitiveness is the primary driver of SME internationalization, followed by a desire to access new, larger markets. However, there are numerous potential causes for this. The fundamental tenet of many theoretical approaches is that a company's growth determines the rate at which it internationalizes. In its analysis, the OECD (2013), for instance, identifies four reasons for boosting SMEs' internationalization and globalization (Saad et al., 2021).

However, the entrepreneurial component (which seeks to make progress) seems to be the most important. So, managers may try to access overseas markets

if they focus on expanding their company. Hence, recognition of offshore companies occurs only in the company of international powers. The chance element is linked to taking advantage of chances in a foreign market (Nurfarida et al., 2022). However, it must be emphasized that the most crucial aspect is entrepreneurship, without which it would be impossible for the other factors to function. The company's expansion then comes as a catalyst after opening new markets. As a result, SMEs are increasing their ability to innovate and launch new products to stay competitive. As a result, some companies indirectly use resources from abroad to help SMEs become more competitive (Julien, 2008).

Global expertise with global business contacts, including components in shared R&D initiatives, information sharing, and capital from international markets. Access to knowledge and technologies encourages globalization, while SMEs engage in exporting operations to obtain technology or expertise. It is vital to note that access to knowledge and technology is a common justification for businesses that merely engage ranks as justification for SMEs using highly complex types of internationalization (Sadiq et al., 2022).

Over one-third of SMEs that only engage in export activities internationalize to gain knowledge. Therefore, the choice to actively internationalize does not solely stem from a desire to boost sales or access new markets, to improve the firm's competitive position; internationalization is a means of acquiring knowledge and insight into new technologies. Thus, it represents a type of broadly accepted innovation. Even though SMEs must adapt to increased global competitiveness, there is still a methodical issue (Bell et al., 2003).

Cho and Lee (2018) state that many small businesses are developing entrepreneurial globalization strategies. The researcher emphasizes the distinction between entrepreneurial globalization and entrepreneurial internationalization. If a company supplies markets in two more nations, entrepreneurial internationalization (the internationalization of enterprises) has already occurred. The economic process of expanding global multinational activities is known as entrepreneurial globalization. Therefore, the following is necessary to determine SMEs' ability to go global.

1. The ability of a corporation to change and adapt to local and international (political and economic) situations usually determines the potential for globalization. Additionally, the capacity to adapt calls for progressive growth and has to be methodically developed.
2. The organizational setup and human resources of the company's entrepreneurial globalization. It includes the company's overall organizational and structural capabilities, workforce qualifications, and, most importantly, the management's/owner-willingness manager to shoulder additional costs for international expansion.
3. Another critical factor in determining if an SME has a favorable or adverse potential for globalization is the issue of financing international and global activities.
4. Accordingly, the competency and aptitude-specific firm's goals, the industry, and the SME's position in the competition require (e.g., SWOT analysis, the five-force model, and portfolio analysis).

Most OECD nations now have widespread access to computers and the internet, but online sales and transactions have not yet taken off. However, the data point to an expansion of electronic commerce, only part of economic activity for businesses of all kinds. Marketing comprises all, including transactions over online networks and between-firm exchanges. When the banking sector was removed, they were 10% in Norway and 6% in the UK and Denmark. The share of retail business sales to customers (B2C) was far lower, circling at 1.4% and 1.24 percent, respectively (OECD, 2013).

The United States SMEs' shares are likely lower than the entire economies. For example, online shopping is more famous for buying than for selling. However, only one in eight individuals reported online sales for the 16 nations where Internet shopping and sales data are available. Between 63 and 93 percent of businesses report utilizing the internet, except for Greece and Luxembourg, businesses utilize it twice as frequently for purchases as for sales (OECD, 2008).

1.3.4 Relationship Between Adoption to ICTs and Internationalization of SMEs

Regarding the relationship between the adoption of ICTs and the internationalization of SMEs, Eze & Duan (2014) conducted research, and they mentioned that the continued success of SMEs in internationalization is enabled

through ICTs and depends on the company's ability to adapt to that constantly (Ramdani et al., 2021). Furthermore, the best use of ICTs is emerging for innovation and commercial competitiveness. As a result, SMEs occupy an important place in most of the world's economies, and the adoption of ICTs supports the internationalization of SMEs (Alam & Noor, 2009).

SMEs have flexibility, dynamism, and simplicity that allow them to adapt to crises and changes in the environment in which they operate and in the global markets. Because of its small size, it is often considered an object and a tool for analysis, and this is due to the theoretical foundations in management sciences. The advantage of SMEs is also that they are family enterprises, simple in organizational structure, and use uncomplicated management methods, and many of them are active in the subcontracting field. Also, its trend today toward research and development has made it a tool to which much hope is attached to the development of the economy in general (Ratten et al., 2007).

According to Consoli (2012), who compiled several indicators, the effects of ICTs on SMEs' internationalization and performance might be organized and examined using metrics including efficiency, effectiveness, competitiveness, innovative business practices, and intangible advantages. ICTs impact economic performance, likely exhibiting high technological advancement and improving productivity. Furthermore, they have a significant social influence (Matei & Savulescu, 2012).

For instance, Liang et al. (2012) and Santos (2010) emphasized that a business or enterprise has two performance categories. First, it is vital to note favored labeling as financial or strategic performance; for example, regarding operational profitability, metrics are frequently used as the primary gauge of business performance. However, simply utilizing profitability metrics is a poor choice that could result in false information. For instance, a recent study defines competitive advantage as the capacity to provide more economic value than the marginal (break-even) rival in its product market (Santos & Brito, 2012).

According to Matei and Savulescu (2012), the World Economic Forum's Global Competitiveness Reports include 12 essential competitiveness factors that have those aspects: The macroeconomic climate, the efficiency of the labor and

goods markets, and scale. According to Matei and Savulescu (2012), given actual circumstances, it might be predicted that the contribution of ICTs to GDP will increase by 1%; such a fluctuation could increase competitiveness by 4.2 percent. The 12 elements have solid connections and tend to build on one another. A deficit in one area frequently has a detrimental effect on other areas.

Similarly, all performance indicators are linked together, and each of the 12 competitiveness factors has the potential to influence others. In this context, Consoli (2012) stated that matching ICTs investments with internal talents are crucial for the most remarkable results and administrative procedures. Therefore, strategic (operational) performance aspects include metrics that assess changes in the company's economic activities, advancements made, satisfaction levels, etc.

In contrast to developed and advanced economies, developing nations' SMEs have been slow to adopt ICTs and have either delayed or failed to do so about e-transformation technologies (Bunker and MacGregor, 2000; Manochehri, Al-Esmail, and Ashrafi, 2012; Ramayah et al., 2016). Developing SMEs in developing nations confront many obstacles and challenges that make it difficult for them to be embraced. These difficulties include, for instance, high telecommunications access costs, inadequate government policies on ICTs, a lack of qualified and skilled labor, inadequate communication infrastructure, high costs for internet connectivity and ICTs equipment, and resistance to change (Ongori and Migiro, 2010). One of the most compelling reasons that lack of information systems and knowledge prevents SMEs from implementing ICTs is that most owners/ managers and workers lack the essential technological expertise, making it challenging to use ICTs in their business. According to some academicians, organizations face obstacles to efficiently implementing ICTs, including structures and approaches (Manochehri et al., 2012).

The causes of reticence have been identified and divided into external and internal elements. Thus, SMEs needed assistance to overcome obstacles, some of which could come from within, some from external initiatives, or both. Similar issues exist regarding implementing and adopting ICTs in the Arab States; obstacles occur due to various variables that hinder or delay adoption. Also, these elements are divided into two groups. It is first linked to economic issues and basic infrastructure (Kapurubandara, 2008).

Large, worldwide organizations have invested much in ICTs in Gulf Cooperation Council (GCC) nations. They have excellent computer systems for running their operations, partly because SMEs lack the funds and experienced personnel to purchase, manage, and use advanced ICTs (Ashrafi and Murtaza, 2010). For instance, a study by Manochehri et al. (2012) examined the ICTs adoption by SMEs in Qatar and revealed that SMEs need government assistance to boost that.

1.3.5 Theoretical Model and Hypothesis Development

1.3.5.1 A Theoretical Model

After establishing the importance of ICTs for businesses, this study explores the adoption of ICTs and their impact on the internationalization of SMEs in Northern Iraq. In similar models, the relationship between the use of ICTs and the success of companies has been well established; these elements affect these variables and form the model's independent variables. Internal variants are company-specific characteristics. For example, research shows a correlation between innovative business culture and the high performance of employees (Muhamad & Fazel, 2013).

In this regard, Lee, Chu, and Han (2012) identify organizational innovation as influencing technology adoption favorably. Finally, the innovation orientation scale seeks to quantify these impacts. Another crucial internal element is employee skill level, assessed using the "Talented Human Capital" scale since companies with well-educated and skilled staff tend to have an edge adopting (Giotopoulos et al., 2016). External factors are external pressures that affect businesses. Although all of the participants in this research are from the service sector, there will undoubtedly be significant differences in how dynamic the specific profession in which they work is. However, not all sectors require constant innovation to stay up-to-date with the latest trends, and destructive ideas occur in different periods. Previous research has found a correlation between external pressure and ICT adoption (Kim et al., 2010). The dynamic of the scope sector addresses such impacts — finally, the measure of external resources relates to external funding and assistance. As a result, companies may buy ICT tools, particularly in the region.

External alliances such as government support for adapting ICTs applications (GS-ICT) may help success with ICT-related projects and impact SMEs to go for internationalization. Li et al. (2018) showed that an intermediate variable was included in the model instead of connecting these independent factors directly, which case variable assesses firms' ICTs usage capabilities, which define how they use such skills to improve their commercial performance. As stated in the literature review, the modern-day question of ICTs adoption is not about whether but how much. How well-equipped a company is in employing or leveraging the ICTs tools at its disposal is a significant factor that deserves its scale.

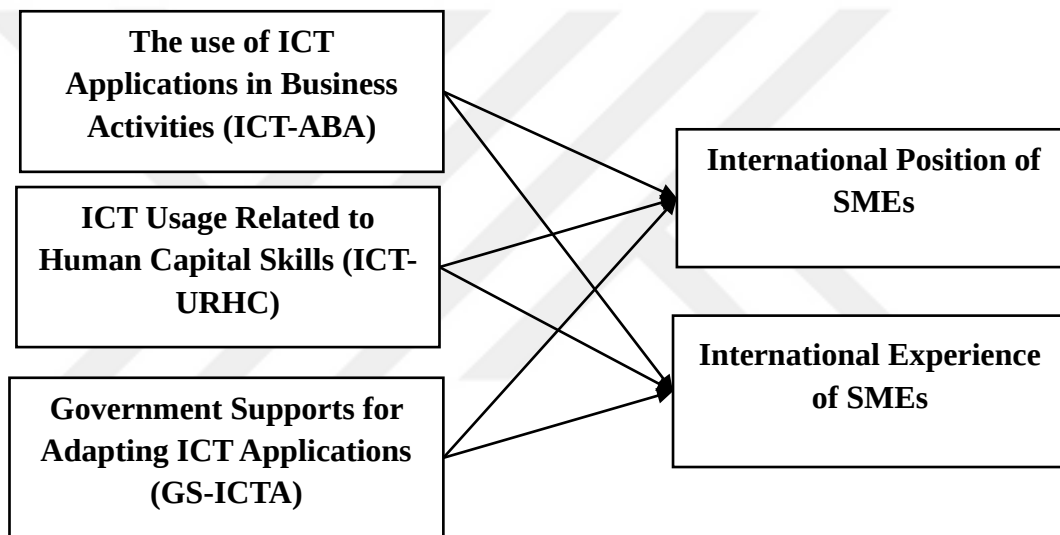


Figure 2.3. Conceptual Study Model.

1.3.5.2 Hypothesis Development

Hypotheses were constructed alongside the conceptual study model see Figure 2.3 above to show how these variables are related. The projected outcomes were based on the current literature. The independent variable is the adoption of Information & Communication Technologies (ICTs), including the use of ICTs in business activities (ICT-BA), innovation orientation, ICT usage related to human capital skills (ICT-URHC), and government supports for adapting ICTs (GS-ICT) as external resources. The dependent variable is the internationalization of SMEs,

such as international position and international experience, to enhance firm performance. All of these factors are expected to have a positive connection.

Adoption to ICTs and Internationalization of SMEs

ICTs innovation orientation has been studied extensively, with mixed results; some research showed it has a significant impact on the internationalization of SMEs. Siguaw, Musa, and Kim (2006) provided a comprehensive overview of the current literature on innovation orientation and a conceptual foundation for the subject. One of their claims is that companies with a substantial innovation focus are more likely to create and deploy new technologies to promote and sustain innovation. Based on this premise, it would seem reasonable to assume that firms prioritizing innovation will be better placed to take advantage of any ICTs benefits. It is defined by Lund et al. (2004) as the ability to introduce new procedures and build a clear positive link between goods and ideas in the organization, innovativeness, and business performance.

The effect of ICTs on improving external and internal communication plays a significant role in SMEs' international position and innovation performance. Today, internationalization has become a reality, and a logical destination for companies, in general, and SMEs, in particular, to enter international markets. Therefore, we must enlist to raise them to meet these challenges, and businesses must impose their interests and protect their development prospects in light of international competition (Cenamor, Parida, and Wincent, 2019). Furthermore, the use of broadband internet has been found to impact innovation among SMEs positively, and the researcher showed the possibility of applying the internationalization strategy by SMEs in light of globalization and ICTs applications (Das et al., 2020).

Ta et al. (2020) explored the impact of ICT on productivity at the corporate level in Turkey using a new longitudinal dataset. The company needs several specialties occupied by individuals specializing in computers and networks. A database manager is responsible for building a database for the information system and also makes sure that the database system works as required. The system analyst also studies and designs critical information systems and cooperates with the programmer and users in building information systems. When the firm wants to build its networks, it entrusts the network engineer to

study, design, and develop the communications network and supervise the extension. Similarly, Leviäkangas et al. (2017) showed a positive impact of ICTs on firm productivity in Australian firms; based on the above literature and empirical findings, the following hypotheses are proposed:

H1a: *There is a significant effect of the use of ICTs in Business Activities (ICT-BA) on International Position (IP-SMEs).*

H1b: *There is a significant effect of using ICTs in Business Activities (ICT-BA) International Experience (IE-SMEs).*

Human capital has always been critical to corporate success, and the introduction of ICT has not changed that. For example, Asare and Fei (2015), Bresnahan et al. (1998), and Cho and Lee (2018) found a link between ICT use and skilled human capital in their firm-level analysis that improves the internationalization and performance of SMEs. According to their findings, there is a higher need for competent and educated workers. As information systems grow common, businesses seek individuals with new abilities who can fully utilize these technologies, and as a result, they must be able to understand computer data and translate it into meaning.

Moreover, Hempel (2004) shows a link between the demand for ICTs and the need for firm-paid training, implying that ICTs incentivize businesses to train their personnel based on data from German enterprises. Furthermore, organizations that employ many university graduates and invest extensively in ICTs had the most significant productivity increase, supporting the beneficial link between skilled human capital, ICTs, and enhanced SMEs' international position and international experience. Based on the above literature and empirical findings, the following hypotheses are proposed:

H2a: *There is a significant effect of ICT Usage Related to Human Capital Skills (ICT-UHR) on International Position (IP-SMEs).*

H2b: *There is a significant effect of ICT Usage Related to Human Capital Skills (ICT-UHR) on International Experience (IE-SMEs).*

Another critical issue for firms is the resources they have at their disposal. Naturally, any firm would benefit from abundant resources in any condition, but

in this case, the focus is on external resources. However, all industries are not created equal, as with sector dynamism. As a result, funders are more interested in some firms and initiatives than others. For example, a few official agencies in northern Iraq are directly responsible for giving funds to entrepreneurs that develop innovative products that enhance SMEs' international position and international experience. In addition, the Ministry of Industry and Technology's small industry development center supports entrepreneurship and provides SMEs funding for R&D and innovative initiatives, enhancing SMEs' international position and experience. Similarly, north Iraq's premier scientific research organization, the Scientific and technological research council of north Iraq (Qubat), offers a funding program to assist SMEs with their R&D projects. For emerging economies, such public support is critical (Manochehri, Al-Esmail, and Ashrafi, 2015).

H3a: *There is a significant effect of Government Support for Adapting ICTs (GS-ICT) on International Position (IP-SMEs).*

H3b: *There is a significant effect of Government Support for Adapting ICTs (GS-ICT) on International Experience (IE-SMEs).*

CHAPTER TWO

2. METHODOLOGY AND DATA

This chapter included the methodology of the study and empirical data. Also, address the research design, the questionnaire's components, and the data collection methods used in the study to evaluate the hypotheses discussed in the previous chapter. The quantitative research method in the study is categorized based on the data collection sources based on the quantitative survey technique. Further, it included the study population and samples, data sources, and scale measurement.

2.1 The Methods and Design

To explore the relationship between the adoption to ICTs and the internationalization of SMEs in Northern Iraq from managers' perceptions of working for service companies or small and medium sizes businesses. The study used a quantitative method and survey to obtain data from the managers working within services sector companies. In this regard, it also used a statistical approach to test study hypotheses. In addition, this method is well coordinated and organized in collecting and examining data from different sources, including those obtained by survey. Quantitative research is a practical approach and information-rich to collect data from participants using sampling methods and sending electronic questionnaires (Beins & McCarthy, 2018).

Besides, the quantitative method is widely used in the social sciences, while the statistical method is implemented to conduct quantitative research. For example, researchers and statisticians in quantitative research provide statistical frameworks and theories related to the quantity in question (Sekaran and Bougie, 2016). The study design is principally related to the analyzing tool, conceptual study framework, and developed hypotheses that assume the relationship between the adoption to ICTs and SMEs' internationalization approach. It is suitable since this design allowed the participants to provide their perceptions, awareness, and relevant information on the adoption of ICTs and the internationalization of SMEs in Northern Iraq.

2.2 The Study Population and Sampling

The population in this study are managers working in small and medium-sized businesses in the service sector, called SMEs, in the north of Iraq, and numbered about 550 prospected participants were emailed to participate in the survey, including managers from tourism agencies, advertising agencies, insurance agencies, translation agencies, software development organizations, and consulting firms. The SMEs were selected based on the main focus of the study aimed to explore the relationship between the adoption to ICTs and the internationalization of SMEs in Northern Iraq as the study intended to obtain observations of managers. In addition, the survey sample or research participants were generally collected from managers who voluntarily and freely participated in the survey, based on a simple random selection method from the research population, allowing business managers to express their views on the use of ICTs that play a role in and the internationalization of SMEs.

As Beins & McCarthy (2018) indicated, a simple random sample contains all population features with equal selection possibilities. In other words, the likelihood of any two elements in the sample being selected should be equal. However, the possibility of choosing any group element whose importance is no more than the sample size should be equal. One of the most convenient ways to create a simple random sample is to use a random table of numbers, usually found in textbooks on statistics topics or research methods (Sekaran & Bougie, 2016).

The final step of data collection was launched through personal visits, emails, and sending out a google survey to 550 prospective participants working within the SMEs in the north of Iraq. The data collection process was implemented in late 2022 when the coronavirus restrictions continued, preventing more visits to companies and obtaining more extensive data since some companies were unwilling to participate in the survey and answer the questions, thus obtaining back only 278 surveys.

Furthermore, the following equations 1 and 2 showed how simple random sampling works, as the $\bar{y}$ is the mean of the sample, and a stable estimator of the mean of the study population or SMEs is μ , which is numbered 550, potential managers respondents to the surveys and the mean of the population μ is the average of the y-value in the whole managers in SMEs:

$$\bar{y} = \frac{1}{N}(y_1 + y_2 + \dots + y_N) = \frac{1}{N} \sum_{i=1}^n y_i \quad (1)$$

The sample mean $\bar{y}$ is the average of the y-value in the sample:

$$\bar{y} = \frac{1}{n}(y_1 + y_2 + \dots + y_n) = \frac{1}{n} \sum_{i=1}^n y_i \quad (2)$$

As mentioned above, the questionnaires were distributed among SMEs in northern Iraq and administered electronically, specifically through Google surveys. Finally, 278 completed and valid surveys were submitted for analysis representing the study population, the SMEs in northern Iraq.

2.3 Data Sources

To achieve the current study's objectives, two data types have been used: primary and secondary. The primary data are collected using surveys to obtain data from samples or study participants. Consequently, this study used questionnaires with several important characteristics, including low cost and effectiveness in giving participants as much information as possible. The primary data in this study consisted of managers' perceptions of small and medium-sized firms regarding the use of ICTs and the internationalization of SMEs.

The secondary data were used to write the theoretical aspect of the study, taken from published sources, including previous studies, international reports, books, and several other sources, including online resources that deal with the theoretical aspect (Sekaran & Bougie, 2016). Secondary data is also obtained from documents that provide information on primary sources by describing, discussing, analyzing, evaluating, and summarizing them, which are used to identify appropriate primary sources for the study.

2.4 Measurement of Scales of ICTs and SMEs

2.4.1 Conceptualization of ICTs

Today, information and communication technologies (ICTs) are commonly used in the international business and transport community to support global supply chain management and logistics. Public administrations also increasingly use information and communication technology to automate processing processes and communicate with customers. The emergence of

electronic network services has enabled the development of new applications for this technology, as it has become possible to send information electronically and to make services based on location and time. Now the ICT systems based on paper documents have been transformed into electronic systems supported by automated ones for exchanging and processing information (Taştan & Gönel, 2020).

ICTs as the concept can be dealt with from two angles. The first is hardware, devices, and materials, and the second is applying the first aspect to all stages of the information cycle, from production to storage and processing, also directing the beneficiaries to benefit from it most easily while ensuring the results of speed and accuracy (Rana, 2020). ICTs are all the necessary means and tools, and this is in the communication technology with its elements of fax, television, radio, Teletext, videotex, the use of computers, information networks, information observatories, Internet networks, teleconferencing and the use of the satellite Industrial, email and other means of communication, as it is the science that is concerned with collecting, storing and transmitting various types of information, which is a mixture of computers and means of communication, starting from optical fibers to satellites and cloning techniques. ICTs are tools and devices that provide the process of storing, processing, retrieving information, and delivering and receiving it afterward through various communication devices anywhere in the world (Paul & Lal, 2018).

In light of information and communication technology, the rapid growth in the dissemination of electronic information sources, and the continuous changes in the profession of libraries and information, these institutions have developed into sophisticated information networks capable of dealing and interacting with contemporary developments and trends and meeting the needs of researchers and scholars in various topics and fields. In addition, modern technology has paved the way for the emergence of types of modern libraries (Alam & Noor, 2009).

Information resources, thus, as the vital product of the application of information and communication technologies, have become a privileged position in the global economy and international markets after economic ideas focused on information resources and productivity as the engine of the world economy and as

the axis of the wheel around which the cycles of economic development revolve (Das et al., 2020).

Especially after the advent of the Industrial Revolution and distances between countries and the shortening time across the continents of the world reduced the time and space gap, and all this helped in the growth and development of the importance of information in economic development (Leviäkangas et al., 2017). Significant transformations and developments have recently resulted from political and economic blocs, prompting entrepreneurs and development policymakers to support growth. The steady growth of the SME sector in both developed and developing countries, so supporting this sector has become a global economic trend through its predecessors.

The information network in information centers means a group of homogeneous or heterogeneous information centers and institutions that agree to share resources using computers and modern communication and broadcasting for more comprehensive information services. It has become known that the tremendous and rapid developments in computer and communication technology are practical tools in expanding the scope of information spread and facilitating access to it to the most significant possible number of beneficiaries, as well as collecting information that was scattered and difficult to obtain, and then processing, analyzing and securing it with the rest of the types of information appropriate quickly for decision-makers and researchers (Arvanitis, 2005).

2.4.2 Operationalization of ICTs Constructs

As shown in Table 3.1, operationally, the adoption to ICTs measured within the SMEs in the north of Iraq, the scale of ICTs adapted from Alam et al. (2022) and Hanan (2018), ICTs are the most critical components of business activities and one of the most prominent pillars of civilized progress. It is closely linked with all fields of human activity and forms an integral part of this activity. In this era, an increasing interest in information has emerged as it is a national wealth that plays a vital strategic role in business activities. This interest has prompted states, institutions, and individuals to make unremitting efforts to control national, regional, and international information resources. These efforts have resulted in many collaborative information systems and networks, with the

Internet at the forefront of these networks (Phutela and Dwivedi, 2019; Salam, Saha, and Dey, 2020).

On this basis, the positive impact of information and communication technology has become evident in the procedures and services of information centers. The development of computer technology, on the one hand, and telecommunications, on the other, played an essential role in transmitting and exchanging data at the local, national, regional, and international levels. Thus, modern technologies played a role in establishing and developing information societies (Arendt, 2008).

Operating system software is a group of complex software of ICTs, some of which are permanently in memory while the computer is working to monitor all its operations. It is known as the Supervisor program. The operation to memory, whether from a stiff or soft store, called system initialization, directs the computer to carry out the tasks required by the application software (Rana, 2020). The application programs include processing sales orders, making flight reservations, processing advice, and preparing and printing invoices. Such tasks carried out by the computer are called applications, and the programs that direct the computer are called application software (Jin, 2006; Phutela & Dwivedi, 2019).

Automated document processing and exchange should be supported by e-business solutions, which require standards and tools to support automated data processing and exchange. Although ICTs offer enormous potential, the real benefits of simplifying and integrating the processing process will not be realized unless its introduction is accompanied by process re-engineering and organizational change. For example, the single window system is considered a change project, not an informational application, based primarily on processes that have undergone radical change and cooperation between institutions and merchants (Eze & Duan, 2014; Nurul, 2019).

Consequently, it is not sufficient to have the physical infrastructure alone to succeed in the new digital economy and realize the potential of ICTs, which also needs government support since an ideal environment will necessitate affordable gear, widespread affordable prices, dependable electricity, and a banking system that encourages entrepreneurship once the infrastructure is in

place. An info structure that includes, among other things, proper corporate engagement is what is necessary. Understanding the size of each nation's digital challenge is essential before attempting to comprehend the digital divide that each one faces (Salam et al., 2020). It is essential to determine how well the nation complies with the new "digital economy" demands first. Several options exist on how to do this. These can be as basic as running a test to determine whether the Internet is accessible and reliable in every city or town nationwide, or they can be much more complex. For example, the self-assessment test created readiness for the networked world. Access, education, society, economy, and policy are the five main themes; this guide asks questions about each country's ranking (Alam et al., 2005).

Human competencies are a significant element of ICTs; thus, the institution needs several specializations occupied by individuals specialized in computers and networks. For example, a database manager is responsible for building a database for the information system and also ensures that the database system works as required. The system analyst also studies and designs critical information systems and co-operates with the programmer and users in building information systems (Phutela & Dwivedi, 2019). Furthermore, when the organization wants to build its networks, it entrusts the network engineer to study, design, and develop the communications network and supervise the extension of its system administrator networks, central network devices management, and network services management. The system administrator's specialty is to set up network resources, register users and their passwords, and maintain resources (Leviäkangas, Paik, & Moon, 2017).

The small and medium-sized firms using ICTs in the services sector involve various direct and indirect costs and thus need government support. Those associated with consultation and networking security maintenance fees are sometimes underestimated. For example, they may involve unforeseen expenses for additional hardware, installation, and configuration. Higher than direct expenditures are the indirect costs. The transition from outdated to modern work practices may incur expenditures for the organization. A temporary reduction in productivity may be felt at first. Once the system's fundamental operations are in place, further organizational costs could arise. These are linked to management's

efforts to maximize the system's greater potential (Love & Irani, 2004). In addition, the executive's businesses and the activity of large ICT infrastructures often need to be reorganized. However, organizations, especially employees, were reluctant to focus on the sector that creates more cost-effective, compact solutions, such as ERP and CRM systems.

Table 3.1. Operational Definition of ICTs Constructs.

Author(s) (year)	Constructs	Definition
Alam et al. (2022) Hanan (2018)	ICTs	<i>Using ICTs in Business Activities (ICT-BA)</i> measures the ICT tools applied to business activities. However, adopting ICTs in business-related development practices is constant and not restricted to specific periods. As a result, the business effectively pursues to execute Modern technologies. Attempts to internally solve ICT-related issues before outsourcing them. Business benefit quality has expanded much obliged to our utilization of ICT tools. For example, business depends on ICT tools to communicate well between various business units. ICT tools are crucial for our business's growth in local and international markets. Business preferences depend on ICT tools for different international markets expansion service conveyance speed has increased, and much appreciated using ICT tools. As a result, business productivity has increased based on ICT tools. However, our business can deliver its services and products without delay based on ICT applications. <i>Government Supports Adapting ICTs (GS-ICT)</i> measures, and the government provides appropriate conditions for technological advancement in business activities. In addition, there are open-source solutions that our business can use for its technological requirements. For example, the government provided collaboration opportunities to develop (ICT) arrangements. Business closely follows government grants and opportunities for Technological Innovations. Business finds it easy to obtain governmental resources to finance our ICTs.

Source: Based on Literature Review Related to ICTs, mainly Alam et al. (2022) and Hanan (2018).

Government support for SMEs is vital to adopting ICTs; failure to protect SMEs could have a multiplier effect on the broader economy and jeopardize any recovery. The crisis likely raises questions about regional economic development efforts. Small cities depend on small and medium-sized companies for employment and economic activity and may face great difficulties and increased immigration rates if these small businesses are closed.

Additionally, because they tend to become tools in everyday life, recent technological advancements could result in an additional indirect expense due to workers departing for competitors or asking for updated pay scales when they acquire new abilities considering directing, organizing, and planning contemporary methods of work. When newly adopted technologies are used, managers may also be forced to review, then alter them. Additionally, they substantially invested in researching ICT's possibilities and testing novel formats (Love, Irani, 2004). Using ICTs in small business management will lower operational expenses because electronic information is typically more current, timely, and conveniently accessible nowadays (Lal, 2005). Finally, the survey questionnaire applied the measuring scale 1= Strongly Disagree, to 5 = Strongly Agree.

2.4.3 Conceptualization of SMEs

The economic literature provided many definitions of SMEs that vary by country. Where there is no comprehensive definition of small and medium enterprises because the term SMEs carries among its aspects many questions, including the type of small project, the minimum number of employees, the distribution of project products, the form of management and organization of those projects, the size of the capital. Although most of the definitions revolve around the definition of a small enterprise as a project owned by a person or a small number of persons; Thus, his investments are limited, and the capital in his fixed assets is low, such as land, buildings, and equipment (Mahmoud and Mahmoud, 2013). On the technological level, given the weak financial capacity of the owner of the small project, the technological level used is often relatively unadvanced; It is also characterized by the limited tools and machines used, and they are often manual and depend on a large extent on the skill of workers (Jawad, 2013).

SMEs are being targeted more than ever based on their capacity to expand and generate employment. There are proposals to increase funding and assistance for small and medium businesses from several development organizations, including the World Bank and the European Bank for Reconstruction and Development. For instance, government representatives from the Middle East and North Africa, the United States, and the European Union examined these businesses' capacities to generate job prospects in the area and on global markets during the recent World Economic Forum in Jordan (García-Cabrera et al., 2016). In Iraq and the northern Iraq regions, small and medium enterprises are a dynamic force to achieve economic development, as a large part of the population works in them. The most comprehensive studies were conducted in the United States, where researchers examined existing companies versus new ones.

Moreover, data about companies may be misclassified by size. Consider, for example, McDonald's, where each of its restaurants is a small entity, while the company itself is significant. Statistical data also includes information on the dates of establishment and liquidation of companies over time, which is not noticeable in the sub-samples of companies. For example, a recent survey of firms in the United States shows that once the firm's age is taken into account, there is no systematic relationship between firm size and its ability to create jobs within the international position; as a whole, job creation is linked to new and emerging companies (Rodriguez et al., 2010).

The interest in SMEs is steadily increasing in recognition of their pivotal role in job creation, international position, and international experience. It is essential in the economic development plans of developed and developing countries; similar businesses and institutions are just an idea, but today they represent more than a reality, as it is the experience of many countries that have become (Schweizer, 2012). It believes that the development of its economies depends primarily on the vital role played by small enterprises, and that is when their weight is measured by the size of their contributions to the production of wealth and job creation exports and absorption of renewable technology (Dar and Mishra, 2019; Warner, 2001).

There is a clear difference between researchers defining a unified definition of the phenomenon of internationalization of SMEs as a

multidimensional economic concept between its various aspects. It is a sequential process or stages based on a combination of different skills that an organization possesses or controls, allowing the enterprise to gain experience in international markets gradually; according to Cho and Lee (2018) internationalization of SME is a process consisting of a set of steps that enable businesses to market their services and products regularly in foreign markets, and this considers others to be internationalization making the institution's activity an international activity, transcending national borders, or moving from the national market to the international market (García-Cabrera et al., 2016).

Concerning the importance of the internationalization of SMEs, previous literature highlights the crucial role of globalization and advances in ICTs that have provided effective competitiveness for SMEs, leading to more critical efforts to manage the internationalization of SMEs related to the International Centre for SMEs' international experience. In addition, the efficiency and effectiveness of the internationalization process of SMEs are directly linked to how they manage their ICT knowledge and applications, enabling the internationalization of SMEs (Madaleno et al., 2018).

2.4.4 Operationalization of the Internationalization of SMEs

Internationalization of SMEs is an essential aspect of maximizing business opportunities, and over the past few decades, it has been initiated by many SMEs as a requirement for business success (Saixing et al., 2009). The literature often discusses three approaches to established internationalization: the phased, network, and emerging global (Hynes, 2010). The construct of internationalization of SMEs was adopted from Sandberg (2012) and measured twelve indicators relating to SMEs' international position and international experience. Regarding the international position, Sandberg (2012) mentioned that the business's possibility for further international expansion constantly seeks data about international markets, which are significant indicators internationalization of SMEs. The internationalization process and network theory were initially developed and applied based on the idea that businesses should realize it is necessary to be internationally active and keenly pursue foreign customers (Björkman and Forsgren, 2000; Gomathi and Gopinathan, 2019).

International experience of SMEs measuring the innovative experience of SMEs in supplying international markets and foreign customers. Products and services are also provided to meet global markets and the needs and desires of foreign customers. In addition, marketing and sales products and services are abroad. Therefore, SMEs modify and deal with international competitors and manage communications with foreign authorities. SMEs adapt to and cooperate with foreign brokers (Sandberg, 2012). The survey questionnaire applied the measuring scale from 1= Strongly Disagree to 5 = Strongly Agree, see Table 3.2 below.

Table 3.2. The Indicators of Internationalization of SMEs Constructs.

Author(s) (year)	Constructs	Definition
Sandberg (2012)	Internationalization of SMEs	<i>International Position (IP-SMEs)</i> companies must find an essential possibility for more international expansion. For example, business is constantly looking for data on international markets and realizes it is necessary to be internationally active. SMEs follow up with foreign customers. SMEs realize themselves as Iraqi and international company. Small and medium-sized companies realize that every market is equally vital. <i>International Experience (IE-SMEs)</i> measuring SMEs with cutting-edge experience supplying international markets and foreign customers. Adapt products and services to meet international markets and the needs and desires of foreign customers. Adapt the marketing and sales of our products and services abroad. SMEs modify and deal with international competitors and manage communications with foreign authorities. SMEs adapt to and cooperate with foreign intermediaries.

Source: Based on a Literature Review Related to the internationalization of SMEs.

To obtain general information on SMEs operating in northern Iraq, mainly to find out the SMEs use what type of ICTs tools and applications in their activities, the following questions are used; these questions formed by the researcher based on the literature review related to SMEs types, size, ICTs tools used and budget's share of the expenses of ICTs, as shown in Table 3.3 below.

Table 3.3. General Questions on ICT Use.

S	General Questions	Possible answers
1	Select the field your company operates in:	Education, Healthcare, Tourism, Consultancy, Advertisement, Media, IT, Language and Translation, Food Services, Energy, Finance/Insurance, or Other
2	Select the business size by the number of employees	Micro (<10 Employees), Small (10 - 50 Employees), Mid-Sized 1 (50-100 Employees), and Mid-Sized 2 (>100 Employees)
3	Select the ICTs that your business use (select all that apply)	Website, Email, social media, Database, CRM systems, Data Mining, Cloud Storage, Cloud Computing, Internet of Things, or Other
4	Which activities do your business consider ICTs essential for? (Please select all that apply)	Accounting, Human Resources, Marketing, Project Coordination, Customer Relationship Management, Supply Chain Management, Resource Planning, Quality Assurance, and Training Other
5	What is the company budget's share of the expenses of ICTs (computers, web hosting, security, (IT) personnel, etc.)?	Less than 10%, Between 10-20%, Between 20-40%, More than 40%

Source: Based on a Literature Review Related to ICTs and the SMEs.

2.5 Data Preparation and Collecting

The data was gathered over eight months, from January to August 2022. Simple random sampling was used to reach as many people as possible who met the study criterion: SMEs in the service sector. Based on that, 550 companies managers in the service sector were visited and emailed; since most SMEs in north Iraq have a branch in Erbil, Sulemanya, and Duhok, the surveys were sent to them, and the SMEs included tourism agencies, advertising agencies, insurance agencies, translation agencies, software development organizations, and

consulting firms, among others. In addition, the survey URL was also published on social media sites to increase the number of respondents. There were 285 answers in all. Before going on to the next level, they were investigated and cleared up. Because the study focuses solely on the service sector, respondents who claimed to work in the manufacturing sector were excluded from the analysis.

Two surveys were eliminated because the responder selected the same choice for all questions, casting doubt on the validity of the responses. After removing faulty and non-service-sector questions, 285 replies were declared legitimate 278; out of the 285 respondents, 87.3 percent mentioned using ICTs in their operations, and these businesses made up the study's sample. Finally, respondents in businesses that did not use ICTs were excluded from hypothesis testing to retain the study's emphasis on organizations' ICTs skills.

CHAPTER THREE

3. ANALYSIS OF THE RESULTS

This study examines empirical data on the relationship between the adoption to ICTs and the internationalization of SMEs in northern Iraq and tests the study hypotheses based on survey replies from the SMEs service sector in northern Iraq. The first part of the data analysis assessed the general information about using ICTs and managers' perceptions regarding the influence of ICTs on the internationalization process of SMEs in Northern Iraq by applying descriptive analysis, exploring empirical data, and checking the study hypotheses using SPSS 28. The tables and figures below show a further interpretation of the results.

3.1 Descriptive Analysis

Descriptive statistical analysis is the discipline of collecting, organizing, and exploring patterns and trends using one of its types, such as the descriptive type (to describe the data) or the inferential type (to generalize the population); in this part, descriptive analysis is used by checking the mean, Std. Deviation, percentages of agreements. The mean is one of the statistical concepts and is the most widely used. The mean is a measure of central tendency in statistics. It is the sum of the values in a sample divided by their number. It is often called the arithmetic mean because it describes the mean of a set of data (Grice, 2001). Standard deviation is a statistical term that measures the dispersion of a data set concerning the mean. It is computed as the square root of the variance and computed as the square root by determining the variance between each data point relative to the mean.

$$\text{Standard Deviation} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$$

If the data points are farther from the average, there will be a higher deviation within the dataset. Therefore, the greater the data spread (dispersion), the greater the standard deviation (Nicholas, 2006).

The Field Company (Business) Operates in the Following Ways:

As summarized in Table 4.1 and Figure 4.1, results showed that the service-sector groups with the most significant proportion of representation in the sample were businesses operating within the tourism sector (15.47%), followed by IT (13.31%), the small businesses working on language & translation same at the third place (12.94%). In addition, institutions operating in the education sector participated in the survey (12.59%), and most of these institutions are a branch of international education firms.

Table 4.1. The Type of SMEs that Participated in the Survey.

Categories	Frequency	Percentages
Language & Translation	36	12.94%
Healthcare	16	5.75%
IT	37	13.31%
Consultancy	22	7.91%
Finance & Insurance	18	6.47%
Media & Advertisement	32	11.51%
Food Service	16	5.75%
Tourism	43	15.47%
Education	35	12.59%
Other (Energy, Logistics, Engineering Services)	23	8.27%
Total (n)	278	100%

Table 4.1 also shows the percentage of media & advertisement (11.51%) and other businesses, such as energy, logistics, and engineering services, reached (8.27%). At the same time, respondents who indicated that their business is consultancy reach (7.91%), banking & insurance (6.47%), then healthcare institutions and businesses working within food service, each reached (5.75%), also see Figure 4.1, which provides a comprehensive analysis of all valid responses.

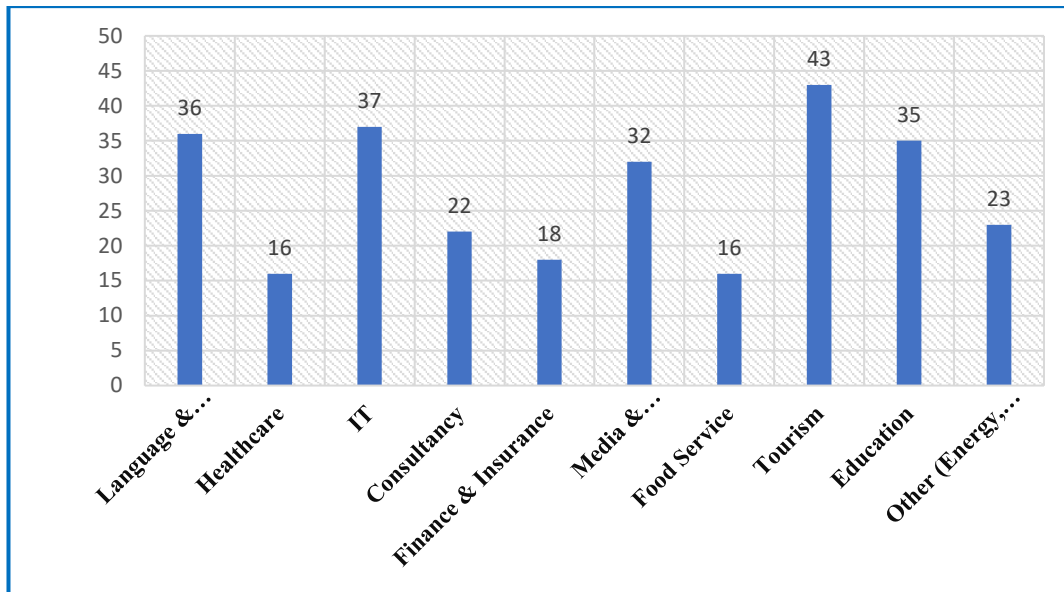


Figure 4.1. The Type of SMEs that Participated in the Survey Results.

Business Size by Number of Employees:

As a measure of business size, results revealed that micro and small businesses made up most of the sample. As displayed in Table 4.2, micro-businesses (those with less than ten full-time employees) comprised the bulk of the sample, accounting for 44.96% (n=125). They were followed by small businesses (those with 10 to 50 full-time employees) with 24.11% (n=67).

Table 4.2. The Size of SMEs that Participated in the Survey

Business Size	Frequency	Percentages
Micro (<10 Employees)	125	44.96%
Small (10 - 50 Employees)	67	24.11%
Mid-Sized 1 (50-100 Employees)	50	17.98%
Mid-Sized 2 (> 100 Employees)	36	12.95%
Total (n)	278	100%

In addition, Figure 4.2 showed that mid-sized businesses were separated into two categories for data collection (between 50 and 100 full-time employees and more than 100 full-time employees), accounting for 17.98% (n=50) and 12.95% (n= 35) of the total sample, respectively. Because of their small numbers, they were pooled and analyzed as a single group for further research.

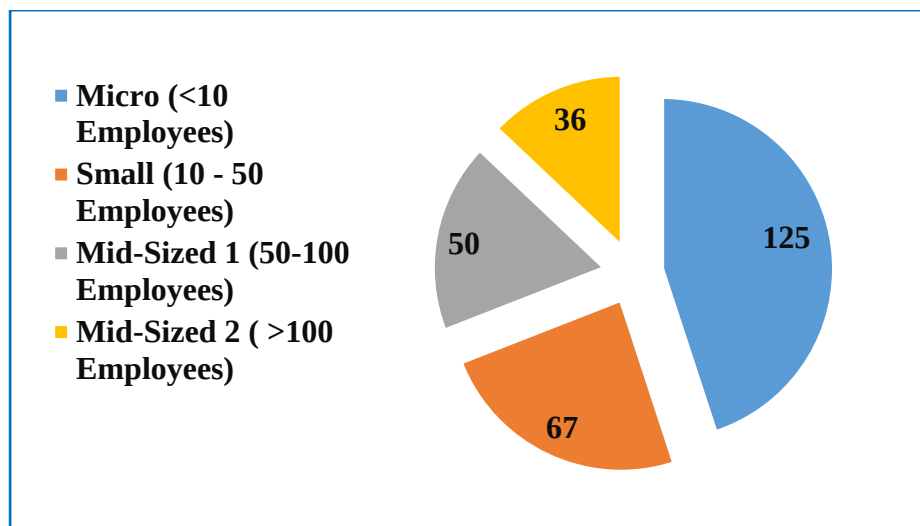


Figure 4.2. The Size of SMEs that Participated in the Survey by Employees

The ICTs that Business Use (Essential Behaviors and Technologies)

Participants in SMEs who reported using ICTs in their operations were further asked to specify which technologies or tools they used and the activities they considered ICTs vital. They were given a list of 11 technologies and nine practices, the majority chosen because they were broad and relevant to various sectors. Table 4.3 and Figure 4.3 show the technologies in order of how frequently they are employed. When we look at the results, it is clear that most businesses in northern Iraq use ICTs for websites (96.40%) and business emailing (92.45%), while social media (90.65%) emerge among the most widely used technologies that SMEs rely on, which is expected considering the simplicity and availability of these technologies.

Table 4.3. Results of Frequency and Percentages of ICTs Used by SMEs

	Frequency	Percentages
Website	268	96.40%
Email	257	92.45%
Social Media	252	90.65%
Database	232	83.45%
CRM Systems	189	67.99%
Data Mining	183	65.83%
Cloud Storage	179	64.39%
Cloud Computing	165	59.35%
Internet of Things	78	28.06%

In addition, (83.45%) of total respondents indicated that they use ICTs for databases; in this regard, respondents showed that they use ICTs for complex technologies such as CRM systems (67.99%), data mining, cloud storage cloud, and computing reached (65.83%, 64.39%, and 59.35), respectively. The internet of things (28.06%) was the least frequently used.

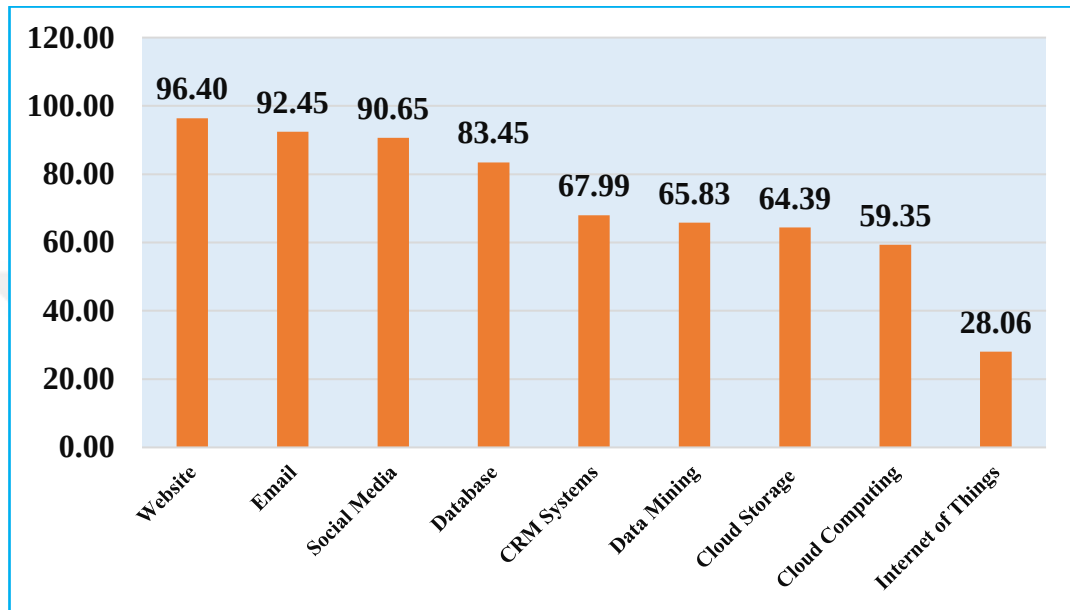


Figure 4.3. ICTs Used by SMEs

Activities Businesses Consider ICTs Essential for:

The managers' participants in SMEs were asked to choose the ICTs practices they consider essential, and the top replies were marketing (76.7%) and accounting (68.9%), followed by project coordination (65%) and customer relationship management (65%) activities. On the other hand, SMEs claimed ICTs were essential for training (34%), and supply chain management (28.2%) activities were the least likely, as shown in Figure 4.4 below.

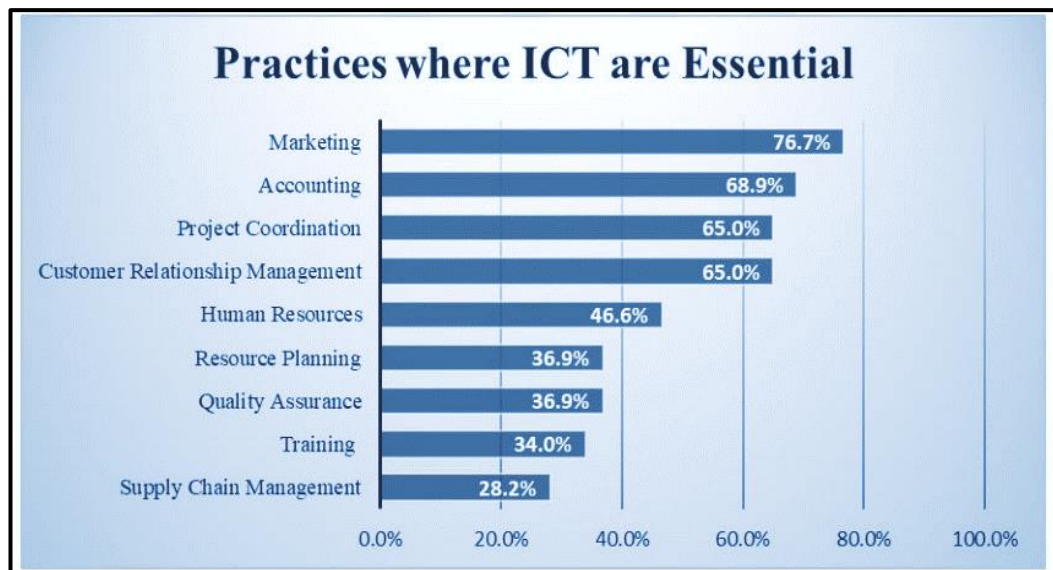


Figure 4.4. Practices where ICT is Deemed Essential

Budget Share of the Expenses of ICTs (Computers, Web Hosting, Security, (IT) Personnel)

Table 4.4 and Figure 4.5 shows managers' responses who indicated that their ICTs spending was less than 10% of their yearly budget with 38.49% (n=107); individuals on a budget were the largest group, followed by those with 10-year plans. While businesses spending 10-20% of their annual budget on ICTs accounted for 31.65% (n=88) of the sample, those spending more than 40% of their annual budget on ICTs accounted for just 20.50% (n= 57). In addition, firms spending more than 40% of their annual budget on ICTs accounted for 9.35% (n=26) of the sample; as a result, most enterprises in the sample did not consider ICTs investment a priority.

Table 4.4. Results of ICTs Spending in Annual Budget by SMEs

ICT Spending in Annual Budget	Number	Percentage
Less than 10%	107	38.49%
10-20%	88	31.65%
20-40%	57	20.50%
More than 40%	26	9.35%

This result shows that small and medium-sized companies in northern Iraq, those who participated in the study, allocate little budget for information and

communication technology due to these companies' lack of financial capacity. Hence, government support and external resources are essential for these companies.

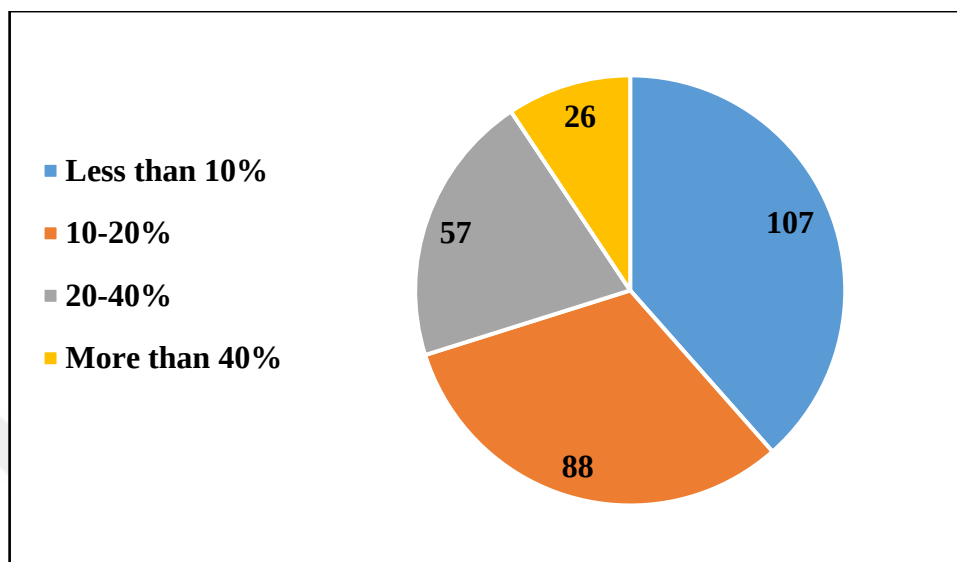


Figure 4.5. Results of ICTs Spending in Annual Budget by SMEs

3.2 Empirical Results

3.2.1 Establishing Reliability

After descriptively examining data related to the companies' ICT usage to enhance the internationalization of SMEs, the scales' reliability was established. The results showed that the study's independent and dependent variables were reliable. Cronbach's alpha values were determined for each scale, ICTs, which included the use of ICTs in business activities (ICT-BA), ICTs Usage Related to Human Capital Skills (ICT-URHC), and government supports for adapting ICTs (GS-ICT).

In addition, the internationalization of SMEs included international positions and experience. To consider the scales credible, values greater than 0.60 are ideal. The results in Table 4.5 showed that all loaded values were higher than 0.60. Cronbach's α values of all indicators of ICTs reached (0,851), and the loaded value of all indicators of internationalization of SMEs reached (0,771). Consequently, the scale used for obtaining data can be considered highly reliable.

Table 4.5. Constructs' Reliability.

Constructs	Cronbach's α	Number of Indicators	Percentage
Indicators of ICTs	0,851	16	100.0
Indicators of Internationalization of SMEs	0,771	12	100.0
All Survey Items	0,884	28	100.0

3.2.2 Distribution of Normality Test

The distribution of normality test was used for all constructs of ICTs and the internationalization of SMEs. Mainly, for the empirical data was obtained from managers of small and medium-sized enterprises (SMEs); the data were generated based on survey participants' perceptions. Thus, each participant expressed a unique perspective based on that it is expected to have no normality distribution since all participants did not answer the same. Hence, Table 4.6 shows that all p-values are less than 0.05. however, the normality was tested again as part of the regression analysis, and it is acceptable that the outcome of this test did not affect the overall results.

Table 4.6. Distribution of Normality Test for the Model Constructs

Tests of Normality						
Constructs	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ICT-BA	.124	278	.000	.969	278	.000
ICT-URHC	.165	278	.000	.952	278	.000
GS-ICT	.190	278	.000	.931	278	.000
IP-SMEs	.165	278	.000	.878	278	.000
IE-SMEs	.112	278	.000	.973	278	.000
a. Lilliefors Significance Correction						

3.2.3 Measurement Model

Factor analysis has been primarily used to measure and establish the validity of survey constructs and their indicators; this test is also known as minimizing components that respond to the model constructs and analyzing it in complex variables, known as principal component analysis (PCA). This test is

also a significant step before testing the hypotheses (Grice, 2001; Smith, 2002). Survey indicators are identified using principal component analysis (PCA), which then uses them to display the most critical components. Occasionally, just a few principal components are utilized with the most influence, while others are omitted (Hörmann et al., 2015: 321).

Meanwhile, through this test, the study aimed to show the loading values on all the indicators of the study variables. First, the independent variable, ICTs, such as include the use of ICTs in Business Activities (ICT-BA), ICT Usage Related to Human Capital Skills (ICT-URHC), and Government Supports for Adapting ICTs (GS-ICT), which has sixteen indicators. First, the internationalization of SMEs includes international position (IP-SMEs) and international experience (IE-SMEs); these dimensions have twelve indicators. The results of the explanatory factor analysis related to the ICTs and the internationalization of SMEs are presented in the following sections.

3.2.4 Findings Related to Factor Analysis of ICTs

Explanatory factor analysis was carried out on the empirical data obtained based on the participants' perceptions about the adoption of ICTs. The results of the analysis carried out in this context are shown in Table 4.7. The Kaiser-Meyer-Olkin (KMO) and Bartlett tests were applied to test the weight of the factor analysis. This test shows a high and acceptable value between (1,0 and 0,5), confirming that the factor analysis is appropriately implemented. When the value is less than 0,5, factor analysis may not be appropriate (Hörmann et al., 2015: 322). Table 4.7 shows that the Kaiser-Meyer-Olkin (KMO) sample adequacy test and Bartlett test results related to the factor analysis for the adoption of the ICTs scale are sufficient KMO value is 0,750. Bartlett test result is $p < 0.000$. This result shows that the sample adequacy and size of the factor analysis of the adoption of ICTs is perfect for the study.

Table 4.7. Explanatory Factor Analysis of ICTs

Components	Expressions	Mean	Factor Loadings	Variance Explained	Eigenvalue
The use of ICTs in Business Activities (ICT-BA)	Our business effectively pursues to execute Modern technologies.	3,94	,871	32,070	5,131
	Our business's productivity has increased based on ICT tools.	4,06	,800		
	Our business attempts to internally solve ICT-related issues before outsourcing them.	4,00	,658		
	Our business's service conveyance speed has increased, much appreciated using ICT tools.	4,10	,656		
	Our business's benefit quality has expanded much obliged to our utilization of ICT tools.	3,92	,649		
	ICT tools are crucial for our business's growth in local and international markets.	3,95	,608		
	Based on ICT applications, our business can deliver its services and products without delay.	4,14	,509		
ICT Usage Related to Human Capital Skills (ICT-UHR)	Employees in our business have an excellent command of the ICT tools applied to business activities.	4,17	,672	13,018	2,083
	Our business preferences depend on ICT tools for further international market expansion.	4,08	,585		
	Our business depends on ICT tools to guarantee good communication between various business units.	4,13	,578		
	The adoption of ICTs in our business-related development practices is constant and not restricted to specific periods.	4,25	,449		
Government Supports for ICTs (GS-ICT)	The government provided collaboration opportunities to develop (ICT) arrangements.	4,12	,824	9,658	1,545
	There are open-source solutions that our business can use for its technological requirements.	4,01	,729		
	Our business closely follows government grants and opportunities for Technological Innovations.	4,15	,676		
	The government provides appropriate conditions for technological advancement in business activities.	4,00	.504		
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0,750 Approx. Chi-Square: 2018,117 Bartlett's Test of Sphericity: 0,000 Extraction Method: Principal Components Rotation Method: Varimax Total Variance Explained: 54,746				

The factorial scores were obtained using the Principal Component Analysis (PCA) method, one of the most popular techniques in applied research because it provides an appropriate number of derived factors in an orthogonal manner (Varimax) or correlates with each other to varying degrees. This allowed us to check loading values on all model constructs and their indicators (Moore, 2003). Therefore, this study relied on the first method (Varimax) to reach factors of distinct value (Hinton, 2014).

Principal component analysis and the Varimax rotation procedure were used for factor analysis of the adoption of ICTs. Values with low factor loadings (expressions below 0,40) were excluded from the scale. In this regard, the question or indicator 16th of the 16 items in the scale related to the adoption of ICTs was excluded because they showed low equivalence. After the 16th question was removed from the scale, 15 items remained. Table 4.7 shows that these items are gathered under three factors. First, according to the factor analysis result, the first factor, named the use of ICTs in business activities, consisted of 7 items, and the second factor, ICT usage related to human capital skills (ICT-URHC), comprised four items, the third factor, the government supports for ICTs (GS-ICT) involves of 4 items.

Table 4.7 shows that loads of the first factor vary between 0,509 and 0,871. The survey indicators on using ICTs in business activities (ICT-BA) are considered together with the expressions based on ICT applications; the business can deliver its services and products without delay, and ICT tools are realized as crucial assets for our business's productivity and growth.

Loads of the second factor vary between 0,449 and 0,672; the questions in the survey are about whether employees have an excellent command of the ICT tools applied to business activities, the adoption of ICTs is constant and not restricted to specific periods, in addition, ICTs tools for further international markets expansion. When the expressions that make up the perceptions are considered together, this factor is called ICTs usage related to human capital skills. Loads of the third factor also vary between 0,504 and 0,824. The survey questions are about government support for technological advancement in business activities and open-source solutions that businesses can use for their technological requirements. In addition, collaboration opportunities to develop

ICTs arrangements, following government grants and opportunities for Technological innovations. The expressions together make the factor called government support for ICTs.

Table 4.7 shows that the total explained variance regarding ICTs is 54,746%. Based on that, the three factors that emerged together explained most of the variance. The distribution of eigenvalues and explained variances showed that the reliability factor has the highest eigenvalue (5,131) and explained variance (32,070). These results show that the reliability factor has the highest share among the variables explaining the ICTs tools applied to business activities. ICT usage related to human capital skills is seen as the factor with the accepted share with its eigenvalue of (2,083) and its explained variance of (13,018). These factors are followed by government support for ICTs (eigenvalue of 1,545 and explained variance of 9,658).

3.2.5 Internationalization of SMEs Factor Analysis

A further exploratory factor analysis within the scope of the study variable is the conducted internationalization of SMEs. The results of the factor analysis of the internationalization of SMEs, in which the opinions of survey participants or managers within the service sector in the north of Iraq are tried to be determined, are shown in Table 4.8.

The results of the explanatory factor analysis of the internationalization of SMEs are shown in Table 4.8 that the Kaiser-Meyer-Olkin (KMO) sample adequacy and Bartlett test results related to the internationalization of SMEs scale are sufficient (KMO value is 0,666. Bartlett test result is $p < 0.000$). This result demonstrates that the sample adequacy and size of the factor analysis of the internationalization of SMEs are suitable for the study. Principal component analysis and the Varimax rotation method were also used for factor analysis of the internationalization of SMEs. There was on values with low factor loadings (expressions below 0.40) hence 12 items in the scale related to the internationalization of SMEs remained to measure the internationalization of SMEs.

Table 4.8. Explanatory Factor Analysis of Internationalization of SMEs.

Components	Expressions	Mean	Factor Loadings	Variance Explained	Eigenvalue
International Position (IP-SMEs)	Our business realizes it is considered necessary to be internationally active.	4,00	,823	33,899	4,068
	Our business realizes itself as an Iraqi and a global company.	4,10	,801		
	Our business keenly pursues foreign customers.	4,02	,707		
	Our business realizes each market as equally vital.	3,82	,617		
	Our business finds a significant possibility for further international expansion.	3,96	,493		
	Our business constantly seeks data about international markets.	3,97	,440		
International Experience (IE-SMEs)	Our business modifies and handles international competitors.	4,08	,818	16,226	1,947
	Our business manages contacts with foreign authorities.	3,93	,794		
	Our business has well-developed experience of supplying international markets and foreign customers.	3,77	,782		
	Our business adapts products and services to meet international markets and foreign customers' needs and wants.	3,97	,665		
	Our business adapts and co-operates with foreign intermediaries.	4,28	,621		
	Our business adapts marketing and sales of our products and services abroad.	4,18	,561		
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0,666 Approx. Chi-Square: 1635.338 Bartlett's Test of Sphericity: 0,000 Extraction Method: Principal Components Rotation Method: Varimax Total Variance Explained: 50.126				

Table 4.8 indicates that these items are gathered under two factors. According to the results, the first factor, the international position, consisted of 6 items, and the second-factor international experience, comprised 6 items. Loads of the first factor ranged between 0,440 and 0,823. This factor related to businesses considers a considerable opportunity for future international growth when the survey's international position and business responses are considered, and as a result, they are continually looking for information about foreign markets. The

business also recognizes that being globally engaged is critical, and as a result, it actively pursues worldwide clients and views every market as equally important.

Loads of the second factor vary between 0,561 and 0,818; the questions in the survey are about the business changes and controls interactions with foreign authorities as well as rivals on a global scale. Moreover, having extensive expertise servicing overseas markets and consumers, one may modify products and services to satisfy the demands and preferences of foreign markets and customers. Moreover, business collaborates and adapts with international middlemen, and ultimately, business adapts the marketing and sales of our goods and services overseas.

Table 4.8 shows that the total explained variance regarding the internationalization of SMEs is 50.126%. The two factors that emerged together explained most of the variance. The eigenvalues and explained variances showed that the first factor has a high eigenvalue (4,068) and explained variance (33,899). These results show that this factor has the highest share among the variables explaining the international position. The international position variable is realized as the factor with the accepted share with its eigenvalue of 1,947 and its explained variance of 16,226.

3.2.6 The Descriptive Analysis Results of ICTs and the Internationalization of SMEs.

Table 4.9 shows the mean values, standard deviation scores, and agreement ratios regarding using ICTs in business activities. The value of the mean reached (4.017), indicating a high level of agreement on the significance of using ICTs in business operations; that was confirmed by the high consistency in respondents' answers, where the percentage of an agreement reached (80.34%), which was reflected by the standard deviation (0.4048). This result supports the service sector in north Iraq that uses ICTs in business activities reasonably; see Figure 4.6 below.

SMEs' adoption of ICTs is associated with ongoing routines and is not limited to certain times. Before outsourcing ICT-related problems, SMEs explore contemporary technologies and make an internal effort to resolve them. The managers also concurred that as ICTs tools are essential resources for corporate success in domestic and foreign markets, adopting them ensures communication

between various business divisions. The findings revealed that managers concurred that SMEs rely on ICTs to grow their worldwide markets further.

Table 4.9. The Descriptive Analysis Results of ICTs and the Internationalization of SMEs Constructs.

Constructs	Minim	Maxim	Mean	Std. Deviation	Weight of Agreement %
The use of ICTs in Business Activities (ICT-BA)	2.71	4.86	4.017	0.4048	80.34%
ICT Usage Related to Human Capital Skills (ICT-URHC)	2.50	5.00	4.156	0.4724	83.13%
Government Supports for Adapting ICTs	2.40	4.80	4.064	0.4416	81.29%
International Position (IP-SMEs)	1.67	4.50	3.977	0.4912	79.54%
International Experience (IE-SMEs)	3.00	4.83	4.036	0.3567	80.72%
Valid N (listwise) 278					

Table 4.9 shows that the mean value and percentage achieved by ICT usage related to human capital skills was high and supported by a mean of (4.156). Low standard deviation scores (0.4724) this was significant. As shown in Figure 4.6, the percentage of the agreement reached was (83.13%). This result explains that employees in SMEs in northern Iraq have an excellent command of the ICT tools applied to business activities. Additionally, based on ICT technologies and human capital skills, productivity has grown, and as a result, a firm can quickly supply its services to clients.

Table 4.9 shows that the mean value and percentage achieved by government support for adapting ICTs was high and supported by a mean of (4.064). Low standard deviation scores (0.4416) this was significant. As shown in Figure 4.6, the percentage of the agreement reached was (81.29%). This result indicates that support is crucial for SMEs since they allocate a small budget for information and communication technology due to these companies' lack of financial capacity.

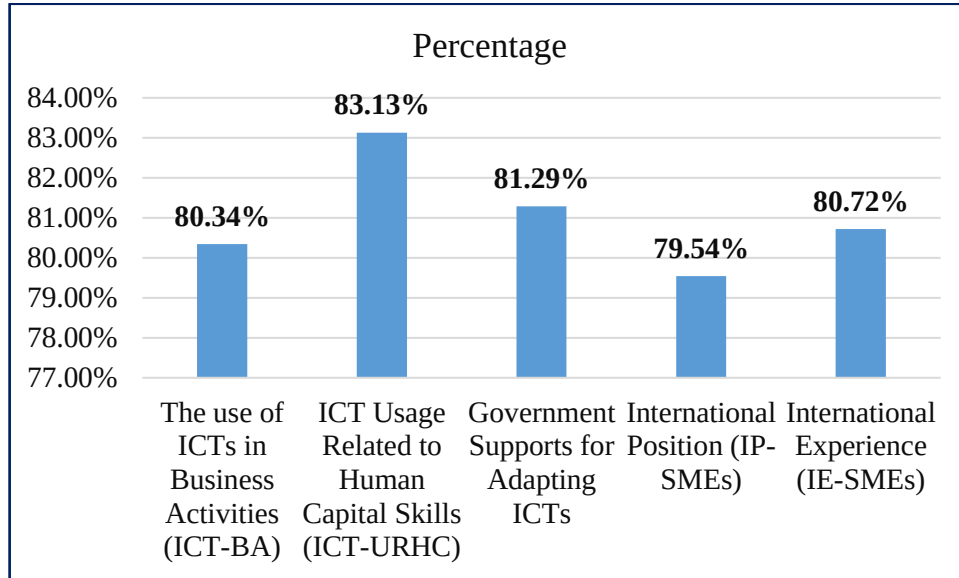


Figure 4.6. The Agreement Percentages on the Adoption to the ICTs and the Internationalization of SMEs

Table 4.9 reveal that managers who participated in the survey agreed on the importance of reaching international position by SMEs, the mean value (3.977), and standard deviation scores reached (0.4912), and the agreement percentage reached (79.54%). This lends acceptance to the perception that SMEs perceive a sizable opportunity for continued international growth. They are always looking for information regarding global marketplaces. SMEs aggressively chase overseas clients because they know the necessity of being globally engaged. Additionally, SMEs saw themselves as international and Iraqi businesses and understood the importance of every market.

The results of mean values and standard deviations related to the respondents' viewpoint regarding international experience are shown in Table 4.9. The mean value was (4.036), the standard deviation was (0.3567) and the agreement percentage of (80.72%). These findings demonstrate that SMEs have a record of serving global clients and marketplaces. Additionally, managers concurred that their companies modify their offerings to fit overseas clients' demands and global marketplaces. SMEs are also equipped to adapt to and deal with certain foreign rivals. Finally, SMEs handle communications with foreign officials. Additionally, they cooperate and adapt to working with international mediators, see Figure 4.6.

3.2.7 Hypotheses Testing

After the results of the factors were determined to be reliable, correlation analysis was performed to reveal the relationship between the use of ICTs in business activities, ICTs usage related to human capital skills, government support for adapting ICTs, international position, and international experience. The relationship between the variables in Table 4.10 clearly showed a strong and direct relationship between the use of ICTs in business activities, ICTs usage related to human capital skills; the government supports for adapting ICTs, international position (IP-SMEs), and international experience. Table 4.10 showed significant positive relationships between the sub-dimensions of ICTs and the internationalization of SMEs (international position and international experience). This result confirms that the adoption to ICTs plays a significant role in the internationalization of SMEs, which plays an essential role in the international position of SMEs and enhances the international experience of SMEs.

Table 4.10. Relationship Analysis Results Between the Adoption to the ICTs and the Internationalization of SMEs

Correlations						
		ICT-BA	ICT-URHCS	GS-ICT	IP-SMEs	IE-SMEs
ICT-BA	Pearson Correlation	1.000				
	Sig. (2-tailed)	.				
	N	278				
ICT-URHCS	Pearson Correlation	.695**	1.000			
	Sig. (2-tailed)	.000	.			
	N	278	278			
GS-ICT	Pearson Correlation	.457**	.496**	1.000		
	Sig. (2-tailed)	.000	.000	.		
	N	278	278	278		
IP-SMEs	Pearson Correlation	.742**	.694**	.401**	1.000	
	Sig. (2-tailed)	.000	.000	.000	.	
	N	278	278	278	278	
IE-SMEs	Pearson Correlation	.376**	.345**	.325**	.541**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.
	N	278	278	278	278	278
**. Correlation is significant at the 0.01 level (2-tailed).						

In this part of the study, multiple linear regression analyses were applied to examine the effect of the adoption of ICTs on the internationalization of SMEs.

Multiple linear regression analysis is a type of analysis for estimating the dependent variable based on two or more independent variables (predictor variables). In this regard, the relationship between the independent and dependent variables was established before the multiple linear regression analysis examined whether the relationship between the independent and dependent variables was linear and whether the scores showed a normal distribution. As shown in Fig. 4.7, normal distribution, linear relationship, and scatter diagrams created for standardized residual values and standardized predicted values describe a linear relationship, and the points tend to gather around an axis. In addition, the histogram and normal distribution curves established for the standardized predicted values also showed a distribution close to normal.

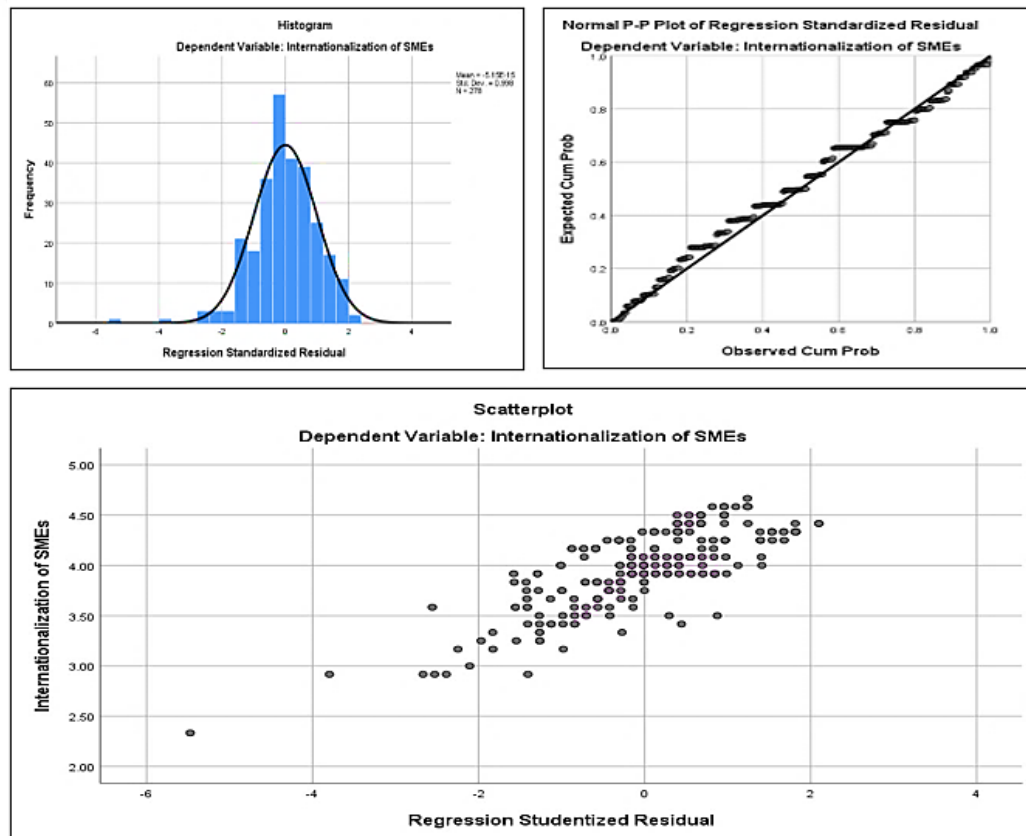


Figure 4.7. Normal Distribution, Linear Relationship, and Scatter Diagrams

As mentioned above, to test the study hypotheses, multiple linear regression analysis was used, and the value of (R^2) is the coefficient of determination of the change in the internationalization of SMEs (international position and international experience) due to the change in the adoption to ICTs

tools through the use of ICTs in business activities, ICTs usage related to human capital skills and government supports for adopting to ICTs.

As shown in Table 4.11, the value of ($R^2 = 0,496$), i.e. (49,6%) of the changes taking place in the international position, is due to the independent variables represented in the adoption of ICTs. The value of F is equal to (90.056) and with significance (0,000) which is less than (0,05), and this indicates that the multiple regression model apparatus for all study variables and the study model are significant, which indicates that the data is ideal for discussing the results. Table 4.10 demonstrated no multicollinearity between the independent variables since there is no value higher than five among VIF values as they reached (1,755, 1,892, and 1,357) respectively, and tolerance values (0,570, 0,529, and 0,737). In addition, the Durbin–Watson coefficient (2,005) shows no problematic relationship between the independent variables and the error terms.

Table 4.11. Results of Multiple Linear Regression Analysis Between ICTs and International Position of SMEs.

Variables		B	Std. Error	β	t	P-value	Tol.	VIF
	(Constant)	,250	,242		1,033	,302		
H1a	ICTBA--> IPSMEs	,559	,069	,461	8,110	,000	,570	1,755
H2a	ICTURHCS--> IPSMEs	,282	,061	,271	4,602	,000	,529	1,892
H3a	GSICT--> IPSMEs	,076	,056	,068	1,372	,171	,737	1,357
Dependent variable: International Position (IP-SMEs)								
R: 0,705 R²: 0,496 df (3, 274), F: 90.056 P: 0.000 Durbin-Watson: 2,005								

The results in Table 4.11 showed that the use of ICTs in business activities positively affects the international position of SMEs; the coefficient of effect is ($\beta=0,461$), t-value (8,110), and ($p=0,000$), which is less than (0,05) significant, therefore, (**H1a**) is accepted, which stated that there is a significant effect of the use of ICTs in business activities on the international position of SMEs. Results in

Table 4.10 is indicated that ICT usage related to human capital skills is positively effect the international position of SMEs the coefficient of effect is ($\beta=0,271$), t-value (4,602), and ($p=0,000$) less than (0,05) significant, thus, hypothesis (**H2a**) is accepted, which stated that there is a significant effect of ICT usage related to human capital skills on the international position of SMEs.

Furthermore, the government supports adopting ICTs, which means external resources are favorably related to ICTs use capacities significantly affect the international position of SMEs, the coefficient of effect is ($\beta=0,068$), t-value (1,372), and ($p=0,171$) greater than (0,05) therefore not significant, hence, hypothesis (**H3a**) is not supported that there is not a significant effect of government supports for adapting ICTs on the international position of SMEs.

Table 4.12. Results of Multiple Linear Regression Analysis Between ICTs and International Experience of SMEs.

Variables		B	Std. Error	β	t	P-value	Tol.	VIF
	(Constant)	2,354	,225		10,479	,000		
H1b	ICTBA--> IESMEs	,169	,064	,192	2,648	,009	,570	1,755
H2b	ICTURHCS--> IESMEs	,130	,057	,172	2,274	,024	,529	1,892
H3b	GSICT--> IESMEs	,114	,052	,141	2,204	,028	,737	1,357
Dependent variable: International Experience (IE-SMEs)								
R: 0,419 R²: 0,176 df (3, 274), F: 19.462 P: 0,000 Durbin-Watson: 2,302								

As shown in Table 4.12, the value of ($R^2=0,176$), i.e. (17,6%) of the changes taking place in the international experience, is due to the independent variables represented in the adoption of ICTs. The value of F is equal to (19.462) and with significance (0,000) which is less than (0,05), and this indicates that the multiple regression model apparats for all study variables and the study model are significant, which indicates that the data is ideal for discussing the results. Table 4.12 established no multicollinearity between the independent variables since

there is no value higher than five among VIF values as they reached (1,755, 1,892, and 1,357) respectively, and tolerance values (0,570, 0,529, and 0,737). In addition, the Durbin–Watson coefficient (2,302) shows no problematic relationship between the independent variables and the error terms.

The results in Table 4.12 also displayed that the use of ICTs in business activities positively effect the international experience of SMEs, with the coefficient of effect up to ($\beta=0,197$), t-value (2,648), and ($p=0,009$), which is less than (0,05) significant, therefore, (**H1b**) is accepted, which stated that there is a significant effect of the use of ICTs in business activities on international experience. In some regard, results showed that ICT usage related to human capital skills is positively effect the international experience of SMEs; the coefficient of effect is ($\beta=0,172$), t-value (2,274), and ($p=0,024$) less than (0,05) significant, thus, hypothesis (**H2b**) is supported, which stated that there is a significant effect of ICT usage related to human capital skills on the international experience of SMEs. The government supports adopting ICTs' effect on the international experience of SMEs; the coefficient of effect is ($\beta=0,141$), t-value (2,204), and ($p=0,028$) less than (0,05) significant, hence, hypothesis (**H3b**) is accepted that there is a significant effect of government supports for adapting ICTs on the international experience of SMEs.

CONCLUSIONS

This chapter summarizes the study's findings, highlights the management implications, explains the limits encountered, and concludes with recommendations for future research.

Discussion of Results

The main aim of this study was to analysis of the relationship between the adoption to ICTs and the internationalization of SMEs in north Iraq, mainly to provide an up-to-date illustration of ICTs adoption by SMEs in north Iraq. As ICTs tools has gained more importance for increasing the possibilities of internationalization of SMEs (international position and international experience) and improving SMEs performance. Before testing the study hypotheses, the reliability of the scale was established by using Cronbach's alpha, and the results supported all study hypotheses.

In today's business, using ICTs has become a necessity and an essential factor since ICTs tools increase efficiency in business activities and the possibilities of reaching international markets. Thus, the current study focused on SMEs that adopt ICTs. However, when SMEs want to move towards internationalization, they need to use ICTs to meet the demands of foreign clients and take advantage of international opportunities through the Internet and other applications.

For instance, SMEs in the service sector can offer multiple services to clients online. It was suggested that firms more able to employ the ICTs tools at their disposal would have an advantage in terms of commercial performance and improve the possibility of internationalization. As a result, business development exploits knowledge resources for the most productive use, including ICTs. Hence, encouraging the creation and entry of new firms into the international market is more logical than comprehensive SMEs promotion programs.

In this context, various studies have concluded that SMEs have achieved a significant share in job creation and productivity growth, mainly when they use ICTs in their work and activities in education, consulting, and tourism. Based on the study, analyzed data were obtained to test the internal and external elements such as innovation orientation and skilled human capital, sector dynamism, and

external resources, which were strongly connected to the ICTs use capacities. Finally, the results explain that managers within SMEs in northern Iraq understand that the ICT tools applied to business activities are significant and the main factor in reaching an international position and international experience.

Moreover, the adoption to ICTs in SMEs-related development practices is constant and not restricted to specific periods. As a result, SMEs pursue modern technologies. They attempt to internally solve ICT-related issues before outsourcing them. The managers also concurred that as ICTs are essential resources for business success in domestic and foreign markets, adopting ICTs ensures communication between various business divisions. The findings revealed that managers concurred that SMEs rely on ICT technologies to grow their worldwide markets further. Additionally, based on ICTs, productivity has grown; as a result, a company can quickly supply its services and goods thanks to ICTs applications.

As a result of these businesses limited financial resources, the finding shows that government support is essential for SMEs because they only spend a small amount on information and communication technology. Results confirm that SMEs believe they have an excellent opportunity to expand internationally. They are always looking for information regarding global marketplaces. SMEs aggressively chase overseas clients because they know the necessity of being globally engaged. Additionally, SMEs saw themselves as international and Iraqi businesses and understood the importance of every market.

In addition, results confirm that SMEs have experience supplying international markets and foreign customers. In addition, managers agreed that their businesses adapt services to meet international markets and foreign customers' needs and want. SMEs are also prepared to modify and handle some international competitors. Finally, SMEs manage contacts with foreign authorities. Further, they adapt and cooperate with foreign intermediaries.

Main Conclusions

The relationship results showed a direct relationship between the use of ICTs in business activities, ICTs usage related to human capital skills, government support for adapting ICTs, international position, and international experience. This result validates that the adoption to ICTs will play a significant

role in the internationalization of SMEs; in particular, it plays an essential role in the international position of SMEs and enhances the international experience of SMEs.

These results confirm that when SMEs, especially in the service sector, use ICTs in their business, they can benefit from the international market and experience. The findings of this research are based on the opinion of the managers within SMEs; for example, some SMEs have been involved in an international experience in northern Iraq, particularly after the end of the former regime and the opening of Iraq to international, so part of these companies is the branch of the international company.

The regression analysis was used to test the study hypotheses, and the value of (R^2) is the coefficient of determination of the change in the international position and international experience of SMEs due to the change in the adoption to ICTs tools through the use of ICTs in business activities, ICTs usage related to human capital skills and government supports for adopting the ICTs. The results indicate that when companies adopt and use ICTs tools in their work, they have more opportunities to enter international markets and benefit from international experience. Thus, (49.6%) of the change in the international position of SMEs is due to the independent variables represented in the adoption of ICTs, and (17.6%) of the change in the international experience of SMEs is due to the independent variables represented in the adoption to ICTs.

The result suggested that using ICTs in business activities positively motivated the international position and international experience of SMEs. Results indicated that the use of ICTs in business activities, based on the usage abilities favorably related to human capital skills is, positively and significantly effect the international position and international experience of SMEs. Furthermore, the government supports adapting ICTs, which means external resources are favorably related to ICTs use capacities significantly effect the international experience of SMEs, while adapting ICTs related to the international position of SMEs but does not significantly affect the international position of SMEs. This result shows that external resources, especially government support, are essential for the international experience of SMEs, even though they do not have

significant capital to benefit from ICTs tools and implement them in their business activities.

The Study Implications

This study has several implications; first of all, it has theoretical implications, as there is insufficient research on SMEs' adoption of ICTs. There are also theoretical gaps in the relationship between the adoption of ICTs and SMEs' internationalization. Second, the study provides essential information to SMEs managers about the critical role of ICTs in business activities and the possibilities of entering international markets. Third, the study's results indicate a strong relationship between the adoption to ICTs and SMEs' internationalization. Finally, the model built to describe the positively associated ICTs use capacities is noteworthy.

The results also showed that the availability of information and data in its raw form might sometimes constitute a problem. However, the little experience that owners of small and medium-sized enterprises usually enjoy does not enable them to understand and make the best use of these data, which requires them to search for the meaning of these data and its implications in an ambiguous form. Alternatively, by some explanation and analysis, this will only be possible with bodies and centers specialized in analyzing and publishing this data. Therefore, this study recommends that SME managers implement ICTs in their business operations since today's world is experiencing many transformations in various economic, social, political, and legal fields due to the world economy's innovations.

Especially the information and communication technology innovation in which information has become the central element and invention in the business world. Consequently, there has become an increasing interest in promptly providing information to all decision-makers to make rational decisions, and this means that traditional information systems have become less appropriate for providing information to decision-makers. Moreover, as information has lost its most critical qualitative characteristic, accordingly, the need arose for new ICTs applications that are compatible with the incubating environment of information and communication technology to be able to provide high-quality information

promptly that contribute to rationalizing decisions, especially investment decisions that depend on high-quality information.

Today's SMEs need comprehensive support. Therefore, governments must set up a management center for SMEs as a single regulator to activate complete integration and to ensure that all efforts are aligned with the main objectives to maximize the government's impact response measures. The first necessary steps include addressing the interests of the various parties, increasing access to information, and matching demand and supply. In addition, the SME admin center can act as a control center that closely monitors how programs are implemented and their impact and acts as a feedback loop. These insights enable policymakers and those involved in the supportive business environment for SMEs to adapt and direct their assistance. The failure of most governments to track progress today may create blind spots that limit their ability to take corrective action to enhance program effectiveness. The Management Center also provides information on the participation of SMEs in government support programs at sector and regional levels; These insights are essential to mobilizing relevant stakeholders in the business environment.

Finally, productivity-enhancing programs will be necessary to keep small and medium-sized enterprises in existence and to enhance their ability to compete internationally. Although many SMEs struggled during the Coved-19 crisis, for example, by offering express e-commerce solutions, there is an urgent need for further innovation and digitization to boost their economies and ensure their survival. In addition, the government can accelerate the development of productivity programs and maximize the effectiveness of existing programs by prioritizing the neediest SMEs (in size, sector, and growth potential) and aligning them with appropriate technology, infrastructure, and capacity-building solutions.

Limitations and Recommendations

The goal of this study was to give a broad overview of the adoption to ICTs by SMEs in north Iraq, mainly within service sector SMEs; so, while conducting this study, we faced several limitations and obstacles; the most obvious limitation was to obtain as much data as possible from SMEs and find the best method to obtain more significant possible data from SMEs managers because some companies refused to participate in the survey, as they said they keep social

distancing. At the same time, only those SMEs continued to provide services since they adopted ICTs, creating significant obstacles. As a result, most managers needed to respond correctly to the forms sent by email and online.

As a result, this study focused on service sector SMEs, such as IT businesses, media, healthcare, education, tourism companies, etc., which would help enhance our understanding of their ICTs uses. Based on that, future studies must be prepared in close collaboration with suitable bodies. For example, they might obtain quantitative performance data such as sales numbers, profitability, return on investment, and so on, demonstrating a more exact correlation between ICT usage and internationalization of SMEs to enhance their performance. Future studies can further examine the relationship between ICTs applications and the internationalization of SMEs within different sectors, for instance, industrial companies, to generalize the findings.

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APPENDICES

Appendix 1 Questionnaire

T.R.

BOLU ABANT İZZET BAYSAL UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
Department of Business Administration



Dear Sir / Madam (Respondent)

I am Brindar Malo KHAWAJA, a master's business administration student at Bolu Abant İzzet Baysal University, Management, and Information Systems Department, Under the Supervision of Prof. Dr. Seyit KOSE. This survey aims to obtain empirical data based on your perceptions as a manager regarding the **Analysis of the Relationship Between Adoption to ICTs and Internationalization of SMEs in Northern Iraq.**

The study explores how small and mid-sized enterprises (SMEs) in the service sector use Information and Communication Technologies (ICT) and digitalize their business processes. We significantly demand that you fill out this questionnaire, which will take approximately (15) minutes, and share your valuable opinions. Please reply as reasonably as possible to the following statements by marking (✓) in a suitable place. Further, all answers will be kept confidential and used only for scientific study, and information about the businesses and participants will not be identified and will remain confidential.

Thanks in advance for your time.

Sincerely,

Brindar Malo KHAWAJA

General information about SMEs in Iraq

G1. Please select the field your company operates in:

☐ Language and Translation, ☐ Healthcare, ☐ IT, ☐ Consultancy, ☐ Finance & Insurance, ☐ Media & Advertisement, ☐ Food Services, ☐ Tourism, ☐ Education, Other:.....

G2. Please select your business size by the number of employees.

☐ Micro (<10 Employees), ☐ Small (10 - 50 Employees), ☐ Mid-Sized 1 (50-100 Employees), ☐ Mid-Sized 2 (>100 Employees).

G2. Please select the ICTs that your business uses (please select all that apply)

☐ Website, ☐ Email, ☐ social media, ☐ Database, ☐ CRM systems, ☐ Data Mining, ☐ Cloud Storage, ☐ Cloud Computing, ☐ Internet of Things.
☐ Other:.....

G3 Which activities do your business consider ICTs essential for? (Please select all that apply)

☐ Marketing, ☐ Accounting, ☐ Project Coordination, ☐ Customer Relationship Management, ☐ Human Resources, ☐ Resource Planning, ☐ Quality Assurance, ☐ Training, ☐ Supply Chain Management.
☐ Other:.....

G4 What is the share of ICTs related expenses (computers, web hosting, security, (IT) personnel costs, etc.) in the company budget?

☐ Less than 10%, ☐ Between 10-20%, ☐ Between 20-40%, ☐ More than 40%

This survey also consists of 2 parts: Part 1: Adoption of Information & Communication Technologies (ICTs), and Part 2: The Internationalization of SMEs. In each part, please read the statement and indicate your response to the statement using the scale below:

1= Strongly Disagree, 2= Disagree, 3 = Neither Agree or Disagree, 4 = Agree, and 5 = Strongly Agree

Part 1: Adoption of Information & Communication Technology (ICT)

The use of ICTs in Business Activities (ICT-BA)

Q1	Based on ICT applications, our business can deliver its services and products without delay.	1 2 3 4 5
Q2	ICT tools are crucial for our business's growth in local and international markets.	1 2 3 4 5
Q3	Our business effectively pursues to execute Modern technologies.	1 2 3 4 5
Q4	Our business's productivity has increased based on ICT tools.	1 2 3 4 5
Q5	Our business attempts to internally solve ICT-related issues before outsourcing them.	1 2 3 4 5
Q6	Our business's benefit quality has expanded much obliged to our utilization of ICT tools.	1 2 3 4 5
Q7	Our business's service conveyance speed has increased, much appreciated using ICT tools.	1 2 3 4 5

ICT Usage Related to Human Capital Skills (ICT-URHCS)

Q8	Employees in our business have an excellent command of the ICT tools applied to business activities.	1 2 3 4 5
Q9	The adoption of ICTs in our business-related development practices is constant and not restricted to specific periods.	1 2 3 4 5
Q10	Our business preferences depend on ICT tools for further international market expansion.	1 2 3 4 5
Q11	Our business depends on ICT tools to guarantee good communication between various business units.	1 2 3 4 5

Government Supports for ICTs (GS-ICT)

Q12	The government provides appropriate conditions for technological advancement in business activities.	1 2 3 4 5
Q13	There are open-source solutions that our business can use for its technological requirements.	1 2 3 4 5
Q14	The government provided collaboration opportunities to develop (ICT) arrangements.	1 2 3 4 5
Q15	Our business closely follows government grants and opportunities for Technological Innovations.	1 2 3 4 5
Q16	Our business finds it easy to obtain governmental resources to finance our ICTs.	1 2 3 4 5

Source: Alam K, Ali MA, Erdiaw-Kwasie M, Shahiduzzaman M, Velayutham, E, Murray PA. Wiesner R. Impact of ICTs on Innovation and Performance of Firms: Do Start-ups, Regional Proximity, and Skills Matter? Sustainability 2022;14:5801. <https://doi.org/10.3390/su14105801>.
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Part 2: Internationalization of SMEs

International Position (IP-SMEs)					
Q17	Our business finds a significant possibility for further international expansion.	1	2	3	4 5
Q18	Our business constantly seeks data about international markets.	1	2	3	4 5
Q19	Our business realizes it is considered necessary to be internationally active.	1	2	3	4 5
Q20	Our business keenly pursues foreign customers.	1	2	3	4 5
Q21	Our business realizes itself as an Iraqi and a global company.	1	2	3	4 5
Q22	Our business realizes each market as equally vital.	1	2	3	4 5
International Experience (IE-SMEs)					
Q23	Our business has well-developed experience of supplying international markets and foreign customers.`	1	2	3	4 5
Q24	Our business adapts products and services to meet international markets and foreign customers' needs and wants.	1	2	3	4 5
Q25	Our business adapts marketing and sales of our products and services abroad.	1	2	3	4 5
Q26	Our business modifies and handles international competitors.	1	2	3	4 5
Q27	Our business manages contacts with foreign authorities.	1	2	3	4 5
Q28	Our business adapts and co-operates with foreign intermediaries.	1	2	3	4 5

Source: Sandberg, S. Internationalization processes of small and medium-sized enterprises: Entering and taking off from emerging markets. Linnaeus University Dissertations. 2012; No 78/2012. ISBN: 978-91-86983-35-2. Written in English with a summary in Swedish.