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Digital Social Innovation in Latin America: A Qualitative Comparative Analysis Research in Progress

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Abstract

Governments are under increasing pressure to meet the Social Development Goals (SDG) by 2030. Digital social innovation has been perceived as an important strategy to address several of the social and environmental needs of developing countries, especially Latin America. Digital social innovation results from the digitalization of resources, capabilities, processes, products, services, and business models with the goal of addressing a social or environmental need. Little is known about the factors that promote the success of these business initiatives in Latin America. In this paper, we analyzed 100 companies that developed and commercialized these initiatives and identified 4 general factors that might influence the success of these initiatives. Applying fsQCA and as preliminary results, we found that the prominence of the company, the type of technology used in the service or product offered, and funds raised are key factors to promote digital social innovation initiatives that are financially sustainable and socially scalable.

Keywords: Digital Social Innovation, ICT, fsQCA.

1. Introduction

Digital social innovation (DSI) has been regarded as a key platform to enable the required systematic changes needed in achieving sustainable development goals (SDGs) by, for example, providing affordable access to information or services to marginalised communities (Escobedo et al., 2021). DSI tends to be embedded in a collaborative ecosystem where innovators, users, and communities cooperate, co-create and co-innovate through digital technologies (Bria et al., 2015). Due to its social mission, most DSI initiatives are led by government agencies, charities, trust, cooperatives and non-government organizations (NGOs). However, given the scope, scale and current regulations to meet SDGs, these initiatives are more likely to include cross-sector partnerships and various stakeholders (Qureshi et al., 2021).

Digital innovation is growing in Latin America despite the frequent political turmoil. Notwithstanding the impact of the pandemic and the emergence of governments prone to economic intervention, venture capital has afloat into Latin America, especially the venture capital investment in technology (Hermans et al., 2020). In 2022, there were nearly 50 unicorns in tech ventures, referred as a new companies valued over $1 billon. Brazil has the largest number of unicorns, with Mexico and Argentina following close behind (Cancino et al., 2022). Despite this growth, DSI has not reached the same success and few start-ups when reached the unicorn status maintain their social mission of the business initiative.

With the intention to explore the reasons of why DSI has not reached the expected and desired reach in comparison to the general digital innovation entrepreneurship in Latin America, this study aims to identify key characteristics among companies that have successfully embarked in successful DSI

initiatives – referred to initiatives that are financially sustainable and socially scalable. In addition, we explore basic configurations of these initiatives that can promote future sustainable DSI initiatives.

Based on prior studies that investigated common characteristics among tech-centric unicorns and on a list of a 100 of digital social initiatives that are transforming the region, we identify four characteristics that could play a critical role in the success of these DSI business initiatives in the region. We then follow a research approach that uses information from secondary sources, applying fuzzy set quantitative comparative analysis (fsQCA) to identify specific configurations of identified characteristics of successful initiatives in Latin America that have DSI as their hallmark. The configurational approach of fsQCA allows to identify combinations of characteristics that together result in a successful scalability and social impact in the region. We created our sample of business initiatives (or cases) based on a list developed by the center for social innovation at ESADE (Buckland et al., 2018) of 100 digital social innovation initiatives that are transforming Latin America. We ultimately identify a set of configurations that influence the degree of social reach and sustainable economic and financial impact of these initiatives. Our research seeks to contribute to the literature on leveraging digital social innovation in Latin America to create an international impact that transcends borders, understanding the role of technology in the development of digital social innovations, and thus, giving emerging companies the opportunity to strategically use their limited resources in order to increase their impact on the region.

2. Literature review

2.1 Digital Social Innovation
Digital innovations have disrupted and transformed economies in the last two decades by developing digital platforms and exploiting internet-based infrastructures (Jha et al., 2016). These innovations have led economies to promote models of sharing economies, collaborative consumption, and crowdsourcing. Compared to commercial use of information communication technologies (ICTs), the digital transformation and impact in the social space has rather been slow, especially in using digital technologies to address societal challenges (Shalini et al., 2021). This innovation is defined as Digital Social Innovation (DSI).

DSI refers to the use of digital technologies in the development and implementation of innovative products, services, processes, and business models that seek to improve the well-being of socially disadvantaged groups or address social problems related to marginality, inequality, and exclusion (Qureshi, Pan, & Zheng et al., 2017; Shalini et al., 2021). That is, DSI is usually perceived as less about technological innovation and more about social innovation, a process of finding innovative, effective, and sustainable solutions to urgent societal challenges, such as those listed in the Sustainable Development Goals (SDGs).

DSI are enabled by technologies that range from a simple WhatsApp-enabled groups (Parthiban et al., 2021) to a more complex supply chain advanced blockchain-enabled technology (Hota et al., 2021). These technologies enable the transformation of the most expensive and often lacking public services such as healthcare, education, energy, agriculture and environmental monitoring and protection (Pee et al., 2021). Prior studies identify several cases of DSI, despite of not using the DSI term itself. For example, studies in social enterprise have examined the leverage of technologies to address societal challenges. Some studies have studied how a financial intermediary leveraged a digital platform to provide small loans to marginalised farmers (Ravishankar 2021) or how a social intermediary uses block chain technology to offer affordable prices to rural farmers (Hota et al., 2021). Other successful examples of DSI intiatives in Latin America are Nubank, an independent digital bank that offers affordable financial services such loans and checking accounts to socially disadvantaged people. This

company has raised more than \$3B USD and has impacted more than 36 million people in Latin America (Reich 2022).

Despite a few existing and promising DSI initiatives; most DSI initiatives still operate on a small scale due to low level of investments, both public and private. A successful scalability of DSI initiatives occurs when a pilot project reaches a satisfactory level of performance and can be implemented on a larger scale to provide greater social value creation (Webb et al., 2010). A DSI initiative is considered successful when it reaches a systemic change in the market chosen by reaching a considerate large population.

2.2 Characteristics of Tech-centric Entrepreneurship

A recent study done at the University of Chile (Cancino et al., 2022) explored the common characteristics among the tech-centric unicorns in Latin America between January 2021 – February 2022. The study identified four common characteristics of these initiatives: (i) disruptive and innovative; (ii) focused on the use of technology and digital tools; (iii) sought to operate on a global scale not just locally, and (iv) venture capital played a key role in their development. In addition, these initiatives have been founded by entrepreneurs with prior and successful experience in the creation of new businesses and with postgraduate studies from Ivy league business schools. Due to this experience, these entrepreneurs tend to have larger networks that allow them to establish new collaboration and to seek external knowledge, infrastructure, and research.

This study also suggests that most unicorns tend to be successful in more developed economies with higher level of education, and thus human capital. The authors also highlight the need to promote the use of new technologies in diverse industries through the implementation of subsidies or other benefits that could increase the adoption of these new business models. That is, governments should support an ecosystem that promote private investment to these initiatives, programs such as tax reductions or changes in the regulatory framework of countries seem to have been successful programs to promote innovation.

3. Methodology

We performed fsQCA to establish configurations of the identified characteristics that promote digital social innovation initiatives that are financially sustainable and socially scalable. fsQCA is often perceived as a suitable method for determining causal relationships in a complex context such as digital innovation in which non-linear behavior can be present (Munoz et al., 2019). One of the big differences with other methodologies is that instead of looking for conditions common to all instances of the result, fsQCA focuses more on the possibility that the same result can be described through different combinations of conditions (Ragin et al., 2008). fsQCA identifies configurations of conditions rather than symmetric dependency relationships (i.e., those identified using variance-based models such as regressions). fsQCA facilitates the consideration of asymmetric relationships—while the presence of a predictor might lead to the achievement of an outcome, its absence does not necessarily imply that the outcome will not occur. Its presence could potentially lead to an outcome when combined with other specific predictors (or characteristics) (Fiss et al., 2011). The analysis consists of three steps. First, a truth table depicting all potential configurations is defined. Each case is assigned to a table row along with the degree to which the particular case corresponds to its assigned row. Second, the table is reduced using frequency and consistency thresholds. Frequency refers to the number of cases assigned to a single row. Therefore, the frequency threshold specifies the minimum number of cases required to support a row in the truth table empirically. Consistency indicates the degree to which the cases empirically support the given truth table row. Based on the selected thresholds, the truth table is reduced to solution formulas presenting configurations of conditions that lead to the required outcome (Ragin et al., 1987;

Soto Setzke et al., 2020). To evaluate the quality of the resulting solution set, fsQCA provides measures of consistency and coverage.

3.1 Cases selection and data collection

We used the list of 100 DSI initiatives identified by ESADE (Buckland et al., 2018). These initiatives were identified using the following criteria:

- A group of experts from different fields classified the type of innovation in the four categories suggested by NESTA, the British foundation organization for innovation. These categories were: open knowledge (e.g., platform the crowdfunding), open networks (e.g., bandwidth infrastructure in remote areas), open data, and open technology (e.g., real-time information).
- The initiative contributes to the achievement of one or more SDGs.

Please refer to the references (Buckland et al., 2018) to access the complete and detailed list of the companies selected.

We collected additional information of the companies from secondary sources such as Crunchbase (platform that groups business information on private and public companies), LinkedIn (social network oriented to business use, business and employment), Google News (news aggregator and search engine), Web pages of the companies (information provided by the different organizations in an official manner).

The information collected for each of the initiatives can be summarized by name, country of origin, ODS challenge, year of foundation, investment raised, number of people impacted, business model, IPO status, industry, founder's name, founder's country, founder's previous experience, type of the technology that enables the solution, active digital technologies.

Based on prior literature and as a preliminary stage of our research, we examined four characteristics that play the role of causal conditions in the fsQCA model. There are:

Previous experience of the founder: Founder's experience in relation to innovation and entrepreneurship in startups.

Funds raised: Capital raised in investment rounds by the startup. All investment rounds are considered, from pre-seed to series C.

Technological complexity of the service or product offered: Considers the number of technologies required to enable the solution and the type of technologies (software or hardware). The greater the number of technologies and the different types of technologies that enable the solution, the greater the technological complexity.

Prominence or recognition of the firm: Takes many signals into account, including the number of connections a profile has, the level of community engagement, funding events, news articles and acquisitions.

As an outcome measure of the fsQCA model, we selected the reach of social impact and viability of the business model. The DSI initiatives (or cases) were classified in: Startup phase (e.g., initiatives in their initial stage that already demonstrate a viable model and have reached less than 5,000 people); Consolidated phase (e.g., a sustainable economic model that have reached more than 5,000 people); and the international phase (e.g., for initiatives that operate in more than one country in Latin America, or even other regions, and that in many cases have already impacted more than a million people)

The software used in the 5odelling is fsQCA 3.0 (Compass, n.d), available on the website of the creator of the method. The algorithm used for the truth table solution is Quine-McCluskey. Note that due to character limitations, each column has been abbreviated, being CBRank (firm position in Crunchbase ranking), TFA (total founding amount raised), Eexp (founder's previous entrepreneur experience), Complex (technology complexity), impact (people impacted). The column "number" is the total amount of cases that show the configuration.

4. Preliminary Results

Table 1 presents the results of the Truth Table (table that lists in its rows all the theoretically possible configurations of the causal conditions).

CBRank	TFA	Eexp	Complex	Number	Impact	Raw consist.	PRI consist.	SYM consist
1	1	1	1	1	1	0.961722	0.636364	1
1	1	1	0	1	1	0.907173	0.696552	0.782946
1	0	0	0	1	1	0.87472	0.762712	0.762712
1	1	0	1	1	1	0.869942	0.383562	1
0	0	1	0	6	0	0.777164	0.553505	0.769231
0	0	0	0	3	0	0.771084	0.537994	0.662922
0	0	0	1	1	0	0.731343	0	0
1	0	0	1	1	0	0.698979	0.276073	0.276073

Table 1: Truth Table

Preliminary results in Table 2 confirm that the set relation between configurations of conditions and the outcome is highly consistent: individual results are above .8 and overall consistency is almost .80. The total coverage of the solution is near to .50, which indicates that causal paths explain most of the outcome.

Solution/Condition	CB Rank	Technology complexity	Founded amount raised	Previous entrepreneur experience	Raw coverage	Consistency	Solution coverage	Solution consistency
CBRank*~Complex	●	○			0.392676	0.87453	0.484507	0.794824
CBRank*TFA	●		●		0.390423	0.806752		

Table 2: Model solutions

Table 2 presents the results of the fsQCA. We follow the notation suggested by Ragin and Fiss (2008). The fsQCA reveals two significant configurations for DSI initiatives in Latin America. Focusing on the core conditions (big circles), the first condition indicates that leveraging the prominence of the firm and offering a solution with low technology complexity are essential characteristics of successful DSI initiatives in the region that are starting (e.g., start-ups and unicorns). In particular, the Crunchbase ranking used as proxy for the prominence of the firm represents the importance for scaling and thus the

subsequent social impact (greater number of people in more countries) and positioning of the DSI initiative in the ecosystem. The prominence also refers to events and news, types of investment, equipment, and number of workers. In addition, the technology must be highly scalable and easy to adopt, therefore of low complexity. Such cases are more related to platform-type technologies, which allow the target audience or client to be massive, such as a smartphone or laptop.

The second configuration suggests that prominence still plays a significant role for firms in a more stable stage in addition to the funds raised. Although previous studies have not shown a direct relationship between the investment raised and the success of the initiative, in this case it can be inferred that raising a greater amount of investment raised translates into investor confidence and validation of the business model. In turn, high investments allow startups to be able to scale their digital models in order to penetrate and impact a greater number of clients.

For this study, the previous experience of the entrepreneur does not seem to be a determining factor for the scaling and impact of the initiatives, although it is possible that this experience could be used for the successful development of the initiatives, as well as for the generation of trust to capital raising.

5. Conclusion

The objective of this research was to identify key characteristics among companies that have successfully embarked in DSI initiatives that are financially sustainable and socially scalable. Since most research has focused on exploring the factors and theoretical frameworks to understand and promote digital innovation, we wanted to examine a more specific domain in this literature, the digital innovations developed to meet and address societal challenges in Latin America. DSI is sought to be a promising solution to meet the persistent economic and social inequalities as well as the environmental issues in Latin America. Therefore, we analyzed case studies of approximately 100 DSI initiatives in Latin America to identify the common characteristics and configurations that have make them successful in their vision of meeting a social need. Based on prior literature and a recent study of tech-centric entrepreneurship in Latin America, we identified and examined four common characteristics. Applying configurational analysis using fsQCA, we found out that the technology used for the solution or product to offer (e.g., accessed through an app via smartphone versus a block-chain enabled technology) is a key resource in enhancing the scalability of the initiative as well as the efforts in keeping a prominence of the firms in the ecosystem. In addition, raised funds are also a key resource for the DSI initiative to scale internationally. We continue our exploration of factors that can promote these initiatives and sustainable business model that can support the development and growth of these innovative ideas.

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