International Journal of Innovative Research and Scientific Studies, 8(3) 2025, pages: 4812-4827

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

Exploration of the relevance of the constructs of the UTAUT 2 model applied to entrepreneurs

Juan Carlos Armijos[1*], David Álvarez-Maldonado[2], Nicolás Barrientos Oradini[3], Luis Felipe Vergara[4], Víctor Manuel Yáñez Jara[5]

[1]*Faculty of Economic and Administrative Sciences, Universidad Americana, Av. Brasilia 1100, Asunción, Paraguay.*
[1]*School of Auditing and Management Control, Faculty of Economics and Business, Universidad Santo Tomás, Chile, Av. Ejército Libertador 146, Santiago, Metropolitan Region, Chile.*
[2]*Social Anthropologist. Universidad Tecnológica Metropolitana, Chile.*
[3]*Faculty of Economics and Business, Universidad Alberto Hurtado, Chile.*
[4]*Facultad de Economía y Negocios, Universidad Andrés Bello, Chile.*
[5]*Instituto de Salud Pública, Universidad Andrés Bello, Chile.*

Corresponding author: Juan Carlos Armijos (*Email: jarmijos@ua.edu.py*)

Abstract

This study explores the validity and relevance of the constructs of the UTAUT 2 model [1] in the entrepreneurial context, with the aim of evaluating its applicability in the acceptance and use of technology in entrepreneurial ventures. Traditional technology acceptance models have been validated in employee and consumer contexts, but their adaptation to the entrepreneurial environment requires careful analysis due to its unique characteristics, such as flexibility and constant innovation. The qualitative methodology employed included semi-structured interviews with 24 Spanish-speaking startup entrepreneurs, seeking to understand their perceptions of technology. The results show that certain constructs of the model, such as performance expectancy and effort expectancy, are relevant in this context, while others, like social influence and habit, have lower applicability. The research suggests that the entrepreneurial profile, characterized by autonomy and an orientation towards innovation, influences the relevance of these constructs. In conclusion, the study proposes potential adaptations to the UTAUT 2 model, such as the inclusion of constructs related to risk perception and trust, which could improve its predictive ability in the entrepreneurial context.

Keywords: Entrepreneurial profile, Entrepreneurship, Innovation, Technology acceptance, UTAUT.

DOI: 10.53894/ijirss.v8i3.7614
Funding: This study received no specific financial support.
History: Received: 21 April 2025 / **Revised:** 23 May 2025 / **Accepted:** 27 May 2025 / **Published:** 3 June 2025

Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Publisher: Innovative Research Publishing

1. Introduction

The main objective of this research is to explore the validity and relevance of the constructs that form the UTAUT 2 model [1] in the entrepreneurial context, with the purpose of evaluating its applicability in the acceptance and use of technology in the entrepreneurial domain. Traditional models of technology acceptance and use, such as TAM in its various versions [2-5] and UTAUT and its extension [1, 6], have primarily been designed and validated in contexts involving employees or consumers. However, applying these constructs to the entrepreneurial population requires a careful analysis of their relevance and validity, given that the entrepreneurial environment has unique characteristics that distinguish it from other population segments, such as flexibility, the need for constant innovation, and exposure to uncertainties inherent in the processes of business growth and consolidation [7-20].

The relevance of adapting these models to the entrepreneurial context lies in the critical role that technology plays in the performance of ventures. In today's business environment, adopting and effectively using innovative technologies is a decisive factor that can significantly impact the sustainability, competitiveness, and growth of entrepreneurial projects [20, 21]. Since entrepreneurs operate in more dynamic environments and face specific challenges when adopting technologies (such as limited resources or the speed of technological changes), it is crucial to evaluate whether the constructs of the UTAUT 2 model remain relevant and valid in this context, especially considering the particularities of the entrepreneurial profile.

It is important to note that this study does not aim to analyze causal relationships within the model, as its approach is qualitative and exploratory, excluding statistical hypothesis testing that might demonstrate causal relationships between constructs. Instead, the primary goal is to provide evidence of the validity and relevance of each construct independently, without delving into the statistical modeling of their dependencies or causalities. This approach allows for a deeper and more holistic view of how entrepreneurs perceive and use technology, without reducing the complexity of their experiences to simple quantifiable relationships.

To address the objectives of verifying the validity and relevance of the constructs in the entrepreneurial population, a thorough review of specialized literature was conducted. This review, based on documentary sources and previous studies on technology adoption in entrepreneurial contexts, helped contextualize the research on the use of technology by entrepreneurs and provided a solid conceptual framework on which the study was developed. Subsequently, a purposive sample of 24 Spanish-speaking startup entrepreneurs was selected, and they participated in semi-structured projective interviews. This methodological approach was carefully designed to minimize social desirability bias in responses, aiming to obtain a deeper understanding of the mental frameworks and perceptions of entrepreneurs regarding technology acceptance and use.

The analysis of the interviews allowed for the identification and evaluation of the presence and relevance of the UTAUT 2 model constructs in this group of entrepreneurs. The qualitative methodology applied, centered on thematic analysis, provided a solid empirical basis for discussing the relevance of each construct in the entrepreneurial context. The results obtained show that some constructs of UTAUT 2, such as performance expectancy and effort expectancy, are highly relevant in the case of entrepreneurs. However, others, such as social influence or habit, showed less consistent or even deficient evidence in this population, suggesting that not all constructs are equally applicable in this particular context. This difference in the relevance of the constructs can be explained by the unique characteristics of the entrepreneurial profile, such as autonomy, orientation toward innovation, and the search for practical and efficient solutions.

Finally, in the conclusions section, the findings are synthesized, integrating the results regarding the applicability of the UTAUT 2 model to entrepreneurs and proposing possible adaptations, such as the inclusion of constructs related to risk perception and trust. Including these factors could help improve the model's predictive ability in entrepreneurial contexts, where technology adoption is strongly influenced by perceptions of risk and the need for trust in technological tools, as noted in previous studies [7, 8, 13, 17, 21].

2. Literature Review

Information technologies have demonstrated significant potential to improve employee performance [1, 4-6, 22, 23]. This argument can reasonably be extended to self-employed entrepreneurs, such as those running startups or new digital businesses. Like employees, entrepreneurs can enhance their performance and success through the use of technology. Conversely, a lack of willingness to adopt and use available technological systems can become a significant obstacle [20, 24]. Various studies have highlighted the benefits that digital tools and information systems bring to entrepreneurs [25].

The VII Micro-Entrepreneurship Survey conducted by the Chilean National Institute of Statistics [26]supports this assertion. This survey, which involved 6,934 entrepreneurs, analyzed various aspects of their businesses. Regarding Internet use, 37.7% of respondents reported not using it, while 57.5% said they did (see Table 1). When correlating Internet usage with income brackets grouped by minimum wages (see Table 2), a moderate correlation of $r = 0.21$ was identified (see Table 3), explaining 4.4% of the variability in earnings. The results show a statistically significant increase in earnings when the Internet is used (see Tables 4 and 5).

These findings demonstrate that Internet usage, as a key component of information technologies, has a positive and significant impact on one of the most relevant variables for entrepreneurs: earnings. However, it is essential to note that this predictor is only one of many factors determining the success of a business. Therefore, the analytical model could benefit from the integration of additional causal factors.

Table 1.
Internet Usage by Entrepreneurs.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Does not use the internet	2586	37.3	39.4	39.4
	Yes, uses the internet	3985	57.5	60.6	100.0
	Total	6571	94.8	100.0	
Lost	System	363	5.2		
Total		6934	100.0		

Note: Chilean National Institute of Statistics [26].

Table 2.
Entrepreneurship' profit Brackets.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Up to 1 Minimum Wage	3847	55.5	58.5	58.5
	Between 1 Minimum Wage and 2 Minimum Wages	1599	23.1	24.3	82.9
	Between 2 Minimum Wages and 3 Minimum Wages	496	7.2	7.5	90.4
	Between 3 Minimum Wages and 4 Minimum Wages	212	3.1	3.2	93.7
	Between 4 Minimum Wages and 5 Minimum Wages	78	1.1	1.2	94.8
	More than 5 minimum wages	339	4.9	5.2	100.0
	Total	6571	94.8	100.0	
Lost	System	363	5.2		
Total		6934	100.0		

Note: Chilean National Institute of Statistics [26].

Table 3.
Correlations between internet use and income levels of entrepreneurs.

		Internet use	Earnings Tiers
Internet use	Yes, he uses the internet	0.210**	0.210**
	Sig. (2-tailed)	0.000	0.000
	N	6571	6571
Internet use	Pearson Correlations	Yes, you use the internet	Sí usa internet
	Sig. (2-tailed)	0.000	
	N	6571	6571

Note: **. The correlation is significant at the 0.01 level (bilateral).

Table 4.
Model summary.

Model	R	R square	Adjusted R square	Standard error of the estimate
1	.210 [a]	0.044	0.044	1.268

Note: [a] Predictors: (Constant), Internet use.

Table 5.
Coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Desv. Error	Beta		
1	(Constant)	1.459	0.025		58.508	0.000
	Internet Use	0.557	0.032	0.210	17.405	0.000

Note: [a] Dependent variable: Earnings brackets.

In this context, the usefulness of technologies is reflected in how individuals perceive their ability to improve performance. According to the TAM model [4, 13], the acceptance or rejection of technology is closely linked to two key factors: the perception that technology will enhance performance and the perception that its use does not require excessive effort. This model aims to explain the intention to use technologies and has been refined and complemented over time (see Figure 2).

"Perceived usefulness" refers to individuals' belief that technology will positively contribute to their performance, which, in the case of entrepreneurs, can be interpreted as a competitive advantage derived from its adoption [14]. On the other hand, "ease of use" relates to the perception that technology will be easy to use, without requiring significant effort or scarce resources [27]. These two factors directly influence the intention to use technology and, from the perspective of the theory of planned behavior, also impact the final behavior of technology use.

In relation to this model, the VII Micro-Entrepreneurship Survey conducted by the Chilean National Institute of Statistics reveals that 35.5% of entrepreneurs do not use the Internet in their businesses due to reasons linked to both perceived usefulness and ease of use, in terms of effort and necessary resources (see Tables 6 and 7).

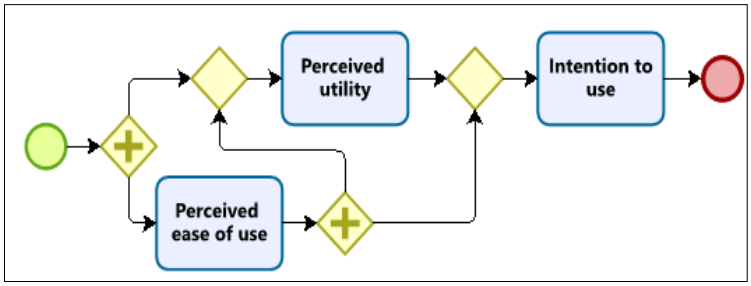

Figure 1.
Original TAM model.
Note: Based on Davis [4].

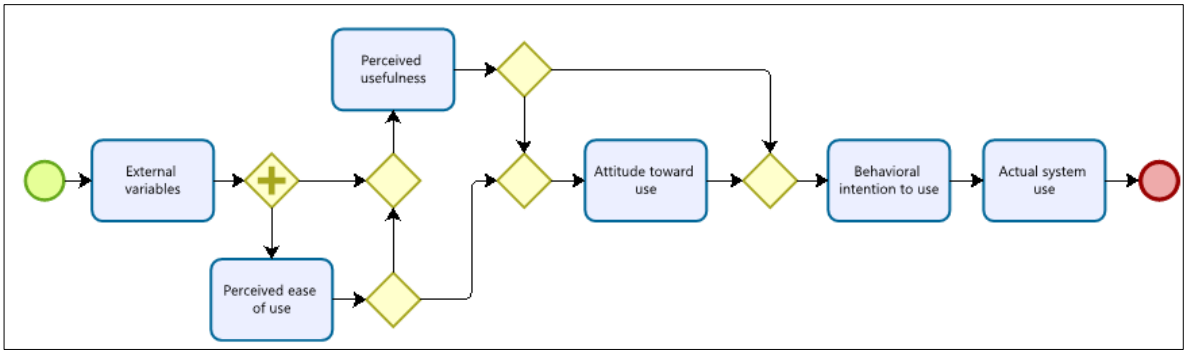

Figure 2.
Extended TAM model.
Note: Based on Davis et al. [28].

Table 6.
Reasons for using or not using the Internet among entrepreneurs.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Thinks it is not necessarily due to the size or type of your business	1333	19.2	19.2	19.2
	Does not know how to use the internet	950	13.7	13.7	32.9
	Does not have the resources to hire internet	95	1.4	1.4	34.3
	Does not have a computer / notebook / tablet / smartphone	85	1.2	1.2	35.5
	Doesn't use the internet	4348	62.7	62.7	98.2
	Other answer	103	1.5	1.5	99.7
	Does not know.	17	0.2	0.2	100.0
	Does not answer	3	0.0	0.0	100.0
	Total	6934	100.0	100.0	

Note: National Institute of Statistics [29].

Table 7.
Reasons for not using the internet among entrepreneurs, when checking: other answer, in Table 6.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Doesn't need it/Not interested.	32	.5	31.1	31.1
	Doesn't have time	2	0.0	1.9	33.0
	Someone else does it for him/her	8	0.1	7.8	40.8
	Other reasons	12	0.2	11.7	52.4
	No signal/Bad previous experience	33	0.5	32.0	84.5
	Uses other means	16	0.2	15.5	100.0
		103	1.5	100.0	
Lost	Total	6831	98.5		
Total		6934	100.0		

Note: National Institute of Statistics [29].

The Technology Acceptance Model (TAM) has been a fundamental tool for explaining variations in the adoption or rejection of information technologies by entrepreneurs. Over time, this model evolved into a more complex version called TAM 2 [5] which enhanced its ability to predict both the intention to use and the actual behavior of technology use (see Figure 3).

In this expanded version, new variables were introduced as key predictors of usage intention. Among these variables, social influence stands out, specifically subjective norms, understood as individuals' perceptions of the expectations of their peers those they consider important regarding the use or rejection of technology. This social influence can manifest through mechanisms of compliance, differing from voluntariness, which refers to the perception that technology usage is not mandatory in non-regulated contexts. The concept of image was also introduced, referring to the perception that using technology can enhance the user's social status.

In addition to these social variables, TAM 2 also expanded the model by including cognitive and experiential factors, such as prior experience with technology, which generates concrete sensory information and influences adoption decisions. The model added job relevance, defined as the perception that a technology is applicable and beneficial for the user's tasks, and output quality, which evaluates how the results obtained through technology usage align with the user's objectives. Furthermore, result demonstrability was included, referring to the user's perception of whether improvements in their performance can be directly attributed to the use of technology.

In this expanded model, both voluntariness and experience play a moderating role, interacting with social influences to improve the prediction of usage behavior. Although TAM 2 refines and expands the original model, many studies continue to use the original version due to its simplicity and effectiveness [8-11, 13, 17, 19, 25, 30].

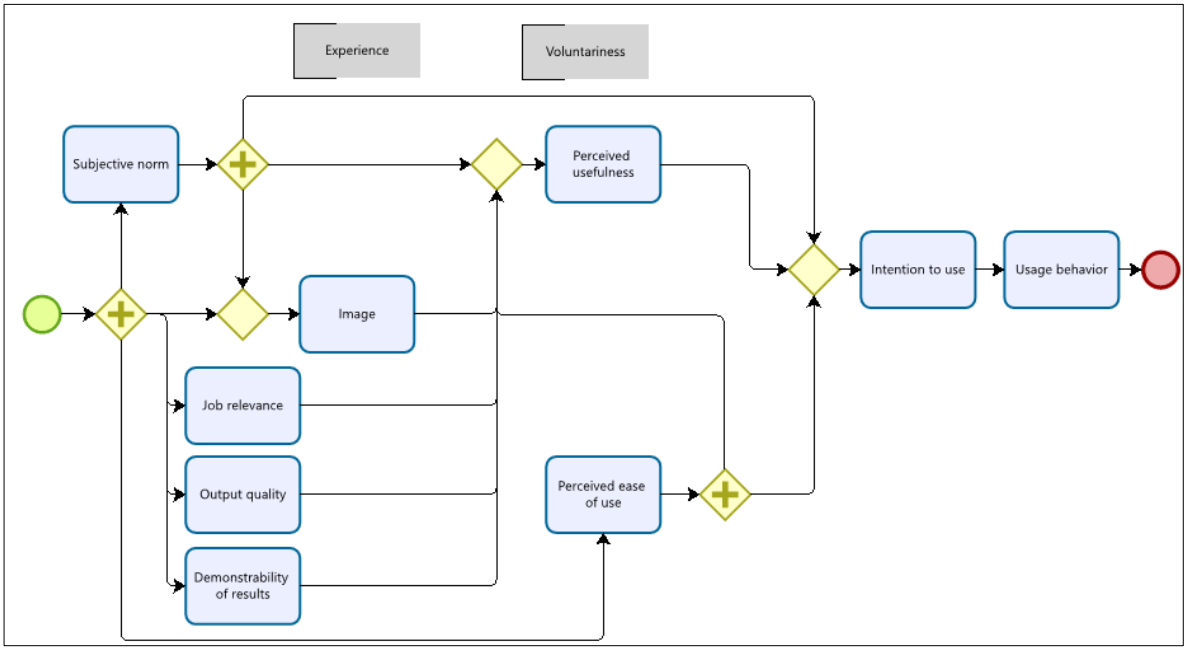

Figure 3.
TAM 2 model.
Source: Based on Venkatesh and Davis [5]. The moderator's experience and voluntariness are not diagrammed to improve visualization.

The TAM model evolved into its third version, TAM 3 [23], incorporating new factors that enrich the understanding of technology adoption (see Figure 4). Key variables include:

- Computer self-efficacy: the user's confidence in their ability to perform technology-related tasks.
- Perception of external control: the perceived availability of organizational and technical resources.
- Technology usage anxiety: fear when facing technology.
- Playfulness: the degree of cognitive spontaneity and enjoyment in technological interaction.
- Perceived enjoyment: pleasure derived from using technology, regardless of its practical benefits.
- Objective usability: comparison between the actual and expected effort required to use the technology.

These additions allow for a more comprehensive analysis of the cognitive, emotional, and practical factors influencing technology acceptance.

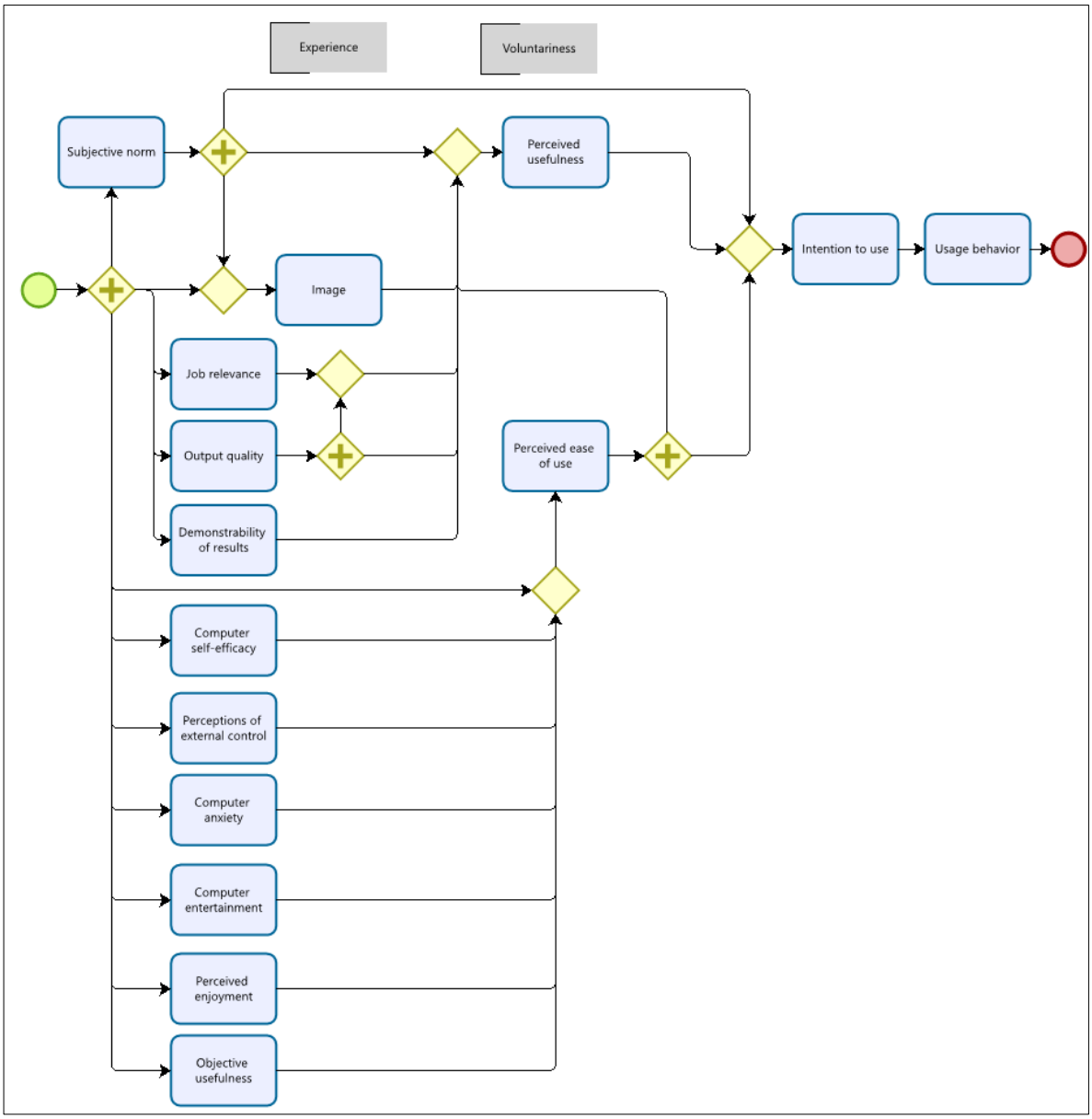

Figure 4.
TAM 3 model.
Source: Based on Venkatesh and Bala [23]. Experience and voluntariness moderators are not diagrammed to improve visualization.

The TAM model evolved through three versions to explain the intention and behavior regarding technology use, with a potential positive or negative impact on productivity [6]. This evolution culminated in the Unified Theory of Acceptance and Use of Technology (UTAUT) (see Figure 5), which integrated new key variables:

- Performance expectancy: the belief that using the system will improve performance.
- Effort expectancy: the perceived ease of use.
- Social influence: the perceived importance of others' opinions regarding the use of the technology.
- Facilitating conditions: the perception of the infrastructure available for using the technology.

The model also introduced moderators such as gender, age, experience, and voluntariness of use to improve the accuracy of predictions regarding intention and actual use of the technology.
Later, UTAUT evolved into UTAUT 2 [1], adding new variables:

- Hedonic motivation: pleasure derived from using the technology.
- Price value: the evaluation of the cost-benefit associated with use.
- Habit: automatic behaviors based on previous experiences.

Moderators were also expanded, including experience, age, and gender, to improve the explanatory power of the model.

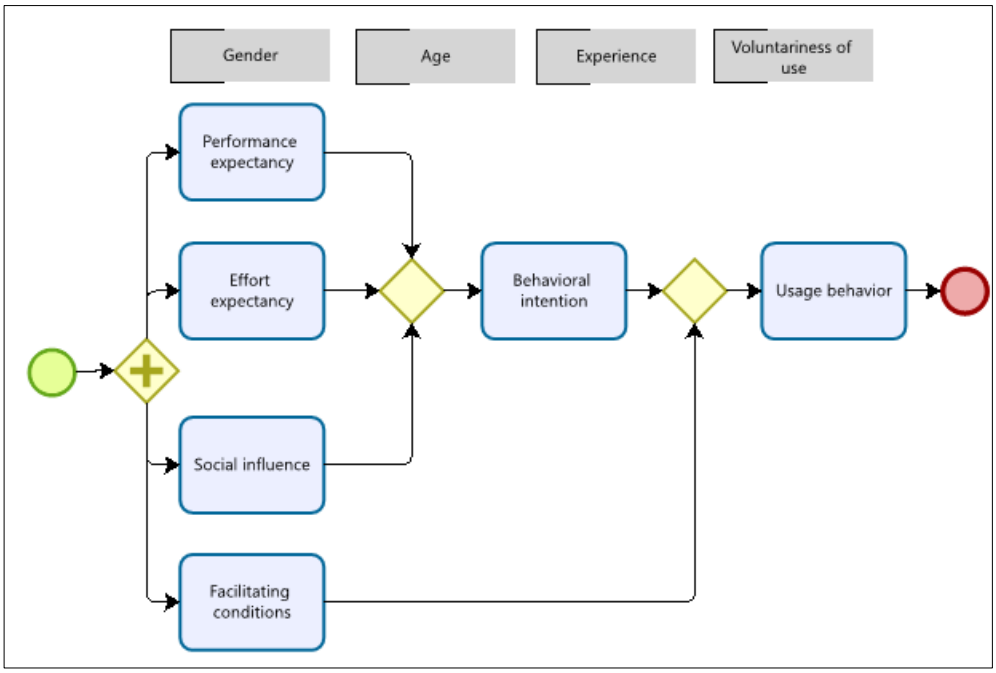

Figure 5.
UTAUT model.
Source: Based on Venkatesh et al. [6]. Moderators' gender, age, experience and willingness to use are not diagrammed to improve visualization.

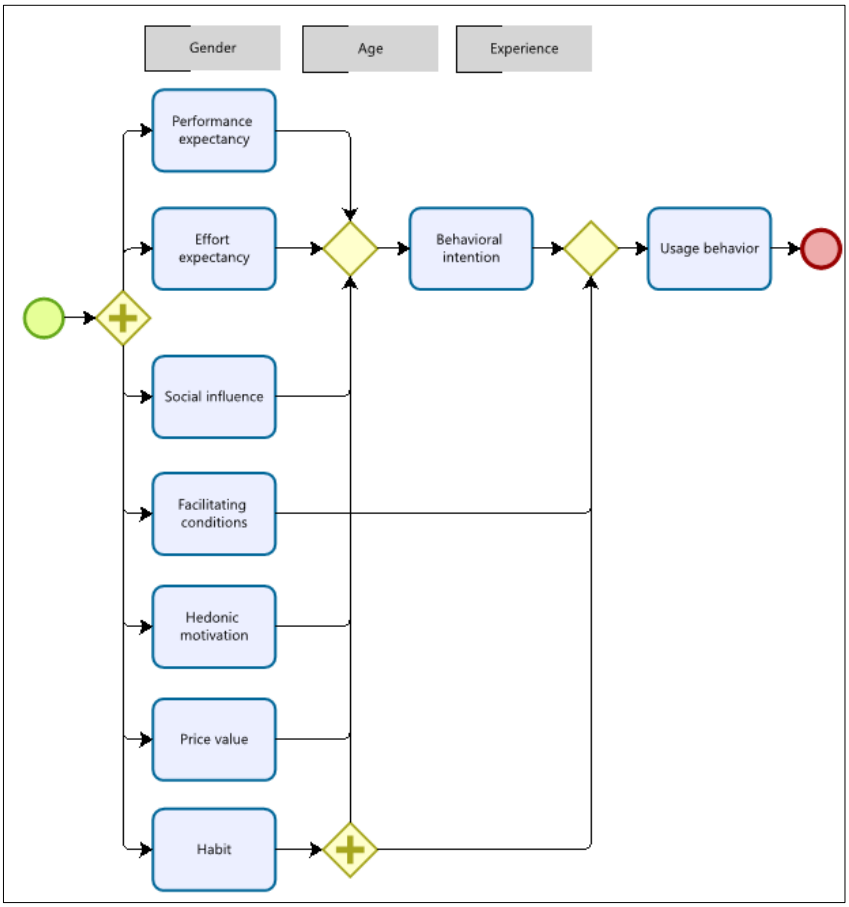

Figure 6.
UTAUT Model 2.
Note: Based on Venkatesh et al. [1]. Moderators gender, age and experience are not linked to improve visualization.

These different versions of the TAM or UTAUT model allow for understanding the phenomenon of information technology usage in entrepreneurship, just as they are used to understand it among organizational employees. To track their previous use in entrepreneurship research, a Boolean search formula was developed in WOS, defined by the following variables: (all= (tam or tam2 or "tam 2" or utaut or "utaut 2")) and all=(entrepreneurship), identifying 289 articles.

The results were filtered using the indexing system categories, selecting exclusively journals in the Business, Management, and Economics sets, resulting in a sample of 123 articles. These articles were reviewed to identify those that directly addressed the phenomenon of entrepreneurship and the use of the models. However, many articles did not refer specifically to business entrepreneurship, focusing instead on developed companies of various sizes, such as healthcare organizations or banking institutions.

The selection of articles that directly addressed the phenomenon of entrepreneurship and the use of the models resulted in a subsample of 18 articles, detailed below (see Table 8).

Table 8.
Selection of articles on entrepreneurship.

Author	Model Used	Description	Extension of the Model Used	Type
Moghavvemi and Salleh [15]	UTAUT	It links the UTAUT model with the Theory of Planned Behavior and the Entrepreneurial Potential Model to measure the entrepreneur's intention towards the adoption of innovation, while also offering a critique of the limitations of the UTAUT model.	The variable "credibility" is added as a mediator. Additionally, the variable "triggering factors" is included as a moderator, affecting the relationship between intention and usage, with the aim of improving the UTAUT model.	Theoretical
Moghavvemi et al. [16]	UTAUT	The UTAUT model is criticized for its limited explanation of the relationship between the intention to use and actual behavior. To overcome this limitation, it is proposed to incorporate external factors that inhibit or facilitate behavior, as well as the propensity to act. Triggering events, such as government policies, financial crises, and market changes, are introduced to measure their impact on innovation and technological adoption. The propensity to act is proposed as a moderator: the higher the propensity, the greater the likelihood of action. In the context of entrepreneurship, it is confirmed that performance expectations, effort expectations, and social influence positively impact behavioral intention, with facilitating conditions playing a key role. The study shows that the inclusion of triggering factors and the propensity to act enhances the model by capturing the influence of external factors, thus reducing the gap between intention and behavior.	External factors and the propensity to act are included, influencing the inhibition or facilitation of behavior. These external factors, such as government policy, financial crises, and market changes, impact the behavior of information technology use. The propensity to act is included as a moderator between the relationship of intention and usage behavior. The significant effects of the moderators of the propensity to act and the triggering factors, which capture external factors, are confirmed in the model. The goal is to bridge the gap between intention and action in usage.	Quantitative
Oumlil and Bennani [17]	TAM	Factors fostering the acceptance of electronic entrepreneurship are analyzed using the TAM model, incorporating trust and risk constructs as external variables that enhance the acceptance of electronic entrepreneurship. This analysis was conducted in business schools with students involved in digital entrepreneurship, resulting in a model that explained 28% of the total variance in the intention to accept electronic entrepreneurship by entrepreneurs, revealing that trust and	Trust and risk constructs are added as external variables that enhance the acceptance of electronic entrepreneurship, yielding significant results.	Quantitative

		risk significantly influenced the intention.		
Ketikidis et al. [14]	UTAUT	The acceptance issues of entrepreneurs regarding digital diffusion and advertising are reviewed. Using the UTAUT model, acceptance and usage problems of digital tools by entrepreneurs are addressed, focusing the research on value co-creation.	No new variables are incorporated nor is the model extended.	Quantitative
Jaziri and Miralam [13]	TAM	The phenomenon of computer-mediated crowdfunding used by entrepreneurs to seek funds from others to easily raise money for their innovative ideas is analyzed, using the TAM model and extending it with the integration of three new variables: perceived service risk, perceived transaction risk, and plagiarism risk. Significant negative effects of these variables on the intention to use are revealed. Additionally, perceived trust, which positively influences the intention to use, is analyzed. It is concluded that perceived risks are associated with security concerns, psychological factors, and concerns about information and perceived control.	Variables related to perceived service risk, perceived transaction risk, and plagiarism risk are integrated, linking these risks to concerns about security and psychological factors, as well as concerns about information and perceived control.	Quantitative
Gavino et al. [11]	TAM	The adoption of social networks for business purposes by entrepreneurs is examined using the TAM model.	No new variables are incorporated, nor is the model extended.	Quantitative
Oppong et al. [18]	UTAUT	Entrepreneurship in relation to the use of information technologies is analyzed using both the UTAUT model and the Technological Opportunism Model.	No new variables are incorporated, nor is the model extended.	Qualitative
Franco et al. [10]	TAM	The TAM model is used to examine the positive influence of digital entrepreneurship on digitalization processes, establishing competitive advantages of digitalization: greater efficiency, better customer relationships, and improved employee behavior.	No new variables are incorporated, nor is the model extended.	Quantitative
Abaddi [8]	TAM	The phenomenon of artificial intelligence in relation to the intention of digital entrepreneurship is analyzed by integrating the Technology Acceptance Model (TAM) with the Theory of Planned Behavior.	The variables from the Theory of Planned Behavior are added to the TAM model.	Quantitative
Phuong Dung et al. [19]	TAM	The phenomenon of digital marketing in relation to entrepreneurship is analyzed, finding	The variables from the Theory of Planned Behavior, particularly the variables of	Quantitative

		a positive relationship between the intention to use digital marketing in technological entrepreneurship and the propensity to start business activities, using both the TAM model and the Theory of Planned Behavior, incorporating normative influence and behavioral control in the formation of entrepreneurs' intentions.	normative influence and behavioral control, are incorporated into the TAM model.	
Allawi and Alyouzbaky [7]	UTAUT	The phenomenon of digital entrepreneurship adoption among students is analyzed using the UTAUT model.	No new variables are incorporated, nor is the model extended.	Quantitative
Godswill and Margaça [30]	TAM	The TAM model is used to examine the intention to use AI by religious entrepreneurs.	No new variables are incorporated, nor is the model extended.	Qualitative
Gonzalez-Tamayo et al. [12]	UTAUT	The UTAUT model is validated to analyze entrepreneurial intentions, replacing the technological object of study with the phenomenon of entrepreneurship, from the perspective of entrepreneurial intention and its likelihood of success.	No new variables are incorporated, nor is the model extended, but the object of study is replaced.	Quantitative
Abaddi [9]	TAM	The Metaverse context is analyzed, focusing on the entrepreneur's learning, from both their personal characteristics and the characteristics of the digital environment. The Entrepreneurial Event Model and the Technology Acceptance Model (TAM) are related.	The Entrepreneurial Event Model is related to the TAM model.	Mixed
Barra et al. [24]	UTAUT	The phenomenon of the digital divide in relation to entrepreneurial orientation is analyzed, linking digital skills with the intention to adopt entrepreneurship-related technologies using the UTAUT model, showing that digital skills and perceptions of technological capabilities impact the intention to use technology in entrepreneurial activities.	No new variables are incorporated, nor is the model extended, but variables related to digital literacy gaps are considered.	Quantitative
Attree and Lewis [21]	UTAUT	The phenomenon of social media utilization by agricultural entrepreneurs, within the context of COVID-19 regulations, is explored using the UTAUT model.	No new variables are incorporated, nor is the model extended.	Qualitative
Hajoary et al. [25]	TAM	The role of digital technologies in circular emerging businesses as part of strategy is analyzed, identifying and analyzing factors influencing the	The Technology, Organization, and Environment model is	Qualitative

		adoption of digital technology in circular businesses, using the Technology, Organization, and Environment model and the Technology Acceptance Model.	related to the Technology Acceptance Model.	
Rahimi and Oh [20]	TAM 3	The phenomenon of the acceptance of Artificial Intelligence, Blockchain, and Internet of Things technologies in the context of technological entrepreneurship is analyzed. A critical analysis of the TAM model and its extensions is conducted as a tool for understanding this phenomenon related to entrepreneurship.	No new variables are incorporated, nor is the model extended.	Theoretical

Note: Prepared based on Web of Science.

The literature review (Table 8) highlights key studies on technological adoption in entrepreneurship. Moghavvemi and Salleh [15] combine UTAUT and the Theory of Planned Behavior, incorporating variables such as desirability and perceived feasibility to improve the original model, validated by Moghavvemi et al. [16], who show the impact of external factors like government policies and financial crises on entrepreneurs' technology adoption. Ketikidis et al. [14] emphasize the role of social media in entrepreneurial marketing, while Gavino et al. [11] identify a gap in platform usage by Latino entrepreneurs. Jaziri and Miralam [13] analyze crowdfunding, pointing out perceived risk as a barrier.

Abaddi [8] highlights the positive impact of GPT tools on digital entrepreneurship. Franco et al. [10] and Oppong et al. [18] confirm that digitalization improves SME efficiency. Allawi and Alyouzbaky [7] stress the relevance of effort expectancy and facilitating conditions in educational digital entrepreneurship. Agu and Margaça [31] analyze barriers to AI adoption in religious entrepreneurship. Gonzalez-Tamayo et al. [12] extend UTAUT to business success, while Rahimi and Oh [20] propose an adaptable approach for startups. Barra et al. [24] explore the digital and gender gap in entrepreneurship, and Hajoary et al. [25] investigate the integration of digital technologies in circular startups. Abaddi [9] analyzes the metaverse as a business space. Attree and Lewis [21] studied social media adoption by rural vendors during the COVID-19 pandemic.

This theoretical review provides a framework for the qualitative analysis of data from 24 Spanish-speaking entrepreneurs, supporting the interpretation of the findings. The methodology used is detailed next.

3. Methodology

The implemented technique adapts the semi-structured in-depth interview method known as metaphor elicitation, a methodology that uses images as stimuli to encourage reflection and dialogue about the investigated topic 32, 33]. In this case, the focus was on exploring the development of technology startups and the entrepreneurs' relationship with technology.

A purposive sample of 24 entrepreneurs was selected, all of whom participated voluntarily. During the interviews, each participant selected between 6 and 8 images from a randomly generated digital set composed of thousands of images. The purpose of this selection was to reflect their views on the investigated issue. Since the image set was operationally infinite and random, the visual stimuli were not controlled by either the interviewer or the participant. However, the final choice depended on the participant's creative ability to interpret and justify their selection.

The technique consists of eight flexible steps, adjusted to the needs of the key informants:

a. History of each image: The participant describes each selected image, explaining their choice and its metaphorical meaning in relation to the research topic.
b. Lost images: Reflection on images that could have been selected, exploring their potential meanings.
c. Discard redundant images: Elimination of duplicate or less representative images.
d. Creation of constructs: Comparison of three randomly selected images to identify similarities and differences, grouping two to six images into representative categories that serve for discourse coding.
e. Image distortion: Fictional expansion of the context of a significant image, reflecting on what might exist outside the frame or what happened before or after the scene depicted.
f. Creation of a sensory image: Development of a mental image based on sensory experiences (sound, smell, touch, color, emotion), with eyes closed to avoid the influence of prior images.
g. Storytelling in vignettes: Creation of a brief story structured in scenes or frames using the selected images.
h. Final collage: Creation of a collage with the discussed images, organizing them according to relevance and assigning a descriptive title.

This approach enabled the collection of rich metaphorical discourse and visual explanations that reflected the entrepreneurs' mental frameworks. Since the questions were indirect and stimulated by images, the risk of socially desirable responses was minimized, fostering authentic and creative answers.

The discourse analysis was carried out using Atlas.ti software, coding significant discourse segments that revealed thematic constructs. The segments were grouped into emerging categories, and those present in more than half of the participants were identified as significant. These categories were analyzed in a coding matrix, allowing for the validation of constructs related to the UTAUT 2 model.

The use of this innovative methodology not only helped to understand entrepreneurs' thinking about technology but also visualized their mental frameworks through metaphorical explanations, providing an inductive and emerging approach to the qualitative analysis of their perceptions.

4. Results

The content analysis applied to the results of the semi-structured interviews explored the relationship between the constructs of the UTAUT 2 model and the entrepreneurs' perceptions. Through coding, 99 relevant verbal statements linked to these constructs were identified and organized by topic. The distribution of statements was not uniform, as some interviews contained few responses, while others included numerous mentions of technology use. The analysis of the grouped statements led to the generation of theoretical propositions summarizing the analytical findings. These statements validate the application of the constructs to the entrepreneurial population.

4.1. Performance Expectancy

Performance expectancy, understood as the perception that using technology will enhance job performance [1], was confirmed by several statements from the participants. For example, Participant 3 emphasized the perceived usefulness of technology in improving performance, comparing it to a tool that turns dreams into reality:

I believe that the child must dream, and the computer, the technology, is what makes that dream come true. Technology helps us scale dreams and reach more people. (Participant 3)

This statement relates to the UTAUT2 model, linking technology with expectations of improved performance in entrepreneurship [10, 13, 14, 18] specifically the items stating that technology is useful for increasing productivity.

A similar statement is made by Participant 1:

"We face such a changing world that we need the freshest, most updated minds regarding new technologies. We must adapt, like I do, because I believe they contribute greatly to the development of startups. Obviously, everything is online; everything is related to technology in terms of processes to scale." (Participant 1).

Participant 2 reinforces the idea of positive performance expectations, confirming that this construct applies to entrepreneurs:

The connection is technology, meaning the connection it offers opens many markets, provides many opportunities, and automates processes. For me, it represents a new world, a fundamental part of all current and future business models. (Participant 2)

The idea that technology can enhance performance is further confirmed by Participant 3:

"Entrepreneurship is about learning, opening up, and connecting with what's happening, and how it can improve your project. That knowledge makes it flow; even if you don't understand it, technology is an ally, but it needs communication, it needs to flow, it needs bridges, and in the end, that will help improve and succeed in the project." (Participant 3)

Not only do entrepreneurs perceive benefits for themselves, but also for their broader environment [20, 25] as seen in Participant 6's statement:

"People encounter this technology, and that creates a better future for the planet. We all think about how to create more technology and things to help the sustainability of each person." (Participant 6).

Together, the statements related to performance expectancy reflect an optimistic attitude toward the use of technology to improve their entrepreneurial efforts. This attitude is widely supported by the literature, which views technology as a source of competitive advantage [12, 19-21, 24, 25, 30].

A relevant finding from these interviews is that no entrepreneur considered technology to be unhelpful, highlighting a generally optimistic view. This suggests that when measuring this construct in different samples of entrepreneurs, a positive bias may exist due to social desirability, as it is expected that technology will generally improve entrepreneurship. Thus, entrepreneurs may be predisposed to evaluate any technology as useful, even if it doesn't necessarily correlate with the intention to use or actual use. This perspective may differ from employees or consumers, as their work may be more variable and less tied to social desirability regarding technology. Their engagement is not necessarily linked to the overall performance of the business or an optimistic view of available tools, but to their own interests as employees.

In this regard, the following proposition is made:

Proposition 1**:** Performance expectations in entrepreneurial samples will exhibit a positive bias due to the phenomenon that it is socially desirable for technology to enhance business performance, without necessarily correlating with the intention to use or the actual use of technology.

4.2. Effort Expectancy

Regarding the construct of effort expectancy, defined as the perception of ease associated with using technology [1] various statements from the interviewed entrepreneurs were identified that address this issue. Specifically, Participant 1 highlights, in a previously reviewed segment under the performance expectancy construct, the following:

"We face such a changing world that we need to keep our minds fresh and updated with new technologies, which we have had to adapt to, as in my case" (Participant 1).

This segment, in addition to reflecting performance expectations, also underscores the need for continuous effort to update and adapt to technological transformations [20]. Thus, using technology involves being willing to face change and dynamically reconfigure the entrepreneur's capabilities. In the same vein, Participant 3 mentions how technology demands are placed on users, stating:

"That knowledge makes it flow; that process makes it flow, even if they don't understand that technology is an ally. They need communication; they need to flow; they need bridges" (Participant 3).

The demands that technology places on users, mentioned by Participant 3, are characterized by the need for both technological connection and the collaborative relationships it fosters in the entrepreneur's environment [10]. Unlike performance expectations, effort expectancy tends to vary according to the specific characteristics of the technology, as evidenced by studies on barriers to technology adoption for entrepreneurs facing complex or risky technologies [13]. A lack of information about the technology's attributes and a lack of specific technical knowledge [20] could lead to significant variability when measuring this construct among entrepreneurial populations.

In this context, it becomes relevant to incorporate other constructs into the model, such as perceived risk and trust in technology use, as shown in previous studies [17, 20]. Additionally, the perception of effort is linked to learning needs, which are also associated with the change and adaptation that Participant 1 mentions. Regarding learning, Participant 4 states:

"To build something, you have to be learning, because if not, technology evolves so quickly that it will pass you by" (Participant 4).

Moreover, along with the learning and adaptation needs in an ever-changing technological environment, the entrepreneur's role is defined as active in participating in this process [9]. The technological environment entails significant user involvement in its configuration. This is reflected in the statement from Participant 6:

"People have an active role in all the technological changes being proposed... We are in the era of technology, and all technology, for me, emanates from us as humans to face those challenges that technology itself presents" (Participant 6).

Thus, the different statements from participants about effort expectancy indicate that the need for adaptation and learning in a constantly changing technological environment generates a strong implication for technology users [9]. Furthermore, the literature suggests that the model could improve its predictive ability for entrepreneurs, as opposed to studies applied to employees, if variables such as perceived risk and trust in technology use are incorporated [17, 20]. This is reflected in the statement by Participant 15, who comments:

"Entrepreneurship is a risky sport" (Participant 15).

Proposition 2: Variability in effort expectancy will be related to constructs outside the UTAUT 2 model, linked to perceptions of risk and trust in technology use, variables that will enhance the model's predictive capability in entrepreneurial populations.

4.3. Social Influence

The construct of social influence, understood as the degree to which users perceive that using technology is important for others [1], was reflected in the testimonies of the entrepreneurs, although to a lesser extent than expected. Participant 6 emphasizes the role of society in technological changes, highlighting inclusion and equality:

"We must be inclusive, not create differences. It is true that women must accept their roles in technological transformation" (Participant 6).

However, a sense of loneliness in entrepreneurship also emerged, as reflected in the testimonies of Participants 15 and 19:

"The entrepreneur often works a bit solo" (Participant 15).

"It's a solitary activity" (Participant 19).

Thus, it is suggested that social influence on entrepreneurs may be weaker compared to other populations, especially if they belong to groups that are technologically marginalized.

Proposition 3: Social influence on entrepreneurs will depend on their membership in subordinated or technologically marginalized social groups, and it may be weaker for those operating outside these groups.

4.4. Facilitating Conditions

Facilitating conditions, understood as the infrastructure that supports the use of technology [1] are viewed positively by entrepreneurs. Participant 3 states:

"We are living in the fourth technological revolution, where technology is essential for scaling and expanding projects" (Participant 3).

This testimony reflects a positive perception of the environment, which facilitates the use of technology in entrepreneurship. However, this positive bias may decrease in socio-economically disadvantaged contexts.

Proposition 4**:** The perception of facilitating conditions will be positive in contexts of high technological innovation, but it may decrease in disadvantaged socioeconomic contexts.

4.5. Hedonic Motivations

Hedonic motivations, referring to the pleasure derived from using technology [1] are key for many entrepreneurs. Participants 7, 9, and 15 agree that work should be combined with pleasure:

"The laptop with that cocktail represents the idea of working nomadically" (Participant 7). "You must enjoy the world in which you work. After all, we create things. Work and pleasure are very much related" (Participant 9).

"The computer with a drink represents that not everything is work and sacrifice; there are also enjoyable moments that can be shared while working" (Participant 15).

Proposition 5**:** Hedonic motivations will strongly predict entrepreneurs' intention to use technology.

4.6. Perceived Price Value

Perceived price value, which addresses the relationship between cost and benefit of using technology [1] is a key factor in entrepreneurs' perceptions. Participants 20 and 24 emphasize the importance of costs in entrepreneurship:

"To start a business, it is crucial to know which tools and areas to cover to build the business" (Participant 20).

"It is necessary to rely on software and resources, which come at a cost" (Participant 24). Participant 3 also reinforces this idea:

"It is essential to believe in your project. If you believe in it, you must connect with people who can help you start, create teams, seek investors, and open doors to other markets to scale the project" (Participant 3).

Proposition 6: Perceived price value will strongly predict entrepreneurs' intention to use technology.

4.7. Habit

Habit, understood as the repetition of previous behaviors affecting current technology use [1] seems to have little relevance in the entrepreneurs' testimonies. Participants 1, 16, and 17 mention the importance of learning from experience, reflecting the dynamic nature of entrepreneurship:

"At some point, you are happy with what you do. The learning that comes from developing your business and adapting to new environments is essential" (Participant 1).

"It's a challenging experience. You face an environment where you must continuously adapt" (Participant 16).

"Entrepreneurship is like an emotional rollercoaster; the most important thing is to learn from the experience" (Participant 17).

Proposition 7: Habit will have a weak predictive effect on entrepreneurs' intention to use technology.

4.8. Behavioral Intention

Behavioral intention, understood as the willingness to use technology [1] is a relevant factor in the entrepreneurial context. The testimonies of Participants 1, 3, and 6 show their high level of engagement with technology:

"We face such a changing world that we must stay updated on new technologies. They contribute significantly to the development of startups" (Participant 1).
"The entrepreneurial process is a continuous learning journey, where technology is an essential tool to turn a dream into reality" (Participant 3).

"People have an active role in the technological changes being proposed" (Participant 6).

Proposition 8: Entrepreneurs' behavioral intentions will show a positive bias, as they are highly engaged with technology and predisposed to its use.

5. Conclusions

The results of this study provide a better understanding of the validity and relevance of the UTAUT 2 model in exploring how entrepreneurs perceive and use technology. Among the most notable findings is a generalized optimism about the positive impact of technology on their work. This optimism may be influenced by a social desirability bias, leading to an overestimation of performance expectations within this population. It would be valuable to compare these expectations between entrepreneurial and non-entrepreneurial groups.

Regarding effort expectancy, interview responses show greater variability. This suggests that the perceived difficulty of using technology depends on its complexity and the level of associated risk. Entrepreneurs tend to be more concerned about the effort required to implement new or complex technologies, which may influence their adoption decisions. Incorporating variables such as risk perception and trust could improve the model's predictive capacity, as demonstrated by previous studies [13, 17].

In terms of social influence, the study found that this factor might be less relevant for entrepreneurs compared to other groups. Many respondents mentioned feeling socially isolated in their work, suggesting that external pressures to use technology may vary depending on demographic and social factors.

With regard to facilitating conditions, entrepreneurs perceive a favorable environment, particularly in technologically advanced contexts, that supports the adoption of technological tools. However, this perception may not hold in economically disadvantaged settings, highlighting the critical role of the surrounding environment.

Hedonic motivations also proved to be a significant factor in technological adoption. The pleasure and satisfaction associated with using technology underscore the importance of technological tools being not only functional but also enjoyable, encouraging entrepreneurs to integrate them into their activities.

Perceived price value also plays a key role. Entrepreneurs, by nature, are highly aware of the cost-benefit ratio of technological tools, which influences their intention to use them. On the other hand, habit seems to play a less prominent role in their discourse, which is understandable given the dynamic nature of entrepreneurship, where constant change and adaptation are the norm. This contrasts with other groups where habit plays a more substantial role in technology adoption.

Nevertheless, the intention to adopt technology is reinforced by entrepreneurs' high involvement and proactive attitude toward exploring new tools. Overall, entrepreneurs demonstrate an optimistic and active approach to technology adoption, influenced by perceived performance, a favorable environment, and perceived economic value. Factors such as hedonic motivations and perceived price value may be decisive in their decision to use technology, while social influence and habit may play a less defining role.

This profile suggests that entrepreneurs view technology as an ally, although its adoption is shaped by various contextual and individual factors. The UTAUT2 model could be further refined for entrepreneurs by integrating constructs related to risk and trust in technology adoption.

References

[1] V. Venkatesh, J. Y. Thong, and X. Xu, "Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology," *MIS Quarterly*, vol. 36, no. 1, pp. 157-178, 2012. https://doi.org/10.2307/41410412

[2] F. D. Davis, "A technology acceptance model for empirically testing new end-user information systems: Theory and results," Doctoral Dissertation, Massachusetts Institute of Technology, 1985.

[3] F. D. Davis, "User acceptance of information systems: The technology acceptance model (TAM)," Working Paper No. 529. University of Michigan, School of Business Administration, Division of Research, 1987.

[4] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13, no. 3, pp. 319-340, 1989. https://doi.org/10.2307/249008

[5] V. Venkatesh and F. D. Davis, "A theoretical extension of the technology acceptance model: Four longitudinal field studies," *Management Science*, vol. 46, no. 2, pp. 186-204, 2000. https://doi.org/10.1287/mnsc.46.2.186.11926

[6] V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User acceptance of information technology: Toward a unified view," *MIS Quarterly*, vol. 27, no. 3, pp. 425-478, 2003. https://doi.org/10.2307/30036540

[7] W. H. Allawi and B. A. Alyouzbaky, "Factors affecting the adoption of digital entrepreneurship: A survey of private schools in Nineveh Governorate in Iraq," *Journal of Science and Technology Policy Management*, vol. 15, no. 1, pp. 1-20, 2024. https://doi.org/10.1108/JSTPM-09-2022-0164

[8] S. Abaddi, "GPT revolution and digital entrepreneurial intentions," *Journal of Entrepreneurship in Emerging Economies*, vol. 16, no. 6, pp. 1903-1930, 2024. https://doi.org/10.1108/JEEE-07-2023-0260

[9] S. Abaddi, "Metaverse, entrepreneurial learning and opportunity exploitation," *Journal of Entrepreneurship in Emerging Economies*, vol. 17, no. 3, pp. 744-773, 2025. https://doi.org/10.1108/JEEE-04-2024-0163

[10] M. Franco, L. Godinho, and M. Rodrigues, "Exploring the influence of digital entrepreneurship on SME digitalization and management," *Small Enterprise Research*, vol. 28, no. 3, pp. 269-292, 2021. https://doi.org/10.1080/13215906.2021.1938651

[11] M. C. Gavino, D. E. Williams, D. Jacobson, and I. Smith, "Latino entrepreneurs and social media adoption: personal and business social network platforms," *Management Research Review*, vol. 42, no. 4, pp. 469-494, 2019. https://doi.org/10.1108/MRR-02-2018-0095

[12] L. A. Gonzalez-Tamayo, G. Maheshwari, A. Bonomo-Odizzio, and C. Krauss-Delorme, "Successful business behaviour: An approach from the unified theory of acceptance and use of technology (UTAUT)," *The International Journal of Management Education*, vol. 22, no. 2, p. 100979, 2024. https://doi.org/10.1016/j.ijme.2024.100979

[13] R. Jaziri and M. Miralam, "Modelling the crowdfunding technology adoption among novice entrepreneurs: an extended TAM model," *Entrepreneurship and Sustainability Issues*, vol. 7, no. 1, pp. 353–367, 2019.

[14] P. Ketikidis, A. Solomon, L. Nersisyan, and F. Siavalas, *Digital social media marketing for entrepreneurs: Boosting brand image and innovation potential. In Responsible entrepreneurship: Vision, development and ethics*. London, UK: Routledge, 2016.

[15] S. Moghavvemi and N. A. M. Salleh, "IT-Related innovation adoption and entrepreneurship," in *Proceedings of the 5th European Conference on Innovation and Entrepreneurship*, 2010, vol. 728736.

[16] S. Moghavvemi, N. A. Mohd Salleh, W. Zhao, and M. Mattila, "The entrepreneur's perception on information technology innovation adoption: An empirical analysis of the role of precipitating events on usage behavior," *Innovation*, vol. 14, no. 2, pp. 231-246, 2012. https://doi.org/10.5172/impp.2012.14.2.231

[17] R. Oumlil and A.-E. Bennani, "Acceptance of e-entrepreneurship by future entrepreneurs in developing countries: case of Morocco," *Journal of Entrepreneurship: Research & Practice*, vol. 2014, pp. 1-10, 2014.

[18] G. Y. S. Oppong, S. Singh, and F. Kujur, "Potential of digital technologies in academic entrepreneurship–a study," *International Journal of Entrepreneurial Behavior & Research*, vol. 26, no. 7, pp. 1449-1476, 2020. https://doi.org/10.1108/IJEBR-03-2019-0156

[19] P. T. Phuong Dung, H. Minh An, P. Q. Huy, and N. L. Dinh Quy, "Understanding the startup's intention of digital marketing's learners: An application of the theory of planned behavior (TPB) and technology acceptance method (TAM)," *Cogent Business & Management*, vol. 10, no. 2, p. 2219415, 2023. https://doi.org/10.1080/23311975.2023.2219415

[20] R. A. Rahimi and G. S. Oh, "Beyond theory: a systematic review of strengths and limitations in technology acceptance models through an entrepreneurial lens," *Journal of Marketing Analytics*, pp. 1-24, 2024. https://doi.org/10.1057/s41270-024-00214-1

[21] K. Attree and C. Lewis, "Entrepreneurial responses to COVID-19 farmers' market closures-the experiences of rural micro vendors using social media," *International Journal of Entrepreneurship and Small Business*, vol. 52, no. 3, pp. 312-331, 2024.

[22] F. D. Davis and V. Venkatesh, "A critical assessment of potential measurement biases in the technology acceptance model: Three experiments," *International Journal of Human-Computer Studies*, vol. 45, no. 1, pp. 19-45, 1996. https://doi.org/10.1006/ijhc.1996.0040

[23] V. Venkatesh and H. Bala, "Technology acceptance model 3 and a research agenda on interventions," *Decision Sciences*, vol. 39, no. 2, pp. 273-315, 2008. https://doi.org/10.1111/j.1540-5915.2008.00192.x

[24] C. Barra, M. Grimaldi, A. Muazzam, O. Troisi, and A. Visvizi, "Digital divide, gender gap, and entrepreneurial orientation: How to foster technology adoption among Pakistani higher education students?," *Socio-Economic Planning Sciences*, vol. 93, p. 101904, 2024. https://doi.org/10.1016/j.seps.2024.101904

[25] P. K. Hajoary, D. S. Jennifer, and M. Pathak, "Digital technology adoption in circular startups: An integrated framework," *Business Strategy & Development*, vol. 7, no. 3, p. e425, 2024. https://doi.org/10.1002/bsd2.425

[26] Chilean National Institute of Statistics, *Survey on entrepreneurs and Internet usage*. Santiago, Chile: Chilean National Institute of Statistics, 2022.
[27] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "Technology acceptance model," *Journal of Management and Science*, vol. 35, no. 8, pp. 982-1003, 1989.
[28] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "User acceptance of computer technology: A comparison of two theoretical models," *Management Science*, vol. 35, no. 8, pp. 982-1003, 1989. https://doi.org/10.1287/mnsc.35.8.982
[29] National Institute of Statistics, *Summary of results of the 7th microentrepreneurship survey*. Santiago, Chile: National Institute of Statistics, 2022.
[30] A. A. Godswill and C. Margaça, "Digital transformation and religious entrepreneurship in Nigeria: Integrating artificial intelligence toward competitive advantage," *African Journal of Economic and Management Studies*, vol. 16, no. 2, pp. 305–319, 2024. https://doi.org/10.1108/AJEMS-06-2024-0349
[31] J. O. Agu and C. Margaça, "Barriers to artificial intelligence adoption in religious entrepreneurship," *Journal of Entrepreneurship and Innovation*, vol. 15, no. 1, pp. 45–60, 2024.
[32] R. H. Coulter and G. Zaitman, "Using The Zaltman Metaphor Elicitation Technique to Understand Brand Images," *Advances in Consumer Research*, vol. 21, no. 1, pp. 501–507, 1994.
[33] G. Zaltman and R. H. Coulter, "Seeing the voice of the customer: Metaphor-based advertising research," *Journal of Advertising Research*, vol. 35, no. 4, pp. 35-51, 1995.