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Contribution of Mobile Smart App Economy to Selected Economies

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Abstract *The current study seeks to shed light on the contributions of the smart application economy through the selection of international models, and to demonstrate the impact that enhances our understanding of the subject of applications and their economic uses, and to analyze the interactions between the spread of mobile technology and its smart applications in influencing changes in economic activities, in order to strengthen and revitalize economic sectors. The study assumes that "the smart application economy for mobile phones plays a vital role in shaping the technological structure, which has important economic contributions, as it contributes to the development of markets and the improvement of the performance of companies and related sectors." Based on the descriptive-deductive analysis methodology. The study concludes that mobile smart applications are an additional artery for the economy and its development, and moving it in the process of internal changes and working to increase the interactive capacity between economic sectors. In addition to strengthening the comparative advantage of the economy and revitalizing it in a direction that may increase the competitiveness of local products, and expand the economic base in obtaining economic and financial resources that contribute to the economic benefits of society.*

Keywords *Mobile Phone, Smart Applications, App Economy, Economic Contribution*

Jel Classification: *A1, E6, F40*

INTRODUCTION

Today, the world is witnessing a tremendous and accelerated development in the field of technology and communications represented by the development of mobile phones, which led to the development of smart applications in these phones and which have become indispensable in the lives of individuals, institutions and companies operating in the economy.

Also, the smart application economy for mobile phones is one of the prominent areas that have radically affected the local and global economic structure. The use of these applications involves a range of economic transformations that have led to changes in the markets and the expansion of the business. In light of the tremendous progress in the technology sector and its continuous transformations, mobile applications have become integrated software, which is an essential tributary in being one of the most important engines and main contributors to improving the quality of life and dynamic change of the economy and its various sectors, thus contributing to the revitalization of production, investment and employment of individuals, and leading to the prosperity and development of the economy and its growth at accelerated rates.

Importance

Importance of this study comes in shedding light on the contributions of the smart application economy to countries more broadly, as well as providing scientific foundations in making future economic decisions. The current study will also have an impact in enhancing our understanding of the subject of applications and their economic uses for societies. These applications are a catalyst for changes at the economic level, which enable efforts and investments to be better directed towards promoting economic growth and improving public welfare.

Objectives

This study aims to analyze the extent to which the smart phone application economy contributes to markets and economies. The study seeks to:

- Determine the contributions of the mobile smart application economy, by referring to selected international economic models, in order to strengthen and revitalize economic sectors.

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- Analyzing the interactions between the spread of mobile technology and its smart applications in influencing changes in economic activities.
- Providing effective recommendations to government and private institutions to benefit from the topic of the smart application economy for mobile phones.

Problem

Despite the increasing importance of the economy of smart applications for mobile phones, but the special understanding of the contributions of these applications in economic activities remains of interest at the required level. The current study demonstrates an urgent need for a deeper understanding of the economic contributions of this type of application technology by focusing on selected international models.

Thus, it is possible to limit the problem of the study to the following question:

Is the spread of smart applications for mobile phones a clear contribution to the economic level?

Hypothesis

The study assumes that "the economy of smart applications for mobile phones plays a vital role in shaping the technological structure, which has important economic contributions, as it contributes to the development of markets and the improvement of the performance of companies and related sectors."

Methodology

To achieve the objectives and hypothesis of the current study, and to verify the validity of the study hypothesis, so the descriptive-deductive analysis was adopted.

OVERVIEW

In 1973, American engineer Martin Cooper introduced the first mobile phone, known as the "Father of the Handheld Cellular Phone." The mobile phone entered the market in the 1980s, giving rise to the first generation (1G) of mobile phones that focused on voice phone calls (Harris & Cooper, 2019: 15-17). To develop phones into a digital mobile device in the 1990s, and then to develop this device into a tablet phone and its smart applications to keep pace with the development of the Internet world, and the continued development of this device for modern generations, the most famous and most used iPhone and Samsung, and their smart tablet version (modern and sophisticated) (Tarif, Atwat, 2018: 141-142, and Yoshinari et al., 2011: 17).

The mobile phone can be defined as "one of the modern means of communication, communication and media, which is carried out through a network of towers distributed at the level of a specific area." It can also be used to obtain economic, political and social data, information and news by connecting to a complex network linked to the local and global Internet. " (Shaqra, 2014: 84-86).

Mobile phones are also known as "advanced devices that we can carry, which use one of the following smart and advanced operating systems: Google's Android, Research In Motion's (rim) Blackberry OS, Apple's iOS, Microsoft's Windows Phone OS, and Nokia's Symbian OS." (Yoshinari et al., 2011: 3).

After the spread of mobile infrastructure, access to mobile services has become easy and wide. In recent years, the number of mobile phone connections has exceeded the world's population, and almost half of them have used mobile Internet services (GSM, 2020: 7). Therefore, a global system was developed that manages mobile communications, known as the Global System for Mobile Communications (GSM), and currently known as the GSM Association (GSMA). This association is a non-profit industrial organization representing 1000 mobile phone operators, and 90% of these operators follow the international standard according to (GSMA), which seeks to facilitate cooperation between countries to spread, support and manage the mobile communications industry (www.gsmaintelligence.com). This spread and recent developments have led to the emergence and development of new generations of mobile technology, in order to enable and improve voice, video and SMS services, raise the level and quality of digital data services, and increase their speed significantly (GSM Association, 2020: 7). Table 1, shows the development of mobile generations:

Table 1: Evolution of Mobile Generations

Generations	2G	3G :	4G	5G
Time periods	1990s	2000s	2010s	2020s
Mobile App Capabilities	Voice calls, SMS, MMS, limited internet browsing	Increasing the possibility of browsing the Internet and mobile applications	The emergence of the possibility of video shooting for meetings and conferences, and increasing the possibility of commercial applications	Increasing the multi-purpose capabilities of the phone and its digital applications
Data transfer	56-115Kbps	5.8-14.4 Mbps	100-300Mbps	100-5000Mbps

Source: GSM Association. (2020). Mobile Technology and Economic Growth: Lessons to Accelerate Economic Growth and Recovery. [Report] Retrieved from www.gsmaintelligence.com

IDENTIFYING

The application can be defined as a smart program designed for the mobile phone whose function is to provide a specific performance or action that serves a purpose for the user (subscriber), and the application also operates the mobile phone device (Hafez, 2019: 127). For example, Apple has launched various applications that provide different services, and the services of these applications are obtained and downloaded free of charge or in exchange for paying cash subscriptions using modern electronic payment methods, and some of these applications may work without the need to connect to the Internet, and some of them need to connect. These applications operate based on the free operating system iOS, which is short for "iPhone Operating System", as this system was launched in 2007 to run the iPhone and its various smart applications (Nieborg, and et al, 2018: 2-5). Also, in 2005, Google purchased the Android operating system from the Android company that it developed, so Google established an alliance with a number of mobile phone companies aimed at using this system to operate mobile devices, the most important of which is the smartphone that owns touch screens in order to obtain various services from various applications from the Google play store installed in mobile devices that use this system. It is indicated that operational systems are used in other devices such as smart wristwatches, televisions, laptops, game consoles, digital cameras, and other electronic devices (Griffiths & Griffiths, 2017: 857-860).

One of the main differences between traditional applications and software is that applications are downloaded and obtained by connecting to the Internet, that is, obtaining applications through channels and portals located on mobile stores instead of obtaining them from retail centers that users of traditional software may obtain, as store operators receive a commission as a percentage of the sale of applications on these stores (OECD, 2013: 8).

Thus, smart applications are modern technologies that support mobile phones that operate according to standards and standards, and within electronic platforms, specifications and software dedicated to smartphones. Or they are digital programs designed for many different purposes and uses, and compatible with mobile phone systems (Al-Otaibi, 2014: 19 and 34). Applications have also been defined by the OECD as "a set of software or programs running on a computing platform" (OECD, 2013: 8). The applications work for the purpose of communication and communication using a mobile phone, in order to entertain individuals or market and achieve material profits, and these applications are characterized by ease of use and simplicity of exchanging information and digital data among users of mobile applications (Al-Sawi, 2019: 489).

Usually, these applications are designed and operated by mobile phone manufacturers, companies that provide mobile phone services, or by companies that specialize in the manufacture of smart applications, which are used in various aspects of life for subscribers of mobile phone applications, as in marketing applications that sell various or some commodity goods, applications for buying and selling securities, news applications that provide political news, economic and sports analysis, social media applications, and many other applications (Shaimaa, 2022: 19).

With the advent of mobile app stores, the statistics of downloading these applications have witnessed a boom and expansion. During the third quarter of 2022, Android users were able to select and download 3.6 million applications, as the Google Play market includes the largest number of applications available on e-stores. The Apple App Store is also the second largest mobile app store, with nearly 1.6 million apps available to iOS users. In the same year, the number of applications available in the Google Play and Apple App Store was about 3.5 and 2.2 million, respectively. While Apple and Google dominate the downloads of apps and their availability in the two stores, there are other

stores with varying degrees of success and importance in the smart app market, the Amazon Appstore offers nearly 476,000 applications, offering education, stock trading and gaming applications. Tencent Appstore has over 43,840 apps available from February 2021 (https://www.statista.com).

APP ECONOMY

The rapid growth of smart applications for mobile phones and their contribution to the economic aspect and its various activities led to the emergence of a new concept of "App Economy", which raised many researchers and scholars of economic affairs. This concept refers to how smart applications contribute to the economy at the local and global level, and how to manage the changes that these applications perform in different markets, which are contributed by a number of stakeholders (such as managers, companies, organizations, institutions, authorities, smart application developers, their operators, platform managers and other organizations working in the field of applications), as well as the impact of many economic sectors on this type of applications that lead to the innovation of many tasks and activities related to various economic aspects (Toris et al., 2020: 1-3).

Breslin, and et al. argued that the concept of an app economy originated globally with the launch of Apple's App Store in 2007, but that this type of economy was still in its infancy about a decade ago (Breslin et al., 2014: 3).

The growth of smart applications of various types, such as the taxi demand application (such as Uber), hotel (such as Airbnb), car rental for luxury and tourist trips (such as Drivy & BlaBlaCar), and others, has led to the emergence of newly emerging economic sectors that have benefited from this growth, as well as to the impact and growth of traditional economic sectors by benefiting from the significant and accelerated development in the field of communication and communication through application software, which led to the expansion of demand for the products of these sectors and the increase in the market at the local level, and easy connectivity to the outside world and its various markets (Toris et al., 2020: 3) and (Mehdi et al., 2019: 15-31). Also, within the application economy, there are smart applications that facilitate the work of banks and their customers. Currently, banks have applications that help the customer review his bank account first-hand from anywhere he wants, and carry out various banking operations with speed and ease that save costs and time, which raises the efficiency of financial transactions and increases investments. It is possible to invest in the real sector and in raw materials such as oil and buying gold, that is, the ease of buying consumer and capital goods from local and global origins. The application economy has also facilitated the e-marketing of local and international brands and markets, the acquisition of purchases without the need to go out and travel, and the monitoring of price changes daily (Isani, 2022: 103-108).

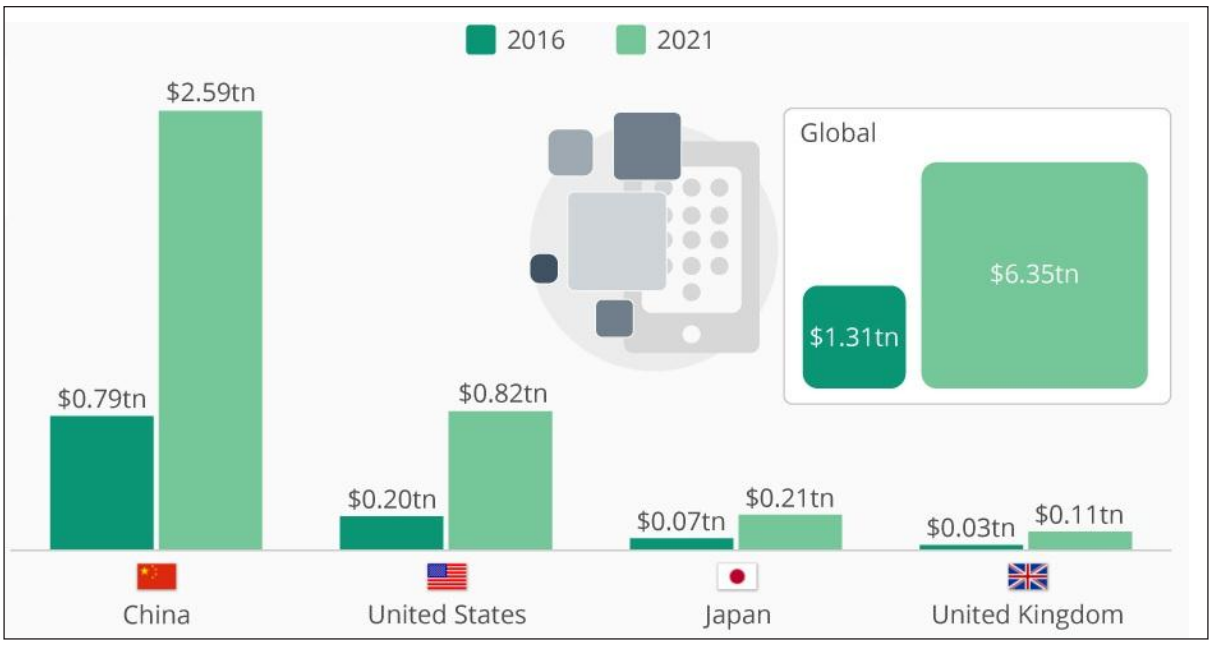
The existence of a wide range of mobile applications has improved the personal productivity of individuals and companies, and the marketing of products more broadly. Applications have increased the production capacity of calculators, monitoring, protection and warning devices, which has helped to reduce economic losses resulting from theft and fire incidents. Applications have also facilitated the work of administrators and accountants by providing simplified applications for accounting and administrative processes and remote meetings (Krum, 2010: 133-134).

ECONOMIC CONTRIBUTION

One of the main pillars of the App Economy is the degrees of ease and speed provided by applications, which led to the birth of various economic activities related to the development of applications, and the availability of abundant financial resources to investors in the field of applications, as these investors receive financial revenues from four sources: Application Downloads, In-App Purchases, Advertisements, Subscriptions (ICTC, 2012: 4).

Google Play may have more apps available to download, but the Apple App Store is the best at monetizing mobile content, with about $500 billion in 2022, of which $336 billion is 67% of the total income from advertising promotion, and $167 billion is 33% of the total income from in-store purchases. Instagram and TikTok accounted for nearly 65% of ad spending, while gaming apps fell 35% (https://www.data.ai). Despite the rise in prices of Apple's mobile apps in 2022 to less than $ 1, nearly 25,000 apps were priced between $ 1 and $2. The Apple App Store also announced price hikes in all countries that use the euro currency and other major markets such as South Korea and Japan. Global subscribers have spent nearly $ 22 billion on mobile apps and games on Apple's App Store (https://www.statista.com).

As mobile applications are software that connects phone users as a means of communication, communication and exchange of information and data, they help to support the process of internal economic growth and development, and work to reduce the knowledge gap between developed and developing countries, and enable developing countries to raise their incomes and living standards among their members at the internal level, and reduce the levels of incomes of developed and developing countries (Lum, 2011: 6). It is possible to clarify the levels of contribution of mobile phones and their applications in the global economy and some countries of the economically developed world as follows:



Source: Statistics. [Report] Retrieved from: https://www.statista.com

Fig. 1: Economic Contribution of Mobile Phones and Their Applications in the Global Economy and Some Economically Developed Countries between 2016 and 2021

Figure shows an increase between 2016 and 2020 in the economic contribution of mobile phones and their applications from 1.31% to 6.35% at the global level. Between the same two years, the economic contribution of some countries (China, the United States of America, Japan, and the United Kingdom) increased by varying rates from (0.79%, 0.20%, 0.07%, and 0.03%) respectively, to (2.59%, 0.82%, 0.21%, and 0.11%) respectively. This indicates the relative importance of mobile phones and their smart applications in developing the economy and raising internal economic growth rates.

In 2021, mobile phones and their applications contributed 5.4% of the GDP of the countries of the Middle East and North Africa region, contributing $225 billion of the economic value added to those countries, as well as directly and indirectly providing about 90,000 jobs in those countries. The taxes imposed on mobile phones and their applications contributed about $20 billion, which provided the general budgets of those countries. It is expected that mobile phones and their applications will contribute in 2025 to the growth of the economy by about $20 billion (Center for Digital Development, 2022: 14), due to the developments expected to improve, which will lead to increased productivity of these phones and the speed and ease of communication between local and global regions through applications in which accelerating spikes occur in their expanded services.

The slight increase in the inflation rate after the Corona pandemic after 2019 in the digital and electronic sector, by 0.3% according to producer prices, and by 1.7% according to consumer prices, has accelerated the reliance on mobile applications, as e-commerce has flourished through these applications, due to the pandemic that led to the near-total closure of the economic sectors and the curtailment of the work of most government and private institutions, so it makes sense that the rise in inflation rate was slight due to the impact of these applications on the general rise in the price level. Whereas, the organizational structure of companies that rely on mobile applications has mitigated inflationary pressures driving price increases (Mandel, 2023: 2).

Statistics issued by the Progressive Policy Institute (PPI) in the European Union also showed that the employment rate of individuals in the Union countries increased by 53.1% between 2019 and 2023, and the total number of jobs created due to mobile phone applications during the same period increased from 1.906 to 2.919 million jobs. When EU countries are combined with non-EU countries (the United Kingdom, Switzerland and Norway), the employment rate of people in Europe as a whole increased by 55.8% during the same period. Jobs in the European Union were distributed among iOS and Android applications by 51.6% and 52.2%, respectively. and in the countries of Europe as a whole by 53.7% and 54%, respectively. The rise in the employment of individuals led to an increase in incomes by 15% during the same period. The above can be illustrated in the following table:

Table 2: Employment Levels of Individuals in Europe, between 2019 and 2023

Terms	Employment (Million Jobs)					
	European Union			Whole European Countries		
	2019	2023	Percentage Change* (%)	2019	2023	Percentage Change* (%)
Total	1.906	2.919	53.1	2.378	3.706	55.8
iOS Store	1,396	2.116	51.6	1.775	2.729	53.7
Android Store	1.553	2.363	52.2	1.940	2.988	54.0

Source: Mandel, Michael. (2023). EU App Economy: Skills for the Digital Age, Progressive Policy Institute, European Union (EU), P 4.

* Percentages of change were extracted by the researcher.

Despite the positive aspects of mobile applications, there are negative aspects to them, including their use in smuggling money and laundering suspicious money, usually through applications of electronic payment tools and means. In a study conducted by MENAFATF for 12 Arab countries (Iraq, Jordan, Saudi Arabia, Sudan, Oman, Palestine, Qatar, Kuwait, Lebanon, Egypt, Morocco, and Yemen).

These countries agreed that electronic and modern applications have been used in money laundering operations, and among the most used applications in these operations are (MENAFATF, 2017: 56-57): applications used in electronic payment by 32%, local applications for money transfer by 28%, swift-based money transfer applications[1] by 12%, e-sale applications by 9%, orders made through e-mail applications by 8%, electronic banking applications by 7%, and digital currency trading applications by 4%.

The most targeted and exploited economic sectors by suspicious money launderers through mobile applications are the banking sector by 70%, followed by remittance applications, electronic payment companies and banking by 7% for each of these applications, and by 3% for each of the remaining personal, tourist and social applications. (MENAFATF, 2017: 80-81).

It is noteworthy that the indicators of money laundering for some Arab countries are as shown in the following table:

Table 3: Statistics of the Basel Index in the Fight against Money Laundering for Some Arab Countries in 2023

Country	Jordan	Saudi Arabia	Sultanate of Oman	Palestine	Qatar	Egypt	Morocco
Degree	4.90	5.38	4.90	4.67	5.19	5-06.	4.69

Source: Basel Institute on Governance. (2023). Basel AML Index 2023, 12th Public Edition, Switzerland.

Table above shows the increase in money laundering scores in the countries most connected to the outside world through economic and local interconnections, some of which are carried out through smart applications for mobile phones. Saudi Arabia, Qatar and Egypt had the highest risk scores for money laundering, with scores of 5.38, 5.19 and 5.06, respectively. These countries are followed by: Morocco, Palestine, Jordan and the Sultanate of Oman. The degrees of risk in achieving money laundering are as follows: 4.69, 4.67, 4.90 and 4.90. These degrees remain high relative to the rest of the world, and their occurrence may be relatively related to electronic and digital links that take place through mobile phone applications, with the exception of Palestine, which may be due to the pressure of the Zionist occupation of the Palestinian territories.

CONCLUSION

Mobile applications have many contributions at the social, economic and even political levels. These applications are an additional artery for the economy and its development and work to move societies to bring about internal changes and increase the interactive capacity between economic sectors, and may increase the comparative advantage of the economy and revitalize it in a direction that may increase the competitiveness of local products. The applications also expand the economic base to obtain economic and financial resources that support the local economy, and enable it to benefit from these resources in achieving economic benefits for society.

The applications also have negative effects on the economic side, through the impact of local economies on external

[1]The Society for Worldwide Interbank Financial Telecommunications (SWIFT), a non-profit organization owned by member states, was founded in 1973, and is headquartered in Belgium, where it began its activity in 1977. Source:
- swift. [Report] Retrieved from: https://www.swift.com/about-us/history

crises due to the linkage of some applications to external economic and financial variables, especially financial market crises and fluctuations in the prices of raw materials such as oil and gold markets, where local individuals may participate in financial and economic applications that sell and buy securities, oil and gold, which may expose these individuals to risks and shocks that occur in global markets. They may also be exposed to fraud and theft of funds. There are cases in which these applications may be used to launder suspicious money and facilitate the smuggling of such money out of the country.

Therefore, we must make a set of recommendations that may benefit future studies and research, namely:

We propose to support the future research of researchers and scholars interested in the economic aspect and its activities related to modern technologies in deepening these activities resulting from the development of technologies in the use of mobile phones and their smart applications in the economy.

Increasing the interest of economic units in the use of mobile applications by expanding and supporting their economic activities, thus contributing to the development of the economy and increasing growth and employment of the working hands, in terms of creating new job opportunities in a way that reduces the unemployment rate.

Encouraging research and studies in the use of social media applications and the extent of their impact on increasing economic linkages and interconnections, as these applications are the most expansive and used in the promotion of consumer and capital products, as they are the most influential in the consumption patterns of individuals and investment in businessmen.

Paying attention to the negative effects of smart phone applications and their role in facilitating the transfer of funds as hidden activities within the shadow economy, and because these effects need more research and investigation by researchers and government institutions, as the uses of these applications in these suspicious activities are relatively recent and easier to hide financial operations and transfers.

There must be formal and informal institutions in collecting and counting data that facilitate research studies interested in the subject of mobile applications in scientific methodological contexts, in order to benefit from the results of these studies.

The interest of government institutions in expanding monitoring and regulating the markets that deal with mobile phone applications, not to leave the matter uncontrolled and unregulated and not subject to government monitoring, and to benefit from the activities resulting from mobile applications in financing the public budget by imposing taxes on the users of these applications in economic activities.

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