

# The Role of Mobiles and Women in the Sustainable Local Economic Development

<https://doi.org/10.3991/ijim.v16i22.34855>

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**Abstract**—Mobile technology can set the ground for creating trusted communities that provide valuable guidance on new partnerships as well as alternative business models. Such business models encompass women's entrepreneurship adapted to the Agenda 2030 for sustainable development. In addition, small and medium-sized enterprises' growth strongly depends on mobile marketing to prolong the life cycle of a product as well as mobile financial services to give them a global network. Therefore, mobile technology advancement as well as local community services and peer-to-peer support initiatives can assist women to grow their business, enhance gender equality and provide long-term economic stability for a country.

**Keywords**—mobile technology, 5G networks, gender equality, entrepreneurship, SMEs, e-commerce, Chatbots

## 1 Introduction

Productive employment is the main driver of sustainable economic growth. Sustainable development goals are horizontal policies that aim at maintaining income growth in combination with equal access to essential goods and services for all people, now and in the future. The introduction of 5G and 6G networks in developed countries shall increase labour productivity, thus giving comparative advantage to their economies. In addition, technological convergence has initiated a new stage, called digital economy [1].

Evidently, access to technological means is related to the endorsement of global gender equality. To be more specific, Information and Communications Technologies (ICTs), such as mobiles, computers and the internet, can work as a catalyst to women's empowerment in multiple ways: First, they can promote women's entrepreneurial activity in the business sector. Second, they can improve their business practices. Both act synergistically to break traditional gender barriers at home and in the marketplace. Women-owned businesses use smartphones as a tool for growing their e-commerce activities, which has made them capable of accessing consumers worldwide. Therefore,

e-commerce provides flexible working opportunities, thus work-life balance improves the lives of women and their families [2,3].

To be more specific, mobile technology and the fifth generation of mobile networks (5G) can be disruptive to productivity, employment and development [4]. 5G and 6G networks shall provide extensive wireless broadband services to implicate complex internet of things systems in all economic sectors, such as energy, manufacturing and agriculture. In addition, mobiles offer text, sound, voice, images and other multimedia tools and applications that transform information to knowledge and disseminate it to the world for instant and cost-effective use. However, women still face issues on accessing and use of technologies, which slows down the attainment of sustainable development. Therefore, by expanding women's skillset and on-the-job training through digital technology their self-confidence rises as well as their career opportunities advance. Furthermore, women's inclusion in the business and technological sector can have a serious impact on local societies, addressing the goal of social equality, resilience and economic development [5].

Digital economy entails that consumers are given the opportunity to receive advanced, highly-customized services. Therefore, consumers' welfare has brought the need for massive digital literacy courses with the aim to broaden digital consumption. At the same time, digital technologies have a local, a regional and a worldwide impact in the achievement and promotion of circular business models. However, mobile telephony is giving rise to new business models in the market and the economy as long as the infrastructure permits it [6].

In the labour market, there is a high demand for employees with better digital skills in the following sectors: agro-industry, manufacturing as well as retail sectors and chains. Notwithstanding, employment-displacing effects in developed economies signifies the need for value added per worker. Evenmore, the viability of small and medium-sized enterprises (MSMEs), such as in the agricultural, food and textiles sector largely depends on their digital transformation and specifically, on effective digital marketing services to gain wider visibility and customer engagement [7].

More specifically, the retail industry demands the implementation of Artificial Intelligence, Internet of Things as well as Big Data Analytics into all areas of production for better operational functionality, such as the supply chain, warehousing and logistics as well as digital commerce and delivery of goods [8].

Likewise, by digitizing the retail chain through digital commerce platforms, automation is achieved in transaction, distribution and marketing, thus economies of scale are achieved. The exponential increase in the use of these platforms, opens up an opportunity for and intensifies the need to strengthen payment systems in order to accomplish secure and efficient remote transactions as well as to update cross-cutting policies to avoid overcharging for services.

Physical commerce shall be integrated with digital commerce through offering virtual experiences in service to the customer as well as virtual agents or Chatbots. However, digital economies in equal and inclusive societies presuppose the existence of the following conditions: First of all, universal access to the Internet, adequate equipment, such as devices and applications as well as inclusive regulatory frameworks for digitized labour markets. Moreover, 21st Century Skills, such as critical, creative

thinking and problem-solving skills alongside leadership and collaborative skills are vital, especially for home-based entrepreneurs and new labour requirements.

## **2 Women as small and medium-sized entrepreneurs (SMEs)**

In general, there are only a few mentoring opportunities for women to become business owners and interact with business associations and networks. A survey presented in [9] depicts that Uganda makes a clear connection between mobile phone usage and the enhancement in women's entrepreneurial ability through the dissemination of good practices towards handling emergency situations, reducing transactional and trading costs as well as minimizing risk factors. Previous studies have shown that mobile phones have a direct contribution to marketing and sales [10, 11, 12].

Furthermore, as identified in [13], rural women entrepreneurs' experience revealed that mobile-based communication and easy access to information developed their knowledge background as well as their daily living routines through their relationship with social structures and systems. The REECALL project intensified women's capacity building on how to make full use of mobile technologies as a major element of added value for their micro small, dairy enterprises. The rural women participants in the PROTIC project from Dimla mentioned that smartphones had saved them money and time in approaching the public extension services for information, making an appointment to receive service and arranging visits to their agricultural field or livestock. Smartphones also helped them stay up-to-date with government welfare schemes, track the allocation of public benefits to their community and to access accurate information easily. Such information may include local weather conditions, research plant conditions, market prices, instructions on the use of their digital wallets for transactions as well as online government support services [14].

Mobile banking refers to the process of connecting the banks to their customers through a cell phone, smartphone or personal digital assistant (PDA), thus mobile devices intertwine mobile technology and financial services for easy access of both consumers and entrepreneurs to banking services [15]. On the other hand, mobile money as an ordinary wallet for payments can increase interoperability, which is the ability of users of different mobile money services to make mutual transactions.

Mobile money consists of an account and the mobile phone is a facilitator between customers and suppliers, thus making it easier for entrepreneurs to expand beyond regional boundaries [16]. Small and medium-sized enterprises (SMEs) need flexibility in budgeting, planning and financial management as they are a predictor of the profitability and overall performance of SMEs [17, 18]. Accessing cloud services for storing transaction data through mobile apps will provide a valuable solution towards capturing the recording of sales, either in cash or in credit, changes in supplies and in stock, orders and discounts in combination with payment of utilities and payment to employees [19].

Mobile marketing technology has risen globally, thus depicting that marketing strategies should, first and foremost, target mobile users [20]. In the UK, a study shows

that 71% of consumers tend to buy products and services through mobile devices [21]. Therefore, innovative enterprises adopt mobile marketing technology and especially, they invest in mobile marketing applications.

As the number of businesses involved in the implementation of mobile marketing increases, SMEs should not remain passive. Women's employability and livelihood in developing countries are strongly connected to SMEs and the effective use of mobile marketing as well as mobile financial management systems. At the same time, women ahead of SMEs should leverage lifelong learning opportunities to enhance their entrepreneurial skills and strategic orientation towards mobile technology services [22, 23, 24].

### **3 Women and e-commerce in contemporary value chains**

Circularity means reusing or selling products, components and materials, which involves the prolongment in a product's lifecycle. Circular economy transition has an eminent role in the business sector and the consumers as it includes a strategic business imperative: reduced waste of input materials, environmentally-friendly manufacturing and "second life" prospect of products.

More specifically, circular business models require a fundamental shift in how companies operate and gain profit. New supply chains are created as goods are recaptured and traceability is consistently listed as a priority. The concept of circularity is met with almost universal approval, although certain hurdles need to be crossed towards its implementation.

The global clothing and textile industry is responsible for millions of tonnes of waste every year, whereas the second hand market grew to €33 billion in 2021. Second-hand trade can assist in extending a garment's life by authenticating and reselling it on secondary marketplaces. The idea is enabled by a technology platform that performs authentication through a unique digital ID installed on each garment or accessory, thus growing overall demand for resale platforms [25].

Digital commerce has transformed local economies and markets through giving small businesses the opportunity to export their products. Women's fair trade cooperatives in developing economies, such as Africa, make handicrafts and sell them to customers worldwide through their mobile phones. However, even in developed economies, women are less likely to make collective bargaining to expand their products on the grounds of low self-efficacy beliefs as well as inaccessible or ineffective community support services [26].

Furthermore, it is recorded that innovative, global trade companies employ more women as well as women-driven, e-commerce business activities were more profitable compared to traditional commerce. The surge in global value chains, even in developing countries like Ethiopia, is strongly dependent on portals and platforms to promote their products and boost their sales. Therefore, e-commerce is creating economic employment opportunities for women in local and global economies. In addition, e-commerce platforms can assist in the growth of several small businesses in rural areas,

where a significant percentage of the villagers are engaged in e-commerce transactions, such as in case of rural Africa. [27].

#### **4 Chatbots as tools to scale up entrepreneurship and business**

Globally, Chatbot market value is expected to go over 454.8 million USD by 2027 [28], although SMEs are lagging in the adoption of Chatbots due to a lack of: data culture, awareness about what AI could bring, information or knowledge in managers and workers as well as few evidence and little visibility on the returns of investment [29]. Chatbots operate in apps or messaging interfaces and help internet users to complete small tasks, such as making purchases online or solving technical issues. Chatbots hosted on social media platforms can offer tailor-made services to customers. This chat interface gives clients relevant information in natural language without ever needing any human involvement. This is what makes them particularly useful for SMEs.

AL and ML are the most booming technologies used by Chatbots in order to get maximum customer data that can be used to understand behaviors and generate replies to the customers. The latest Chatbots are equipped with natural language processing to decode queries and linguistic decoding. Chatbots are most commonly used for e-commerce and customer service through promoting user experience over smartphones and enhancing interaction with their customers.

AI Chatbots are able to help users in finding search results for e-commerce products, shows, music, and more easily with voice commands. AI and the data of user behaviour collected by machine learning, help in displaying customized recommendations to users. Image recognition ensures that users do not have to type everything. Live translations assist in recognizing languages and dialects [30, 31].

The major usage of AI and Chatbots lies in their capacity to operate in resolution to the customer's problem, while providing trustworthy, immediate and tailored responses, without the involvement of a person. Therefore, AI Chatbots set the ground for customized and engaging experiences in support of marketing and sales, as Chat apps are quite popular in an extremely important demographic group for brands, advertisers and publishers, the young people [32].

In addition, many brands choose to invest in developing mobile apps with AI-supported Chatbots to maintain a positive brand image. As feedback matters the most, AI-supported Chatbots act in an interactive way and learn from the answers given by their users to offer personalized customer services. The convergence of mobile technology with digital payments and e-commerce sets the ground for AI and Chatbots advancement in emerging markets. Thus, AI and Chatbots for SMEs is a prosperous investment business venture by itself. In addition, Chatbots can be used to help SMEs provide 24/7 service while saving time for more meaningful work to grow their core business, including building better products and distribution channels or improving partnerships [33].

## **5 Research highlights**

The vast majority of women-owned small and medium enterprises have inadequate or no access to financial services, let alone digital financial services. Nevertheless, mobile money can become the medium for democratizing digital financial services, especially in developing economies, where women, poor people and other groups are traditionally excluded from the formal financial system [34].

Mobile technologies play a vital role in increasing women's entrepreneurial skills, although having a mobile phone is not enough to establish a beneficial and sustainable relationship with markets, banks and formal institutions. Nevertheless, a previous global report in 2015 demonstrated that mobile phones have a positive role in women's production and entrepreneurship as well as they assist in interpersonal communication and relationships in resource constrained countries [35].

As a result, the gender gap concerning the implementation of mobile financial services by women in low and middle income countries can be dealt with certain measures: initializing skill-building programmes, providing affordable handsets as well as challenging misconceptions as well as demonstrating successful use cases of mobiles in the business sector.

In addition, community-led circularity frameworks capturing market insights, leading use cases, best practices and key actionable solutions designed and deployed to increase supply chain resilience can lead women to mobile technology-enhanced commerce, leveraging circularity and local sustainability as a comparative advantage in electronic commerce. Moreover, awareness campaigns as well as educational curricula designed and delivered by local community services and peer networks need to be developed [36].

Women entrepreneurs in small and medium enterprises form a significant part of the business sector, which signifies the huge impact of women's entrepreneurship on themselves and the entire nation. Therefore, employment rate and economic stability lie on women's empowerment and thus, on the advancement of their economic and social role in local communities. Local communities can assist women in communication and networking as well as in effective mobile marketing and financial management of their SMEs [37, 38].

Mobile marketing is part of an entrepreneur's value chain through effective communications with customers and suppliers resulting in improved output value and potentially higher margins. Mobile technology has given enterprises a whole new perspective on marketing as capturing new types of data assists in developing customer profiles in order to provide tailor-made customer experiences (CX). Customer experience (CX) refers to how a business engages and interacts with its customers leading to business growth as providing great customer experiences offer a significant return on investment (ROI).

Empirical evidence shows that SMEs are not sustainable or profitable if they do not comply with current sales promotion strategies. Mobile marketing applications are essential to small and medium-sized enterprises (SMEs) as they increase clients' satisfaction and retention, thus boosting the sales of their products. Furthermore, investment in Information Technology (IT) is accompanied by having a better chance

of finding a niche in the market and winning new customers. In addition, mobile marketing technology diffusion depends on the entrepreneurs and their attitude towards exchanging good practices and integrating knowledge to grow their potential [39].

## 6 Conclusion

5G networks are a prerequisite for large data transfer, thus acting in a proactive way towards high-quality digital financial and marketing services. Uneven access to high speed broadband is one main factor associated with digital gaps across firms, sectors and sectoral value added. Social media and e-sales are an asset for SMEs as part of their digital marketing. Cloud computing amplifies the IT capacity as well as the digital infrastructure of SMEs at a reasonable cost [40].

Moreover, ICTs aim at improving women's access to knowledge and communication channels, thus creating strong rural urban links, building local supply chains as well as launching local, circular business models. In addition, the incorporation of digital technologies in women's educational and training programs can enhance their applied and transversal skills, such as digital literacy, leadership as well as entrepreneurial skills to promote both personal and societal prosperity. Moreover, a complex of environmental and nutritional factors [41-44] accompanied by innovative educational tools lying in mobile technologies [45-54], ICTs applications [55-87], AI & STEM education [88-97] and serious games [98-103] as well as integrative theories and models of human consciousness, metacognition, mindfulness, meditation and emotional intelligence [104-126], are related to higher educational impact and business growth.

In conclusion, mobile technology empowers businesses with the transition to a circular economy in addition to macroeconomic development. Circular economy models merged with technological innovations can bring employability opportunities. Women's empowerment can transform social norms and facilitate the economic and social sustainability of a country. SMEs need mobile finance and mobile marketing tools, such as Chatbots to offer immersive and personalized customer experiences, whereas e-commerce demands safe and reliable mobile payment services and apps in order to support world trade. For women entrepreneurs, mobile technology can bring increased sales, more business opportunities as well as improved profitability to generate supplemental income and improve their financial status, especially in lower and middle income countries.

## 7 References

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Article submitted 2022-08-22. Resubmitted 2022-10-17. Final acceptance 2022-10-17. Final version published as submitted by the authors.