

Becoming a Women Leader: A Qualitative Study in the Information Technology Sector

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Abstract: Based on social cognitive career theory (SCCT), our aim in this qualitative paper is to examine the factors that contribute to the success of women obtaining and maintaining positions in upper management in the IT field in the United States. To better understand their career development, we conducted interviews with 20 women aged 40 years or more in top-level, IT-industry management positions in the U.S. state of North Carolina. The information collected were analysed using thematic analysis. The results reveal interesting points related to the personal and contextual variables that help participants develop their careers. In addition, the study identifies the leadership styles that the participants adopted, and the challenges they faced as they worked to achieve their goals. Hence, this study shows that women can evolve in a male-dominated environment and succeed, thus contributing to career development theory.

Keywords: women leaders, career development, IT field, U.S. thematic analysis, authentic leadership

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1. Introduction

A study shows that the number of women CEOs in the S&P 500 changed from 41 in 2023 to 39 in 2024¹. Also, as of July 2024, there are 52 women serving as CEOs in the Fortune 500, maintaining the same count as recorded in 2023 (2024 Executive Summary - Women Business Collaborative). This issue is even more obvious in the science, technology, engineering, and mathematics field (STEM field), where in 2021 women constituted around 35% of the STEM workforce in the United States². Hence, we observe that there is still a disparity in the workplace, even if certain measures have been taken to reduce the gap between men and women—especially in certain fields such as information technology (IT). Consequently, the aim in this paper is to provide an answer to the following research question: *What are the factors that contribute to the success of women reaching positions in upper management in the U.S.-based IT field?* To our knowledge, few studies have focused on this issue. Based on social cognitive career theory as developed by [1], we

investigate the factors that played roles in helping women reach and occupy top-level management positions in the IT sector. Accordingly, this paper proposes three contributions: The first is related to SCCT in that it reveals some factors that can influence women's choices and level of interest in their career development. The second is linked to the literature of gender stereotypes by demonstrating that women can occupy important positions in top-level management in a male-dominated environment. And, finally, the third is associated with the leadership literature by showing that women can develop their own leadership styles.

In tackling our research question, we've structured the paper as follows. First, we present the position of women in the workplace and identify some challenges they face throughout their careers. Then, we focus on the place of women in the U.S.-based IT field, and we investigate the hurdles women encounter when striving to occupy positions in this field. Then, we introduce social cognitive career theory (SCCT). After that, we present our findings as well as our theoretical and managerial implications. Finally, we conclude with our limitations and new avenues for future research.

2. Literature Review

2.1. Women in the Workplace

¹ Women Business Collaborative. (2024), "2024 Women CEOs in America Report", Retrieved from 2024 Executive Summary - Women Business Collaborative

² National Center for Science and Engineering Statistics. (2023), "Diversity and STEM: Women, Minorities, and Persons with disabilities 2023", from <https://nces.ed.gov/ipeds/data/2023/23315/assets/23315-report.pdf>

The percentage of women occupying senior leadership positions in the world varies across countries. The percentage of women occupying positions in top-level management is 28% in Asia Pacific, 33% in North America, 34% in the European Union, 36% in Latin America, 38% in Southeast Asia, and 39% in Africa [2]. These figures show that women still face obstacles in their careers, and that they continue to struggle to rise through the hierarchy and occupy top-level management positions. Several scholars were interested in identifying the obstacles that women face throughout their careers. For instance, [3] studied the gender managerial barriers faced by women in private companies in the United Arab of Emirates. They revealed that gender stereotypes, formal and organizational barriers like sexual harassment and lack of respect for women in companies, and finally the absence of a women leaders' association to protect their rights are amongst the difficulties confronted by women in private companies to grow in the hierarchy. [4] examined the work challenges and career barriers women face in the Kingdom of Saudi Arabia. They identified barriers such as gender discrimination in the workplace; a lack of mobility; limited opportunities for growth, development, and career advancement; the weight and influence of gender stereotypes; a lack of work-family balance; and pregnancy-related challenges. Also, [5] studied a sample of 123 CEOs (23 women and 99 men) from U.S. S&P 500 companies and observed that having children and higher levels of education are hurdles that women must overcome to become CEOs. Furthermore, women encounter significant challenges even after reaching upper-management positions [6]. These challenges include lack of or low recognition [7, 8], shorter tenures [9], lower levels of compensation [10], and difficulty managing traditional cultural influences, work stress, and work-life balance [11]. Consequently, we still observe that even today women cannot easily reach top positions, and the process is even more complicated in fields such as the IT sector.

2.2. Women in IT in the United States

In the United States in 2023, women hold 26.7% of IT jobs [12]. In the GAFAM companies (Google, Apple, Facebook, Amazon, and Microsoft), 24% of the IT positions are held by women [12]. Women occupying leadership positions in the GAFAM group are respectively 29% at Amazon, 34% at Facebook, 31% at Apple, 28% at Google, and 26% at Microsoft [12]. Finally, only 15% of tech CEOs are women [12]. These figures show that women are still not well represented in the IT field and can be explained by the numerous obstacles that women encounter in a male-dominated environment hampering their ambitions and sometimes forcing them to resign. Scholars have tried to identify some barriers faced by women in this type of environment. For instance, [13] showed that women working in a male-dominated field such as engineering frequently face a hostile, discouraging, and discriminatory environment. Along the same line, [14] showed that women occupying leadership positions in the U.S. construction industry frequently face hostility and discrimination. Also, a study by [15] revealed that Filipina women business leaders working in male-dominated

industries in the Philippines faced discrimination and, if married, had to negotiate the effects and influence of their husband's egos and cultural preconceptions. They noted that there were very few women on company boards. To conclude, it seems obvious that environment plays a role in the development of women's career.

2.3. Social Cognitive Career Theory

In this study, we use SSCT to explain the career development of women in the IT field. Social cognitive career theory (SSCT) was based on [16] social cognitive theory and developed by [1]. SSCT explains how personal factors, environment, and acquired experiences influence career development [1]. Furthermore, SSCT highlights the impact that developed experiences, self-efficacy, and outcome expectations have on career development [1]. In addition, SSCT examines the influence that personal variables, environment, and experiences gained over time have on self-efficacy and outcome expectations in the career development process [1]. Over the years, the SSCT expanded to include two additional models, one emphasizing the role of satisfaction and well-being in the educational context [17 in 18], and the second one highlighting career self-management over a lifetime [19 in 18].

3. Methodology

3.1. Data Collection

The research adopted a qualitative study. We conducted semi-structured in-depth interviews, a format that enables us to collect rich narrative data [20]. The 20 taped interviews lasted 45-90 minutes and were then transcribed by the researchers. At the beginning of each interview, the researcher explained the objectives of the research and assured the confidentiality of the answers collected. We selected and interviewed women in medium-sized and large companies occupying different positions in upper management, such as vice president, senior vice president, senior manager, senior director, director, president, and chief operating officer. All were based in the U.S. state of North Carolina. Most of the participants are at least 40 years old and highly qualified. Based on SSCT [1], our purpose is to provide an answer to the following research question: *What are the factors that contribute to the success of women who reach upper management positions in the IT field?* To understand their career development, we asked them the following questions: *Tell me about your career to date? Describe to me how you got to your current managerial position?* Then, to identify the factors that helped them to reach their current positions, we asked them: *What are the factors that helped you to reach your current position? How did you react to these factors?* Finally, we wanted also to identify the challenges they encountered by asking them: *What are the challenges that you met to reach your current position? And what are the challenges that you still meet? How do you face them? What lessons did you learn?* We completed the interviews in 2023.

Table 1. Interviewee profile

Interview	Age	Level of education	Positions in company
1	40	MSc	Senior manager, product management
2	43	PhD	Senior director of product marketing.
3	50	MSc	Communication lead
4	48	PhD	President and Chief Operating Officer
5	45	MSc	Vice-President
6	52	MSc	Manager, Internal communications
7	54	MBA	Director of public relations & Communication
8	48	MBA	Senior Vice-President
9	48	MSc	Vice-President
10	47	MBA	Marketing director
11	50	PhD	Senior Vice-President
12	46	MSc	Senior manager, product management
13	49	MBA	Senior Vice-President
14	55	PhD	President and Chief Operating Officer
15	57	MSc	Senior director
16	49	PhD	Senior Vice-President
17	53	MSc	Vice-President
18	53	MSc	President and Chief Operating Officer
19	48	PhD	Senior Vice-President
20	50	PhD	Vice-President

3.2. Data Analysis

We analysed the content using thematic analysis, as described by [21]. Following the steps of [22], several broad themes mentioned by the literature review were identified [23] and used as preliminary codes [24]. Also, we read, examined, and coded the interview manuscripts. Throughout the analysis process, and because of continuous comparison between the transcripts, we identified new themes that were not initially included in the preliminary set of codes [15]. This led to what [23] qualify as axial coding, where the preliminary list of codes was adjusted continually to include new themes and sub-themes and to simultaneously establish correlations between these themes. This allowed the development of a new set of themes that were highlighted in the analysis. In all, we obtained five themes that we present in the next section.

3.3. Results

We organized the interview results around the major questions posed to the participants which are: What are the factors that helped you to reach your current position? How did you react to these factors? What are the challenges that you met to reach your current position? And what are the challenges that you still meet? How do you face them? What lessons did you learn?

3.3.1. The Role of Gender in the IT Sector

The first theme identified is participant gender. This idea is also mentioned in SCCT [1] and is related to the individual variables. Interviewees mentioned clearly that gender was not a barrier for them to join companies working in the IT environment. For instance,

Interviewee 4 said:

I was raised in the South, went to the Navy, and studied at law school. I did not let gender hold me back. I was lucky to have parents who believed in me and made sure that I knew that I could do anything in life that I wanted to do.

Interviewee 2 stated:

For me, my identity has affected my personality. The cultural part influences a person as an individual a lot. It's not only related to the job—it can change the perception and point of view of a person. So, it can influence how people operate with each other. For instance, you can see during the interview process if the company is focused on diversity. You can see along the way with the recruiter if the company has an open policy and how it's operated by the company.

3.3.2. Background and Start in the IT Field

The 20 women leaders interviewed started differently in the IT industry without having a certain technical expertise in this field. However, they had either a strong interest in IT from an early beginning in their career or a desire to take on new challenges in this fast-paced environment. Hence, the work environment has a significant impact on some of our interviewees. The work environment is cited in SCCT [1] and is one of the components influencing outcome expectations [1]. Interviewee 3 and 4 highlighted this point. Interviewee 3 worked in different fields before her first start in the tech field. She worked for seven different companies in seven different industries, including finance, insurance, and healthcare. The healthcare industry proved to be too much as a job; it was difficult to maintain work-life balance. She received an email from SAP through LinkedIn. The role was like her current job, related to executive office communications. She decided to take on this challenge in this new tech environment. She described her working environment as:

A dynamic and fast-paced environment where women are challenged to find innovative solutions to the IT problems of the future; a place where you can stretch yourself professionally.

Interviewee 4 became interested in the IT industry back when she was in the U.S. Navy serving in the Naval Nuclear Propulsion Program. She found it interesting and stimulating to work in an environment with exceptional engineers. She pushed herself to understand as much as she could about the construction of nuclear-powered submarines and aircraft carriers. After her first year at Stanford Law School, she decided to stay in California for the summer and interned at the law firm Wilson Sonsini Goodrich & Rosati because it represents many Silicon Valley tech companies. As she progressed in her career, she realized that she was truly enjoying learning about technology while at the same time following her passion for law.

3.3.3. Factors Influencing Women's Career Development

Women leaders identified seven factors that helped them to reach their positions: passion/interest, interpersonal and communication skills, relationship-building skills, network, mentors, level of expertise and confidence, and, finally, education. We notice that among these factors the level of expertise and confidence are

related to career self-efficacy in SCCT [1] and education is put under the contextual variables in SCCT [1].

First, the basis of being successful at what you do is being passionate and interested in doing it. Individuals must love what they do, as well as be ambitious and focused on their career growth. This point was mentioned by Interviewee 2, who stated that:

I love what I do. I'm passionate about technology. It's the foundation of everything. When an individual doesn't love what they do, it doesn't make for a good foundation.

Second, interviewees pointed out the importance of having interpersonal and communication skills to tailor interactions with people and to understand who they are. Interviewee 7 said:

To be a great leader, you must be clear, concise, and simple. The clarity of the way you speak is primordial. Each group is different. You must be very open-minded and clear about your ambitions. As a leader, it's crucial to understand the different metrics of the organization. It demonstrates your level of adaptability and flexibility.

Interviewee 5 also emphasized this, stating:

It's crucial to be able to communicate easily and understand the tech to build the bridge between the technology and the world.

Third, our respondents mentioned the importance of relationship-building skills. It represents one of the main pillars of becoming a great leader. It's critical for building loyal and trusting relationships with your peers. Interviewee 1 insisted on this idea in the following verbatim:

It is crucial to collaborate with individuals when I know I'm not good at something. I don't have to be good at everything. There's always someone who'll be better than you.

Fourth, it's important to use these relationships skills to build, grow, and retain one's network. The human dimension is critical. It's vital to pay attention to build a network and to build strong relationships with one's colleagues, as mentioned by Interviewee 3:

Individuals who trust you will be more willing to recommend you and share opportunities with you. The only way is to jump on every opportunity.

In line with that, women must look for opportunities because they don't frequently present themselves. Interviewee 6 said:

Good opportunities show up just occasionally.

Fifth, our participants emphasized the role that mentors have played in their careers. Their mentors have not only enabled them to understand how to grow and become great leaders, but they've also helped them see the big picture, as well as opportunities. They're one of the most powerful tools for leadership. According to Interviewee 3, her mentors had an important influence on her mindset, as well. In line with this, Interviewee 7 mentioned:

Women are too self-critical. For this reason, it's crucial to help other women. Helping ambitious women should be obligatory. I've been fortunate to have mentors along the way.

Also, Interviewee 4 felt individuals interested in the IT field should also be mentored by someone in the same sector. She mentioned the importance of increasing the number of role models who publicly speak:

Women leaders should visit schools or be on panels. It will lead to improving the visibility of the IT industry, particularly for women.

Aware of the importance of the role of mentors, some companies have set up a mentor cycle. Interviewee 7 describes it as:

...a one-man leader for 11 female employees. There aren't a lot of role models. It's vital that people can feel comfortable with their mentor. It'll give them the opportunity to advance and influence other people.

Sixth, women underlined their level of expertise and their confidence. Interviewee 4 insisted on the fact that:

Practicing in corporate governance, securities, and M&A law helped me get my role in my current company. Having a reputation of high integrity, tenacity, and a strong work ethic helped.

Interviewee 17 also highlighted her self-confidence:

I'm confident in myself. I'm concise. I don't need to justify myself. As a person, I'm outcome focused. I like to do things where I can measure what's happened. I've worked on all the projects. I can make decisions without depending on anybody.

The seventh and last factor is related to education. All the interviewees agreed that education is critical for women leaders to progress in their careers and overcome obstacles. Interviewee 2 highlighted:

Education continues to guide me. It's crucial to work more at school to understand how new things develop and change. You'll ensure your position by being knowledgeable and flexible that way.

For interviewee 14:

Education is society's great leveller. It's also our greatest tool to overcoming barriers for women. It's essential to get as much as education you can get in IT. It can increase the interest of young individuals in STEM careers, so that they can become the future leaders.

Other interviewee, like Interviewee 12, insisted on the importance of capturing the interest of young individuals in STEM careers:

Education should focus on IT to enhance this field by giving it the same exposure as other subjects. If you study science, technology, engineering, and math [STEM] classes, it can open doors for many opportunities if you want to enter the IT field.

3.3.4. Characteristics of the Leadership Style in the IT Sector

Most of the women interviewed have developed their own leadership styles. According to Interviewee 14, the leadership style must combine six main elements: authenticity, integrity, collaboration, empowerment, courage, and commitment. She has also underlined that a leader needs to have the 'ability to use the right skills to tackle a given problem and find the right solution'. Whereas Interviewee 17 highlighted the strength of being fair and just in relation to others: 'You must treat people as you would like them to treat you'.

Furthermore, interviewee 12 emphasized the importance of personal environment and of having a role model to succeed:

Having role models has enabled me to be more self-confident. It helped me to understand what I need to do. I am not as confident as I seem. You must know who you are and who you want to be. The key is to focus on improving.

To pinpoint the role of the surrounding environment, Interviewee 19 stated:

I have been positively impacted by my own family. On one hand, my mother was a school principal. My mother enabled me to improve my abilities and sensitivity to others, as well as my creativity and my problem-solving skills. On the other hand, my father is in the military. He always encourages me to rely on myself.

In addition, the women interviewed agreed that they've developed their leadership abilities by watching other individuals leading. For instance, Interviewee 18 developed her leadership skills by seeing bad leaders' lead. She stated:

I know what bad leadership is. I can see it right away. Bad leaders helped to make me a great leader. I've been happy to work where I did. But I worked for some bad leaders. I always say to myself that I will never behave that way. I avoid bad leaderships.

Motivation is also an important element of leadership. All the interviewees believed that a great leader motivates people. Interviewee 11 described her experience and her role as a leader by saying:

[Company 1] has been in the process of remodelling sales tax. Everyone had different priorities, which led to conflicts. I recognized that we had different problems; I focused on finding solutions by helping people to reach their outcomes. I spent time helping the team move in the same direction towards the same goals.

In addition, Interviewee 16 stressed that it's critical to pay attention to leadership and management skills. Soft skills, for example, can help or hinder you from going where you want to go. Furthermore, Interviewee 13 mentioned the importance of paying attention to see what works. She added that the leaders who have influenced her have represented role models. They've helped her to give people the opportunity to see the big picture and work with them to get there. These women also believe that good leadership is not natural. Interviewee 17 mentioned that 'A leader grows with experience'.

In conclusion, the interviewees in our sample developed their own leadership styles by being authentic, by knowing how to motivate their employees, by paying attention to the details, and by having a role model to help and advise them when needed.

3.3.5. Challenges in the IT Sector

In our sample, women leaders outlined three main challenges: the balance between family and work, the ability to adapt in very fast-paced environments, and existing competition among female-leaders. The first challenge is related to maintaining family-work balance. As Interviewee 4 said:

The most challenging part of being a woman leader is trying to be the best mother that you can be while at the same time being the best leader. It's being there when you're needed at work and having the wisdom to know when you're needed most by your children, so you can be with them.

Female leaders witness some pressure to maintain a balance between family and work, as expressed Interviewee 7:

As a woman leader, the image you project is fundamental. I've experienced an implicit pressure to find

the balance between work and life. But I'm open. I don't want to be different from the others.

The second challenge concerns the adaptability of women leaders and their ability to cope with very fast-paced environments. This point was described by Interviewee 3:

With time, I've been able to change and adapt my style to the IT field. In this fast-growth innovative atmosphere, I learned how to do things more quickly.

The third challenge is related to the competition that exists among female leaders. Interviewee 3 stated that:

Another challenge for women comes from other women whose actions are detrimental to women [...] There are some women in management whose actions make it seem like they think there's only one spot at the top for women, and they don't want to be challenged for that spot, so they tend to undermine other women. I think that's one of the bigger issues that women face today. I hope that it diminishes over time.

4. Discussion

4.1. Theoretical Contributions

In this paper, we used SCCT [1] to examine the factors that contribute to the success of women reaching upper-management positions in the IT field in the United States. Table 2 provides a summary of our key findings.

Table 2. Summary of findings

Theme 1: The role of gender in the IT sector (Personal variable)	No impact on the choice and decision of our participants to work in IT field.
Theme 2: Background and start in the IT field (contextual variable)	An interest in working in a dynamic, fast-paced, and challenging environment.
Theme 3: Factors influencing women's career development.	Passion/Interest/Challenge. Role of education. Level of expertise and confidence. Interpersonal and communication skills. Relationship building skills. Networks. Mentors.
Theme 4: Characteristics of the leadership style in the IT sector	Development of their own leadership style by: being authentic. knowing how to motivate their employees. paying attention to the details. having a role model to help them and advise them when needed.
Theme 5: Challenges identified	Balance between private and professional life. The ability to adapt quickly in a dynamic environment. Existing competition among female leaders

First, the findings of our study contribute to SCCT [1] by revealing some factors that can influence women's career development. Our analysis revealed that women decided to enter the IT field because they had a strong interest in that field and/or a desire to take on new challenges in this fast-paced environment. Hence, the work environment plays a role in their decisions. This idea is in line with the study of [25], who also found that the environment has an influence on participants wanting to work in a STEM field. In addition, by having a passion/interest—as well as the desire to take on new

challenges, a certain level of education, and the expertise and confidence required—women were able to enter the IT sector and occupy important positions. Moreover, the analysis showed that interpersonal and communication skills, relationship-building skills, networking, and mentoring helped our participants to progress in the hierarchy: Networking can boost women's careers, provide information about job opportunities, and bestow power and recognition [26]. And women in our sample stressed that mentoring helped them to occupy important positions. [27] and [28] showed a positive relationship between mentoring and career mobility and managerial advancement. Also, [29] and [30] illustrated the importance of mentoring for women in organizations. To sum up, our results show that some personal variables (passion/interest/challenge, interpersonal and communication skills, relationship-building skills, capacity for building a network), institutional variables (having a mentor), contextual variables (the role of education), and career self-efficacy (the level of expertise and confidence) all played significant roles in influencing our participants in their choices of career development.

Second, our study contributes to the literature of gender stereotypes by showing that women can break the glass labyrinth defined by [31] and occupy important positions in environments like IT where there generally exists a higher proportion of men and an aggressive and competitive culture [32]. In this paper, the factors identified are individual ones. Scholars like [33] studied the institutional factors that help women to be promoted to top leadership positions. They found that institutional diversity helps women to progress in the hierarchy and become CEOs. Moreover, our study contributes to the leadership literature by showing that our participants did not follow a male or female leadership style. On the contrary, our participants developed their own leadership styles, although some studies showed that women adopt masculine behaviours to be accepted in a male-dominated environment [34,35,36]. In this study, the interviewees adopted authentic leadership styles and had role models to coach them and help them in their careers.

Finally, the study showed that the women identified three main challenges: the balance between private and professional life, the ability to adapt quickly in a dynamic environment, and existing competition among female leaders. Our results are in line with the work of [37] and [30], who found that women report experiencing more conflict between personal and professional life than do men. Our results are also in line with the work of [38] and [39], who showed that women's careers differ from men's careers because the impact of family responsibilities is not the same for men as it is for women [40,41]. Others have found that women can make the necessary accommodations to balance family and business commitments [42], especially if the male spouse/partner is willing to support his wife/partner in her career as [43] showed in their study. Moreover, participants mentioned the necessity to be flexible and to adapt quickly to this fast-changing environment. Finally, participants mentioned the existence of competition among female leaders. This issue was faced by the interviewees, and it was their experience that enabled them to solve it.

4.2. Managerial Contributions

This study gives some thought to how women leaders succeed in top management positions in the IT sector. To progress in the hierarchy, women must build strong networks that make them visible and help them seize offered opportunities. At the same time, having a mentor in the field can help women develop their expertise. This helps raise and reinforce their confidence levels and helps them to overcome obstacles. In addition, the paper highlights the importance of education. Highly qualified women have the required potential and skills to be successful and occupy positions, even in a male-dominated field like the IT industry.

Also, this study has shown that women can break the glass labyrinth and progress in the hierarchy. By simply creating awareness in the workplace, people will be more sensitive to the prejudice and stereotypes related to women leaders. Consequently, women will be less likely to face discrimination and more likely to have the same chances to evolve in the hierarchy. Finally, organizations and educational institutions can prepare women to occupy positions in upper management by providing them with specific training that give them the required skills to succeed in their careers.

4.3. Limitations and New Avenues For Future Research

This work has certain limitations that could constitute an avenue for future research. One is related to the sample context. Including interviewees from other countries could bring a broader view and provide women with insights that could help them progress in their careers. Also, we could observe the career development of women leaders for a longer period to follow their progression through the hierarchy in the IT sector and investigate the ways by which they're able to maintain their positions. Furthermore, we could identify the institutional factors that can help women progress through the hierarchy in the IT field. And we could use surveys to collect data and analyse them quantitatively to see the different relationships between the concepts analysed in this paper. Finally, it could be interesting to extend the study to other sectors to compare the career development of women leaders in different domains.

5. Conclusion

Through this study we believe we've contributed to SCCT by identifying several types of factors that helped women reach and occupy positions in top-level management in the IT field in the United States. We've shown how our participants, coming from different backgrounds, were resilient and able to negotiate and surmount the challenges they faced while developing their careers in a male-dominated environment. Also, we think we've contributed to the leadership literature by demonstrating that women were able to develop their own leadership styles to succeed.

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