



The use of mobile phones to support women's entrepreneurship in the Arab countries

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1. Introduction

Women entrepreneurs are referred to as “those who use their knowledge and resources to develop or create new business opportunities, who are actively involved in managing their businesses, and own at least 50 per cent of the business and have been in operation for longer than a year” (Moore and Buttner, 1997). The importance of the contribution of women in entrepreneurship has been acknowledged in previous studies (Jamali, 2009; Cohoon *et al.*, 2010; World Economic Forum, 2011; ITU, 2013; Azmat, 2013). Moreover, the importance of women entrepreneurs has been acknowledged in previous studies conducted in developing countries, such as; India (Maradi and Dasar, 2013; Malyadri, 2014). Gender differences exist in terms of entrepreneurship in both developed and developing countries (Watson *et al.*, 2014). Franck (2011) found that the exclusion of women from the labour force and employment may not be the only motivator for women to become entrepreneurs as other factors such as earning income, helping their families and self-fulfilment, can motivate them. It can also be a matter of choice rather than women being pushed to become entrepreneurs and run their own businesses (Franck, 2011).

Ahmad (2011) emphasised that the factors that can motivate women to become entrepreneurs are different in developing countries owing to cultural and social differences. There are several challenges facing women's entrepreneurship in these countries, and these have been acknowledged in previous studies (McLoughlin, 2013; Zeidan and Bahrami, 2011; Itani *et al.*, 2011; Hattab, 2012; El-Hamidi, 2011). The role of culture cannot be neglected when studying entrepreneurship (Roomi and Harris, 2010). There are 22 Arab countries in the Middle East, all of them developing countries where women have fewer rights than men. Gender gaps exist in these countries with women having less freedom; this has impacted on how women live and work there. Young people form the largest segment of the population in the Arab world (Roy *et al.*, 2011). Women constitute nearly half of the population in most Arab countries (World Bank, 2016b). The region as a whole (except the Gulf Cooperation Council (GCC) countries) suffers from high unemployment levels (Jelili, 2010; Roy *et al.*, 2011). There are challenges for women's entrepreneurship even in the Arab Gulf countries, for example Saudi Arabia (Danish and Smith, 2012), despite the fact that these are rich countries. There is a need to conduct an in-depth analysis of these challenges and to find new ways to overcome them.

In previous studies, there has been an increasing level of interest in women entrepreneurs and in finding solutions to the problems they encounter when running their businesses (Franck, 2011). A considerable amount of research exists on women's entrepreneurship in the Arab countries (e.g. Jamali, 2009; El-Hamidi, 2011; Hattab, 2012; Azmat, 2013). However, it is worth noting that academic research on how technology can be used to help women to become successful entrepreneurs in Arab countries is inconclusive. There is a lack of research that identifies how the technology products with the highest level of penetration (mobile phones) can be used to close gender gaps in entrepreneurship in Arab countries. The current research makes a contribution to the existing body of literature by summarising the challenges facing women entrepreneurs in Arab countries. Furthermore, it identifies new ways in which the most widely available technology (mobile phones) can be employed specifically to help female Arab entrepreneurs to start and run their businesses successfully. Accordingly, this study is important because it contributes to closing gender gaps in the region- a major problem identified in many previous studies (e.g. McLoughlin (2013), Zeidan and Bahrami (2011), Itani *et al.*, (2011), Hattab (2012) and El-Hamidi (2011)).

Female Arab entrepreneurs are restricted by many social, cultural and religious barriers which they still struggle to overcome. They also suffer from restricted mobility in comparison to women in Western countries. The importance of the contribution of female Arab entrepreneurs in creating new business opportunities, increasing family income and decreasing unemployment cannot be neglected. The results of the research conducted by Ahmad (2011) on women's entrepreneurship in Saudi Arabia revealed that even when female Arab entrepreneurs took part in their business, certain cultural and religious factors required them to conduct their business activities and operations near to their homes and families. This was also the case in previous studies on female Arab entrepreneurs in other Arab countries (e.g. Zeidan and Bahrami 2011; Itani *et al.*, 2011; Hattab, 2012). The current research attempts to find solutions that allow women to conduct their business activities within these restrictions. Furthermore, the research extends beyond this to find new ways in which women can self-educate themselves from home to become successful entrepreneurs. Owing to the importance of these contributions and the gaps identified in the existing literature, this paper provides an important contribution to the existing body of research on female Arab entrepreneurs by finding new and effective ways to boost women's entrepreneurship in the region that do not contradict the culture in Arab countries. This will contribute to

decreasing gender gaps, increasing employability levels and providing higher incomes to families in these countries. Such research is of particular interest to academic researchers, practitioners and policymakers who are interested in reducing gender gaps in entrepreneurship in the Arab region.

This paper investigates how mobile phones can be used to support women's entrepreneurship in Arab countries. Accordingly, it attempts to find simple but comprehensive solutions to the following issues:

1. What are the main challenges facing females' entrepreneurship in Arab countries?
2. How mobile phones can be used to support females' entrepreneurship in Arab countries?
3. What are the implications for government initiatives, policymakers and telecommunication companies operating in Arab countries?

The first part of this paper provides an analysis of the literature and recent reports relating to women's entrepreneurship in the Arab countries. The main challenges facing women entrepreneurs in these countries are also analysed and discussed. The second part of this paper provides a discussion and analysis of the current level of mobile phone adoption and usage in Arab countries. It also highlights these countries' similarities and differences in terms of levels of mobile phone adoption. The third part includes an investigation and analysis of the main areas in which mobile phones can be used to support women entrepreneurs in facing and overcoming some of the challenges outlined in the first section. An identification of the areas that can benefit the most from the use of mobile phones is also provided. The final section includes recommendations and conclusions for government initiatives, telecommunication companies and academic researchers in relation to this topic.

In order to address the issues listed above, an extensive analysis of the existing body of literature on females' entrepreneurship and associated mobile phone usage was conducted. The data collected in this research included journals, reports and books, using both quantitative and qualitative data.

The Arab countries are heterogeneous in terms of many economic, political and demographic factors. However, they also differ in terms of a number of cultural factors. Women in Lebanon experience more freedom than in other Arab countries (Jamali, 2009) such as Saudi Arabia. Furthermore, Arab countries differ in terms of the level of mobile phone adoption. United Arab Emirates (UAE) has one of the highest rates of mobile phone adoption and usage in the world; rates in the other Arab countries are not as high; Sudan and Yemen are considered the two countries with the lowest rates of mobile phone adoption in the world (Alrawabdeh *et al.*, 2012). The fact that these countries are heterogeneous cannot be neglected when investigating women's entrepreneurship and mobile phone adoption. However, within the context and purpose of this research, these countries share similar problems (albeit at different levels) in relation to women's entrepreneurship; the solutions provided in this research are applicable in all of them. Given the main purpose of this research, namely investigating how mobile phones can be used to support women's entrepreneurship in the Arab countries, it is necessary to conduct an in-depth secondary data analysis. Therefore, an extensive analysis of the existing body of literature is carried out in relation to the phenomenon under investigation. The literature review conducted in this research and the data collected were from several Arab countries including; Lebanon, UAE, Iraq, Jordan, Morocco, Egypt, Saudi Arabia, Bahrain, Syria, Libya, Yemen, Algeria and Tunisia. This review helped us to understand the similarities and differences between these countries in terms of the challenges facing women's entrepreneurship. Secondary data on mobile phone adoption in these countries and on women's entrepreneurship and participation in the labour force were collected and included in the analysis.

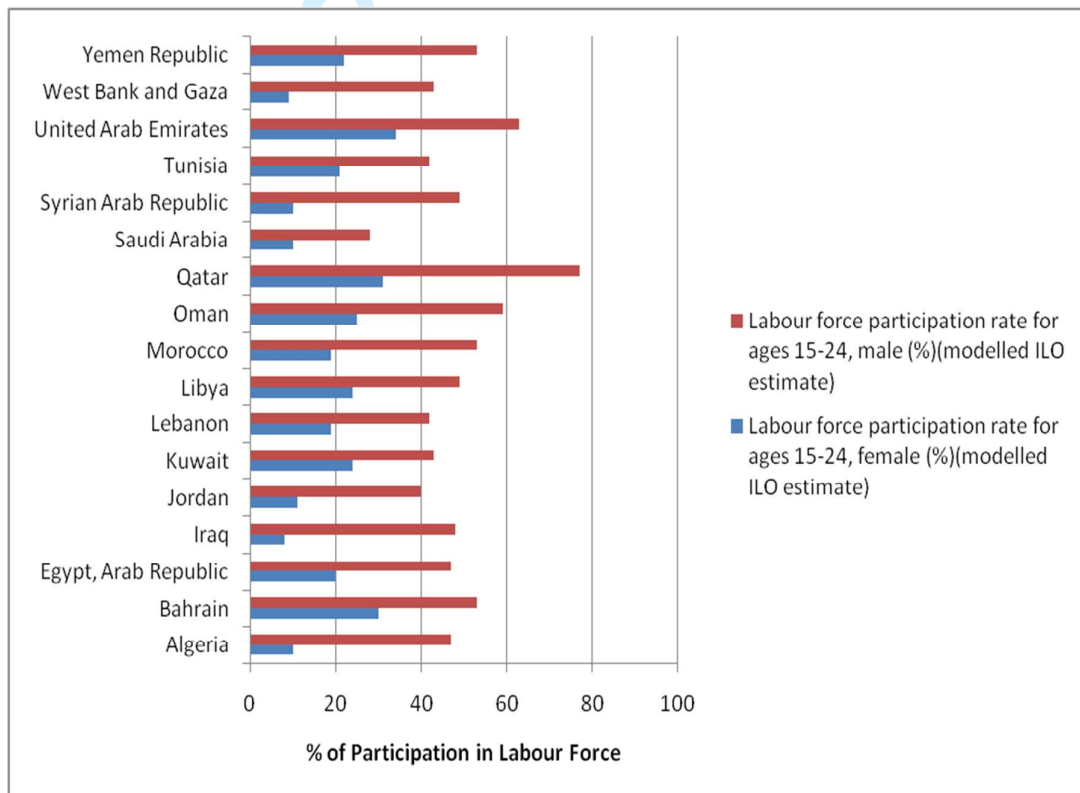
2. Women's entrepreneurship in Arab countries

The concept of women's entrepreneurship in Arab countries has two dimensions. First, at the microeconomic level women are creating new opportunities for themselves and ensuring financial security for their families. Second, at the macroeconomic level women are contributing to an improvement in the economic situation of the country in which they operate. Governments and policy makers are involved and have a significant role in promoting and helping women entrepreneurs to survive in such societies (Swedish Institute Alexandria, 2014).

Entrepreneurship in the Arab world is generally behind that in the more developed countries (Swedish Institute Alexandria, 2014). The contribution of women to entrepreneurship in these countries does not exceed 13%. However, it has had a significant positive effect at both the microeconomic and macroeconomic levels (Swedish Institute Alexandria, 2014). Female labour participation in all of the Arab countries is low in general (World Bank Gender Statistics, 2015). Figure 1 shows the female participation rates in different Arab countries in comparison to the male participation rates (World Bank, 2016a). These rates vary from a high female participation rate of 34% in United Arab Emirates to low female participation rate in Iraq (8%). This clearly shows that gender gaps exist in the Arab countries as women lag behind in terms of work-force participation.

Furthermore, the number of women business owners in the Arab countries is low. According to the Enterprise Survey.org (2015), the proportion of businesses owned by women in Algeria is 15%, Egypt 16.1%, Iraq 6.8%, Jordan 15.7%, Lebanon 43.5%, Morocco 13.3%, Syria 14.4%, Tunisia 49.5%, West Bank and Gaza 12.6% and Yemen 6.6%. These figures show that there are variations in Arab countries in terms of the level of female participation in business ownership (Enterprise Survey.org, 2015), with rates varying from 49.5% in Tunisia to 6.6% in Yemen and 6.8% in Iraq.

Figure 1. Female labour participation in Arab countries in 2014



Source: World Bank (2016a)

We conducted an extensive analysis of the most recent studies on women's entrepreneurship in Arab countries. More specifically, we analysed the results of the empirical work conducted in these studies in which barriers facing female Arab entrepreneurs were identified, grouping these challenges into five areas -as they appeared most frequently in the studies. These areas are considered major barriers to the successful implementation of women's entrepreneurship in all the Arab countries. Table 1 shows these challenges based on what was found in the existing literature and are as follows: gender gaps (in terms of education and financial support); cultural barriers and norms; social and family barriers; lack of government support and policies and lack of access to

information and communication technologies (ICT) and of information on how to use them in entrepreneurship. These areas are discussed in the following subsections.

Table 1. Main challenges identified in studies on women's entrepreneurship in Arab countries

Key challenge	Studies
Cultural barriers and norms <ol style="list-style-type: none"> Cultural factors Lack of self-confidence Limited mobility 	Zeidan and Bahrami (2011), Itani <i>et al.</i> (2011), Hattab (2012), Vossenberg (2013), Welsh <i>et al.</i> (2012), Sadi and Al-Ghazali (2010), Badran (2010), Yaseen (2013)
Gender gaps <ol style="list-style-type: none"> Lack of education and training for women Lack of financial support for women 	McLoughlin (2013), Zeidan and Bahrami (2011), Itani <i>et al.</i> (2011), Hattab (2012), El-Hamidi (2011), Vossenberg (2013), Sadi and Al-Ghazali (2010), Badran (2014)
Lack of government support and policies <ol style="list-style-type: none"> Lack of government support Lack of laws and regulations to support women's entrepreneurship 	OECD (2012), Sadi and Al-Ghazali (2010), Zeidan and Bahrami (2011), Itani <i>et al.</i> (2011), Hattab (2012), Welsh <i>et al.</i> (2012), Vossenberg (2013), Badran (2010), Yaseen (2013)
Social and family barriers <ol style="list-style-type: none"> Managing family life Balancing family life with business life 	Zeidan and Bahrami (2011), Itani <i>et al.</i> (2011), Hattab (2012), Vossenberg (2013), Sadi and Al-Ghazali (2010), Badran (2010), Yaseen (2013), Ahmad (2011)
Lack of access to ICTs and lack of information on how to use them <ol style="list-style-type: none"> Lack of access to ICTs among women Lack of access to ICTs among small and medium-sized enterprises (SMEs) Lack of information on how to use ICTs to be successful in entrepreneurship 	Yaseen (2013), Hattab (2012), Ashrafi and Murtaza (2008), Dutta and Coury (2003), Goswami and Dutta (2015), Center of Arab Women for Training and Research (2007), Sadi and Al-Khazali (2010), Badran (2014), Elnaggar (2007)

Source: Authors' own research

2.1 Cultural barriers and norms

A recent report on women's entrepreneurship in the Middle East and North Africa (MENA) region showed that cultural barriers still exist in the region (Swedish Institute Alexandria, 2014). In fact, these barriers exist within women's mentality as well as the society (Swedish Institute Alexandria, 2014). The nature of the Arab culture, being collectivistic and high in power distance and uncertainty avoidance (Hofstede, 2001) may have an effect on how Arab females decide to be entrepreneurs. In fact, the Swedish Institute Alexandria's report highlighted that the main motivation for Arab females to become entrepreneurs is the lack of employment opportunities for women in the region (Swedish Institute Alexandria, 2014). This was also confirmed in a study conducted earlier by Jamali (2009). The role of the Islamic religion and the belief that women should be separated from men is another factor that feeds into the culture of these countries.

Social and sexual harassment has also increased significantly in the region in recent years as a result of changes that have occurred in many of these countries including Egypt (ECWR, 2009; FIDH, 2014), Tunisia (European Training Foundation, 2011) and other Arab countries (Gharaibeh, 2007). This makes the goal of increasing women's entrepreneurship even harder to achieve. Being in contact with men has become even more of a concern for women in recent years following the demonstrations that have taken place in many Arab countries.

Women in Arab countries have limited mobility and are restricted in terms of the places to which they can travel. This is especially the case for young women who constitute a larger proportion of women entrepreneurs in these countries (Yaseen, 2013), given that the young population forms the largest segment of the Arab population (Roy *et al.*, 2011). The restriction on mobility varies from one Arab country to another. For example, in extreme cases such as Saudi Arabia, women are not even allowed to drive a car to travel to different places.

Although some changes have occurred in these countries, with female Arab entrepreneurs participating more than they did previously (Hattab, 2012), they are still behind in comparison to more developed countries. Furthermore, it seems unlikely that the cultural and social norms in Arab countries will change in the near future to become supportive of and open to women's entrepreneurship.

2.2 Gender gaps

The Middle East is one of the main regions of the world where gender gaps exist in relation to women's entrepreneurship. For example, gender gaps exist in educational opportunities where the focus is more on male students (Mcloughlin, 2013). Although this has decreased in recent years, the gaps still exist as men are still provided with more opportunities than women for training on starting a business as well as financial support. The lack of education relates not only to education in general but also to business education (e.g. human resources and financial management) and training provided by different institutions (Welsh *et al.*, 2012).

The lack of financial support is a major challenge faced by women entrepreneurs in Arab countries (Jamali, 2009; Mcloughlin, 2013). There is also a lack of formal financial institutions that can support these women (Mcloughlin, 2013). Therefore, most women entrepreneurs rely on private financial sources to start their business; this presents many problems as the interest rates are high and completing applications is complicated (Mcloughlin, 2013). Without financial support, women will not even have the courage to invest in a new business. Most financial support and loans are provided to male entrepreneurs, increasing the gender gaps in these countries.

2.3 Lack of government support and policy making

Government initiatives in most of these countries have failed to provide a sufficient level of financial support to women entrepreneurs. Women in some of these countries may not require financial support as they have the funds required to start their own business. For example many women in Saudi Arabia are wealthy as a result of inheritance (Minkus-McKenna, 2009). However, this does not apply to women in the other Arab countries such as Jordan, Iraq and Yemen. The lack of government support, and of laws and policies to protect and foster women's entrepreneurship is an issue that applies to all Arab countries (Examples include Lebanon (Jamali, 2009) and Saudi Arabia (Zeidan and Bahrami, 2011)), although to different degrees. Several projects and supporting programmes have been introduced to enhance women's entrepreneurship in the region for example the programme introduced by the World Bank (2012). However, there is an urgent need to launch new government programmes to support women's entrepreneurship in Arab countries (OECD, 2012; Badran, 2010; Itani *et al.*, 2011; Hattab, 2012). In addition to new government support programmes (Welsh *et al.*, 2012), these women need support at the micro level from their families and from society.

2.4 Social and family barriers

Women's responsibilities towards their families and the nature of the Arab family (being generally unsupportive of the idea of working wives) were found to be significant obstacles facing successful women entrepreneurs (Vossenber, 2013, Jamali, 2009). The limited amount of support and encouragement from men in the family for their wives is a critical factor. Although a successful business provides an additional income or sometimes the main source of income, for the family, women are found to be under pressure when balancing family life and business life. The research conducted by Jamali (2009) showed that women entrepreneurs in Lebanon had difficulty in balancing their family life and business life, and this issue was highlighted in several other studies conducted in different Arab countries (e.g. Vossenber, 2013; Sadi and Al-Ghazali, 2010; Badran, 2010).

2.5 Lack of access to ICTs and lack of information on how to use them in entrepreneurship

Arab females in general, and Arab female entrepreneurs in particular suffer from lack of access to ICTs (Hattab, 2012; Sadi and Al-Khazali, 2010; Badran, 2014; Elnaggar, 2007). Furthermore, the adoption of ICTs has been slow in small and medium sized enterprises (SMEs) in general (Ashrafi and Murtaza, 2008; Dutta and Coury, 2003) and in SMEs managed by women entrepreneurs (Center of Arab Women Training and Research, 2007; Badran, 2014; Goswami and Dutta, 2015). Although large gender gaps still exist in comparison to other ICTs, mobile phones are considered more accessible for female Arab entrepreneurs than any other technology (Center of Arab Women Training and Research, 2007; GSMA, 2014). There is a lack of access to information on the most effective ways to use ICTs, including mobile phones that enable successful entrepreneurship by Arab females (Center of Arab Women for Training and Research, 2007; Badran, 2014).

Thus, although the Arab countries are heterogeneous in many ways, women entrepreneurs experience similar problems and although these occur at different levels, they are still critical issues that need to be addressed. The use of mobile phones to improve women's entrepreneurship has proved to be successful in other regions in the world, for example in countries in Africa (Komunte, 2015). Some of the barriers outlined in this section can be overcome by the use of the ICT products that are most accessible to Arabs in these countries, namely mobile phones. The following section provides a background of the current use of mobile phones in Arab countries and of how these devices can be used as platform for business in order to successfully develop women's entrepreneurship in these countries.

3. Mobile phone adoption in Arab countries

The mobile phone penetration rate in Arab countries is expected to reach 126% by 2020. The level of mobile phone adoption varies across these countries. However, it exceeds the level of adoption of any other technology, including PCs, in the region (GSMA, 2014). Mobile phones have been an effective tool for reducing the digital divide between Arab countries and more advanced countries (Kamel and Farid, 2007). Table 2, which is adapted from the report by GSMA (2014) shows the number of unique subscribers along with the number of mobile connections and the population of 19 Arab countries. The number of connections is high in most of these countries, particularly Egypt, Jordan, Kuwait, Libya, Morocco, Oman, Saudi Arabia, Tunisia and UAE where the number of connections exceeds the population. The number of unique subscribers is still significantly less than the number of connections.

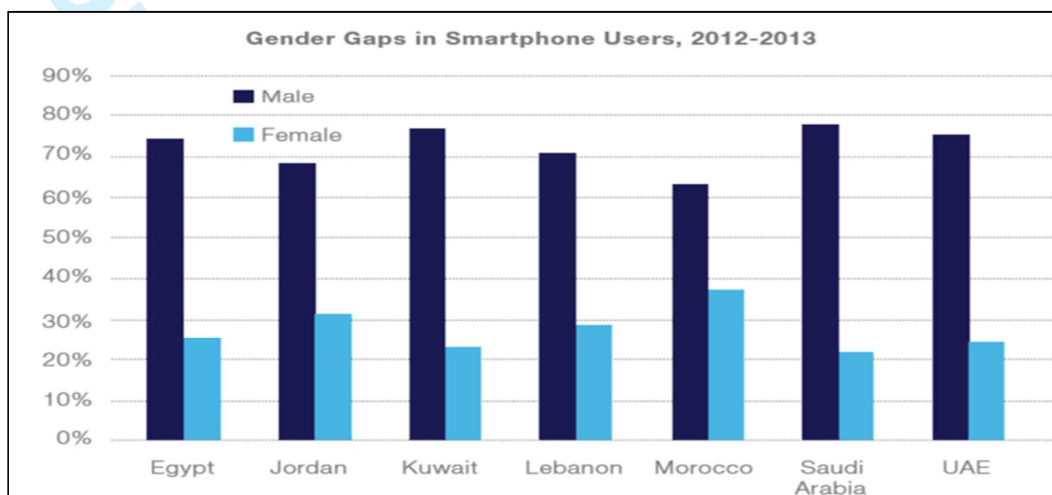
Table 2. Number of unique subscribers and mobile phone connections in 19 Arab countries

Country	Unique Subscribers (million)	Connections (million)	Population (million)	GDP per capita (US\$)
Algeria	19.0	39.5	39.6	5,361
Bahrain	1.0	2.6	1.3	24,613
Egypt	44.1	99.6	82.7	3,314
Iraq	20.5	33.3	34.3	6,670
Jordan	5.2	9.9	7.4	5,214
Kuwait	2.6	6.5	3.4	54,506
Lebanon	2.5	3.9	4.9	9,928
Libya	3.8	10.2	6.2	12,167
Morocco	16.9	42.4	33.3	3,109
Oman	2.7	5.6	3.8	22,181
Palestine	2.0	3.3	4.4	1,898
Qatar	1.6	3.8	2.2	93,352
Saudi Arabia	21.6	51.3	29.1	25,852
South Sudan	1.9	3.0	11.5	1,221
Sudan	15.6	27.6	38.4	1,753
Syria	9.2	12.5	21.9	1,219
Tunisia	5.9	13.9	11.1	4,329
UAE	7.8	15.7	9.4	42,153
Yemen	11.1	15.9	24.7	1,473

Source: GSMA (2014)

Gender gaps exist in terms of access to technology and its use. Women in the Arab countries are 24% less likely than men to use a mobile phone (GSMA, 2014). This is a large gap in comparison to other regions in the world. According to ITU (2013) gender gaps exist in smartphone usage in Arab countries. Figure 2 shows that gender gaps in terms of smartphone adoption are high in Egypt, Jordan, Kuwait, Lebanon, Morocco, and UAE and particularly high in Kuwait and Saudi Arabia. However, Arab females who did have access to a mobile phone were empowered and more independent (GSMA, 2014). Smartphone penetration reached 69% in Kuwait in 2013 while it reached 63% in Lebanon and 72% in both Saudi Arabia and UAE in 2014 (CMO Council, 2015).

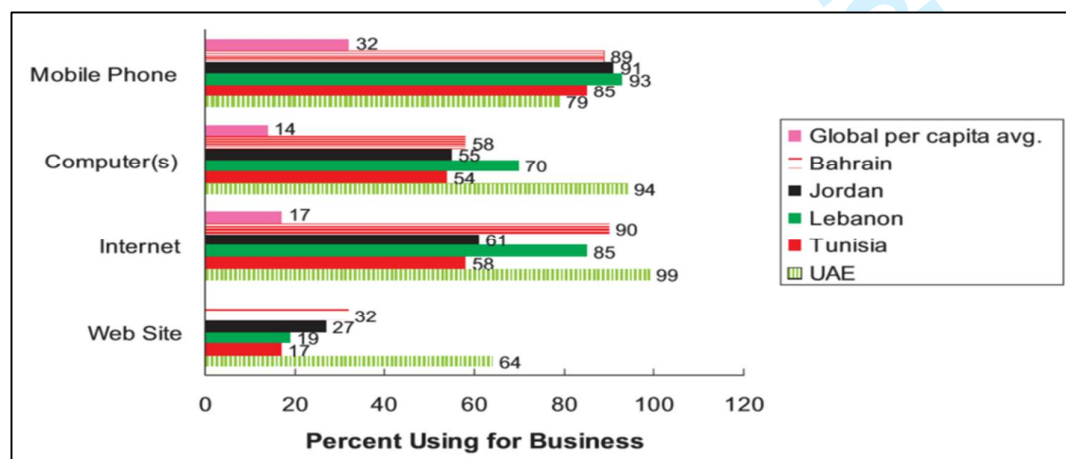
Figure 2. Gender gaps in smartphone users in selected Arab countries



Source: ITU (2013)

It is anticipated that in 2017, 87% of online sales will be made via mobile devices in the Arab region (CMO Council, 2015). Mobile phone technology has the ability to change an individual's life style (Sabri *et al.*, 2011). The report by GSMA (2011) showed that increasing the inclusion of women in mobile phone usage in low and middle-income countries will allow mobile phone operators globally to increase their annual revenue by \$13 billion. A recent report showed that Arab females are interested in using mobile phones, though they have not yet realised the full potential of mobile technology (GSMA, 2014). Figure 3 shows that in 2007, mobile phones were used more than computers by female Arab entrepreneurs in business operations in Bahrain, Jordan, Lebanon and Tunisia. Mobile phones are used widely by women involved in business operations in the Arab countries in comparison with other ICTs.

Figure 3. Women's use of ICT in business operations



Source: Center of Arab Women for Training and Research (2007)

In the new era of smartphone devices, mobile services can address almost every aspect of an individual's life and the effect of mobile services has been enormous during recent years. This is particularly the case in developed countries where the benefits of mobile services are fully experienced and realised. However, in Arab countries the potential of these services has not yet been fully experienced or realised. Mobile services can meet the requirements of women starting up or managing an existing business. Examples of the aspects of life in which mobile services can play a role are mobile health, m-commerce, mobile marketing, mobile banking and mobile learning. These services can be used to overcome the challenges faced by women entrepreneurs in Arab countries. Our research identified that mobile phone services can be used in several ways to support women entrepreneurs in overcoming the five main challenges described in this study. Table 3 shows how mobile phone services can be used in several ways to support women entrepreneurs in overcoming each of the five key challenges. These services include communicating via mobile phone applications (technology-mediated meetings), mobile money, mobile banking, mobile marketing, m-commerce and mobile learning.

Table 3. Key challenges facing female Arab entrepreneurs and how mobile phones can help in overcoming them

Challenge	Mobile services that can help in overcoming the challenge
Gender gaps	Mobile learning Mobile money Mobile marketing
Cultural barriers and norms	Communication via mobile phones (mobile-mediated meetings) Mobile learning M-commerce Mobile marketing Mobile banking Mobile money
Social and family barriers	Communication via mobile phones (mobile-mediated meetings) M-commerce Mobile learning Mobile marketing Mobile banking Mobile money
Lack of government support and policies	M-commerce Mobile banking Mobile money
Lack of access to ICTs and lack of information on how to use them	Mobile phones are already widely used in Arab countries. They allow users to access a high number of mobile services via the device.

Source: Authors' own research

The following sections illustrate how some of the mobile services can be used to overcome the main challenges identified in the literature.

3.1 Communication

The principal task that can be conducted using a mobile phone is making phone calls. Although this is a basic function, it can provide great benefits to women entrepreneurs as it enables them to contact suppliers and customers. The mobile phone can thus be used as a platform for managing a business. Within the new generation of mobile phones-smartphones, the use of which is rapidly increasing in the region-mobile apps such as Skype and Viber can be used as an alternative to face-to-face meetings, which require a high degree of mobility on the part of women. However, a key challenge that needs to be overcome here is the nature of the Arab culture which generally has a preference for face-to-face meetings rather than (mobile) technology mediated meetings (Loch *et al.*, 2003). Another aspect of entrepreneurship that can be addressed using mobile phones is managing and contacting employees as well as monitoring their performance at anytime and anywhere. There are several mobile apps that can be tailored for specific business needs and act as a platform for employees and managers to be constantly connected. Furthermore, there are mobile apps that can be used as a platform to analyse data entered by employees to enable managers to monitor sales at anytime through dashboards integrated into the app.

3.2 M-commerce

M-commerce provides its users with a shopping experience that is convenient in terms of mobility and location (Lin and Shin, 2008; Liu, 2008). It is an effective way to overcome three of the major challenges facing women's entrepreneurship in the Arab countries. Using m-commerce enables women to overcome the cultural and social barriers outlined in the previous sections. In fact, in m-commerce, the entire supply chain process of the business can be carried out online, from dealing with suppliers and customers to carrying out mobile marketing activities as well as delivering and distributing products. This does not go against the cultural and social structure of Arab countries, since women will not be required to go out and come into contact with others. This, in turn, will also allow these women to balance their family life with their business life. Marcelle (2002) reported that e-commerce was an effective tool for women who used it to create and run their businesses in Africa and that it contributed to the empowerment of these women. Since mobile phones are the most widely used technology in Arab countries, they can be used as an alternative to computers. Therefore, m-commerce is more applicable in the case of female Arab entrepreneurs. Furthermore, the use of m-commerce, if applied successfully, enables Arab females to start and operate a global business rather than concentrating on acquiring customers in one geographical area only. M-commerce brings new potential by increasing the scale of the businesses that women entrepreneurs can run. A recent report on the United Nations conference on empowering women entrepreneurs through ICT highlighted that m-commerce and other ICT enabled facilities are important for inclusion and use in women-owned businesses (United Nations, 2014).

In some Arab countries, m-commerce is still at an early stage and it is gradually but slowly, moving forward. In other Arab countries, m-commerce is increasing faster owing to the level of support provided (for example in the GCC countries (Manochehri and Al-Hinai, 2008)). However, security of mobile transactions is one of the main barriers facing successful implementation of m-commerce even in these countries (Manochehri and Al-Hinai, 2008). The lack of an accurate postcode system is also an obstacle (Al-Nawayseh, 2012). M-commerce and mobile money are still relatively behind in the entire region including in the GCC countries, compared with other countries in the world (GSMA, 2014). In order for m-commerce to be successfully used to support women entrepreneurs, government initiatives and policymakers need to boost and regulate its use.

3.3 Mobile marketing

Recent reports showed that most Arabs access social media via their smartphones (TNS, 2015). Mobile marketing can be carried out using SMS and mobile social media. The ability of social media to empower women entrepreneurs was acknowledged in previous studies (Ukepere *et al.*, 2014). Mobile marketing enables business owners (including women entrepreneurs) to enhance customer segmentation and product targeting as well as to understand customer behaviour and needs (Cherie Blair Foundation for Women, 2012). A recent study showed that customers prefer to use their mobile phones to share messages about brands (CMO Council,

2015). For example, in Saudi Arabia, 87% of the smartphone users included in the study notice adverts on their mobile devices (CMO Council, 2015).

Mobile marketing can be used as a tool to develop a strong customer base for a business. Since mobile phones are owned by a large number of people, using mobile marketing effectively helps businesses to reach customers quickly and efficiently. Specific mobile apps can also be used, such as WhatsApp which was found to be the most preferred channel (TNS, 2015). WhatsApp is currently competing with Facebook in the Arab countries (TNS, 2015). Both the WhatsApp and Facebook apps can be used as platforms for marketing different products offered by businesses. Mobile social media can be an effective tool for enabling women entrepreneurs to stay constantly connected to their customers. Not only can they market and advertise their products, they can also listen to their customers' needs, reviews and feedback, obtaining real-time information that helps them to promote their business. Mobile marketing can help women entrepreneurs to reach their customers with minimum mobility. It also helps them to balance their family life with their business life.

3.4 Mobile banking and mobile money

Women can manage their finances effectively using mobile banking. They can have easy and quick access to their business accounts at anytime and anywhere, enabling them to monitor their accounts on a regular basis. An alternative option to mobile banking is mobile money which can also provide women entrepreneurs with access to finance and the ability to acquire and receive loans through mobile devices. This helps to overcome the lack of financial support provided to women in Arab countries. In fact, a number of such projects have been implemented successfully in developing countries for example countries in Africa (United Nations, 2014). Since women in Arab countries have less access than men to the banking system, mobile banking is an appropriate solution that can allow women to have a greater control over their business finance. In addition, mobile money applications can be integrated as a method of payment, and in this way can also help to address customers' needs. Mobile money can provide a solution to the lack of access to the banking system faced by women, especially if they do not have a bank account, as it enables people to manage their finances even without such an account (GSMA, 2014).

3.5 Mobile learning

There are numerous advantages that can be gained from using mobile devices for learning in the MENA region (Rhema and Sztendur, 2013). However, in the Arab countries, mobile learning is still at an early stage (Rhema and Sztendur, 2013). It is a powerful tool that can be used not only to enhance women's entrepreneurship but also to empower women at a personal level, which will impact on their ability to successfully manage their business. Mobile learning has great potential for giving women the opportunity to access education and for creating and preparing materials tailored for women's entrepreneurship, covering different aspects of business management. For example, areas such as financial management, human resource management and supply chain management and the provision of case studies on successful businesses operating in their countries can be covered through mobile learning. Policymakers play an important role in ensuring a safe mobile learning environment by defining the rights and responsibilities of different stakeholders to participate effectively (UNESCO, 2012).

The successful implementation of mobile learning faces several challenges in itself. Chanchary and Islam (2011) categorised these challenges in Saudi Arabia into two types: first, there are factors that relate to the mobile device itself such as user interface, memory size and battery life; second, there are factors that relate to mobile learning in Saudi Arabia such as internet usage and the adoption of new network technologies. In order to enable effective mobile learning, the key barriers facing its use in the Arab countries need to be identified.

4. Discussion

In this study we have investigated and summarised the main challenges facing women's entrepreneurship in Arab countries by analysing the existing literature. Furthermore, we have identified new ways in which mobile phones can be used to overcome these challenges. The results of this research relate to the fields of both women's entrepreneurship and information systems. Women's entrepreneurship in Arab countries is important both for female Arab entrepreneurs themselves and for their families. Furthermore, its effects can extend to a macroeconomic level. Although women's entrepreneurship has increased in recent years in Arab countries, the findings of this research indicate that it is still behind.

Several barriers facing female Arab entrepreneurs were identified in this research. The literature review showed that the five main obstacles are gender gaps (in terms of education and financial support), cultural barriers,

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3 social and family barriers, lack of government support and the right policies and regulations and lack of access
4 to ICTs and lack of information on how to use them in entrepreneurship. The results of this research provide
5 solutions that are relevant to the challenges identified in the results of previous studies on Arab females'
6 entrepreneurship (e.g. Ahmad, 2011; Hattab 2012; Vossenberg 2013; Badran, 2014). These solutions do not go
7 against the culture in Arab countries where women are restricted as identified in previous studies (Zeidan and
8 Bahrami, 2011; Ahmad, 2011; Swedish Institute Alexandria, 2014). Furthermore, these solutions are applicable
9 and solve the problem of the lack of access to ICTs as previously identified (Yaseen, 2013; Badran; 2014).
10 Nevertheless, there are some potential disadvantages associated with the use of mobile phones in Arab countries
11 given their cultural barriers such as family conflicts as these women will spend more time using their mobile
12 phones and running their business ventures and therefore, less time will be given to their families.

13 ICTs were found to be effective in enhancing women's entrepreneurship as they can help in overcoming many
14 of these barriers. However, the findings of this research indicated that there is a lack of access to ICTs for Arab
15 females in general and Arab females entrepreneurs in particular. Furthermore, there is a lack of access to ICTs
16 in SMEs. Since mobile phones are the most widely used technology products in the Arab countries, they can be
17 used effectively as a platform for women to start, build and manage their businesses effectively. Female Arab
18 entrepreneurs can access various mobile services using mobile phones and the large number of mobile services
19 available on smartphones facilitates this. The use of mobile phones has already caused changes in Arab culture.
20 Mobile phones have created a new digital communication channel between Arabs.

21 Gender gaps include the lack of education and training for women and the lack of financial support. First, the
22 lack of education can certainly be overcome using mobile learning, as women can be introduced to short courses
23 and information on how to become successful entrepreneurs and run their businesses successfully. The use of
24 mobile learning helps to overcome the gender gaps in terms of inequality in education. This is a core area that
25 requires particular attention. Mobile learning will not only enhance women's entrepreneurship but also empower
26 women entrepreneurs to become more independent. Specific training programmes and up-to-date information
27 related to entrepreneurs (especially women entrepreneurs) can be provided via mobile phones. Second, the lack
28 of financial support can be addressed using a range of mobile services including mobile money and mobile
29 marketing. Mobile money can be used as a tool to acquire finances and loans, helping to overcome the lack of
30 financial support for women in these countries. If used correctly, mobile marketing is certainly a cost-effective
31 way to reach a large customer base and increase revenues within a short time period. Different mobile social
32 media platforms and mobile messaging applications can be used as platforms for marketing.

33 Cultural barriers and norms include cultural factors, Arab females' lack of self-confidence and their limited
34 mobility. Social and family barriers were also identified as major obstacles. These barriers can affect Arab
35 females externally (when working outside their homes, interacting with the society) and internally (in their
36 family life). This puts a high degree of pressure on these women which can hinder both their freedom and their
37 success in running a business. These barriers can be reduced using m-commerce, mobile marketing, mobile
38 banking, mobile money and mobile mediated meetings (for example, via Skype). The use of these services does
39 not require a high level of mobility, since women are restricted in these countries, and mobile technology
40 enables them to balance their duties towards their family with their business life. Mobile phones can be used as
41 a tool to benefit women in the areas of promotion, marketing, financing and managing the business effectively.
42 Their use allows Arab females to be in constant contact with both suppliers and customers without the need to
43 go completely against Arab cultural beliefs. It minimises the need for female Arab entrepreneurs to be in
44 constant face-to-face interaction with their suppliers and customers which is usually disapproved of in Arab
45 countries.

46 The lack of government support and of laws and regulations to support women entrepreneurs is the most
47 significant major barrier. Arab governments do not provide sufficient financial or policy support for these
48 women. However, the use of different mobile services, including m-commerce, mobile banking and mobile
49 money, can reduce the effects of this challenge since women are more protected when operating their business
50 online. Nevertheless, government support and the presence of the right policies and regulations to protect these
51 women even when they do use mobile phones, remain important issues that cannot be fully resolved with the
52 use of mobile services. In fact, government policies are required to support the use of many of these mobile
53 services for example; m-commerce, mobile banking and mobile money in addition to the support that is required
54 for female Arab entrepreneurs.

55 Our findings highlight the importance of exploiting the advantages offered by mobile phones to significantly
56 reduce gender gaps in entrepreneurship in Arab countries. The fact that Arab females enjoy using ICTs,
57 specifically mobile phones, and that Arab customers prefer using mobile applications to acquire information and
58 receive adverts on products makes the results of this research even more applicable.

5. Conclusions

5.1 Research implications

The value of this research in the area of women's entrepreneurship lies in its ability to be applied in practice. It provides solutions to several problems that are being faced by female Arab entrepreneurs, and has several implications for policymakers, government initiatives, telecommunication companies and banks. Our evidence also shows that there is a need for these parties to collaborate in order to enable Arab females to invest in new businesses efficiently via the use of mobile phones.

The lack of government support is a major obstacle facing women entrepreneurs in Arab countries. Government support is required to increase women's entrepreneurship, and the level of support should be extended to support mobile phones and services used by these women in order to overcome the main challenges they face. This, in turn, will help to improve the countries' economic position by creating an additional income for families. The findings of this research highlight the need for government initiatives and telecommunication companies to launch new programmes to introduce Arab females to the endless opportunities associated with the use of the mobile phone and its services to manage their businesses, allowing these women to understand that using mobile phones and mobile services can help them to operate a successful business. Once Arab females recognise the different types of services available through their mobile phones, they will be more likely to start their own businesses or run their existing businesses more effectively. The findings of this research indicate that there are gender gaps in terms of mobile phone adoption in the Arab countries. Thus, telecommunication companies and government bodies are required to make mobile phones and services more accessible to women entrepreneurs. Government initiatives and telecommunication companies need to collaborate to introduce new reduced tariffs and offers for women entrepreneurs, and this, in turn, will also benefit telecommunication companies operating in the region as it will enable them to increase their revenue. In addition, government bodies, training centres and business schools located in universities need to collaborate to initiate mobile learning programmes that are specifically designed for entrepreneurship. For example; new business training programmes can be delivered via mobile phone devices. These programmes should not be limited to providing guidance on how to run a business, financial management or human resources management, but should also focus on how individuals can use the different mobile services effectively in relation to their business to gain the maximum advantage. For example, information should be provided on how to run successful m-commerce and mobile marketing. It will also be necessary to create a regulatory environment in which mobile learning can be implemented successfully.

Government initiatives and policymakers should support and regulate the use of m-commerce by women entrepreneurs. There are many challenges facing successful implementation of m-commerce in these countries, including the lack of an accurate address list and postcode system. Regulations relating to mobile payments and transactions also need to be put in place. The creation of a solid yet flexible regulatory environment to monitor the purchasing process is required. Furthermore, banks need to support the use of m-commerce by ensuring a secure system for making online (mobile) payments. This will help to increase customers' trust in m-commerce (in terms of financial security) and in turn, create a solid virtual business environment in which women entrepreneurs can operate.

The lack of financial support was one of the main challenges identified in this research. Female Arab entrepreneurs certainly need financial support to initiate or expand their businesses. Therefore, enabling mobile money and providing loans through mobile money is a core area that requires support if women's entrepreneurship is to increase. Banks, government bodies and mobile companies could work together to plan and implement new ways for female Arab entrepreneurs to obtain the financial support required to start a new business or expand an existing one.

5.2 Research limitations

This research is based on the collection and analysis of secondary data from different sources rather than primary data to support the findings. There is a lack of up-to-date data on women entrepreneurs in Arab countries in general. In addition, as sexual harassment and cultural norms relating to women in Arab countries are sensitive issues, there is a lack of accurate data that can be used to measure the extent of their actual effects on women's entrepreneurship and their employment opportunities.

It is important to note that the findings of this research are not applicable to the same degree to all Arab countries since although these countries, share similarities in the problems facing women entrepreneurs, they still have their own differences. For example, the underlying ICT infrastructure and mobile phone usage is more advanced and more accessible for people in the UAE than any other Arab country. Another example is the

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3 difference in terms of financial assets available to women entrepreneurs in Saudi Arabia as a result of
4 inheritance and wealth which are not available to the same extent to women in other Arab countries. The level
5 of mobile phone adoption and gender gaps in mobile phone adoption in these countries also vary. Therefore,
6 there are arguably more issues and challenges that need to be addressed in some of these countries than in
7 others. This research constitutes the first step in overcoming the obstacles facing women's entrepreneurship in
8 Arab countries in general.

9 10 **5.3 Future work**

11 It will be necessary in future research to verify the results through investigations in each Arab country separately
12 in order to find out how applicable the findings are. This research was based on an extensive analysis of the
13 literature. There is certainly a need to conduct empirical studies by collecting primary data (for example
14 conducting interviews with women entrepreneurs) separately from each Arab country in order to validate the
15 findings of this study. Moreover, this research studied women's entrepreneurship in Arab countries in general.
16 However, in order to find more accurate solutions, future studies should build on the results obtained in this
17 research by studying each Arab country separately. It is important to conduct such a study in Arab countries
18 where gender gaps are relatively high, such as Iraq, Jordan and Saudi Arabia. Researchers can also examine
19 whether the challenges identified in this research are applicable across the different Arab countries.
20 Furthermore, conducting a cross-country study in more than one Arab country (possibly two countries) to
21 identify the challenges facing women's entrepreneurship will certainly bring interesting results, and will also
22 help to identify the similarities and differences between them in terms of women's entrepreneurship. In addition,
23 the findings of this research are applicable to women in both urban and rural areas. Future studies undertaking
24 empirical research may find distinct differences between women residing in these two areas.

25 Future research is needed to investigate how each of the mobile services identified in this research can be used
26 successfully to help female Arab entrepreneurs. For example, an in-depth investigation could identify how m-
27 commerce can be used successfully by female Arab entrepreneurs by investigating customer preferences. In-
28 depth study is also required on the policies that can be put in place to protect consumers and business owners'
29 rights and to ensure transactions are secure. In addition, future studies can investigate how mobile learning
30 programmes for entrepreneurship can be developed and implemented successfully in order for Arab females to
31 obtain the knowledge required to run their business.

32 33 **5.4 Conclusion**

34 This research provides new insights, solutions and recommendations on the use of the most widely used
35 technology in Arab countries (mobile phones) to help in reducing gender gaps and empowering women in these
36 countries. The findings of this research contribute to the economic improvement of these women, their families,
37 telecommunication companies and the Arab countries in which they operate. Improving women's
38 entrepreneurship through the use of mobile phones can help to increase the economic development of these
39 countries in two ways. First, the inclusion of women in mobile phone usage will increase the revenues of mobile
40 operators and therefore increase the income of these countries. Second, the success of women entrepreneurs will
41 bring additional income to their families. The possibilities associated with the use of smartphones and mobile
42 services are endless. Thus, they can certainly be used in various ways to support women entrepreneurs in these
43 countries.

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