



Unpacking the Dynamics of Digital Entrepreneurship: Managing Work-Family Boundaries among Women Entrepreneurs

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Abstract

The global spread of internet technology and the associated advancements are making it easier for women entrepreneurs to manage the work-family boundary. However, there is a need for more research on digital entrepreneurship (DE), especially on how different degrees of DE influence the success of work-family boundary management (WFBM). This study explores the effect of extreme, moderate, and mild pursuit of DE on women's abilities to manage the boundary between work and family. This study uses a quantitative research method and collected data from 312 women entrepreneurs. The results show that DE enables women entrepreneurs to manage the work-family boundary. We found that with extreme DE, women are more likely to experience high levels of cross-role interruption behaviours and perceived boundary control, while with moderate DE, women experience high levels of identity centrality of work and family roles. Therefore, this study contributes to the literature on women's DE by investigating different degrees of DE and its effects on work-family boundary management. The study also contributes to the literature on WFBM through examining the dynamics of DE in enabling women entrepreneurs to manage work-family boundaries to different extents. Therefore, this study captures the interplay between DE and managing work-family boundaries, which facilitates our understanding of women entrepreneurship and the role DE has in enabling the agentic potential of entrepreneurial actors.

Keywords: Digital Entrepreneurship, Women Entrepreneurs, Degrees of digitalization, Work-Family Boundary management.



Introduction

Managing the boundary between work and family is a continuing and particular challenge for women entrepreneurs (Shelton, 2006; Agarwal & Lenka, 2015). Being in charge of a company can lead to professional activities undermining the quality of family life, i.e., to the breakdown of that boundary (Ezzedeen & Zikic, 2017; Bunk et al., 2012). However, many women entrepreneurs are capable of handling and motivated to tackle such challenges (Welsh et al., 2016; De Clercq et al., 2019). In today's exciting and innovative world, digital entrepreneurship (DE) offers a potential path for anyone who needs to multiply their business gains while thriving in their social life. DE involves using technological platforms and other telecommunication devices to pursue entrepreneurial opportunities (Davidson & Vaast, 2010; Giones & Brem, 2017).

The recent increase in DE has led to more women embracing paying jobs. DE offers a chance for women to work at their choice of time and place. According to Koyame-Marsh (2017), most women welcome the concept of owning and operating their own companies, as doing allows them to be more than conventional homemakers. In such cases, women's DE has become a powerful opportunity for women because of its flexibility and autonomy; with DE, women can draw a clear line between their work and family obligations. Hull et al. (2007) identified the three DE types: extreme, moderate, and mild DE. However, little has been covered by subsequent studies on the suitability of these modes of DE for women digital entrepreneurs managing work-family boundaries. Other studies have outlined work-family boundary styles (Kossek et al., 2012; Kossek 2016; Gardner et al., 2021). However, none of these have explicitly explained how their findings apply specifically to female digital entrepreneurs. To the best of the researcher's knowledge, no study in the Saudi context has examined the work-family boundary related to DE. To address these research gaps in the existing literature, the present study aims to examine the work-family boundary in relation to DE types in and outside of Saudi Arabia. Therefore, this study asks how digital businesses enable women entrepreneurs to manage the boundaries between work and family and whether different types of DE affect work-family balance management (WFBM) differently.

This study seeks to contribute to the literature in several ways. Firstly, it contributes to Entrepreneurship literature. Entrepreneurship has a significant contribution to the economic landscape and digital advancement acts as a catalyst for entrepreneurs and innovation. Secondly, the study extends its contribution to the literature of DE by facilitating our understanding of DE and enabling the agentic potential of entrepreneurial actors. Additionally, a contribution is made by examining the differences among the three types of DE (Hull et al., 2007) in relation to WFBM. A typology of DE would enable a better understanding of DE and facilitate exploration of the potential of digitalization in the activities, processes, limits, and relationships linked with the enterprise. Thirdly, the study contributes to WE by defining the role of women in developing entrepreneurial activities. As we know, women entrepreneurs are an untapped resource and have potential to contribute to a country's economic performance (Braun, 2008). Women entrepreneurs are intricately

connected across various platforms by DE, which provides them with numerous opportunities and enables their businesses to develop. Lastly, this paper contributes to WFBM (Kossek et al., 2012) by investigating the importance of DE in enabling women entrepreneurs to manage work and family boundaries effectively.

We now divide the paper into six sections. First, we introduce DE and WFBM as a framework for analysing whether the types of DE enable women entrepreneurs to manage the boundaries between work and family. In the second section, we outline the context and impact of women's DE on WFBM in Saudi Arabia and outside. The third section describes the methods used in collecting and analysing data. The fourth section presents our findings on WFBM in relation to DE types. The following section presents a discussion of the results, recommendations, theoretical and practical contributions, limitations of the study, and suggestions for future research. Finally, we conclude our study by summarizing the paper and its importance.

Literature Review

Digital entrepreneurship (DE)

Entrepreneurship can be defined as self-employment in its simplest form (Gohmann, 2012). DE, on the other hand, is defined as the utilization of digital media and its related technologies to pursue new business opportunities (Elia et al., 2020; Davidson & Vaast, 2010). According to Nobanee and Dilshad (2020), entrepreneurship makes significant contributions to the economic landscape and digital advancement acts as a catalyst for entrepreneurs to innovate. Digital technologies have enabled entrepreneurs to grow their start-ups using strategic methods. Entrepreneurs are intricately connected across various platforms by DE, which provides them with numerous opportunities. Despite the importance of DE, it has garnered little attention (Muafi et al., 2021; Sahut et al., 2019). Little research has addressed the topic of DE, and the literature on DE is quite scarce (Kraus et al., 2019).

Most researchers only focus on addressing the topic of DE in relation to other specific topics such as digital transformation (Antonizzi & Smuts, 2020; Bican, & Brem, 2020), innovation (Prendes-Espinosa et al., 2021; Satalkina & Steiner, 2020), business models (Pfau & Rimpp, 2021; Bican & Brem, 2020; Ghezzi & Cavallo, 2020), and the Covid 19 pandemic (Purbasari et al., 2021; Qermane & Mancha, 2021). Additionally, some researchers have studied the current issues of DE (Von Briel et al., 2021) and the future of DE (Von Briel et al., 2021; Berger et al., 2021). Therefore, there is a need to examine DE in the context of new topics such as WFBM.

According to Hull et al. (2007), a typology of DE (types of DE) would enable a better understanding of DE. Exploring the potential of digitalization in the activities, processes, limits, and relationships linked with the enterprise is one point from which to start such a typology. The degree of digitalization can be determined by looking at: (1) the degree of a company's digital marketing, (2) a company's digital selling, (3) the digital nature of a company's goods or services, (4) the digital distribution potential of goods or services, (5) the

potential virtual interactions with main external stakeholders in the value chain, and (6) the digital potential of virtual internal activities associated with a firm's operation. It is clear that some or all of the traditional entrepreneurship activities are carried out online in DE. In line with Hull et al. (2007, p. 293), "digital entrepreneurship is a subcategory of entrepreneurship in which some or all of what would be physical in a traditional organization has been digitized." Their study indicates that there are three types of DE. The first type is mild DE, which involves using the digital economy to support traditional operations. Basically, in mild DE, websites and social media are just operational extras; goods or services may be available for purchase online but are not digital.

Additionally, the distribution of products is done physically. There is the constant use of traditional interaction tools like emails and customer-facing touchpoints as primary operational bases (Von Hoffman, 2007). Examples of multinational corporations embracing mild DE include Chevron, Total, Lamborghini, and Nippon Steel Corporation. The second DE category, moderate DE, necessitates a strong emphasis on the market's digital goods, digital distribution, or other digital aspects (Yimamu, 2018). An initial digital infrastructure must be established within the business set-up before the shift towards moderate DE can occur. Digital marketing is the primary mode of marketing, sales can be made online, products may or may not be digital, and distribution of products can also be done digitally or physically. Stakeholder interaction is also mostly done electronically, though traditional means take centre stage and operations are mainly in physical outlets (Kirkpatrick, 2007). In this type of DE, most resources are channelled into products and product distribution to create added value (Balli, 2020; Nadia & Youssef, 2019).

Some multinational corporations in the moderate DE category include eBay, Alibaba, Amazon, and AliExpress. The third type, called extreme DE, refers to a situation in which "the entire venture is digital, including production processes, the goods or services themselves, advertising, distribution, and the customers" (Beliaeva et al., 2019; Hull et al., 2007). Through extreme DE, all aspects of business digitalization are explored. Such entrepreneurs are solely driven by the modernity of innovations in the business sector (McAdam et al., 2019). Extreme DE projects are defined by digital marketing exclusively. All orders are conducted online, all goods are accessible digitally, and all product transactions are conducted electronically. The primary mode of interaction is via internet channels and conventional methods are seldom used (Nadia & Youssef, 2019). There is also a large online presence of all customers and prospects. Operations can be done in physical outlets though this is unnecessary because everything else is digitized (Gupta & Kim, 2007; Kirkpatrick, 2007; Fahri, 2006). Excellent examples of companies in this category are Netflix, Amazon Prime, Disney plus, HBO, iTunes, and Spotify.

Women Digital Entrepreneurship

A woman digital entrepreneur can be defined as a woman entrepreneur who increasingly incorporates digital tools and technologies into her business venture. Dy, Marlow, and Martin (2017) suggest that the developments and progress in the digital realm have entirely changed

the entrepreneurial landscape for women in developing countries worldwide in the form of innovative applications and technologies. They stated that the emerging field of DE may act as a 'great leveller' due to perceived lower barriers to entry, disembodiment of the entrepreneurial actor, and the absence of visible markers of disadvantage online. The limited research on women digital entrepreneurs has been based on assumptions of a 'neutral' Web. Therefore, the manner in which the phenomenon is gendered, racialized, or directly impacted by class position remains unknown and disregarded by Internet use surveys (Dy et al., 2017). Furthermore, the diverse range of entrepreneurial activities in which women participate online is often ignored in favour of a focus on high-tech entrepreneurship, which is widely seen as the example of DE (Kaplan & Malach-Pines, 2010).

Hossain (2018) argues that most women see digital businesses as a means of achieving economic freedom, social respect and approval, and a sense of self-importance. A study by Ughetto et al. (2019) aimed to deepen people's awareness of whether and how women entrepreneurs use emerging technology to address obstacles in developing and conducting new projects. They reveal that DE can provide equal opportunities to women bound by cultural and social constraints, male guardianship over female families, and division of the sexes. The digital space helps live a reality other than escaping gender embodiment offered by the online environment.

Most critics have focused on the motives of women starting businesses, their leadership and management skills, social expectations, and how they satisfy their individual needs while managing their businesses simultaneously. Female digital entrepreneurs are more democratic, transformational, and interactive. They are more receptive to others' perspectives and are more likely to communicate and exchange ideas and experiences (Kamberidou, 2020). According to Tahir and Raza (2020), most women opt for DE because it offers them the opportunity to design their work hours and avoid work-family conflicts.

Work-Family Boundary Management (WFBM)

Boundary management refers to how people build, maintain, and adjust boundaries to navigate the world around them efficiently, including their work and non-work roles (Ashforth et al., 2000; Nippert-Eng, 1996). With the rise of virtual work and modern work-life policies in recent decades, a body of research addressing "work-life boundary management" has emerged. Work-life boundary management is defined as the organization of work and non-work roles to reinforce or weaken the cognitive, physical, and emotional boundary between them (Kossek et al., 2012; Allen et al., 2014; Ashforth et al., 2000). Researchers concur that individuals differ in how they manage their work and home lives (Ammons, 2013; Bulger et al., 2007; Kossek et al., 2012; Sturges, 2012).

Individuals also differ in how they prefer to organize and synthesize work and non-work roles to align with their career and family identities and to handle task demands (Kossek et al., 2012). Those who prefer integration are at ease with removing or blurring the lines between work and non-work, whereas those who prefer segmentation try to keep the lines between work and non-work more intact (Kossek et al., 2012; Allen et al., 2014; Ashforth et al., 2000).

Others cycle through various boundary styles on a regular basis as work and family roles demand shifts in valleys and peaks over time (Kossek, 2016). Kossek, Noe, and DeMarr (1999) proposed that many factors, such as gender and family status, may influence an individual's decision to segment or integrate. Thus, there is a need to explore research that examines whether women or men (since gender is a factor that influences an individual's choice to segment or integrate) integrate or separate work and family roles, and whether they can manage their work-family boundaries.

Additionally, with the ongoing COVID-19 global health crisis, there is a greater need than ever for us to better understand the relationships between boundary management and the work versus non-work issue (Kossek et al., 2020). Clark and Ashforth et al. (2000) argue that to comprehend the nature of the work-family interface, one must first comprehend how individuals manage their work-family boundaries. Kossek's (2016) study presented three primary characteristics of work-family boundary management. The first characteristic is cross-role interruption behaviours (CRIB), which are the interruptions that occur when one role of the individual intersects with the other.

For instance, the disruption caused by family and household demands on the business management activities of the entrepreneur would constitute a cross-role interrupting behaviour (Kossek & Lautsch, 2012). CRIBs are divided into work to family interruptions (WFI) and family to work interruptions (FWI). Identity centrality of work and family roles (ICWFR) is the second characteristic and is divided into work identity (WI) and family identity (FI). The centrality of work identity is known as the salience of an occupational career, such as one's identification with being a professor, a manager, a doctor, or a CEO of a Fortune 500 company. Similarly, the degree of identification associated with an individual's undertaking of a family role constitutes the family centrality characteristic. In comparison, those entrepreneurs who put equal emphasis on both work and family responsibilities are considerable of dual-centrality and give equal salience to both family and work (Kossek et al., 2012). The last characteristic is perceived control of boundaries or boundary control (BC). BC differs from boundary interruption behaviours and identities. BC is not related to personality traits but is a psychological interpretation of supposed control over one's boundary environment (Kossek, 2016).

Research Hypotheses and framework

Digital entrepreneurship and Work-Family boundary management

It is understood that there is a paucity of research examining the relationship or association between WFBM and DE ,especially for women entrepreneurs. As mentioned previously in WFBM literature, there is a need to explore research that examines whether women or men (since gender is a factor that influences individuals' choices to segment or integrate) integrate or separate work and family roles, and whether they can manage their work-family boundaries. Over the last few decades, there has been a significant expansion in the availability of technology tools which has changed where and how work is being conducted

(Olson-Buchanan et al., 2016). As a result of these new technologies, the number of people working from home has increased (US Bureau of Labor Statistics, 2018). Nonetheless, until COVID-19, only a small percentage of the workforce had the option of working remotely (Desilver, 2020).

Never before in history has society seen a circumstance in which millions of workers around the world have been compelled to transition to remote labour. Working from home may appeal to some, but the decreased boundary between work and non-work presents its challenges. In other words, there may be significant differences in individual outcomes between those who do remote work frequently and those who do it infrequently, which may have an impact on the outcomes of this practice. Furthermore, due to the largely voluntary nature of prior remote working, in which people choose to work remotely at their own discretion, some previous findings on remote working have suffered from selection bias (Lapierre et al., 2016). As a result, the identified benefits of remote working may only, or especially, be true for those who are interested in, or capable of engaging in, remote working (Kaduk et al., 2019).

In fact, many studies have been done on the relationship between virtual communication technologies and work-family boundary management. Sayah (2013) illustrated the influence of communication technologies (ICTs) on managing work-life boundaries. The results show that participants form their spatial, temporal, and psychological work-life boundaries by using multiple ICT-mediated tactics. Cousins and Robey (2015) studied the role of mobile technologies in the ability of mobile workers to manage the boundaries between work and non-work domains. Their findings revealed that mobile technologies have material features that offer five specific advantages which mobile workers use in managing work-life boundaries: mobility, connectedness, interoperability, identifiability, and personalization. These affordances have a continuous influence across time in spite of their connection to different features of technology.

Connection technologies such as Smartphones and Wi-Fi internet access allow us to more flexibly navigate the boundaries between roles, which may improve family and work performance for those who are comfortable integrating work and life roles (Derks et al., 2016; Mazmanian et al., 2013; Diaz et al., 2012; Tammelin, 2018). On the other hand, because connection technologies foster a blurring of the boundaries between life roles, they may create greater challenges in keeping the various parts of our lives distinct, which might exacerbate work-life conflicts and create negative family dynamics (Boswell & Olson-Buchanan, 2007; Ferguson, et al., 2016; Diaz et al., 2012; Butts et al., 2013; Mazmanian & Beckman, 2018) as well as undermine psychological detachment and recovery from work (Derks & Bakker, 2014; Lanaj et al., 2014; Foucreault et al., 2016; Perlow, 2012).

Thus, the need to increase our understanding of relationships between boundary management and work versus non-work issues and DE is more pressing than ever. Wahee, Garg, and Gupta (2016) found that the cyber world may play an essential part in empowering women by providing a platform for women to run their businesses from home, allowing them

to maintain a suitable work-life balance. Their study states that the drivers of women's cyber entrepreneurship can be identified, which may aid in increasing start-up success rates and empowering women. Meeta Jethwa and Chhaya Mishra (2016) explained the status of women entrepreneurs in the e-commerce environment and the factors that encourage them to become digital entrepreneurs, such as global reach, cost saving, and ease of communication. Their study mentioned a list of successful women digital entrepreneurs in India, as well as the challenges and issues that women face in the e-commerce sector. A study on a group of mobile teleworking entrepreneurs by Hill, Hawkins, and Miller (1996) showed that most of them are hailing technology for aiding the handling of both their families and work. They stated that mobile teleworkers reported significantly greater work flexibility. Some reported that their families thrived as a result of their flexibility.

Others reported that their families struggled as a result of workplace and schedule flexibility, which blurred the lines between work and family life. In 2016, Derks et al. examined whether work-related smartphone use during off-job time was linked to fewer conflicts owing to the blurring of the boundaries between work and family life. The results indicated that more frequent work-related smartphone use during off-job time is linked to better family role performance through lessened work-family conflict for integrators. For segmenters, smartphone use does not have any effect on work-family conflict levels or family role performance. Kossek et al. (2012) stated that in this digitally diverse age, it is almost impossible to avoid a spill over of family-work or work-family roles. For instance, it is hard for any individual to ignore a call or text message that appears on their phone from their family while in their office away from home.

Mobile technologies have contributed to expectations of anywhere, anytime connectedness, making it hard for people to switch off. As a result, it can be hard to feel truly disconnected from work. A lack of control over work-home boundary crossovers and interruptions can lessen post-work recovery, decreasing productivity and increasing stress. Technology is not inherently good or bad, but the way it is adopted and used can negatively or positively colour one's experience. As an example, the study of Kossek et al. (2012) took a social constructionist approach to emphasize how communication technologies are challenging, as well as supporting, work-home boundary management. In doing so, they brought together work from occupational psychology (boundary theory) and human-computer interaction (computer-mediated communication and cross-device interaction). Understanding how these sides interact and affect each other is important in supporting people appropriately, informing policies and guidelines, and assuring both social and digital interactions are designed to work together. The study of Smith (2014) identified relationships among the boundary management clusters (cross-role interruptions, role identity centrality, and boundary control), virtuality, organizational climate supporting work-family boundary customization, and organizational identification.

Smith also considered how the modern-day challenge of virtual work arrangements affects boundary control and perceptions of a supportive organizational climate. Moreover,

the research examined the relationships of boundary control and climate with employees' organizational identifications. Results demonstrated that the boundary management clusters of Kossek et al. (2012) can be replicated and affected by virtuality. Additionally, virtuality was significantly related to perceptions of a supportive organizational climate for customizing work-family boundaries and negatively related to perceived boundary control. Concerning the three types of DE, the following hypotheses about women DE and WFBM were devised.

H1: There is a significant difference between the type of DE (extreme, moderate, mild) and cross-role interruption behaviours.

H1a: There is a significant difference between the type of DE (extreme, moderate, mild) and family interrupting work behaviours.

H1b: There is a significant difference between the type of DE (extreme, moderate, mild) and work interrupting family behaviours.

According to Smith (2014), ICWFR exists in different forms: work-centric, dual-centric, family-centric, or other non-work-centric. Individuals who are work-centric have their focuses and energy directed towards their work. Individuals who are family-centric focus their career decisions in a way that accommodates their moral virtue of family first. Dual-centric persons are those who have found a perfect balance between their family obligations and work demands. Leung (2011) conducted a study which considered gender role identity as an informal institution that forms women's entrepreneurship and illuminated the dual impacts of institutions as constraining and enabling forces. The findings investigated Japanese women's intentions to pursue the entrepreneurial path as it relates to a strong identification with their family roles, in particular their roles as mothers. In addition, a strong gender role identity is reflected in the identity of the business, the products and services provided by these businesses, and their organizational structure and practices.

Chasserio et al. (2014) conducted a study to demonstrate the dynamics of multiple identities of women entrepreneurs (WE). The study analysed how WE form work identities in relation to specific identity regulations in the French cultural context. The results revealed the ability of these WE to deal with numerous and various identities. Their daily strategies to accommodate different roles illustrate how their entrepreneurial activity is intertwined with their personal and social lives. The outcomes broaden the too simplistic vision of WE as a homogeneous whole. Among French WE, the analysis found that forms of identity in work are along a continuum from accepting conventional norms and social expectations and integrating them in self-identity, to challenging them by transformation or accommodation, to redefining and recommending new norms.

The study also provided a nuanced understanding of complexity and multidimensionality of their daily lives. Farnham and Churchill (2011) investigated key issues people experience when managing personal boundaries within and across social technologies particularly in email and online social networks. They tested how people facet their identities and their lives, and how these facets are expressed through use of email and Facebook. The outcome of the

research showed that family was an extremely important context for sharing online, and that email was still the preferred form of communication for private sharing of the facets of life. Gluesing (2008) drew on personal experience of remote work that is facilitated by virtual communication and collaboration technologies.

The personal story demonstrates how technology, work, and lifecycle coevolve and how the integration of work, friends, and family into the new virtual workspaces and can open up new conceptualizations of personal identity. Ollier-Malaterre et al. (2019) postulated that the use of technological tools offers flexibility to navigate between work and family roles. From the above descriptions, the following hypotheses are proposed to guide the research conclusions.

H2: There is a significant difference between the type of DE (extreme, moderate, mild) and related identity centralities of work-family roles.

H2a: There is a significant difference between the type of DE (extreme, moderate, mild) and related work identity roles.

H2b: There is a significant difference between the type of DE (extreme, moderate, mild) and related family identity roles.

Smith (2014) defined BC as the extent to which one believes they can control the set borders between their family and work, and the perception that employees hold on how to manage the flexibility of their work or family boundaries. Golden and Geisler (2007) tested how the personal digital assistant (PDA) used by workers was seen as a boundary management resource. Results suggest that the spirit of the device is control, and that users explained their technological practices as expressions of personal agency, using the PDA to control the work-life boundary through both integration and segmentation of work and personal life. Furthermore, MarketBridge (2015) notes that DE eradicates the old ways of conducting a business. This means the individuals are not restricted to regular working hours and they may have to respond to customer complaints, reviews, or inquiries on products online at any time of the day. Therefore, the following hypothesis regarding women's DE and BC is proposed.

H3: There is a significant difference between the type of DE (extreme, moderate, mild) and perceived boundary control.

Figure 1 defines WFBM in three dimensions: CRIB, ICWFR, and BC. These dimensions were examined depending on the type of DE enacted in the business, whether mild, moderate, or extreme.

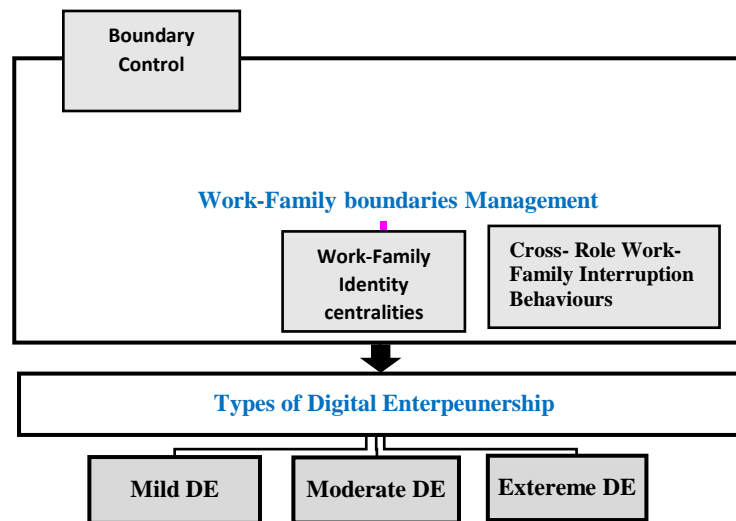


FIGURE 1: PROPOSED RESEARCH MODEL FOR TESTING WORK-FAMILY BOUNDARY MANAGEMENT IN RELATE TO THE TYPE OF DE

Methodology

Research Approach

We used a quantitative approach in this study to collect as much data as possible to evaluate how digital businesses enable women entrepreneurs to manage the boundaries between work and family and to test whether there is a difference between the degree of digitalization in WFBM in Saudi Arabia and outside. This study also applies a deductive approach to reach its goals and objectives. Dudovski (2010) noted that a deductive research approach aims to develop a hypothesis regarding existing theory of a phenomenon and develop a strategy that aims to prove the hypothesis.

Research Design and Sample

This research utilizes a cross-sectional design with descriptive and analytical form. Kesmodel (2018) stated that cross-sectional studies are used for analytical purposes to investigate the state of exposure and outcome, compare the prevalence between variables, and compare the results against existing theories. Additionally, the research uses convenience sampling (also called availability sampling) as a non-probability sampling method relying on data collection via participants from the population who are readily available to engage in the study (Lavrakas, 2008). Two samples were obtained several months apart, so that scales developed and validated using the first sample could be confirmed in the second sample. The first sample was a pilot study, while the second sample was the main study. Both samples consisted of women digital entrepreneurs in Saudi Arabia and other nations. Since this study had 312 participants, the total sample size was good. According to Sudiyanti (2009), the guidelines for the adequacy of total sample size are: sample size 50 = Very poor, 100 = Poor, 200 = Fair, 300 = Good, 500 = Very good, and 1000 = Excellent.

Data collection and statistical analysis

Primary data collection was conducted by collecting information using electronic questionnaires and observations from women entrepreneurs in Saudi Arabia and outside. The questionnaire was composed of three sections (see appendix A). The data obtained from questionnaires was analysed using SPSS (Version 22.0) and Microsoft Excel to answer the main research questions. Additionally, secondary data collection was used in this research from sources such as books, journals, articles, reports, and web pages. The analysis of statistical data requires the use of statistical tools, which also require statistical knowledge to use them (Statistics Solutions, 2009). The sampling method is used to compute frequencies, means, medians, modes, percentages, and standard deviations. Descriptive statistics are shown in the form of graphs and tables. Inferential statistics such as Spearman correlation, T-test, and one-way ANOVA (Statistics Solutions, 2009) are used with the level of $p < 0.05$ considered significant.

Variables and measures

The dependent variable of this study is WFBM while the independent variable is DE. Measurements of constructs in this study were formulated using the guidelines from studies of Hull et al. (2007), Kossek and Lautsch (2008), Kossek et al. (2006) (See appendix A). The items in the questionnaire that relate to the degree of digitalization in the businesses used in this study were developed from Hull et al. (2007). Kossek et al. (2012) developed measures to assess the three different dimensions of CRIB, BC, and ICWFR. The 10 items related to CRIB were modified from the study of Kossek and Lautsch (2008). The items related to BC and ICWFR were taken from Kossek et al. (2006). Participants completed the questions on WFBM using a Likert rating scale from 1 (strongly disagree) to 5 (strongly agree). According to Preedy and Watson (2010), a five-level Likert scale is a psychometric reply measurement where respondents indicate their extent of agreement using five different dimensions.

Tool reliability and validity

The internal consistency coefficient for each of the six instruments was assessed using Cronbach's Alpha. Reliability implies the consistency of the measure, and the internal consistency reliability coefficient is considered as one of the reliability types. Cronbach's Alpha indicates the degree to which the items are interrelated. The value of α ranges from 0 to 1, and a higher value is preferable ($\alpha \geq 0.9$ = Excellent, $0.9 > \alpha \geq 0.8$ = Good, $0.8 > \alpha \geq 0.7$ = Acceptable, $0.7 > \alpha \geq 0.6$ = Questionable, $0.6 > \alpha \geq 0.5$ = Poor, $0.5 > \alpha$ = Unacceptable) (George & Mallery, 2019). Questionnaires were distributed to a small sample of participants to test the reliability of the questions to determine the extent to which a measure would generate the same result from one occasion to another. Questionnaires were distributed again to test the validity and reliability was re-tested. Firstly, a Cronbach's alpha test was applied for 20 participant responses for each scale in this research. Cronbach's alpha coefficients for each scale varied between 0.70 to 0.73. These values are indicators that the internal consistency has acceptable reliabilities for the three primary scales (CRIB, ICWFR, BC) with numbers of

items (10,4,3) respectively. From the reliability scores, the scales used for this study were considered reliable. In addition, after re-testing reliability using all 312 participants, Cronbach's alpha values were also between 0.70 to 0.73. Hence, the scales used for this study were considered reliable and valid overall.

Results

Socio-demographic and business Information

Results presented in Table 1 reveal that most women digital entrepreneurs participating in the research were Saudi citizens residing in Saudi Arabia, aged between 18 and 44 years. Moreover, a large percentage of them were married and were graduates.

Table 1. Women Digital Entrepreneurs' Socio-demographic information

Categorical Variables	Category	Mild	%	Moderate	%	Extreme	%
		N=82		N=170		N=60	
Citizenship	Saudi =231	67	21.5%	120	38.5%	44	14.1%
	Non-Saudi=81	15	4.8%	50	16%	16	5.1%
Residence	Saudi Arabia=260	74	23.7%	140	44.9%	46	14.7%
	Outside Saudi Arabia=52	8	2.6%	30	9.6%	14	4.5%
Age	Below 18 =3	0	0.0%	2	0.6%	1	0.3%
	18 – 24 =61	12	3.8%	35	11.2%	14	4.5%
	25 – 34 =143	29	9.3%	85	27.2%	29	9.3%
	35 – 44 =76	32	10.3%	35	11.2%	9	2.9%
	45 – 54 =26	9	2.9%	13	4.2%	4	1.3%
	55 or order=3	0	0.0%	0	0.0%	3	1.0%
	Single=121	23	7.4%	74	23.7%	24	7.7%
Marital	Married=164	53	17.0%	85	27.2%	26	8.3%
	Divorced=24	6	1.9%	10	3.2%	8	2.6%
	Widowed=3	0	0.0%	1	0.3%	2	0.6%
Education	Undergraduate=78	25	8.0%	41	13.1%	12	3.8%
	Graduate=177	44	14.1%	97	31.1%	36	11.5%
	Postgraduate=57	13	4.2%	32	10.3%	12	3.8%

Note: Values are reported as frequencies and percentage

Additionally, moderate DE was found to be the most prevalent practice among women digital entrepreneurs, followed by mild, and lastly, extreme DE. Most of them began their businesses in 2020, meaning their business operation period was less than one year. Additionally, the number of employees of the majority of these start-ups was 0-5 employees, as shown in Table 2 below.

Table 2. Women entrepreneurs' Business information

Categorical Variables	Category	Mild N=82	%	Moderate N=170	%	Extreme N=60	%
Business start year	Before 2016=48	17	5.4%	21	6.7%	10	3.2%
	2016=25	6	1.9%	16	5.1%	3	1.0%
	2017=34	9	2.9%	20	6.4%	5	1.6%
	2018=39	14	4.5%	17	5.4%	8	2.6%
	2019=66	15	4.8%	40	12.8%	11	3.5%
	2020=100	21	6.7%	56	17.9%	23	7.4%
Operation Time	Less than 1year =131	31	9.9%	73	23.4%	27	8.7%
	1 – 3 years =98	29	9.3%	55	17.6%	14	4.5%
	3– 5 years =40	10	3.2%	22	7.1%	8	2.6%
	More than 5 years=43	12	3.8%	20	6.4%	11	3.5%
Number of employees	0 - 5 =275	68	21.8%	154	49.4%	53	17.0%
	6 - 49 =29	8	2.6%	15	4.8%	6	1.9%
	50 - 250 =6	5	1.6%	1	0.3%	0	0.0%
	More than 250 =2	1	0.3%	0	0.0%	1	0.3%

Note: Values are reported as frequencies and percentages.

Assessment of Digitalization degree in the business

To assess the extent of digitalization in the business, some questions were posed to the entrepreneurs, who answered using a scale of 1 to 3 (in appendix A). At that point, by calculating the mean of each question and the weighted mean of the large scopes, factors were evaluated. To quantify the weighted mean for positive inquiries, the configuration of an average three level scale was Mild 1 to < 1.67, Moderate 1.68 to < 2.34, and Extreme 2.35 to < 3. Therefore, the weighted mean of digitalization degree in the women's DE overall was "moderate," since Mean \pm SD = (1.99 \pm 0.43). In addition, observed deviations from the answers to each question were very minimal. Thus, the standard deviation indicated no confusion in the entrepreneurs' opinions for each question.

Assessment of CRIB, BC, and ICWFR

The CRIB, BC, and ICWFR were estimated using a five-point Likert scale. The inquiries were then presented to entrepreneurs, who evaluated their opinions by utilizing a scale of 1 to 5. This was accompanied by measuring the means of each response and the weighted mean of the entire set to analyse the tested variables. A configuration of a standard five level scale is Strongly disagree 1 to < 1.80, Disagree 1.80 to < 2.60, Neutral 2.60 to < 3.40, Agree 3.40 to < 4.20, and strongly agree 4.20 to \leq 5. This shows a quantification of the weighted mean for positive inquiries. The weighted mean of entrepreneurs' CRIB overall was "Neutral" since the Mean \pm SD = (3.38 \pm 0.49) and observed deviations from the answers to each question were very minimal. Thus, the standard deviation indicated that there was no variation in entrepreneurs' opinions for each question. The observed Mean \pm SD= (3.49 \pm 0.53) on FWI

(family-work interruptions) was "Agree." On the other hand, WFI (work-family interruptions) was "Neutral." with Mean \pm SD = (3.27 \pm 0.73). Additionally, the assessment of entrepreneurs' ICWFR showed that the weighted mean overall was "Agree" with Mean \pm SD = (3.67 \pm 0.77). Moreover, the deviations in the answers for each question were minimal, indicating that there was little variation in the entrepreneurs' attitudes. This was derived from responses from the WI (work interruptions), which was "agree," where the Mean \pm SD = (3.78 \pm 0.74). The average response concerning FI (family interruptions) was "Agree" Mean \pm SD = (3.357 \pm 0.74). Furthermore, the boundary control was "Agree" with Mean \pm SD = (3.78 \pm 0.66), and the deviations of the answers for each question were minimal, thus indicating that there was little variation in the entrepreneurs' BC.

Hypotheses tests

One-way ANOVA was used to discover distinctions by studying different degrees of DE (extreme, moderate, mild) as the relate to CRIB, ICWFR, and BC. This formed the basis of accepting or rejecting the overall hypothesized model.

The research hypotheses state:

H1: There is a significant difference between the type of DE (extreme, moderate, mild) and cross-role interruption behaviours.

In the findings, no significant differences for the DE and related CRIB were found, since (p-value > 0.05). Hence, the first hypothesis is rejected. However, a minor difference could be seen in Figure 3 (in appendix B), where women were likely to have medium CRIB in mild DE and low CRIB in moderate DE. Those in extreme DE had the highest cases of CRIB.

H1a: There is a significant difference between the type of DE (extreme, moderate, mild) and family interrupting work behaviours.

There were no significant differences among the different forms of DE concerning FWI, since (p-value > 0.05), so hypothesis H1a is also rejected. Nevertheless, as shown in Figure 4 (in appendix B), there was a negligible difference where women in mild DE were likely to have medium FWI, and low FWI when in moderate DE. Once more, those in extreme DE had the highest cases of FWI.

H1b: There is a significant difference between the type of DE (extreme, moderate, mild) and work interrupting family behaviours.

The findings showed no substantial difference in WFI depending on the type of DE since (p-value > 0.05). Consequently, hypothesis H1b is rejected. However, a slight difference was noticed, as presented in Figure 5 (in appendix B). Here, women were more likely to have medium WFI when in mild DE and low interruptions when in moderate DE. The highest number of cases of WFI were noticed among those in extreme DE.

H2: There is a significant difference between the type of DE (extreme, moderate, mild) and related identity centralities of work-family roles.

Under this assumption, results showed otherwise. The difference between which form of DE participants used and their ICWFR was not significant (p -value > 0.05). Thus, the second hypothesis, H2, is rejected. As shown in Figure 6 (in appendix B), minimal differences were realized. Women were likely to have medium ICWFR in extreme DE and low when in mild DE. However, those whose businesses adopted moderate DE had the highest ICWFR.

H2a: There is a significant difference between the type of DE (extreme, moderate, mild) and related work identity roles.

Results showed no substantial differences between any DE type and work identity (p -value > 0.05), making hypothesis H2a also rejected. However, a slight difference existed, as shown in Figure 7 (in appendix B). Women in mild DE were more likely to experience a low WI than those in an extreme DE setting who were likely to experience medium WI. Finally, those running businesses with moderate DE experience the highest WI.

H2b: There is a significant difference between the type of DE (extreme, moderate, mild) and related family identity roles.

Based on the research findings, no significant differences were recorded regarding the participants' form of DE and their choice to identify more with family (p -value > 0.05), leading to hypothesis H2b being rejected. Nevertheless, Figure 8 (in appendix B) reveals a small difference, stating that women in extreme DE were likely to have a medium FI and low FI in a mild DE. While they had the highest family identity in the moderate DE.

H3: There is a significant difference between the type of DE (extreme, moderate, mild) and perceived boundary control.

Lastly, results showed an absence of a significant difference in participants' DE type and their boundary control (p -value > 0.05). Therefore, H3 is rejected. As shown in Figure 9 (in appendix B), women were likely to have the highest BC in extreme DE and the lowest in mild DE. A medium BC was highly prevalent among those in moderate DE.

Discussion

This study concludes with various findings, which will be discussed in the following paragraphs and compared with the outcomes of the previous studies conducted by other researchers in the field.

Degree of Digital Entrepreneurship

The results of the current study discover that there are no significant differences between the type of DE (extreme, moderate, mild) and WFBM variables (CRIB, ICWFR, BC). Nevertheless, there was a negligible difference and women were more likely to experience high levels of cross-role interruption behaviours (CRIB) and perceived boundary control (BC), when using extreme DE, and high levels of identity centrality of work and family roles (ICWFR) when using moderate DE. This indicates that regardless of the type of DE, digital

businesses enable women entrepreneurs to manage work family boundaries .The findings here are in line with Sayah's (2013) work which examines how individuals manage their work-life boundaries by using information and communication technologies (ICTs). The results show that individuals actively use multiple ICT- mediated tactics to form their temporal, spatial, and psychological work-life boundaries. This also confirms Cousins and Robe's (2015) study findings showing that the material features of mobile digital technologies offer five specific benefits that workers use to manage work-life boundaries: interoperability, mobility, connectedness, personalization, and identifiability .These affordances persist in their impact across time, despite their connection to different technology features. Connection technologies such as Smartphones and Wi-Fi internet access allow us to more flexibly navigate the boundaries between roles, which may improve family and work performance for those who are comfortable integrating work and life roles (Derks et al., 2016; Mazmanian et al., 2013; Diaz et al., 2012; Tammelin, 2018). Wahee et al. (2016) found that the cyber world may play an essential part in empowering women by providing a platform for women to run their businesses from home, allowing them to maintain a suitable work-life balance. Their study states that the drivers of women's cyber entrepreneurship can be identified, which may aid in increasing start-up success rates empowering women. Jethwa and Mishra (2016) explained the status of women entrepreneurs in the e-commerce environment, as well as the factors that encourage them to become digital entrepreneurs, such as global reach, cost saving, and ease of communication . A study on a group of mobile teleworking entrepreneurs by Hill et al. (1996) showed that most of them are hailing technology for assisting them in managing both their families and work.

Cross-Role Work-Family Interruption Behaviours

The findings of the current study show that there are no significant differences in the type of DE and cross-role interruption behaviours (WFI and FWI). However, a minor difference was noticed, where women were likely to have medium cross-role interruption behaviours in mild DE and low in moderate digital entrepreneurship. Those in extreme DE had the highest cases of cross-role interruption behaviours .Our results agree with the outcomes of a study done by Derks-Theunissen et al. (2015) which showed that for WE who integrate work and family, more frequent work-related smartphone use during off-job time is associated with better family role performance through reduced work-family boundaries. On the other hand, for segmenters, smartphone use does not have any impact on work-family conflict and family role performance. This means the using digital technologies such as smartphones during non-work time may be useful for integrators to satisfy both work and family obligations, and have the potential to reduce work-family boundaries and improve family role performance . According to Cox (2020), digital technologies such as mobile technologies have contributed to expectations of anywhere anytime connectedness, making it difficult for people to switch off. As a result, it can be difficult to feel truly disconnected from work. A lack of control over work-home boundary crossovers and interruptions can reduce post-work recovery, raising stress and lowering productivity .Kossek et al. (2012) stated that in this digitally diverse age, it is almost impossible to avoid a spill over of family-work or work-family roles. For instance,

it will be hard for any individual to ignore a call or text message that appears on their phone from their family while at the office away from home.

Work-family Identity Centralities

The results of the present study demonstrate that the differences between which form of DE participants used and their ICWFR, work identities, and family identities were not significant. However, minimal differences were realized. Women were likely to have a low ICWFR in mild DE, a medium ICWFR in extreme DE, and the highest ICWFR in moderate DE. Our recent study confirms Gluesing's (2008) argument, which draws on personal experiences of digital work that is enabled by virtual or online communication and collaboration technologies. That personal story illustrates how technology, work, and lifecycle coevolve and how the integration of work, family, and friends into the new, digital workspaces can lead up to new conceptualizations of personal identity. Additionally, Farnham and Churchill (2011) shed light on some key issues that people face when managing personal boundaries within and across social technologies. Their study investigated how people facet their identities and lives and how these facets are expressed via email and Facebook. The results showed that family was an extremely significant context for online sharing, and email remained the favoured form of contact for private sharing across all aspects of life. According to Chasserio et al. (2014), WE have the ability of to deal with numerous and various identities. Their daily strategies to accommodate multiple roles depict how their entrepreneurial activity is intertwined with their personal and social lives. The results of their study expanded on the too simplistic view of WE as a homogeneous whole. In addition, Leung (2011) revealed that women have a strong identification with their family roles, in particular their roles as mothers, which encourages Japanese women to become WEs. A strong gender role identity is also reflected in the identity of the business, the products and services provided by these ventures, and their organizational structure and procedures. Ollier-Malaterre et al. (2019) postulated that the use of technological tools offers flexibility to navigate between work-family roles.

Boundary Control.

The outcomes of present study show an absence of a significant correlation between participants' DE types and their BC. Women were likely to have the highest BC in extreme DE and the lowest in mild DE. A medium BC was highly prevalent among those in moderate DE. These results are aligned with the study conducted by (Golden & Geisler, 2007), which examined how workers used and interpreted the personal digital assistant (PDA) as a boundary management resource. The findings suggest that the device's spirit is control, and that users interpreted their technological practices as expressions of personal agency, using the PDA to control the work-life boundary through both work and personal-life integration and segmentation .

Lastly, what makes our recent findings interesting is that the three variables of WFBM: CRIB, ICWFR and BC can be formed as clusters called boundary management profiles (Kossek et

al., 2012) (See Figure 9 in appendix B). According to Smith (2014), three clusters show significant positive relationship to virtuality. Work Warriors, Reactors, and Fusion Lovers all reported higher levels of virtuality than Family Guardians and Dividers. Examining the characteristics of these clusters, it is no surprise that Fusion Lovers have a positive relationship with virtuality because they have high control over boundary management. Additionally, Fusion Lovers prefer to integrate, thus they are likely to use a variety of digital techniques to accomplish their work and manage their families across domains. However, Reactors and Work Warriors have low boundary control. Those that fall into these two clusters are less likely to control where and when they accomplish their work, which means they take work phone calls at home, work from the road, or deal with family while they are at work. On the other hand, two clusters show a significant negative relationship to virtuality. Family Guardians and Dividers reported low levels of virtuality. This is no surprise, taking into consideration what is important to those who fall into these clusters. Dividers have very high boundary control to keep work and family separate, allowing for very few interruptions from non-work to work and work to non-work. Likewise, Family Guardians accept non-work to interruption at work and prefer to keep work apart from non-work, which implies they are unlikely to use communication technology at home to complete work after hours, indicating that they do not fit the criteria for virtual workers. Because digital work blurs boundaries and makes it difficult to keep things separate, it appears that those who fall into the Divider and Family Guardian clusters choose to keep certain aspects of digital work out of their family domains, including working from home or when traveling.

Research Contributions

Theoretical Contributions

There are several theoretical contributions made by this study. First, by expanding the scope of research on DE and WFBM, this study not only contributes to the DE literature, but it also contributes to the study of WFBM. Most studies on DE focus on its challenges and opportunities, its ecosystem, and innovation (Samara & Terzian, 2021; Purbasari et al., 2021; Li et al., 2017; Prendes-Espinosa et al., 2021; Berger et al., 2021; Beliaeva et al., 2019). Little is known about DE in relation to managing work-family boundaries. This research fills this gap by examining the degree of digitalization in business used by women entrepreneurs who struggle to manage family and work roles. Second, the research findings suggest that WEs are a much-needed aspect of economic development, especially for developing countries. As Ahmad et al. (2020) noted, women possess a unique skill set that facilitates entrepreneurial activities. In the same way, a decision to start a business could emancipate women from social and religious limitations and restrictions. Nonetheless, women entrepreneurs must manage DE to fulfil their family and work responsibilities. Shukla et al. (2021) substantiated these claims. They added that women who came from entrepreneurial backgrounds and had access to ICT possessed a positive attitude towards setting up their own businesses.

Practical Contributions

One of the practical contributions of this research is that the boundary characteristic measures could be useful in promoting self-awareness. Assessments such as the Work Life Indicator can be developed and fed back to entrepreneurs, business owners, work teams, and families to help people understand whether they are enacting boundaries to help them feel more or less in control. This will not only assist women entrepreneurs but also individuals who need to learn how to better communicate their preferred boundary management approaches to managers, clients, co-workers, and families and help them to better set and manage expectations and to identify solutions (Kossek et al., 2012). The findings indicate that entrepreneurs who embrace moderate and extreme entrepreneurship have better management of their work-family boundaries. Therefore, having digital marketing, virtual stakeholder interaction, digital products, and digital distribution of products offers flexibility in operating businesses and attending to the family at the same time. However, findings showed that digitizing everything in a company raises the likelihood of commuting from home, which increases the likelihood of family interfering with job habits and vice versa. An associated limitation of the level of digitalizing is that it may prove to be expensive to implement. This is especially true when the products are physical, and the employee base is large. The shift from traditional means calls for training and purchasing equipment, requiring a capital investment that the entrepreneurs may not have. This research is informative to stakeholders in Saudi Arabia and beyond. The findings align with Saudi Vision 2030, which shows that the government plans to increase the number of SMEs in the kingdom (Alsulami and Abutaha, 2018). Saudi Arabia's 2030 vision focuses on diversifying the economy and promoting innovation and entrepreneurship to shift the economy from a natural resource-based economy to a knowledge-based economy. Human capital can help achieve this vision by increasing manpower contributions to output and creating opportunities.

Research Recommendations

The first recommendation is for more women to embrace entrepreneurial activities considering the analysis of previous literature, current findings, and proven hypotheses. This will help develop them as individuals and contribute to the general growth of the economy and will further lead to self-employment to help female graduates. Correa (2020) highlighted that developed countries in Europe continue to encourage women to get involved in business activities to help curb gender differences in unemployment rates. Similarly, the World Bank continues to fund various women's entrepreneurial activities to empower women to thrive in individual projects and stand independently. Additionally, society is encouraged to foster the growth of brilliant female business ideas rather than condemning them based on traditional assumptions and prejudices about what women should and should not do. Alternatively, to help these women remain relevant figures in their families, the study recommends DE. This way, they can easily switch between work and family without either side being undermined. Specifically, because businesses differ in terms of products they specialize in, they are encouraged to adopt moderate DE as it offers a 50/50 variation in terms of marketing, nature

of products, stakeholder interaction, and physical location of business operations. This way, the entrepreneurs can choose which strategy to use based on convenience. Furthermore, provided the current state of a world pandemic, with physical interaction discouraged unless necessary, many businesses have seen the significance of virtual operations. According to Wong (2020), digital entrepreneurs are bound to become the most remarkable transformers even after the pandemic. Their digital strategies in business are ahead of their time. Therefore, DE has gotten much more attention recently because, now more than ever, online transactions are on a rapid rise. Customers have shifted online, offices have become obsolete in some cases, and working from home has become the new norm. Therefore, women entrepreneurs need to take this advantage and explore their business ideas to use online operations to balance family roles.

Limitations and Future Research

The first limitation concerns the research sample since most participants were Saudi citizens. A minority of them were non-Saudi outside the Kingdom. In addition, it was challenging to get the required number of female digital entrepreneurs worldwide because it is an unlimited number, especially since the research timeline was limited. Additionally, some groups, such as widowed participants, were inadequately represented. Therefore, the outcomes from this question would be biased if generalized to all widowed entrepreneurs. It could also be argued that the study was conducted during a pandemic during which most business operations were conducted online. The argument may be made that some of the women entrepreneurs in the sample confine their marketing and stakeholder experiences to interactive environments. This may be due to health protocols rather than the fact that their companies use automated platforms. Moreover, there is a need to apply more inclusivity in terms of nationality and religious diversity in future research. This could be attained by targeting a larger research sample.

Conclusions

The world is rapidly evolving, and DEs are becoming an increasingly important part of our daily lives and work. According to Van Welsum (2016), DEs “may level the playing field in certain sectors, creating opportunities to work from remote areas, at different hours, from the home, or on the go. DE can play an important role in promoting gender equality and social and economic inclusion, stimulate local development, and contribute to sustainable development, especially when new technologies are combined with the availability of open and public data” (p. 1). Therefore, this research has provided a clear picture concerning the importance of DE in WFBM. As previously stated in this study, there is no significant difference between the degree of digitalization and WFBM. This means that regardless of the type of DE, the presence of DE enables women entrepreneurs to manage work-family boundaries.

Conflict of Interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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Appendices

Appendix A: Research Questionnaire Form

Demographic Questions:

Please select the appropriate answer for you:

Do you run an enterprise/business of your own?	- Yes - No (please do not complete the full survey if your answer is No)
Gender	- Male - Female
Nationality	- Choose from the list of options
Country of Residence	- Choose from the list of options
Age	- Less than 18 - 18–24 - 25–34 - 44–35 - 45–54 - 55 or order
Marital status	- Single - Married - Divorced - Widowed

Education degree earned	<ul style="list-style-type: none"> - Undergraduate - Graduate - Postgraduate
Which industry/sector does your business specialize in?	<ul style="list-style-type: none"> - Art, entertainment, or recreation - Education - Construction - Finance and insurance - Health and social care - Hospitality and food services - Legal services - Technology and innovations - Real estate, rental, or leasing - Other industry, please specify
In which year did you set up your business? (suitable if the businesses fall within the past 5 years)	<ul style="list-style-type: none"> - Before 2016 - 2016 - 2017 - 2018 - 2019 - 2020
For how long have you owned/operated your business?	<ul style="list-style-type: none"> - Less than 1 year - 1–3 years - 3–5 years - More than 5 years
How many employees do you have in your business?	<ul style="list-style-type: none"> - 0–5 employees - 6–49 employees - 50–250 employees - More than 250 employees

Questionnaire Questions:

Variable	Items	Type	Source
The degree of Digitalization in the business (Mild, Moderate, Extreme)	<p>(Please select the best option that speaks to your current business)</p> <ol style="list-style-type: none"> 1. <i>The degree of digital marketing undertaken by the business:</i> <ul style="list-style-type: none"> - I use a website to supplement traditional marketing and advertising. - I use digital marketing, e.g., social media, as the primary mode of marketing in my business. - I use digital marketing as the only mode of marketing in my business. 2. <i>The business's digital selling:</i> <ul style="list-style-type: none"> - In my business, products may or may not be available for sale digitally. - In my business, products can either be purchased digitally or physically. - In my business, products are only available for sale digitally. 3. <i>The digital nature of the business's good or service:</i> <ul style="list-style-type: none"> - In my business, products are non-digital. - In my business, products may or may not be digital. - In my business, products are digital. 4. <i>The digital distribution potential of the business good or service:</i> <ul style="list-style-type: none"> - In my business, product delivery is done through physical means. - In my business, product delivery may be done through physical or digital means. - In my business, the product is delivered digitally. 5. <i>The potential digital interactions with key external stakeholders</i> 	One Choice Questions- Each answer is measured at a certain value	

	<p><i>(NGOs, suppliers, industry associations, and governmental agencies) within the value chain:</i></p> <p><i>*Interactions with key external stakeholders are through traditional interactions such as face-to-face interactions, paper-based interactions, and telephone calls, or digital interactions, such as emails, social media channels (WhatsApp, Instagram, Facebook, Twitter, etc.), virtual meetings (Zoom, Skype, etc.), and virtual collaboration tools (Microsoft Teams, Google Docs, etc.).</i></p> <p><i>Choose the answer that represents your interactions with your key external stakeholders.</i></p> <ul style="list-style-type: none"> - Traditional interactions, e.g., face-to-face, with key external stakeholders, are common in my business, while digital interactions seldom or never occur. - Digital interactions and traditional interactions with key external stakeholders are both common in my business. - Digital interactions with key external stakeholders are common in my business, while traditional interactions seldom or never occur. <p>6. The extent to which your business operations have been affected by the digitization of internal business activities:</p> <p>a) Physical location of the business operations and the virtual presence or virtual team interaction (Use of Twitter, Facebook, WhatsApp, LinkedIn, Skype, company websites, etc.) within the organization:</p> <ul style="list-style-type: none"> - There is a physical location for my business, which is the primary base of all our business operations; some virtual presence may be available but not required. - In my business, there is a physical location, and some virtual presence is required. - There a strong virtual presence, and the physical location is possible but not required for my business. <p>b) Traditional interactions (face-to-face interactions, paper-based interactions, and telephone calls) within the organization:</p> <ul style="list-style-type: none"> - In my business, the primary mode of internal interaction is through traditional means. - In my business, the internal interaction is through both traditional and virtual means. - In my business, the primary mode of internal interaction is through virtual means; traditional interaction is possible but not required. 		(Hull et al.,2007)
Variable	Items	Type	Source
<p>Work-Family boundary management</p>	<p>(Please select the best option that speaks to you)</p> <p><i>Family interrupting work behaviours</i></p> <ol style="list-style-type: none"> 1. I take care of family needs during work. 2. I respond to family communications (emails, texts, and phone calls) during work. 3. I do not think about my family while working so I can focus. 4. When I work from home, I handle family responsibilities during work. 5. I monitor family-related communications (emails, texts, and phone calls) when I am working. <p><i>Work interrupting family behaviours</i></p> <ol style="list-style-type: none"> 6. I regularly bring work home 7. I respond to work-related communications (emails, texts, and phone calls) during my family time away from work. 8. I work during my vacations. 9. I allow work to interrupt me when I spend time with my family. 10. I usually bring work materials with me when I attend family activities. 	5-points Likert scale	(Kossek and Lautsch,2008)

	ii. Work-family Identity centralities	<i>Work identity</i> 11. People see me as highly focused on my work. 12. I invest a large part of myself in my work. <i>Family identity</i> 13. People see me as highly focused on my family. 14. I invest a large part of myself in my family life.		(Kossek, et al., 2006)
	iii. Boundary control	15. I control whether I am able to keep my work and family separate. 16. I control whether I have clear boundaries between my work and family. 17. I control whether I combine my work and family activities throughout the day.		(Kossek, et al., 2006)

Appendix B: Statistical assessments & Figures

Assessment of CRIB, ICWFR, and BC according to citizenship, place of residence, and marital status.

The assessment of the main factors of the study may vary as indicated by specific demographic factors of the participants. A one-way ANOVA and T-test were used to discover these distinctions after checking the homogeneity of data collected. Otherwise, we could also use alternative non-parametric tests such as Kruskal–Wallis and Mann–Whitney tests. It is important to note that a T-test was used to assess the main factors of the study according to participants' citizenship. There was no significant difference in CRIB, BC, and ICWFR based on participant citizenship since P values were more than 0.05. In addition, a T-test was applied to determine the critical factors of the sample. There was no significant difference in the tested factors (CRIB, ICWFR, and BC) that correlated with where the respondents reside since P values were greater than 0.05. Second, One-way ANOVA was used to identify the different assessments of the main factors of the study according to the marital status. Results indicated no significant effects of marital status on CRIB, ICWFR, or BC.

Correlations between the primary factors and entrepreneurs' general information (age, income, and education level)

The relationships between the primary factors and participants' age, income, and education level, were initially assessed with the aid of Spearman's correlational analyses. This was because the demographic factors were all categorical. The following scales describe the correlation.

Size of Correlation	Interpretation
.90 to 1.00 (- 0.90 to -1.00)	Very high positive (negative) correlation
.70 to < 0.90 (-.70 to < - 0.90)	High positive (negative) correlation
.50 to <0.70 (-.50 to < -0.70)	Moderate positive (negative) correlation
.30 to < 0.50 (-.30 to < -0.50)	Low positive (negative) correlation
.00 to <0.30 (-.00 to < -0.30)	Negligible correlation

Results indicated an insignificant association among FWI and the number of employees in the business. A significantly small negative relationship between WFI and decisions made by women entrepreneurs to set up their businesses was analysed. This extended to the relationship between WFI and business operations. The p value < 0.05, showing that the relationship was positive. Moreover, there was a significantly negligible negative relationship between CRIB and start-up businesses of women entrepreneurs. Further analysis between CRIB concerning business operations showed p values < 0.05; thus, there was a negligible positive relationship. Alternatively, there was a weak positive correlation between WI and the education level of women entrepreneurs. WI and business operations provided showed p values < 0.05. Once more, there was a negligible correlation between BC and the business operation.

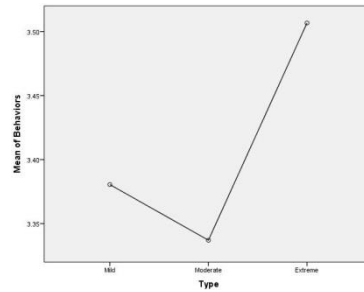
Figures:

Figure 2. Means of cross-role interruption behaviours among different levels of DE

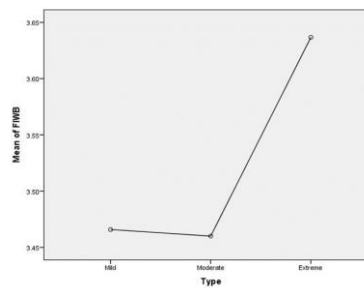


Figure 3. Means of Family interrupting work behaviours among different levels of DE

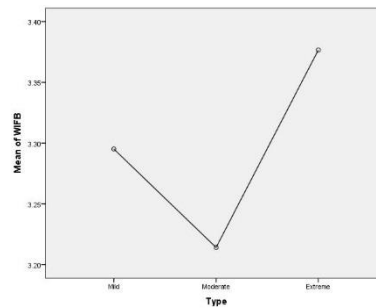


Figure4. Means of work interrupting family behaviours among different levels of DE

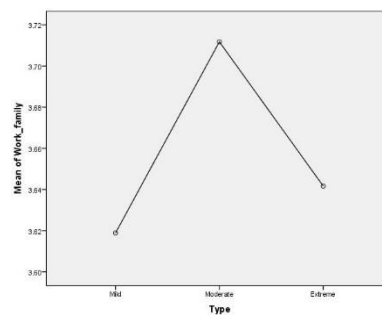


Figure 5. Means of identity centralities of work-family roles among different levels of DE

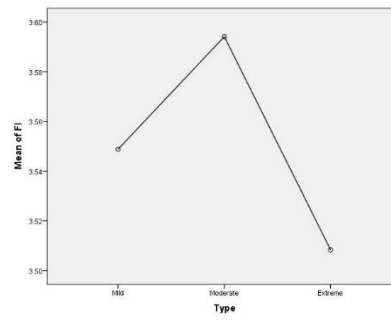


Figure 6. Means of work identity roles among different levels of DE

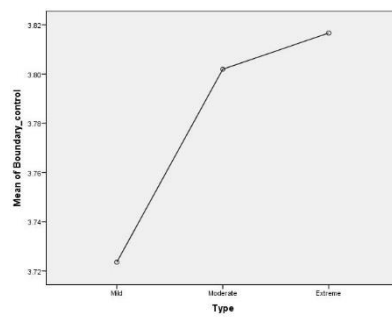


Figure 7. Means of family identity among different levels of DE

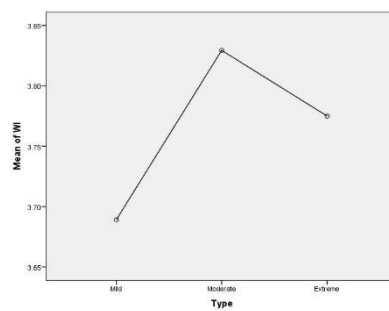


Figure 8. Means of perceived boundary control among different levels of de

Boundary-Crossing Interruption Styles				
Type	Integrators	Cyclers	Separators	Role Firsters
1. Definition	Constantly blend work and nonwork with lots of cross-role interruption)	A fluctuating style switching back and forth between cycles of high work-life integration followed by periods of separation	Keeps work and nonwork separated in defined blocks of time; focuses on each role with few interruptions from the other	Has a dominant role identity that is prioritized and focused on first where those role demands often cross over & interrupt other roles but not the reverse
2. Level of boundary control - High to moderate - Low	Fusion lovers	Quality timers	Dividers	Work firsters
3. Common Advantages	Reactors Can do attitude Available whenever needed	Job warriors Engaged Very flexible	Captives Reliable Look focused, professional	Misaligned Identities Ability to focus and do one role well Less work-life conflict
Downsides	Switching costs Potential for role overload Can feel exhausted and rushed	Burnout, exhaustion, chaotic Peaks and valleys, leads to lack of recovery Limited buffers with potential for overload and "ball dropping" of other life roles during peaks	Rigid, not adaptable Lack of work-family positive cross-over enrichment	Countervailing role creep Under-development of whole self Workaholism for work firsters Career sacrifice for family firsters and Nonwork other-centric individuals
4. Technological dependence	High	Peaks and valleys of electronic tethering	Low	Asymmetrical
5. Need time for self	Low	High for quality timers, limited episodes for Job warriors	Moderate for Dividers, likely for Captives	High for Nonwork other-centric individuals, Can be low for other styles, especially those with dependent care demands
6. Career family Identity centralities	Many are Dual Centric, valuing both work and nonwork equally but unsure how to prioritize	Tends to value one role more than another at different times of the year or month	Tends place equal importance on work and nonwork roles and strives for focus mindfulness for each	One role identity is clearly dominant; cross-role interruption behaviors reflect crossover "creep" to support dominant identity

Figure 9. Boundary management PROFILES (Kossek, 2016)

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