

Female Entrepreneurship in Software Startups. Motivations, challenges, and opportunities

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Abstract— *The significantly low level of women's involvement in technology entrepreneurship, particularly in software startups, is widely recognized. Although research on female entrepreneurship has been ongoing, very little has focused on what motivates women to start new software ventures or the specific challenges they usually face. The purpose of this study was to identify the factors that motivate women to start new ventures in the software industry, and the challenges and obstacles women face when launching a software startup. Through semi-structured interviews with female founders of five software startups, two female business mentors, and a business investor, several motivations for women's entrepreneurship in software were identified (e.g. desire for autonomy, opportunity to innovate), along with the main obstacles and challenges they encounter (absence of entrepreneurial partners, pitching in founding rounds, lack of direction, among others). Additionally, a series of actions is suggested to increase women's participation in software startups, such as support for remote work and greater access to business and technology mentoring.*

Keywords— *Female entrepreneurship, Software startups, STEM, Gender gap.*

I. INTRODUCTION

In recent years, research on women entrepreneurs and their entrepreneurial activities has increased significantly, gaining widespread support among scholars, and mainly helping to understand the factors that motivate and challenge women in pursuing an entrepreneurial career [1].

Female entrepreneurship refers to the process of creating, managing, and growing a new venture by a woman or a group of women.

A particular branch of entrepreneurship focuses on software startups. A software startup is a newly created company with little or no operating history, focused on the creation and development of an innovative software-intensive product or service as a basis for creating business value [2].

Main challenges of these new ventures are their limited resources, being, by definition, a new company with little or no operating history, made up of small teams with limited experience, relying on a single product, and beginning to operate in conditions of uncertainty, with time pressure and high risks [3].

Regardless of gender issues, besides the desire and passion for entrepreneurship, starting and growing a software startup requires business expertise, as well as strong technology and software engineering skills.

However, as Kovalena and colleagues pointed out, the gender gap in computer sciences and software engineering is highly noticeable in the science, technology, engineering, and mathematics (STEM) fields [4], with the consequent impact on

the low number of women in technology ventures. This disparity also influences the software industry, with multiple reports indicating that women are notably underrepresented in the workforce [5], [6].

On the other hand, some studies have identified additional barriers to female entrepreneurship. According to Comeig and Lurbe, empirical research shows that the gender gap in entrepreneurial propensity mainly stems from subjective perceptions, such as self-confidence in one's skills and fear of failure, as well as women's lower exposure to other entrepreneurs [7]. Furthermore, women entrepreneurs face specific challenges that influence their entrepreneurial intentions, such as a lack of self-confidence stemming from gender stereotypes and conflicts between family life and entrepreneurial careers, as noted by Merino and Duchemin [8].

Despite the challenges mentioned earlier, some women are committed to pursuing entrepreneurship in the technology sector, particularly in software startups.

The purpose of this article is to present the results of a study aimed at understanding a) what factors motivate women to start new ventures in the software industry, b) what challenges and obstacles women face when launching a software startup, and c) what actions female entrepreneurs believe can promote women's entrepreneurship in software startups.

The remainder of this article is organized as follows. Section 2 provides background on female entrepreneurship, including motivations and common challenges faced by women entrepreneurs. Focusing on software startups, this section also examines gender disparities in STEM entrepreneurship and careers, and in software engineering practice. Section 3 explains the methodological design of this study, including research questions, criteria for selecting key informants, and data collection and analysis methods. Section 4 presents the results, followed by Section 5, which discusses those findings. Finally, Section 6 presents the conclusions and outlines directions for future research.

II. BACKGROUND

This section presents background information about female entrepreneurship, the gender gap in STEM careers and in software engineering practice and highlights the limited research on female entrepreneurship in new software ventures.

A. Female entrepreneurship

It is a well-known fact that women make up about half of the working-age population worldwide, yet they remain underrepresented in many fields, including entrepreneurship [9].

The literature on entrepreneurship offers various definitions and descriptions of female entrepreneurship, such as "a process by which women initiate, organize, and run a business venture" [10], "the processes by which women start and/or run their own businesses" [11], and as "referring to the businesswomen themselves and their business" [12], to a broad definition of female entrepreneurship that encompasses women founders, their ventures, and their entrepreneurial behaviors [13].

Zhang and colleagues have pointed out several constraints that prevent women from entering entrepreneurial activities, such as cultural norms that tend to discourage women from taking risks or stepping outside their conventional roles in household and family, less access to professional networks and mentoring opportunities, and challenges in accessing funding and investment, among others [14].

Regarding entrepreneurial intentions, a study conducted by Patra and Kumari [15] highlights that the most important factors influencing women's entrepreneurial intentions are attitude, self-efficacy, motivation, role models, culture, and entrepreneurial education. Conversely, the same study notes that a lack of exposure to a supportive environment can significantly hinder women's entrepreneurial careers. The lack of self-confidence also impedes their ability to obtain funds and ultimately stops their growth. Personal factors contribute to the fact that women are more prone to avoid taking risks in entrepreneurial ventures due to their mindset, and thus they often miss opportunities to become entrepreneurs.

B. Gender gap in STEM careers and entrepreneurship

Since a software-intensive product or service is the main source of business value in a software startup, knowledge and skills in computer science and software engineering in the founding team are crucial for starting and growing such a new venture.

According to Kovaleva and colleagues, even though there have been significant changes in the labor market in recent decades, some sectors still have not achieved gender equality, and they believe that the issue of gender inequality in STEM remains a global problem [16].

Although female representation in STEM careers has increased in recent years, it remains insufficient. In this regard, Radhakrishnan and Ho argue that despite the increased participation rates in STEM, women are still greatly underrepresented among technology startup founders, showing there's a lot of unused potential in the entrepreneurial and innovation ecosystem [17].

According to Wilson and Patón-Romero, the largest gender gaps within entrepreneurship today are in the Information Technology (IT) sector, where male entrepreneurs are more than twice as likely as women to operate [18].

Felgueira and colleagues underscore the persistent barriers women face in STEM entrepreneurship, including limited access to capital, networks, and mentorship opportunities, which inhibit their ability to thrive in this sector [19]. These authors recommend the following actions to empower female students in STEM: establish mentorship programs and networks

specifically for female students in STEM, incorporate practical entrepreneurship courses with hands-on, project-based modules into STEM curricula, and develop partnerships with tech companies and startup incubators that support female-led ventures—providing students with access to funding opportunities, internships, and professional networks essential for launching successful businesses.

C. Female underrepresentation in software engineering

The low participation of women in STEM careers naturally leads to their underrepresentation both in the software industry and in software startups. Murphy and colleagues note that countries with more gender-egalitarian societies show an increase in the number of women in software engineering and STEM, and they argue that this may suggest gender disparity in software engineering mainly results from personal choice rather than discrimination or stereotyping [20].

With this in mind, it is important to highlight what motivates women to pursue software ventures, understand specific obstacles and challenges, and identify actions that increase their interest and participation in software startups.

To the authors' knowledge, no published studies specifically examine these aspects of female entrepreneurship within software startups.

III. RESEARCH DESIGN

This section outlines the study's methodological design, including the research questions, the criteria for selecting key informants, and the procedures for data collection and analysis.

A. Research questions

The research questions (RQ) posed for this study are:

- RQ1: What factors motivate women to start new ventures in the software industry?
- RQ2: What challenges and obstacles do women face when launching a software startup?
- RQ3: What actions are usually suggested to boost women's involvement in entrepreneurship and software startups?

B. Key informants

For this study, female founders of software startups, along with mentors and investors in technology and business, were chosen as key informants. A key informant is a source of expert knowledge about the subject being studied, and because of their skills or position in society, they can provide more detailed information and deeper insight into the phenomenon under investigation [21].

C. Data collection and analysis

To address the research questions, data was collected through interviews with the key informants as described above. The interviews were conducted in a semi-structured format, following interview scripts (different for founders, mentors, and investors) aligned with the study's objectives, while allowing

flexibility to explore emerging issues raised by the participants. All interviews were carried out individually, in a setting considered appropriate for confidentiality and participant comfort, and were audio-recorded with participants' consent. The recordings were later transcribed to support systematic qualitative analysis.

The data were analyzed through a coding process aimed at identifying recurrent themes related to women's motivations for entering software entrepreneurship and the challenges they faced when launching their startups. The coding scheme combined deductive elements derived from the study objectives with inductive codes that emerged from the interview material. To strengthen coding reliability, the researchers discussed the coding structure, reviewed the interpretation of categories, and resolved disagreements through deliberation and refinement of the coding framework.

Data saturation was addressed as a criterion of analytical adequacy rather than numerical completeness. During the analysis, the researchers examined whether additional interviews were contributing substantially new themes or whether the main patterns had become recurrent across participants. Although the limited number of interviews suggests that saturation should be interpreted cautiously, the collected data were considered sufficient to identify relevant preliminary themes consistent with the exploratory nature of the study.

Ethical considerations were taken into account throughout the research process. Participants were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time. Informed consent was obtained prior to each interview. In addition, confidentiality and anonymity were protected in the transcription, analysis, and reporting of results, ensuring that personally identifiable information and sensitive organizational details were not disclosed.

IV. RESULTS

This section presents demographic details about the women participating in the study and outlines the results of the data collection activities.

A. Participants

During the data collection phase (December 2024 and January 2025), semi-structured interviews were conducted with female founding partners of seven software startups at different stages of development, as shown in Table 1. Those startups have been or are being incubated at the Center for Innovation and Entrepreneurship (CIE, <https://cie.ort.edu.uy>), the university's business incubator at Universidad ORT Uruguay.

Table 1 also shows the status of the interviewees' software ventures. "Graduated" means that the venture has completed the incubation process and is now operating normally in the market. "In incubation" indicates that the venture is still in the process of being incubated at a business incubator. "Terminated" signifies that the startup has ceased its operations.

Table 1. Profile of entrepreneurs involved in the study

Interviewee ID	Startup stage	Year established	Interviewee's background
W1	Terminated	2023	Systems engineer
W2	Graduated	2016	Accountant
W3	Graduated	2016	Systems engineer
W4	In incubation	2017	Chemical engineer
W5	In incubation	2021	Bachelor in Marketing

Additionally, a CIE-affiliated female business mentor and two independent female investors in technology new ventures took part in the interviews.

B. Motivations

To address research question RQ1, interviewees were asked to describe their specific situations or circumstances that motivated them to start a new software venture.

Based on the analysis of the interviewees' responses (as explained in section 3.C), Table 2 presents the most common reasons or situations mentioned by the interviewees.

To illustrate the reasons listed in Table 2, the following are excerpts from the interview transcripts.

For the motivation labeled "Capstone project", interviewee W2 stated: *"The biggest motivation for me was the final project I developed during my university studies ... It was a chance to take all the theoretical knowledge and hard work from my degree and apply it to a real-world product. Starting a company was the logical next step to bring that idea to life"*.

For the reason labeled "Desire for autonomy," interviewee W3 stated: *"Honestly, my main motivation was the desire for financial Independence ... I wanted to be in a position where my hard work directly translated to my own financial security and success, not just a bonus or a raise ... Building my own company was the only way to truly have that kind of autonomy"*.

Table 2. Motivation for starting a software venture

Reason	Interviewees	Definition
Capstone project	W1, W2	Using the final academic project or prototype developed during university studies to create a real-world software startup.
Desire for autonomy	W1, W3, W4	Seeking financial independence and control over their own work and decisions.
Interest in the business idea	W2, W4	Observing underserved markets, especially those related to women's needs, and seeking to address them with software solutions.
Opportunity to innovate	W1, W3, W5	Wanting to build new products or solve technical problems that existing technological or software companies have overlooked.

Regarding the motivation "Interest in the business idea", interviewee W4 mentioned that *"I was motivated by a market need I saw that wasn't being met, specifically for women. I saw a real opportunity to create something that would genuinely help people ... I felt I was uniquely positioned to understand and address those needs. It wasn't just about building a*

company; it was about building a solution for a community that had been underserved for too long”.

Finally, regarding the reason "Opportunity to innovate," interviewee W1 said in her interview: *"What really drove me was the technical challenge. I kept seeing these problems that felt like they were being overlooked or handled with clunky, outdated solutions ... I wanted to build something from the ground up that was technically superior and elegant ... I was motivated by the sheer challenge of solving a problem that no one else was willing to tackle."*

Other reasons mentioned by the entrepreneur interviewees were **self-fulfillment** (pursuing personal passions or dreams related to technology or innovation), **overcoming workplace barriers** (escaping gender discrimination or glass ceilings experienced in traditional tech jobs), and **career advancement** (using entrepreneurship as a strategic move for upward mobility or leadership opportunities).

On the other hand, the female business mentor and the investors who were also interviewed agree that the three main motivations observed in the female entrepreneurs they have interacted with are desire for autonomy, interest in the business idea, and opportunity to innovate, as defined above. To illustrate their perceptions of these motivations, excerpts from their interview transcripts are provided below.

For instance, regarding the motivation "Interest in the business idea", the business mentor stated: *"From what I've seen, women tend to be very purpose-driven. They often want to solve a specific problem they've personally experienced or observed in an underserved market, rather than just chasing a hot trend ... Because their motivation comes from a place of genuine interest and a desire to make an impact, it gives them the resilience to push through all the inevitable obstacles"*.

Regarding the motivation "Opportunity to innovate", one of the female investors mentioned that *"From my investor's perspective, I've noticed that women founders often identify market gaps that have been overlooked by the male-dominated tech industry. They're not just iterating on existing ideas; they're truly innovating by addressing a unique problem or serving an entirely new demographic ... And for us as investors, that's incredibly compelling because a novel idea in an underserved market often leads to a high-growth, defensible business"*.

C. Challenges

To address research question RQ2, the entrepreneur interviewees were asked to describe the obstacles and challenges they faced while creating their software venture.

As a result of analyzing the interviews transcripts, Table 3 shows the main obstacles and challenges identified. Regarding these challenges, some interview excerpts vividly illustrate different situations. For example, for "Absence of entrepreneurial partners", interviewee W2 mentioned *"The biggest challenge for me was the absence of a strong team. When I started, I was essentially a solo founder. I had the technical skills to build the product, but I was also responsible*

for all the strategic and operational decisions—things like marketing, sales, and finances ... trying to do it all myself was incredibly difficult and often overwhelming".

Table 3. Main challenges and obstacles

Challenges	Interviewees	Definition
Absence of entrepreneurial partners	W2, W4	The absence of a strong team to support the business's strategic, operational decisions, and software development.
Family and care responsibilities	W1, W3, W4, W5	Women are more likely to balance entrepreneurial work with household or caregiving duties.
Lack of business expertise	W1, W2, W3, W4	The lack of business training hindered important areas like marketing and sales, especially in how to connect with customers and recognize when a change in strategy is necessary.
Pitching in funding rounds	W2, W5	Struggling to prepare for a funding round presentation and feeling anxious about pitching at an investor meeting.
Understanding market needs	W1, W3	Understanding the needs of their potential market and defining the right business model was not easy.

Regarding the challenge labeled "Family and care responsibilities", interviewee W3 stated *"The biggest challenge for me was definitely balancing the demands of a startup with my family responsibilities. It's an issue that a lot of women face. Launching a startup is a full-time, round-the-clock commitment, and so is being a parent or a caregiver. I was constantly trying to juggle both, and it felt like there weren't enough hours in the day"*.

Regarding the challenge "Lack of business expertise", interviewee W4 mentioned *"The biggest challenge I faced was the technical side of the business. I have a background in marketing, so I understood how to reach customers and how to build a brand, but I was not a software developer"*.

For the challenge "Pitching in funding rounds", interviewee W5 stated *"The biggest challenge for me was definitely the funding rounds. The whole process of pitching to investors was incredibly intimidating. It's not just about having a great idea; you have to package it in a way that's compelling and stand up there and sell it with complete confidence ... I spent a lot of time feeling anxious, second-guessing my numbers, and worrying about whether I had the right answers for their questions"*.

Finally, as an example of the "Understanding market needs" challenge, interviewee W3's words were: *"Honestly, the biggest challenge for me was understanding the market needs and defining our business model. My background is in accounting, so I'm great with numbers and financial projections, but that's a world away from figuring out what customers actually want ... It was a really humbling experience to realize that having a great idea is only a tiny part of the equation"*.

Less frequently mentioned challenges were **bootstrapping constraints** (relying on personal savings, which may be more limited due to existing gender income gaps) and **lack of female**

role models (a shortage of visible female tech entrepreneurs reduces opportunities for inspiration and guidance).

From the perspective of the business mentor and the investors, the main challenges faced by female software entrepreneurs are outlined in Table 4.

Table 4. Main challenges: Investors and Business mentor

Challenges	Definition
Fear of failure	Fear of failure, losing job security, and presenting the product to clients and investors.
Lack of direction	Uncertainty arises from a lack of understanding about the next steps or who to seek support from, thereby impeding decision-making during business startup and growth.
Lack of networking	The absence of a contacts network that can help develop the business or offer guidance and support on next steps.
Work-family balance	The difficulty of balancing work and family life limits the time and energy available for entrepreneurship.

Regarding "fear of failure", one of the interviewed investors said that *"...there's the professional risk ... The idea of leaving a stable job and a good salary to jump into the unknown of a startup, with no guarantee of success, is terrifying ... there's the more public aspect of it, especially around pitching to investors and presenting the product. The tech and venture capital worlds are still very male-dominated, and that can make the environment feel intimidating. The fear of being judged, not just on your idea but on your ability to lead, can be overwhelming"*.

For the business mentor, not having a contacts network is a challenge because *"... lack of a strong network is a huge hurdle for women founders ... the tech industry and the venture capital world have been like an exclusive club, and the traditional networks are still largely dominated by men ... This makes it a lot harder for women to get their foot in the door ... your network is everything. It's how you find mentors, connect with potential customers, and, most importantly, get warm introductions to investors"*.

On the other hand, for one of the interviewed investors, lack of direction can be a barrier because *"...it's not just about not knowing what to do next; it's about the fact that so many women founders don't have a clear map or a network to guide them. The entrepreneurial journey ... it's a lot less intimidating if you have people you can call for advice ... This uncertainty can lead to a kind of paralysis, where you're so worried about making the wrong move that you don't make any move at all"*.

D. Opportunities

Regarding research question RQ3, the participating entrepreneurs were asked about the actions they believe are necessary to boost women's participation in software ventures. Table 5 provides a summary of their opinions.

Excerpts from the interview transcripts with the participating women entrepreneurs are also included here to illustrate their views on this point.

Regarding the suggested action of encouraging more women to pursue IT careers, interviewee W2 said *"If we want*

to see more women in leadership and founding roles, we need to start by encouraging them to pursue tech from a young age ... this means better access to coding education in schools, more visible female role models in the industry, and mentorship programs that create a clear pathway".

About boosting visibility of women in the industry, W5 opinion is *"... it is really needed to do a better job of celebrating women who are already making waves in IT and software and, of course, in entrepreneurship ... the media, industry, and various platforms tend to focus on a small group of male founders, which can unintentionally reinforce the idea that tech is mostly a man's world ... when you see someone who looks like you and shares a similar background, it becomes so much easier to imagine yourself starting your own company and achieving similar success"*.

Regarding the suggested action of supporting remote work, interviewee W4's opinion is very illustrative, as she considers that *"When you're launching a startup, the hours are long and unpredictable, and trying to do that while also managing a household or caring for children is incredibly difficult By making remote and flexible work the norm ... women can balance these competing demands and lower the barriers to entry ... it's about creating a system that allows them to pursue their ambitions without having to sacrifice their personal lives"*.

Table 5. Actions to promote women entrepreneurship in software

Actions	Interviewees	Definition
Encourage more women to pursue IT and software careers	W1, W2, W3, W4, W5	Promote women's interest, access, and opportunities in IT via education, mentorship, outreach, and policies that reduce gender barriers and create clear pathways into tech studies and careers.
Boost visibility of women in the IT and software industry	W2, W3, W5	Highlight women entrepreneurs in tech by showcasing their achievements, leadership, and contributions through media, conferences, awards, and platforms to display role models and challenge stereotypes.
Support remote work opportunities	W1, W2, W4	Expand access to flexible, location-independent work in the software sector to help women balance entrepreneurship with personal or family responsibilities and lower mobility barriers.
Expand access to mentoring in technology and entrepreneurship	W1, W2, W3, W4	Offer women more chances to connect with experienced professionals who can provide guidance and support in both technical skills and business growth, helping them handle challenges and accelerate startup development.

The participating investors and the business mentor also provided input on this same aspect. They agree that encouraging more women to pursue careers in IT and software, as well as supporting remote work opportunities, are essential steps to promote and facilitate female entrepreneurship in the software industry. They also mentioned **"Bridging various tech and business careers and disciplines"**, defined as

creating programs and opportunities that combine technical expertise with business, design, and leadership skills, allowing women to develop the multidisciplinary knowledge needed to start and manage successful software startups.

Regarding this particular action, the business mentor shares her supportive view, saying, *"From my perspective ... we have a lot of talented women who are excellent engineers or brilliant marketers, but they may lack expertise in the other area ... create more opportunities for women to get exposure to both sides of the coin ... by creating these interdisciplinary pathways, we're helping women become more well-rounded founders who are prepared for the full scope of a startup"*.

One of the investors endorses this vision by saying *"I see this all the time in my meetings ... a founder will have a brilliant technical product but no idea how to sell it, or they'll have a fantastic business plan for a product that's technically unfeasible ... create programs and communities where a woman with a strong background in business can easily connect with a woman who has deep technical skills ... not only overcome the 'lack of business expertise' or 'absence of technical co-founder' hurdles but also builds more robust, defensible companies from the start"*.

V. DISCUSSION

This section discusses the results and puts them in the context of the background outlined in Section 2.

A. Motivations for becoming a software entrepreneur

The motivations behind female software entrepreneurship, outlined in Table 2, are a mix of academic achievement, personal ambition, and a desire to impact change. The "Capstone project" motivation, as described by interviewee W2, serves as a direct springboard into entrepreneurship, where a solid academic foundation leads to the tangible application of knowledge in a real-world product. This successful innovation can then fuel the "Opportunity to innovate" motivation, as noted by interviewee W1, to address new technical challenges and problems that have been overlooked. The motivation for "Desire for autonomy" and financial independence, which interviewee W3 highlights, can be a driving force behind bringing these innovations to market.

Additionally, the "Interest in the business idea," which interviewee W4 connects to developing solutions for underserved markets, especially for women, adds a purpose-driven element to the other motivations. These factors are interconnected and form a logical progression from academic pursuit to meaningful business.

The motivations for female software entrepreneurship directly reflect and address broader issues discussed in the background section. The motivation of "Interest in the business idea," which focuses on underserved markets, aligns with Radhakrishnan and Ho's observation that there is "unused potential" among female technology startup founders.

The "Opportunity to innovate," as one interviewed investor notes, often targets market gaps overlooked by the male-

dominated tech industry, directly addressing the gender gap in the IT sector, as noted by Wilson and Patón-Romero [18]. The motivation from the "Capstone Project" can be seen as support for Felgueira et al.'s [19] suggestion to include project-based modules in STEM curricula to empower female students. The "Desire for autonomy," as described by interviewee W3, can serve as a strong response to the "glass ceilings" and discrimination, which are mentioned as less common motivations. This desire allows women to bypass workplace barriers and gain direct control over their success. These motivations are not only about personal fulfillment but also strategic and deliberate responses to systemic issues in STEM and entrepreneurship.

B. Challenges of becoming a software entrepreneur

The main challenges faced by women software entrepreneurs shown in Table 3 are interconnected, not only because multiple interviewees mentioned each one, but also because of the implications they have for each other. Therefore, the lack of business experience is directly linked to the absence of entrepreneurial partners. As interviewee W2 emphasizes, being a "solo founder" with only technical skills forced her to handle all strategic and operational decisions for her new software venture, which she described as "overwhelming". This knowledge gap makes it hard to understand market needs and develop a viable business model, a challenge that W3 mentions and shares with W1. This, in turn, increases the anxiety and intimidation tied to participating in funding rounds, where a founder must confidently pitch her idea and her numbers.

Furthermore, the huge amount of time needed to overcome these interconnected challenges is made more difficult by family and caregiving responsibilities, which, according to W3, can feel like a constant juggling act. It is noted that four of the five interviewees identified this factor as one of their main challenges. These issues, along with others like self-employment limitations, show how one challenge can add to another, creating a complex barrier to female success.

The challenges outlined in Table 3 generally expand on the broader gender gap issues discussed in the background section. The lack of entrepreneurial partners and business experience are direct results of the underrepresentation of women in STEM fields and the absence of professional networks and mentorship, as noted by Zhang et al. [14] and Felgueira et al. [19]. This absence of a supportive environment, as Patra and Kumari point out, also leads to a lack of self-confidence, making participation in funding rounds particularly intimidating, as W5's account shows. This perspective aligns with that of one of the investors interviewed, who mentioned the "fear of failure" as a major obstacle (Table 4), also mentioned in the work by Comeig and Lurbe [7] cited in the Introduction section.

Additionally, the challenges related to the lack of networks and the lack of direction, as noted by the interviewed business mentor, also match the viewpoints of Zhang et al. [14] and Felgueira et al. [19] mentioned above. The challenge of family and caregiving responsibilities (a factor pointed out by all the

interviewees) is a manifestation of the cultural norms discussed in the background section, which tend to discourage women from deviating from conventional roles. Taken together, these connections illustrate how social and cultural factors contribute to the individual and systemic challenges faced by female software entrepreneurs.

C. Actions to promote female entrepreneurship in software

The suggested actions to promote female entrepreneurship in the software startups sector, outlined in Table 5, are closely linked and work together as a strategic pathway for aspiring software startups founders. Encouraging more women to pursue careers in IT is the fundamental first step, as it expands the talent pool and lays the groundwork for potential software entrepreneurs, as highlighted by interviewee W2.

This effort is further reinforced by increasing the visibility of women already in the field, as a lack of role models can be a significant obstacle. As interviewee W5 notes, seeing "someone who looks like you" makes it easier to envision your own success. These efforts can then be supported by increasing access to mentoring, which can offer women vital guidance in both technical and business skills. Supporting remote work opportunities is crucial for helping women balance personal and professional responsibilities, as W4 emphasizes, which reduces a major barrier to entry. Together, these actions contribute to creating a supportive ecosystem that spans from technology and entrepreneurial education to everyday work.

Those suggested actions directly address the obstacles and gaps identified in the background section. Promoting more women to pursue careers in IT and increasing their visibility directly confronts the "gender gap in STEM careers" and the "female underrepresentation in software engineering" highlighted by Kovaleva et al. [16] and Radhakrishnan and Ho [17].

The suggestion to establish mentorship programs and networks, as mentioned by Felgueira et al., [19] is addressed by increasing access to mentoring in technology and entrepreneurship. This directly addresses the issue of "less access to professional networks and mentoring opportunities" noted by Zhang et al. [14]. Additionally, these mentoring programs can focus on implementing strategies to connect careers in technology and business, a recommendation supported by the business mentor and the investors interviewed.

Supporting remote work opportunities is also a vital step in addressing cultural norms and personal barriers that prevent women from taking risks and stepping outside traditional roles. It helps them balance entrepreneurial endeavors with household or caregiving responsibilities. These proposed measures aim to create a more equitable and supportive entrepreneurial environment for women in the software startup sector.

VI. STUDY LIMITATIONS

A limitation of this study is the small number of interviews conducted. While the interview data provided rich and detailed accounts of participants' experiences, the study included only

five founding partners of software startups, two female mentors, and one female investor. Accordingly, the findings should be interpreted as exploratory and contextual rather than as representative of the broader population of women entrepreneurs in the software industry.

In particular, the limited number of founders interviewed may not fully reflect the diversity of motivations and challenges experienced by women launching software startups. These experiences may vary according to multiple factors, such as the nature of the software venture, the startup's stage of development, the founders' prior experience, access to funding, team characteristics, and the surrounding entrepreneurial ecosystem. Given the small sample, some potentially relevant perspectives may not have been captured. This limitation also applies to the interviews with mentors and the investor. Although these participants contributed valuable external perspectives, the inclusion of only two mentors and one investor restrict the breadth of viewpoints considered.

Therefore, the results are not intended to support statistical generalization. Rather, they should be understood as analytically useful qualitative insights that help illuminate relevant themes and patterns within the studied context. Future research could strengthen and extend these findings by including a larger and more diverse group of participants.

VII. CONCLUSIONS AND FURTHER WORK

The gender gap in STEM careers and the IT and software industries leads to a shortage of female software entrepreneurs. To explore the motivations and challenges women face in this type of entrepreneurship, five female software entrepreneurs were interviewed, along with a two business mentor and an investor.

The journey of female software entrepreneurs is characterized by a unique interplay of motivations and challenges. A desire for autonomy and a purpose-driven interest in addressing underserved markets often fuel their software ventures, providing the resilience needed to overcome obstacles. While some of the identified motivations match those discussed in the literature, the motivation to create a software startup based on the final year project (Capstone project) of their university career is a novel finding.

However, challenges such as lack of business expertise and limited professional networks, which stem from those same systemic issues, can impede progress. Therefore, a multi-faceted approach is needed, focusing on actions that encourage more women to enter IT, increase the visibility of female role models, and offer essential mentoring and flexible work opportunities to create a truly supportive and equitable entrepreneurial ecosystem. In this sense, the recommendation to have more support for remote work opportunities is also a new finding of this study.

For future work, we suggest expanding the sample of interviewees to include female entrepreneurs whose software ventures are being incubated in other business incubators besides the aforementioned CIE. This will help determine if the

entrepreneurial ecosystem they are part of provides additional motivating factors and support to overcome common challenges. Additionally, we aim to include other female mentors and investors, as well as those involved in teaching entrepreneurship in STEM fields.

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