

## SECURITY ISSUES FOR DIGITAL TECHNOLOGY ENTREPRENEURSHIPS AND STARTUPS

Tinatin Mshvidobadze  
Professor Gori State University (Georgia)

**ABSTRACT:** The unprecedented digital revolution has transformed the meaning and forms of entrepreneurship across the globe. In this article is proposed a conceptualization and characterization of three different phenomena: technology entrepreneurship, digital technology entrepreneurship, and digital entrepreneurship. Each of them has different origin and different emergence dynamics, and in most cases, they generate rather different trajectories for growth and technology evolution.

It is shown the different cybersecurity trends and threats for Startups.

**KEYWORDS:** *Entrepreneurship, startup, digital technologies, cybersecurity, sensors.*

### INTRODUCTION

This article is focused on the identification and description of technology entrepreneurship in times of digitization. Based on current examples, we identify and describe characterizations of technology entrepreneurship, digital technology entrepreneurship, and digital entrepreneurship.

According to the MacInnis approach, we describe the different types of technology entrepreneurship and their characteristics. On this basis, we propose and discuss conceptual differentiation[1].

The overwhelming focus on technologies innovation might acquire an ambiguous meaning when related to startups [2]. Firms operating into the so-called traditional sectors of Western countries often exhibit higher growth rates than firms placed at the technological border.

The incoming of digital technologies in the realm of entrepreneurship represents a new challenge for entrepreneurs and policy makers. When applied to manufacturing, digital technologies (such as social media, mobile computing, data analytics, 3d printing, cloud, and cyber solutions) lead to a remodeling of productive patterns originating new market opportunities, higher revenue streams, faster time-to-market, enhanced service provision, and increased productivity [3]. Moreover, digital technologies also deeply modify the boundaries of products and processes, in doing so transforming the nature of uncertainty inherent entrepreneurial processes and outcomes, as well as the ways of dealing with such uncertainty. All these changing's are shifting the traditional way of creating and doing business, determining the emergence of a new specific type of entrepreneurship, the *digital entrepreneurship*[4]. specific digital knowledge base and ICT markets, the creation of digital business environments, an easier access to finance facilitations, the diffusion of digital skills, the creation of e-leadership, and the creation of entrepreneurial culture. These complex aims assume a heuristic and wide-ranging approach that, presumably, requests a reconsideration of the logic that leads to the emergence and development of startups operating in the digital setting.

The innovative and entrepreneurial critical processes become linked to the entire external environment, considered as a place of aggregation of individuals, companies, individual talents, institutions and support services. This feature is consistent with the needs of digital entrepreneurship, where the most important

productive factors are the availability of specialized personnel, of venture capitalists, and knowledge generation sources. To be placed in an ecosystem also could help all the memberships companies to obtain legislative rules that ensure, for example, the ownership of the innovations introduced and the cybersecurity of client companies, in doing so encouraging the adoption of the same technologies [5].

### **Implications for Digital Technology Entrepreneurship**

A significant contribution to the definition of technology entrepreneurship as a field was made by Tony Bailetti [6]. His definition not only changed how organizations connect with users, but also transformed the importance of technology entrepreneurship.

Studies by Davidsson and Brush have shown that the type and nature of technology opportunities can be a key factor in driving the entrepreneurial process[7]. According to Nambisan, digital entrepreneurship is much closer to information systems' concepts of artefacts, platforms, and information infrastructure. Digital technology entrepreneurship refers to technology: its products are technological [8].

Table 1 provides some examples of entrepreneurial firms that can identify the differences between types of technology entrepreneurship. The proposed typology, as Drori points out, aims to connect traditional science-based technology entrepreneurship with university intellectual property[9] to new and rapidly developing Internet-based digital startups.

According to Fauchart, each of these types of firms may respond to specific entrepreneurial motivations towards their founders, which may reflect a combination of multiple entrepreneurial identities or specific dominant identities [10]. However, digital entrepreneurs are expected to be able to sell their players to a larger player, effectively transferring their customer base to the new firm.

Digital technology entrepreneurs, unlike digital entrepreneurs, do not rely solely on the innovative ecosystem. They strategically combine technological product knowledge with consumer know-how. From an academic perspective, researchers could use the different classifications of entrepreneurship to learn more about the personal motivations of entrepreneurs and their founding behaviours, financing preferences, etc.

Westerlund, Leminen, and Rajahonka [11] describe the example of new entrants in the Internet of Things (IoT) ecosystem, where the lack of structure and solid standards in the ecosystem increase the complexity of entrepreneurs' decisions.

Typology	Example	
Technology Entrepreneurship	Fractus (www.Fractus.com)	Started as an academic spin-off, Fractus was a pioneer in the development of internal antennas for smartphones. They first attempted to commercialize their new antenna designs as a finished product, but then realized that it made more sense to just focus on R&D, patenting and licensing their technology to manufacturers and OEMs such as Nokia, Samsung, or Motorola.
	Oryzon Genomics (www.Orizon.Com)	Founded by bio-pharmaceutical researcher's Oryzon's first decade of operations was focused in offering genomics diagnostics. The company took-off in 2008 when it shifted its focus developing proprietary drug candidates and licensing to large pharmaceutical such as Roche.
	Rust Patrol (www.rustpatrol.com)	The technology was invented by a chemistry professor, and it offered a potential alternative a solution to address metal corrosion. A decade later, in 2014, two students joined the researcher to successfully start commercializing anti-corrosion products for industrial and consumer needs.
Digital Technology Entrepreneurship	Go pro (www.gopro.com)	Founded by surfer frustrated with the limited options he had to take nice action shots, Go pro become a manufacturer of action cameras and created a new category in the market. It is good example of user entrepreneurship.
	Fitbit (www.fitbit.com)	Started by a team IT professionals that identified the untapped potential of sensors and wireless technologies, it transformed from being a consumer electronics to a digital healthcare company.
	Tesla (www.tesla.com)	First a hobby electric car, it was one of the rare successful attempts to build an electric sports car from scratch. In a few decades, it has become a disruptor in the automotive industry, challenging the innovation pace and accelerating the technological development of electric vehicles.
Digital Entrepreneurship	Air bnb (www.airbnb.com)	What started as an idea to make a bit of money by renting space in an apartment, quickly become a popular site for people to share and find accommodation. After failing to attract business angels, it was only after being part of an acceleration program in 2009 that is started to gain traction as an accommodation-sharing platform
	Just Eat (www.just-eat.com)	An attempt to make takeaway ordering an option for all types of restaurants in 2001 was the birth of one of the largest networks of international restaurants that offers online ordering in an increasing number of countries around the world.
	Dropbox (www.dropbox.com)	The idea of having a user's files synchronize in the cloud was behind in the digital storage company that has successfully competed with the largest software firms. Since 2009, when the competitive treat of the iCloud arose, they have managed to keep growing what was once a feature into a full product line for consumers and businesses.

Table 1. Examples of different types of technology and digital entrepreneurship

The successful I-Corps program (<http://www.nsf.gov/i-corps>), implemented by the National Science Foundation in the United States, it is a remarkable example of how digital technology entrepreneurship also activates new policies and support mechanisms. The digital core of new technologies allows for accelerated approaches to market validity and early growth.

One of the most quoted scholar, Audretsch DB. of entrepreneurship states that new firms do not always have an innovation propensity higher than incumbent firms, “even for a developed country such as the United States, only a very small fraction of new startups is really innovative” [12]. Without innovative capacity, in a contestable market, these firms have limited chance to grow.

As researchers agree to sustain that the entrepreneurial process is the result of a complex interaction between individuals, cultural, social, and environmental factors, the alternative that is intended to endorse and concentrate efforts on entrepreneurs/aspiring entrepreneurs who show the best business plans, the preeminent entrepreneurial features, and the ability to withstand market difficulties [13,14].

These entrepreneurs have the higher probability of founding and managing entrepreneurial ventures.

### ***The concept of startup***

Consistent with the pillar of Schumpeterian theories, the focus of a startup is expected to be on innovation. Innovation understood as a positive change compared to a pre-existing situation, therefore not only technological but also managerial, organizational, productive, or technical, that allows and sustains a company in the proposition of a profitable business model.

As reminded by Blank [15], a scalable startup created from the very beginning by founders who believe that their proposal could change the world.

A Consistent with Blank, a scale ups can be framed as fast growing startups that have already overcome some phases on which the activity of the startup is focused. A scale up stands out for some parameters attesting its success like market traction, 1–10 million € turnover annually, at least 1 million users (in the b2c), 20% growth in revenues or headcount for 3 years running after at least 10 people and \$ 1 million in revenues, and 20% of the turnover from the foreign market [16].

The incoming of digital era certainly is a source of uncountable opportunities. A new wave of economic openings linked to the Industry 4.0, where digital platforms will be coupled and connected with sophisticated infrastructures of sensors, cyber-physical systems, and robots, is expected [17]. In this perspective, according to Brown and Mason [18], this possibility is linked to the capacity to create a specific business environment consistent with scale ups needs. Only when effectively planned, this framework provides consistent outcomes. In Italy, for instance, the low number of scale ups created is not believed to depend on the lack of quality startups but mainly on their need to move abroad to find sufficient risk capital investments for tackling scaling, as well as for the shortage of connections with external actors.

By Brown and Mason recommended, new policy measures are requested, as the environments in which scale ups prosper are distinct from those which have high rates of startups [19].

To this purpose, the necessity to create a distinctive type of supportive economic and social framework emerges to establish steady and productive relationships among all the local stakeholders; to provide relational forms of support, instead of money-based facilities that have showed limited impact [20]; to attract different businesses funding resource targeted to the specific requirements of the businesses; to nurture the developing of the innovation system joining local customers end users, suppliers, universities, and so on ; to guarantee the recognition of unprotected and open sources innovations, respect on technological innovations and the protection of intellectual property rights; and to limit its action at regional or local level by Bosma NS, and Sternberg R. [21]. As by Isenberg DJ. The specific environments and specialized resource scale ups and HGFs need are usually defined in ecosystems[ 22].

***An ecosystem for the emerging of scale ups***

In the last decade, the *entrepreneurship ecosystem approach* has emerged as response for the propagation of scale ups and HGFs in general.

Evidence shows that ecosystems have typically emerged in places that already have an established and highly regarded knowledge base which employs significant numbers of scientists and engineers. Universities, research and corporate R&D laboratories are a primary source of skilled personnel who can found innovative startups [23]. Anyway, sometimes the substantive disconnection between universities and their surrounding local entrepreneurial and innovation ecosystem belittles entrepreneurial spillovers from universities.

Three types of services facilitating the process of business startup and growth by enabling new firms to focus on their area of expertise can be highlighted: specialist business services (law, marketing, accountability, management, consultants familiar with the unique needs of technology startups, technology marketing and assessment consultants, and PR firms), technical services offering precision machining, prototyping, testing, and so on, finance providers, such as venture capital firms or investment banks.

***The digital technologies***

According to EC (European Commission) With specific regard to digital startups, “the biggest transformation in business the world has seen in over a century” [24], they are radically changing the way people live, work, communicate, and play. Their pervasive diffusion is also causing significant repercussions on the dynamics of companies in European countries: 2.6 new digital job for each job destroyed is expected, manufacturing can achieve growth from 15 to 20% by 2030 if digitalized, revenue coming from digital technologies will growth of 2% for year, big data technology and services are expected to grow worldwide to USD 16.9 billion in 2015 at a compound annual growth rate of 40%, while companies using that data become 5–6% more productive.

Consequently, by proceeding with digital technologies adoption and implementation, an almost infinite number of economic opportunities for existing or new ventures is emerging, waiting to be grasped. Even more by considering that the boundaries of digital technologies in the three interrelated components of digital artifacts, platforms, and infrastructures are still unexplored, and every innovation such as cloud computing, data analytics, online communities, social media, 3D printing, and digital maker spaces contains indefinite applications.

In this way, the traditional funding gaps for new businesses, particularly in technology sectors, normally looking for small amounts of finance, can also be easily filled.

An ecosystem guarantees the passage of the traditional business environment to one no longer linked to individual or company factors but to a network of specialized partners with a wide availability of knowledge and open innovations.

Not by chance, some authors [24] put cities as the key organizing unit for innovation, entrepreneurship, and economic growth and argue about how digital startups and scale ups may take in place in cities and, sometime, require them as preferential ecosystem that help lever their development [25].

***The different cybersecurity trends and threats for Startups***

Establishing trust as a startup can be a long and demanding process. Cybercriminals target startup businesses because security measures may not be fully in place yet. Customer trust is critical in a time of widespread cybercrime and data privacy attacks. Startup owners now face the challenge of building consumer confidence as they build their business.

Cyberthreats and privacy issues can seriously affect enterprise. Recent studies show that 87% of consumers will do business elsewhere if a company is untrustworthy.

***Recommendations for cyber security***

1. Get the latest Cybersecurity Software - Hackers are devising more ingenious ways to break into systems and infect it with malware or steal data. Get the best and latest cybersecurity software you can get.

There is a lot of reliable security software recommended by experts that have a vast network enabling them to discover the latest malware attacks and develop bug fixes and security patches right away for their users.

2. Use a Robust Internet Security Suite and Firewall - With such a program, you can prevent accidental downloading of malicious software, and better detect and stop attacks like MITM (Man in the Middle), phishing, Trojan malware, and the like.<sup>1</sup>

3. Install SSL (Secure Sockets Layer) Certificate - It is a standard security protocol to install an SSL or Secure Sockets Layer. Trust brings in higher web traffic, and higher web traffic drives sales. 85% per cent of online customers say they refuse to purchase from a website with no SSL certificate. Site URLs that start with HTTPS can encrypt standard HTTP requests for a more secure shopping experience.

4. Set Up a Secured Cloud Storage -Cloud-based storage and back-up solutions add another layer of security to your business.

5. Create a Culture of Cybersecurity in Your Team- It is about building a culture of security protocols in your team.

6. Use Strong, Complicated Passwords - Every member needs to have their own network account. Require this from your customers as well.

7. Require your online vendors to prioritise security.

**Conclusion**

A flourishing entrepreneurship research stream believes that a chance to reach the above objectives lies in the ability to implement specific business environments called ecosystems. These are targeted on selective measure supporting the emerging of ventures with innovative business models but also their development and growth .

Moreover, the ecosystem needs to involve, since the beginning, many stakeholders/actors (at least an interested large corporation, policy makers, local bankers, and venture capitalists, people acting on the local culture, local universities, etc.) [26].

Nevertheless, both domains and actors are characterized by proximity and include hundreds of variables interacting in highly complex and idiosyncratic ways.

Beyond this theoretical-conceptual paper, aimed to connect the increasing sector of digital firms with a specific business environment, future surveys should focus their analyses at least on three directions. Firstly, a clear individuation of the needs and resources requested by digital firms and startups in the light of their own specificities; secondly, the detailed examination of the operative mechanisms of existing ecosystems precisely focused on digital technologies; and lastly, data management system and cybersecurity should be one of your company's top priorities.

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<sup>1</sup> <https://www.softvire.co.nz/kaspersky-total-security-2019-review/>

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