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Component Technologies on Home-Based Enterprises: A Trend in Smart Cities Development

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Abstract
This article examines Home-Based Enterprises (HBEs) operations following the advancement of component technologies usage by its operators for trading and promotion. HBE operators use the home as a place of business to contribute to the income and improved welfare of households, especially in times of crises as recognised in many studies. Adequate ICT requirement is needed to drive any enterprises, especially in HBEs in the long run may result in regional and local development, a fundamental point and trend in the promotion of smart city development. The essence of this article is to examine the use of the internet in HBE transactions and its contributory factor. This paper is to outline the transformational impact of technology use on HBEs toward smart city development. The emerging circumstances of internet usage like social media, mobile applications, ICT, and websites applications have been considered in detail. HBEs development based on the availability and usage of internet facilities has been suggested for its application where necessary, and this can serve as a guide to changing dynamics of the cities towards the total adoption of the internet for business operations and transactions for the benefit and improvement of the local economies. The government in collaboration with stakeholders and the private sector should be willing to make available knowledge of the component technologies that will benefit HBEs as well as provide favourable programmes, and enact policies guided by laws and regulations. This paper discussed the various information fusions in the use of internet services to aid transactions as well as the selling and buying of products with ease without any form of difficulties encountered.
Keywords: Component Technologies, HBEs, ICT, Smart Cities, Transactions
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1. Introduction

The environment of HBEs as well as its daily activities process is transformed by the emergence of component technologies (Nambisan, 2016). The use of component technologies in modern times is widespread to boost business quality (Deloitte, 2015) and create a wide range of awareness. However, investigation on the use of digital technology to drive HBEs is in the early stages (Kraus et al., 2019a; Kraus et al., 2019b), and many HBEs goods and services are being rendered through digital channels (Di Fatta et al., 2018). Consequently, internet use which is online communication through the connectivity of electrical-induced mechanical devices for business purposes often facilitates transactions. Particularly, the internet is a technical invention that covers all facets of human endeavour specifically the economy, by prompting many businesses to improve productivity (Prieger, 2013). According to Stockdale et al. (2012), Nikunen et al. (2017), Sianturi et al. (2019), and Tyas et al. (2021), HBE's potential to utilise internet services is boundless. In many countries, HBEs have gained the attention of investigators like Van Gelderen et al. (2008) in New Zealand; Jain and Courvisanos, (2013) and Burgess and Paguio, (2016) in Australia; Holliss (2015) in Japan and the United Kingdom; Folmer and Kloosterman (2017) in Netherlands; Kane and Clark (2019) in United States of America (USA) as well as Nathan et al. (2019) in Malaysia and Singapore.

The majority of businesses are linked to HBEs in some progressive economies, Reuschke and Domecka (2018) reported that 52% of the businesses in the USA are linked to HBEs, and according to the Department for Business, Innovation, and Skills (2014) reported that 59% of businesses are linked to HBEs in the UK. It is worth noting that e-commerce and digitalisation are among the proposed significant drivers of HBEs (Phillips, 2002; Clark & Douglas, 2011; Anwar & Daniel, 2016). A major challenge of HBEs is the restriction of sales and services to local consumers, and the territorial limitation to expand the business frontiers (Sianturi et al., 2019). Notwithstanding that, in recent times there is high demand for works that are attributed to technology-based. This is a result of the rise of internet usage that has gradually shifted the pattern of conventional buying and selling (Tyas et al., 2021). The internet-enabled HBEs are more likely to connect with the global markets effortlessly (Sianturi et al., 2019), however, according to Tyas et al. (2021), studies have shown that internet use emphases communication devoid of physical customer interaction. As a result of these changes, market competitiveness is increasingly becoming tough which includes consumer interactions that are more far-reaching than the supposedly conventional models (Sianturi et al., 2019).

Besides that e-commerce and the internet decreases the impact of the economies' scale and commercial size

operation, it also encourages viability with less turnover, and evolves digital marketing of goods and services known as 'e-goods'. Online storefronts like Shopify and Magento; with marketplaces like Amazon and Alibaba. From the account of Church and Oakley (2018), the emergence of online marketplaces has caused the improvement of opportunities in innovative marketing strategy without geographic restrictions, facilitating businesses especially home-based business to specifically direct market patrons to their e-trading sites, and display their products. Social media users made new trading opportunities possible (Huws et al., 2018), that is, products of businesses held within living apartments could be made competitive through technology. Taiminen and Karjaluoto (2015) said that internet services use creates new different platforms to market existing commodities and services. This is to say that digitalisation relates to the competitiveness, development, and productivity of businesses, especially when adopted by HBEs (Acosta et al., 2018). Hence, the presence of globalisation facilitates technological improvements which enable things to be easily accessed to produce HBEs that can reach international markets (Tyas et al., 2021). Researchers observed that Internet users can help HBEs provide opportunities; improve marketing and operational efficiency with lowered costs for business enterprise (Hamidi & Safabakhsh, 2011; Eid & El-Kassrawy, 2012; Hanafizadeh et al., 2012; Eid & El-Gohary, 2013; Tyas et al., 2021). With the use of internet trading, positive opportunities are created for HBEs in ways that were formerly impossible promoting business-to-consumer competitive advantage, and business-to-business cost-benefit (Leeflang et al., 2014; Tyas et al., 2021).

Notwithstanding that the system of online payment that has been globally accepted by both operators and customers of HBEs (Weltevreden & Van Rietbergen, 2007; Nathan et al., 2019); there seems to be inadequate logical indications to specify if HBEs are more inclined to e-commerce, internet trading, and digital payment styles than other small businesses, or pinpoint its consequence as a motivator of growth of HBEs activities (Reuschkea & Masonb, 2020). Specifically, however, the emerging trend of the redesign and introduction of the new Naira (200, 500, 1000) notes by the Central Bank of Nigeria with the 10th February 2023 deadline, and the intervention of the Supreme Court have advanced huge challenges. More importantly, the scarcity of the denominations is compelling and notable evidence that small-scale businesses held at residential dwellings are now more engaged in e-transactions like other businesses both in the urban and rural areas. Hence component technology has thereby become an influencer and driver of economic growth and sustenance of HBEs as well as ease of doing business in residential precincts.The evolution and expansion of smart cities are reliant on the economic sector. Cities that experience progress in their economic sector are cities that develop continually involving digital technologies by their inhabitants as a factor that makes the city smart. HBEs expectedly are vital to the commercial activities of smart cities because it provides job opportunities and life-sustaining streams of income for low-income earners, and also, are majorly patronised by the low-income group. Home-based businesses are usually linked closely with the paucity of resources and experience of their operators (Dyerson et al., 2012; Tyas et al., 2021). The structure of HBEs is diversified because it could be in the form of a family business, an entrepreneurial business with one or more employees, and a self-starting business (Tyas et al., 2021). Although HBEs are only engaged within residential dwelling vicinities for business activities, this could significantly contribute to a family income (Ismail, 2012; Tyas et al., 2021), and could as well be sustained when there are economic crises.

Home-based Enterprises have transformed their operations with the emergence of the internet and social media for easy buying and selling making payment of commodities easier for customers who engage in petty and bulk buying since some HBEs are located either in the rural /urban areas (Mason et al., 2011; Reuschke & Houston, 2016; Kane & Clark, 2019; Reuschkea & Masonb, 2020;). Newbery and Bosworth (2010), and Townsend et al. (2017) noted that the use of internet services by HBEs has also positively eased trading in rural areas encouraging its sustainability. Home-based enterprise is an essential primary aspect of an innovative rural economy, specifically making creative industries such as digital communication very important. This simply shows that HBEs irrespective of their location require the adoption of technological advancement to thrive (Philip & Williams, 2019). Lakshmi et al. (2017) and Tyas et al. (2021) stressed the need for HBEs operators to be aware of the frequently used social media tools and websites by customers to take full advantage of their reach while putting into consideration what they set to achieve. Asides from the prompt creation, access, and exchange of content through internet usage and social media help to sustain online trading that eases HBEs' growth; reaches more people, timely disseminate information, offers varied product promotion choices, and introduction of new products which every HBEs aspire for (Daniel et al., 2015; Lyons & Davidson, 2016; Tyas et al., 2021). With the growth of the economy and the initiation of an information-based society, people's necessities for their condition of living are constantly increasing. Building smart cities are simply based on information technology use to drive the traditional process gradually which is becoming continually vital. It is imperative to process and use the enormous and decentralised information.

Reuschke and Domecka (2018) reported that Home-based Enterprises are categorised as those that carry out their business activities at residential dwellings as well as operators from their living apartments with major activity conducted at outdoor sites, or client residences. On this note, this study examines internet use in HBEs

transactions, its contributory factor, and as a trend in the development of smart cities. The use of internet services and the transformational impact on the HBEs towards smart cities development are being looked into, the study addresses the question of how technology influences cultural and traditional commodities which seems to have been inadequately focused. According to D'Cruz and Noronha (2016) and Church and Oakley (2018), despite the progress of digitalisation in HBEs, its approach is notably an unprecedented global phenomenon. Based on the universal significance of enterprises held in residential neighbourhoods and their underlying trending growth, the discoveries of this study would be indispensable further than the exact situation and direct the degree to which advancing component technologies opportunities promotes the progress of home-based enterprise (Reuschkea & Masonb, 2020).

2. Literature review

To examine the impact of component technologies on home-based enterprises as a trend in smart city development, concerns on the concept of smart home-based enterprises, the concept of a smart city concerning home-based enterprises, and the operational mode of home-based enterprises were underpinned. Others include home-based enterprises and advancing component technologies effects, and the relationship of component technology with home-based enterprises.

2.1 The concept of smart home-based enterprises

HBEs are usually operated from homes either to minimise costs, avoiding to get business premises due to the nature of the business and the convenience associated with it, lowering the time spent going to such premises outside the home (Mason et al., 2011; Vorley & Rodgers, 2012). In a similar vein, some researchers (Walker et al., 2008; Ekinsmyth, 2011; Loscocco & Bird, 2012; Wynarczyk & Graham, 2013; Reuschke, 2019; Reuschkea & Masonb, 2020; Nezai et al., 2021) particularly for women, secured additional factors such as convenience given by working from home, which improves the balance between work and life, living standards, parenting demands, and other family engagements and situations.

- *Smart environment:* Conservation of available productive capacity through resource efficiency; assessed by the physical attributes of natural circumstances, pollution levels, protection of the environment, and natural resources and environmental accountability (Buhalis & Amaranggana, 2015).
- *Smart mobility:* Accessibility and ease of handling of contemporary transportation systems for inter- and intra-city travel, as measured by the indicators of connectivity and flexibility at the local, national, and ICT services levels, and the accessibility of contemporary, inventive, and safe transportation processes (Giffinger et al., 2007; Nezai et al., 2021).
- *Smart people:* This refers to the standard of the city's citizens as assessed by their traits and variables of educational attainment, their interest in lifelong learning, their sensitivity to social and ethnic diversity, their adaptability, their creative thinking, their approachability, and their involvement in civic affairs (Jasrotia & Gangotia, 2018).
- *Smart economy:* Put into practice economic strategies that capitalises on the digitalisation of marketing processes, and have benefits and indices such as cost-effective image and brands, attractiveness, creativity, improved quality, flexible employment market, global economic integration, and transformational potentials (Nezai et al., 2021).
- *Smart life:* It is an offer of a better quality of life, social solidarity, and a healthy environment accessible through socio-cultural and educational services, and which expresses an intelligent life form through the availability of cultural landscapes and well-being, housing quality, individual security and self-consciousness, academic facilities, and socioeconomic harmony (Harrison & Donnelly, 2011).

2.2 Concept of the smart city in relation to home-based businesses

"Smart" or "intelligent" is a new catchphrase used to explain social, commercial, and technological advancements that rely on the sensors fuelled by technologies like open data, Big Data, and new approaches to data documentation and information connectivity, accessibility, and transaction (Gretzel et al., 2015; Nezai et al., 2021), and the concept was also introduced to cities (smart city) to denote initiatives aimed at the use devices innovatively and creative means to enhance equitable distribution of resources (Basri, 2019). The operation and functioning of HBEs in smart cities are of high quality in general delivery for both its operators and customers towards restocking of products (Bravo, 2019). The concept of HBEs operating in a technology-driven city requires the use of internet-enabled devices like phones in advancing technologies. Harrison et al. (2010) and Nezai et al. (2021) reported that 'smart' as a concept defines high communication levels and numerous functions in the marketing context involving HBEs to mean a smart economy. Hence, the phrase 'smart city' describes sustainable urban growth resilience (smart environment), the incorporation of ICTs into the management of HBEs services (smart economy), and the creation of a participatory environment for creativity and collaboration (smart governance). A smart city uses extensively cutting-edge ICT conjunctive with diverse urban structures

and environments. This enables a city to manage access to its resources safely, sustainably, and effectively as well as improve economic and societal outcomes (Gajdosik, 2019). To achieve effective administration, environmental sustainability, and a higher standard of living for citizens, smart cities are information hubs that manage and handle data, innovations, and technologies (Bibri & Krogstie, 2017).

2.3 Mode of home-based economies operation

A sizable portion of cottage businesses sell nationally and globally (Mason et al., 2011), and in contrast to other enterprises, a minority of HBEs work full-time (Mason et al., 2011), the dwelling unit where the business operates does not prevent the growth and production of jobs (Walker & Webster, 2004; Kane & Clark, 2019). HBEs, however, often have fewer employees and turnover rates lower than other SMEs (Mason et al., 2011). Once they start to expand, some HBEs do relocate into separate business locations (Reuschke & Houston, 2016). The literature is divided on whether or not proprietors of residence-based businesses are different from other owners. Some business-inclined studies considered gender proclivity for women, and grown-up businesspersons emphasising that the residential buildings provide an avenue for indulging in entrepreneurial services for a particular cluster of people (Ekinsmyth, 2011; Wainwright & Kibler, 2014) especially the low-income earners, comparatively, other researches have shown slight variation in the socio-economic status of HBEs operators (Mason et al., 2011; Reuschkea & Masonb, 2020; Ayo-Odifiri et al., 2022a). While conducting its business activities, Kane and Clark (2019) emphasised that home-based enterprise consists of knowledge-intensive and traditional activities.

2.4 Home-based enterprises and advancing component technologies effects

Home-based enterprises adapt to the new era of trending component technologies (Nambisan, 2016), the emergence of advanced component technologies has altered traditional ways of commercial engagements which gives rise to innovative processes of business conduct and creating new ideas (Kraus et al., 2019a&b). Researchers believe that digital technologies not only redefine the economic focus of business prospects but also how the prospects are consistently followed to achieve best practices (Autio et al., 2017). Nambisan (2016) observed that digital technologies allow less bounded and more transparent business methods and results. Kraus et al. (2019a&b) emphasised that when technology-driven enterprises are compared with traditional entrepreneurial skills and services, there are greater social interactions and a higher social component of digital business which in a digital domain eventually increases the significance of link investment for the success of the enterprise to identify opportunities, build legitimacy, and resources assemblage. Suggestively, digitalisation is growing the tempo of private enterprises, allowing for a wide range of new product awareness as well as prompt initiation and execution of business models structurally, improved, and restructured iteratively for testing and application. Component technologies offer prospects for businesses to thrive well (Nambisan, 2016). According to Sussan and Acs (2017), digitalisation impacts on HBEs by creating new goods to take advantage of emerging market possibilities, such as moving offline businesses online and advertising new goods and services that take the shape of digital offerings, new items that are not inherently digital must make use of digital technology. Stressing further, Laudien and Pesch (2019), and Reuschkea and Masonb (2020) reported that incorporating production and service activities to generate blended solutions with both material and immaterial components is also made possible by component technologies.

However, component technologies provide the capability of connecting various shades of customers at a lesser cost while facilitating the creation of fresh commercial models. The three emerging models identified by Sussan and Acs (2017) include (i) subscriber revenue models that draw in both free as well as subscription users (such as Spotify); (ii) user-intensive pricing strategies that offer content free; and (iii) cooperative business models that depend on underused physical assets (like Uber, and AirBnB). With the trend in the advancement of technologies, digital infrastructure development has instigated online payment systems and social media trading platforms. Therefore, Pergevova et al. (2019) stressed that technology serves as a guide to HBEs operators to provide and improve effective ways for interaction, and gathering high-quality market data from customers towards increasing product knowledge. This thus evolves more collective and combined ways of tracking business prospects (Aldrich, 2014). Through digital processes, different platforms have unlocked varying chances for HBEs operators, offering appropriate value infrastructure for business owners using their capacity to establish contact with a large number of potential customers at low transaction costs and by reducing the risks associated with combining newness and smallness According to Hsieh and Wu (2018), innovative systems support business owners to create supplementary goods and services inside a digital environment, whereas exchange platforms support business activities like internet sales and demand for services and goods, and platforms integration is a combination of innovation and transaction platforms.

Besides, Laudien and Pesch (2019), and Reuschkea and Masonb (2020) implementation of component technologies allows the facility firms to moderate environmental limitations on commercial activities, promoting and straightening the connection between human activities and rendered services. Component technologies

likewise assist HBEs in becoming more globally inclined (Pergevova et al., 2019). It had even been proposed that digitalisation is exerting a democratising effect by starting new enterprises for vulnerable and disadvantaged persons by moving business intentions into a digital community thereby lowering the physical barriers to competition. This is in contrast to Martinez Dy et al. (2018), who contended that the digital disparity of resources mirrors the imbalance of offline resources and the challenges of setting up a business that happens offline owing to communal structure also on online undertakings. They added that new inequality dimensions are emerging in addition to the intensification of existing ones, as a result of the phenomena of a digital enterprise. Accentuating further that the economic landscape is not leveled by internet services (Martinez Dy et al., 2018).

2.5 The relationship of component technology on home-based enterprises

Component digital technologies eradicate a lot of the limitations of business operations from dwelling places, with the inclusion of the spatio-physical environment like order fulfillment services as well as digital products and services. Though, home-based enterprises are limitedly researched relative to digital component technologies. Adaptively, the essence is to understand the HBEs whose operations are fostered by internet services (Van Gelderen et al., 2008; Daniel et al., 2015; Daniel et al., 2017) that supports the opinion that HBEs have been transformed from physical contact to virtual transactions (Sussan & Acs, 2017). Despite the conflicting practices of independence, loneliness, and feelings of isolation cannot be ruled out (Daniel et al., 2017) as well as business progress. Nevertheless, little has been identified on the range of technological digitalisation to pilot the affairs of the home-based enterprise to gain entry into global markets. Other studies (Wynarczyk & Graham, 2013; Burgess & Paguio, 2016; Kapasi & Galloway, 2016) concentrates widely on house-centered enterprise operation and motivation pinpointing the significance of internet skills for effective home trade. However, as a base of transactions, yet slightly conflicting with the bid of internet and virtual trading at variance in online transactions among the non-HBEs and HBEs appears to be relatively small (Anwar & Daniel, 2016; Mason et al., 2011).

Asides from buying and selling using the internet for online activities, HBEs also adopt digital technologies for day-to-day communication, promotion, marketing, and management of goods. In some circumstances, (Wynarczyk & Graham, 2013; Reuschkea & Masonb, 2020) upheld that component technologies are a trade model. Therefore, for commercial activities to succeed, access to ultra-rapid bandwidth is required (Philip et al., 2017). Not minding that internet access is often preferred in viable commercial precincts than in housing areas. Although, challenges abound for HBEs in some inaccessible rural areas (Williams et al., 2016; Philip et al., 2017; Wilson et al., 2018). This may pose an environmental limitation (Reuschkea & Masonb, 2020). Pickernell et al. (2013) reported that e-trading in the service sector among SMEs is higher than those of smaller fresh businesses for fundamental activities, experience and understanding services, and UK-based companies with expansion plans. The report also noted that e-commerce in the UK serves to facilitate trade with non-local markets rather than with international markets. The investigation did not look into home-based businesses, but given that they are overrepresented in service-related industries and are considered to be "smaller" than non-HBEs (Mason et al., 2011), it is possible that e-commerce trading is more significant to HBEs than to non-HBEs. Folmer and Kloosterman (2017) highlighted further that the survey of conceptual enterprises in a few Dutch cities revealed that HBEs have more non-local trade links than non-HBEs. Nonetheless, the attrition rate and part-time operations are factors that contribute to the small size of many HBEs (Thompson et al., 2009; Mason et al., 2011; Reuschkea & Masonb, 2020).

3.0 Materials and methods

As it is believed to be an effective method, a comprehensive literature review was employed to conduct this study in the interest of accomplishing the objectives of the study. This is in line with Aliyu et al. (2022) and Ayo-Odifiri et al. (2022b) that a review of literature denotes a method that social science investigators must use in achieving outcomes that are quick and usable in inquiry as a basis for making choices needing extensive information dissemination. This assertion agrees with the opinion of Flynn et at. (2022) on the utilisation of a five-stage data collection process, which includes developing research questions; finding related studies; assessing the quality and relevance of the studies; summarising and outlining the findings; and completely describe the adopted study results. Accordingly, this study reviewed articles published from 2009 to 2023 (15years) to comprehensively expose the evolution of related literature, and report on the emerging trend of how component technologies impact home-based enterprises as smart cities develop. Relevant current information was retrieved from articles published in Google Scholar, Academia, Researchgate, and Scopus databases, particularly empirical papers.

The literature search was limited to smart home-based enterprises; smart cities; home-based business operations; home-based economies and advanced component technologies; and the connection of component technology with home-based enterprises. A total of 416 relevant and cross-referenced articles were retrieved from the databases, and their abstracts were reviewed for appropriateness in this study at a scale of 3(very

significant) to a scale of 1(not significant) by putting their objectives into consideration. Thereafter, 79 articles were suitably considered in this study and reported accordingly.

4.0 Conclusion

Since the emergence of component technologies, smarting all human endeavours has become commonplace that is, smart citizenship, smart buildings, smart infrastructure, smart mobility as well as smart cities where the HBEs enjoy smart economy, environment, governance, interaction, and transactions, and smart quality of life where traditional cities are transformed to smart metropolitan areas. Internet usage tends to grow the output of HBEs traditionally produce commodities, hence, confirming a recent trend of the benefits of employing component technologies in HBEs. Internet usage could be to make payments and order goods/commodities which could be known as electronic transactions; it could be for online marketing/ promotion of products using several online marketing sites, the web, and social media aimed at introducing products through media interactions where there is an exchange of ideas and dissemination of information between buyers and sellers.

Even though some HBEs use the system of electronic internet transactions, it has not been generally widespread, especially in some areas where there are internet fluctuations. It is a known fact that the use of the internet offers enormous chances for various business activities. Internet usage could also affect the generation of income for HBEs operators positively as it is known to improve the dissemination of information/ communication and transactions that are done online which makes it possible for the transactions to be done anywhere at any time provided there is supply on demand being facilitated by the internet. This is possible also even where there is no physical interaction between buyers and sellers. Finally, internet usage promotes an exceptional prospect for HBEs in smart cities development because of the various positive benefits which it tends to offer.

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