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**KEY FACTORS AND IMPLICATIONS FOR A
BUSINESS NETWORK TRANSITION
IN THE METAVERSE:
THE CASE OF FUTURE FASHION**

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ABSTRACT

Il presente elaborato si propone di analizzare, con un approccio teorico e pratico, come le start-up si sviluppano in una rete di imprese in costante movimento. Si propone di capire come e grazie a chi (attori terzi, istituzioni) le start-up portano innovazione in un ambiente dinamico e ultra-competitivo.

Il Capitolo I approfondirà dal punto di vista teorico due fenomeni che si intrecceranno nella parte finale del capitolo stesso: l'innovazione e le relazioni nella rete d'impresa.

Nel Capitolo II le luci saranno puntate sul secondo pilastro di questa ricerca: Metaverso e Web 3.0. Questi due concetti sono attuali, dove la letteratura è solo agli albori, nel prossimo futuro le aziende cambieranno ed evolveranno drasticamente l'organizzazione del proprio business e il modo di competere con le altre realtà.

Nel capitolo III la ricerca si sposterà su un'analisi più verticale applicata all'industria della moda e del lusso. L'interesse per questo settore è dovuto al modo peculiare in cui i marchi della moda e del lusso combinano l'innovazione digitale all'interno e all'esterno delle proprie organizzazioni. In questo capitolo verrà illustrato un numero limitato di casi di studio, con un paragrafo finale in cui verranno evidenziati gli effetti dell'innovazione digitale e del Metaverso in altri settori come l'automotive, la logistica, la formazione professionale, ecc.

La parte finale, il Capitolo IV, è incentrata sul caso di studio di Future Fashion, in cui verrà illustrato il modo in cui l'azienda utilizza l'innovazione digitale per creare un vantaggio competitivo in un approccio interfunzionale all'interno dell'organizzazione. Il presente e le prospettive di Future Fashion sono supportati dall'analisi e dalle ricerche effettuate nei mesi precedenti all'interno dell'azienda e dalle interviste a figure critiche dell'organizzazione. La ricerca è stata condotta tra agosto 2022 e maggio 2023.

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INTRODUCTION

This paper aims to analyze, with a theoretical and practical approach, how start-ups develop in a constantly moving business network. It aims to understand how and thanks to whom (third actors, institutions) start-ups bring innovation in a dynamic and ultra-competitive environment.

Chapter I will take a theoretical in-depth examination of two phenomena that will become intertwined during the final part of the chapter itself: innovation and relationships in the business network.

In Chapter II the lights will be on the second pillar of this research: Metaverse and Web 3.0. These two concepts are actual, where the literature is just at its beginnings, in the near future the companies will change and evolve drastically the organization of their business and the way to compete with other realities.

In chapter III the research will move to a more vertical analysis applied to the Fashion and Luxury industry. The interest for this industry is due to the peculiar way the fashion and luxury brands combine the digital innovation inside and outside their own organizations. A limited number of case studies will be illustrated in this chapter, with a final paragraph where the effects of digital innovation and the Metaverse will be highlighted in other industries such as Automotive, Logistics, Job Training etc.

The final part, Chapter IV, is focused on the case study of Future Fashion in which will be illustrated the way the company uses digital innovation to create a competitive advantage in a cross-functional approach within the organization. The present and the perspectives of Future Fashion are supported by the analysis and research made in previous months inside the company and by the interviews of critical figures inside the

organization. The research was conducted between August 2022 and May 2023.

CHAPTER I.

BUSINESS NETWORK AND DIGITAL INNOVATION:

THE ROLE OF BUSINESS RELATIONS

I.1 Dynamicity of Business Network: how to relate in a context in motion

In today's business environment, it is critical that individuals and organizations share information and resources efficiently and economically. One of the most common means of achieving this goal is through the use of a business network. By definition, this is a cluster of small and medium-sized businesses with shared interests and goals. Companies that are part of a business network collaborate with each other to pool their resources and capitalize on the assets they share. By working together, members of the group can undertake projects that, individually, they would not have been able to manage. A network is established because there is a tangible need: members are looking for solutions to specific challenges and new opportunities for growth.

The challenge of developing initial business relationships is made more complicated by the fact that it takes place in an environment that is continuously changing and subject to incessant change. The business networks to which early-stage start-ups relate experience constant change, with new actors entering and some exiting the network, and the relationships between actors are perpetually changing and evolving. This affects all enterprises, but for start-ups dynamic networks are more common because the context is that of newly established enterprises.

The aim of this research is to analyze how new established firms, technology based start ups, relate in a business context that is constantly in motion.

One prerequisite for the start-up to become a new enterprise is that it develops business relationships by which it plugs into a pre-existing business network. The early business relationships, particularly with customers and suppliers, are critical to the accessing and obtaining of needed resources. The development of initial business relationships is compounded by the fact that business networks are always in flux.

The study made by La Rocca, Snehota and Harrison (2017) addresses the following question: *'How does a would-be new business venture become embedded in a context in motion?'* The authors frame the issue as a process of relating to the business landscape. This involves the development of a series of business relationships with particular actors, with their specific constellations of resources and patterns of activity. Examining the relationship process, the contributors highlight the effects of the uncertainty of connections and the ambiguity of economic consequences for the involved parties.

Examining how the network position of the new enterprise affects its development path, is possible to argue that:

- a) the position acquired by an individual enterprise in the network implicates a specific horizon that affects the perception and interpretation of opportunities and liabilities;
- b) the achieved position in the net determines the resources and competencies that can be mobilized through the set of customers, suppliers and other stakeholders;
- c) a position in the business network is a valuable asset but also a liability that empowers some development paths but also inhibits others.

The authors conclude that the network positions of individual firms are interdependent and that individual companies keep the network "in motion," adapting to each other.

The opportunities emerge from the movements of the network.

The authors conclude that, on the one hand, relating to the moving context entails connecting the emerging enterprise to the resources, activities and skills of the various network actors, and on the other hand, it involves acquiring a face and meaning for the relational partners. Two perspectives to be achieved simultaneously and with the same priority, acquiring a face and a meaning for the other actors, as the failure of either can lead a young enterprise to failure.

The probability of a startup's success is low. The chance of failure in the first three years is estimated at 85%; statistics reveal that only a few startups survive more than a handful of years (Short, McKelvie, Ketchen, et Chandler, 2009). Thus, business markets can be typified as "business networks," in which firms are nodes of business relationships. Considering the start-up from a business network point of view, if it wishes to develop into a profitable new venture, it must be embedded in the context of the existing business network (Snehota, 2011).

Embedding means to make something an integral part of something else, in our case a part of a new business network. So, embedding a venture implies that it has to develop the initial business relationships to customers and suppliers through which it can have access and obtain the resources necessary to sustain its own activities and operations (Aaboen, Dubois, Lind, 2011). Developing initial business relationships means relating the various components of at least two businesses, their resources, their activities and the individual players involved.

There are various reasons for the continuity of customer–supplier relationships. The most self-evident is that, to sustain ongoing operations, customer organizations need continuous supplies of various resources. When they buy, they do not "shop", rather,

they secure the supplies they need for their activities. When a firm engages in "doing business" with a particular counterparty on an ongoing basis, it stabilizes to some extent the environment in which they operate. Since firms act on the basis of only partial knowledge and face considerable uncertainties that cannot be settled, the stabilization of the environment is useful both for planning future transactions and for protecting needed investments.

The key business relationships are not homogeneous. Instead, it is always an assortment of complementary relationships related to the nature of the operations performed. This means that there are interdependencies not only among the two organizations involved in a relationship, but also among the relationships in which the two partners are involved. Such interdependencies underlie another characteristic of business markets; the relatively restricted number of important complementary business partners and the emerging interdependencies among the different interrelationships give business markets the characteristics of a network like structure. Expectation of future performance in various aspects seems to be the main motivation for relating to other firms. Time matters, since such expectations are based on direct and indirect past experience. (Gadde, L.-E., & Mattsson, L.-G. (1987).

There is continuity in the sense that the single positions of the individual businesses are always a result of previous and past interactions and the current network positions are a stable base for a future development. Business networks are always 'in motion' because existing relationships are continuously changing, some cease to exist and new relationships keep emerging.

Interaction in business relationships goes far beyond communication. It includes cognitive processing, learning and teaching, and the mutual construction of meanings

that guide interaction behaviors. The development of initial relationships requires that a start-up acquire a "*face*" and an identity both in relation to individual partners and in the network. The "relationship process" therefore has two levels: the level of the individual relationship and the one of the network. At the relationship level, as previously supported, no business relationship is ever fully "completely developed and accomplished." Business relationships can be temporarily stable, but an equilibrium state is inconceivable. Business relationships are perpetually exposed to demands for change that come from within the existing relationship (e.g., the effort to improve a solution for a customer) or from changes in the network environment of that specific relationship. Business relationships and networks may be mature, but they are never "completed": they are always within "processes of manifestation" (Tsoukas, Chia, 2002). Moreover, when a new node has been inserted into the existing network, that network does not maintain the same configuration, but has changed. Therefore, the success of a new business venture involves a change in the business network.

Although the concept of network position may evoke stability and resilience, this is a rather inaccurate impression. The need for continuous adjustments within existing relationships and the development of new relationships drive changes in the business network and fuel its "movement." That which distinguishes business networks is the absence of equilibrium. The network positions of individual firms are interdependent, and the actions of individual enterprises and mutual adjustments keep the network "in motion." Dealing with movement is challenging, but at the same time it is important to recognize that this movement in the business network opens up new inputs and allows new nodes to develop (Johanson et Mattson, 1992).

I.2 How does a business relationship start?

The relationship initiation process: 6 perspectives.

In the previous section, the research focus was on understanding how start-ups behave in a constantly moving network. It was emphasized how the search for equilibrium itself has meant that this equilibrium is never there since in a dynamic network actors are constantly moving in and out. The focus of this section is in figuring out how a business relationship begins through the analysis of different perspectives.

It is very curious about the way start-ups develop initial business relationships with customers and suppliers and is rooted in two strands and perspectives of research. The former is the entrepreneurship studies strand that focuses on the organization of a new venture. The latter is the stream of research that investigates the relationships between suppliers and industrial customers, the industrial marketing and purchasing (IMP) research tradition. The first research line has its origin in the late 1980s, when Gartner (1988) first challenged the focus of entrepreneurship research on the individual entrepreneur. He claimed that the question "*Who is the entrepreneur?*" is incorrect. Gartner's reasoning was that if we want to explicate why and how new businesses develop, we have to examine the process of organizing and integrating resources in the early stages of the new enterprise. This perspective originated the call for a process-oriented approach to new venture creation (Landström, Harirchi & Åström, 2012).

The focus on business relationships in the early stages of start-up also reflects the results of current IMP research, which sees industrial markets as networks of business relationships between organizations, where each firm is a unique nexus of business

relationships with customers and suppliers (e.g., Håkansson & Snehota, 1995).

In this context, considering individual investors, institutions or the business model, Snehota and Håkansson add to the existing entrepreneurship research by exploring start-up as a process of embedding the new venture into an business landscape characterized by constellations of resources, patterns of activity and interdependencies among existing actors. From this perspective, the initial stages of the start-up journey consist of relating to an established landscape of business organizations, customers, suppliers, and other institutions for the purposes of becoming a node in the business network. For the early stage business, this involves developing initial relationships with customers and suppliers to obtain the resources needed to run and operate the new enterprise itself.

The goal is to shed light on the process of initiating and developing the initial relationships when starting up.

Articles that focus on the processes of business relationship development and those that focus on interactions between resource entities mainly consider only actors and resources. There is still a shortage of studies dealing with the activities that take place during the initiation of business relationships among start-ups. Holmen et al. (2005) emphasized the importance of activities by concentrating on the places where business relationships commence and the activities that actors perform in these spots. Considering only actors and resources, the research lacks the connection of those nodes (actors and resources).

Therefore, in addition to combining the branches of research which focus on actors and resources, an activity element should also be added in the studies of start-up business

relationships.

1.2.1 The Six Facets of Initiating Business Relationships in Start Ups

The process to understand how a business relation initiates can be analyzed from different perspectives and subprocesses; it also takes into account diverse components of an actor or an organization. A study conducted by Aaboen, Holmen and Pedersen (2017) identifies six different facets of the relationship initiation process. The six subprocesses or facets identified are as follows:

- 1) the initiation of business relationships as the first state in the business relationship development process
- 2) the initiation of business relationships as a process of its own
- 3) focal relationships instead of focal actors,
- 4) third actors playing an active role in the initiation of business relationships
- 5) one of the focal actors' portfolio of other relationships
- 6) the initiation of business relationships as an interaction between resource entities

The literature on the initial phase of a business relation has been scarce. There are several reasons why this peculiar topic has been given less attention than other topics related to business relationships. For instance, Aarikka-Stenroos (2008) asserted that relationship initiation is a confusing phase in which many actors are involved, making it therefore a particularly difficult stage to investigate. Then again, Holmen et al. (2005) argue that since economic value is often believed to be generated only after the business relationship has fully developed, its initiation is neglected.

From the survey process described above, the authors identified six facets of the

literature on relationship initiation in business.

In relation to the theme of *relationship dynamics* over time, two facets of the relationship initiation process were identified; the first concerns the initiation of business relationships as the first stage in the process of developing a business relationship. This means that the process of business relationship initiation characterizes and is functional to the early stages of relationship development. The second, on the other hand, sees the initiation of business relationships as a process in its own right, separate from the later states of the business relationship development process.

Getting back to the first facet under the theme of relationship dynamics, Aaboen, Holmen and Pedersen (2017), it is important to introduce some literature and contextualization. Business relationships allow start-ups to both combine resources and fit into a network. Exactly when the relationship begins and ends has been a matter of debate among scholars, but most agree that relationship initiation consists of a pre-relationship state, followed by a relationship initiation state and culminating in the signing of a contract.

According to more recent models of relationship development, the initiation of new business relationships can include and be The most widely known and mentioned stage model is the one proposed by Ford (1980). The model has five stages:

- (1) the pre-relationship stage
- (2) the initial stage
- (3) the developmental stage
- (4) the long-term stage
- (5) the final stage

In addition, each of these stages is characterized by five important variables:

experience, uncertainty, distance, commitment and adaptation. Comparable stage models have been developed by Dwyer, Schurr and Oh (1987), among others. A major assumption of the model is that a business relationship has two active parties that interact in episodes where adaptations occur. These adjustments lead to greater investment on the part of both parties, which in turn leads to greater commitment and effort put into developing the relationship. During the various stages, the distances and uncertainty between the parties will decrease as the experience becomes larger. The distances being referred to can be categorized into five components: social distance, cultural distance, technological distance, temporal distance, and geographical distance. Ford, (1980).

Under the model of states, the process can also shift to a quiescent or dormant state becoming inactive for a period of time. Polonsky, Gupta, Beldona and Hyman (2010) made their contribution to the model by the addition of a de-actualization phase in which the relationship can move in and out of any other phase. This addition allows active and inactive relationships to be investigated in conjunction and emphasizes the significant influence of preceding interactions on ongoing developments, because many new relationships may essentially be reactivated forms of older ones.

The second facet introduced by Aaboen, Holmen and Pedersen (2017) is the theme of relationship dynamics is described as *Initiation of Business Relationships as a Process of its Own, Separate from Subsequent States of the Business Relationship Development Process*. The process of initiating business relationships is important for start-ups to learn how to navigate it quickly, since customers are both necessary for revenue and resources tend to be scarce in the very beginning. Start-ups can save a significant amount of time if they are capable of learning from their first attempts to start business

relationships.

For early-stage ventures, systematic consideration of business relationship initiation processes may enable them to become more successful at establishing relationships faster.

Focusing on the *perspective taken* in the initiation of a business relationship, a facet was found: two possibly different perspectives on the initiation of business relationships, instead of concentrating on who the two actors are there was a focus on the link (thread) that binds the two actors (nodes).

In the literature on the start-up facet as a process in its own right, it has been said that product changes are an important element for start-ups in the initiation of business relationships. However, it is also worth considering that there are two active players in a business relationship. As Mandják et al. (2015) stated, the initiation of a business relationship is the outcome of the decisions and actions of the actors that are involved. Consequently, there are at least two actors to consider: the focal firm and the customer.

This option was explored by Østensen (2013) by means of a framework based on Edvardsson et al. (2008). In the two-sided extended framework, both a firm and a customer may enter the initiation stages of the business relationship unrecognized, acknowledged, and considered; both a firm and a customer also may be influenced by converters and inhibitors in the transition from one stage to the other. The initiation of the relationship is complete only when the two firms reach a business agreement. Østensen's (2013) framework also uses the one proposed by Aarikka-Stenroos (2014) third actor concept to argue that third actors can influence the process from the perspective of the firm, the customer, or both. In addition, Østensen (2013) argued that the process of initiating business relationships described by Edvardsson et al. (2008) is

not sufficiently detailed and therefore divided the nonrecognition stage into three other sub-stages: unawareness, general awareness and specific awareness.

The use of a framework that integrates the perspectives of businesses and customers opens up the possibility to more accurately analyze whether the two parties to a business relation are considering it at the same phase, and also the actions taken based on their assumptions and hypotheses. As a result, it then would be easier to delineate the relational factors operating as converters and inhibitors in the relationship. In addition, this would allow for a closer analysis of what intentional movements between stages look like from the perspective of both sides. For start-ups, it is important to realize that counterparts have their own perspectives and an interest in entering into a relationship with them probably depends on self-interest.

In analyzing the *network context* of business relationship initiation, two facets were identified by researchers:

- Categories of third-party actors who play an active role in the initiation of a business relationship.
- A portfolio of other relationships of one of the actors involved encompassing the focal business relationship being initiated

Related to the *resources involved* in business relationship initiation, one facet was found and it is: initiation of business relationships as an interaction between resource entities.

The literature has repeatedly pointed out that these facets overlap in some cases, especially in the case of start-ups where business ties in the early stage do not follow a smooth and entirely predictable process. New ventures often develop their activities, products, and strategies at the same time as they enter into their first business

relationships. Start-ups often make changes and adjustments to be compatible with the structures of their potential business partners.

Each firm relies on a specific set of resources. Start-ups, in particular, must assemble external resources, the majority of which are new to them. This assembly of resources necessitates the development of business relationships with other players who control and can supply the needful resources. At the time a new enterprise is established, actors possess only part-knowledge of the way to assemble resources. Therefore, actors have to engage in extensive adaptation and interaction with others to create viable interfaces and combinations of resources. This necessity makes the process of forming a new enterprise as nonlinear and onerous. (Ciabuschi, F., Perna, A., & Snehota, I. (2012).

Many of the studies that have analyzed adjustments made to improve compatibility with potential business partners are based on the four resource entity model (Håkansson & Waluszewski, (2002)).

The model is used to identify start up's changes in the:

- a) relationships
- b) business units
- c) products
- d) structures

The four resource entity model is generally shared in the studies of start-ups and new entrants in a network context, though many of these studies have focused on the connection between start-ups and networks rather than on the initiation process of the relationship itself. Mainela, Pernu and Puhakka (2011) consider the business creation process to be composed of three interrelated processes:

- 1) business opportunity-focused processes, where the start-up becomes part of a social

network

2) technology-focused processes, as the start-up becomes part of a technology network

3) internationalization-focused processes, the start-up becomes embedded in an inter-firm network

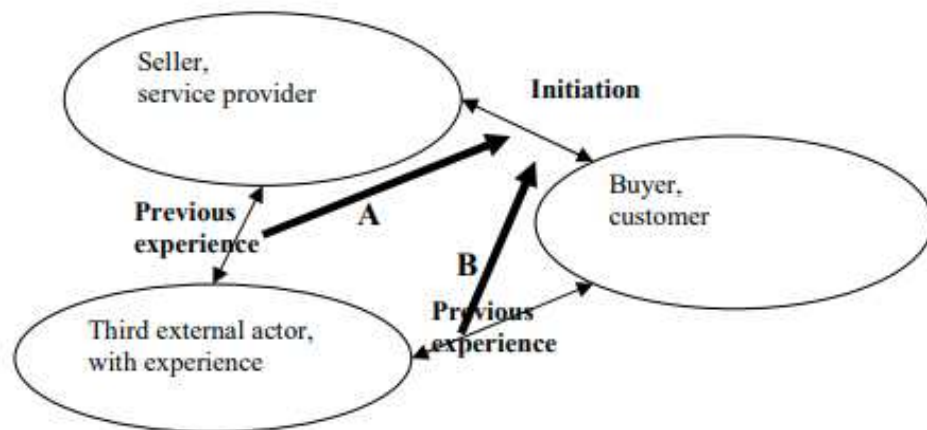
By comparison with the articles that apply the four entity model, the firm creation process approach is similar in that it considers the interrelated processes, in which different aspects of the start-up develop simultaneously, as being part of interactions with customers and other stakeholders. This can benefit managers by considering ways in which their companies and resources may change as a result of starting new business relationships. For established enterprises, the establishment of a new business relationship may not result in major shifts for the enterprise. But entering into a new business relationship can also lead to friction as one faces inertia in the company's established resources, activities, business models, offerings, and value propositions. Contrarily, a start-up firm is just getting started in gathering its resources and may be strongly shaped by the resource interactions in the business relationships it undertakes. To properly model a start-up, some plasticity in terms of resources will probably be needed and also a benefit in resource interactions.

I.3 Third actors role in Business Relationships

Once a third side is engaged in initiation, we do not consider a relation to be dyadic but a three-actor perspective is required. At least three actors and their relationships deserve attention: the seller, the buyer and the third outside actor. The influence of third parties in the initiation process is grounded in the experience and relationships they own (see

the figure below). The third actor experiences one or both sides of the emerging dyadic relationship and participates in initiation by sharing this experience with the other party. (Leena Aarikka-Stenroos, 2007)

Figure 1.1 The key actors in the initiation of a business relationship



Source: Leena Aarikka-Stenroos (2007)

The figure thus includes three stages: experience, sharing the experience, and the actual initiation. The direct experience of a third party is arguably the most valuable to potential buyers and sellers. Potential buyers and sellers, but indirect experience is also valuable in the marketplace. In the case "A" the third party will mediate its experience of the seller to the potential buyer, and will support the company in the purchase and evaluation of the potential service provider. In case "B" the third mediates its experience of the buyer for the seller supporting the seller for example in the prospecting pipeline stage. The third (actor) helps both parties of the dyad in networking and communicating with other important actors.

The linking role of a third-party actor can support a start-up's business relationships in

two ways. The first is that third-party actors mitigate the uncertainty associated with the skills and resources of a start-up's potential partners by connecting additional counterparts in a way that is beneficial to all parties (Howells, 2006). And second, a start-up can alleviate the possible negative effects of its narrow network by relying on its partners to link some of their existing relationships to the start-up (Holmen et Pedersen, 2003).

As we stated in previous paragraphs, the vast majority of studies on business relationship initiation focus only on the two parties between whom the relationship is initiated. The one exception is Aarikka-Stenroos et Halinen's (2007) analysis of third parties/actors who foster business relationship initiation by their actions during the initiation process. A third actor can be either a person or an organization.

An evolution of the network context of business relationship initiation is to analyze the relationships from a portfolio point of view. To get a more holistic picture of the portfolio of relationships in a start-up, it is important to be aware of which relationships should be given priority and developed further. Portfolio strategizing is related to what patterns of relationship development are established in the portfolio that will lead a start-up to its desired goals (see Aaboen, Holmen et Pedersen, 2014). Companies should take a holistic view of their complete portfolio of business relationships when starting and developing new relationships.

In sales literature, there is a current of scholarship that advocates that sales and product development should be complemented rather than divided. The aim of most sales models is only to sell a product, but because start-ups need to interact with customers on an ongoing basis in order to develop their products and businesses, the ongoing relationships are at least as critical as the initial ones. In their investigation of ways to

reach agreement with pilot customers, Hetzel, Neergård, and Sørensen (2015) built a framework consisting of the following stages: search and selection, contact, acquaintance, negotiation, and agreement. The stages are illustrated as a funnel to point out that the start-up may need to undertake initial interactions with different potential pilot customers in order to identify those with whom to engage more intensively. The first interactions with multiple potential pilot customers may have to happen at the same time, as the start-up's success is time-sensitive. Among all the phases, there are also potential third-party influences and potential iterations, as the start-up may learn how to proceed in initiating business relationships during the interactions. Because of the nascent stage of a start up's development and products, the type of pilot customer needed may typically vary. This can result in the relationship moving backwards both during the start-up and after an initial agreement is achieved.

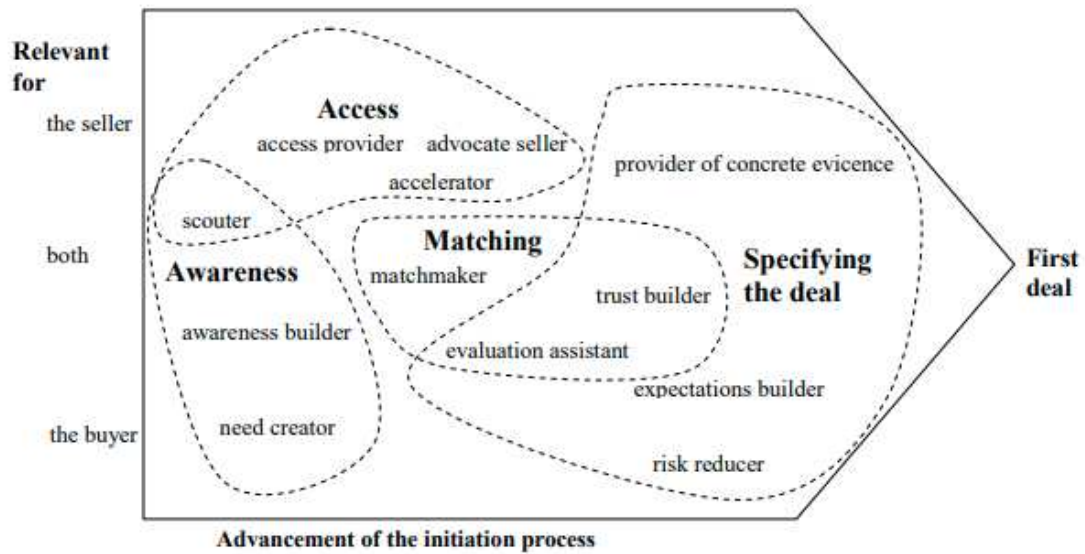
For a new venture, however, most of its relationships will be in an early state. Because of resource limitations, a start-up needs to consider the priority and allocation of resources to different processes for initiating and developing business relationships when setting up a productive set of initiating processes that will stimulate its development. This means that a start-up might have to use a portfolio approach to simultaneously initiate initiation processes with different actors, in order to have different options to develop further, according to how the interactions and the start-up develop.

Two main questions should be answered while analyzing the third actor's role in a start up business relationships initiation: Why do third actors share their knowledge with a newborn venture and how do they facilitate the integration of this start up in a pre-existing network?

The motivation for sharing knowledge and experience to others is potentially grounded in the collectiveness of business actors. People narrate stories of success and failure, and the ultimate goal of sharing this information is to warn against failure or to glorify success (Coffey et Atkinson, 1996). By reporting on past activities, people give guidance to others, and thus reputation can be seen as a social control mechanism, guiding individuals and firms to choose successful actors and avoid unsuccessful and unreliable ones (Nunlee, 2005). Another possible explanation can be found in the literature of the social exchange theory. Referrals, for example, can be seen as reciprocal favors from one colleague to another, where the referrer, according to the fair exchange view, expects to receive a similar favor from the referrer in the future (Ruy & Feick 2007).

In order to answer the second question, the research will follow the studies achieved by Aarikka-Stenroos and Halinen (2007). Their research resulted in the classifying of 12 roles in four main categories: awareness, access, matching and specifying the deal. The first category is awareness and it involves the identification of potential partners, nurturing awareness among suitable partners and creating advantages for a specific partner. The second one, access, refers to establishing contact between partners, accelerating the initiation process and delivering marketing information. Third category is about matching, which includes evaluating the fit between actors, providing information on the reliability of a partner and assessing its quality. The last one, specifying the deal, includes offering prospects of the relationship outcome, providing risk-reducing information and making intangible services tangible.

Figure 1.2 The promoting role of third actors in initiating business relationships



Source: Leena Aarikka-Stenroos (2007)

As seen in the upper figure, third actors can drive a start up’s relationship initiation in many ways and fill the relationship itself with different levels of effort. It is useful to give an explanation of each of those 12 types of third actors found by the researchers:

- a) *Scouter*: In initiation, the first move for the salesperson is to find potential customers, as proposed in the sales literature. The role of third party explorer suggests that third parties can seek out potential clients for the salespeople.
- b) *Awareness builder*: Third actors can build the awareness, due to the fact that the dyadic parties need to be aware of each other in order to initiate a potential relationship.
- c) *Need creator*: a referral or reference from a third party may create a need for professional support.
- d) *Access provider*: The role of providing access entails that the third party actor may provide access, create contact, or aid in creating contact. Access can be based on the third actor's social relationships or experience.

e) *Accelerator*: the rollout can be protracted and may take several months and years after the first promising contacts are made.

f) *Advocate seller*: the third actor can function as an advocate vendor of marketing messages. The third actor can provide marketing information on the job, process, and relationships and then support the seller.

g) *Matchmaker*: when a third actor acts as a matchmaker, it assesses the fit between potential parties or helps the parties themselves assess the fit.

h) *Trust builder*: the third actor transfers trust by delivering an external "statement" on reliability.

i) *Evaluation Assistant*: a third actor can help the new client assess quality, as the outcomes and processes of intangible and knowledge-intensive services are difficult to assess in anticipation.

j) *Expectations builder*: A third actor can support the new customer in building his or her expectations. In the business service environment, it is challenging for the customer to understand the outcome of a service and the service process in advance, and likewise, it is challenging for the service provider to represent the outcome and process to the customer in advance.

k) *Risk reducer*: the role of risk reducer entails that third parties can reduce risk by actively or passively offering information that reduces it.

l) *Provider of concrete evidence*: the role of a provider of concrete evidence involves that a third party actor can make the intangible service tangible.

The twelve roles are not clear cut, distinct activities, but they often function together in support of relationship initiation. At a deeper level of abstraction, they relate to four key processes of relationship initiation: awareness creation, access, meeting the partner, and

establishing the agreement. In the figure at the beginning of the subsection, the potential footprint of a third party actor in initiation is displayed by linking the potential roles of a third party to the established key processes.

I.4 Innovation: origins, definitions and business implications

A crucial point to the research is to understand the origins and the meaning for the concept “innovation”, before facing the vertical implications of the innovation on the business network and a start up behavior and its functioning in terms of value creation, key partnerships etc.

The word “innovation” is so generic that it has come to mean a lot of different things to a lot of different people, and its meaning has changed and sometimes the word may have begun to lose the meaning itself. To find the etymology of the word we should travel a few centuries left behind. While the word is derived from the Latin noun *innovatus* and appears in print as early as the fifteenth century, the more modern interpretation of the term goes back to the famous economist Joseph Schumpeter and his writings in the 1930s (Schumpeter, 1934). In 1934, Schumpeter put out the definition of “innovation,” or “development,” as “new combinations” of new or existing knowledge, resources, equipment, and other factors. The famous economist underlined that innovation needs to be distinguished from invention. The reason why Schumpeter stressed this difference is because of the observation that innovation should be intended as a specific social activity, or “function,” carried out within the economic sphere and with a final commercial purpose, on the other hand, inventions in principle can be

carried out everywhere and without any intent of commercialization. Thus, for Schumpeter, innovations are novel combinations of knowledge, resources, etc. subject to attempts at commercialization. In other words, the main reason for innovation is essentially the process through which new concepts and ideas are generated and put into commercial practice. The combinatory activity Schumpeter defined as “the entrepreneurial function”, with the social agents fulfilling this role are entrepreneurs.

After the introduction of the concept of innovation, an important work on this subject came alive thanks to the famous management student Peter Drucker in the 1980s (Drucker, 1985). Peter Drucker defines innovation in his 1985 book “*Innovation and Entrepreneurship*” with the following words: “*Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced. Entrepreneurs need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation, and they need to know and apply the principles of successful innovation.*” (citation, *Innovation and Entrepreneurship*, P.Drucker, 1985.)

It is clear from this definition that the concept of innovation is not just about inventions or about new technology, but it has to do also about new business opportunities created through new technologies, products, services, processes, business models, etc. Innovation is not something that just happens by itself, but is a structured and systematic business process that requires organizational discipline and that can be learned, explained and practiced. With the aim to succeed at innovation, an entrepreneur needs to be proactive and search for the sources of innovation and exploit them. Innovation is a process for creating and introducing something new, novel, or

sophisticated with the intention of creating value or benefit (Hisrich and Kearney, 2014). Innovation is a process that begins with a new idea and concludes with market introduction.

From a business point of view, innovation results from the application of knowledge and results in new business opportunities, regardless of whether these are the result of innovations in technology through innovations in process, product, or service or innovations in business models and business processes.

Innovation should be intended as a driver of competition and it could lead to significant success and wealth in the business area. Academic literature supports the thesis that there is a meaningful relationship between culture and innovation: innovation only happens when an organization shares its beliefs, knowledge, skills and values with the rest of the organizational structure. In addition, the firm must show a low resistance to the external environment and high entrepreneurial proactivity.

The following paragraphs of this chapter have the goal to give a deeper analysis and perspectives of the innovation concept: Digital transformation and its relation with the digital innovation, open innovation (inside-out and outside-in innovation) and the business process management implications.

I.5 Digital Innovation: definitions and framework

This paragraph has the aim to give some definitions of the concept of digital innovation and then, thanks to the interconnection of these definitions, provide a more generalized framework from a company's point of view.

Digital innovation could be explained as the application of information and

communication technology (ICT) with the purpose to implement new and improved products, processes, business models, network, and organizational and marketing methods. Although digital innovation is related to design, it has a more holistic perspective to focus wider concepts interconnected with the company's business processes (Kohli and Melville, 2019).

According to Nambisan et al. (2017) digital innovation is “the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology”. Authors such as Yoo et al. (2010) focused on product innovation. Henfridsson, Yoo et Svahn (2009) define digital innovation as using unused digital technology in a product. Yoo et al. (2010) believe that using digital technologies initiate digital innovation which creates digital transformation. Akesson (2009) underlines that digital innovation is a solution triggered by digital technologies for innovating information and communication technology (ICT) products (Nowicka, 2019). Digital innovation is the adoption of ICT in order to implement new or improved products, processes, external relations, new marketing methods and organizational methods. Digital innovation can be intended as a new business model, product and process which requires significant changes of adopters, and is enabled and embodied by information technology (Fichman, Dos Santos, and Zheng, 2014). Digital innovation management is the set of principles, practices, and processes which underlie the effective orchestration of digital innovation (Nambisan et al., 2017). Digital innovation includes technologies for the design manipulation in the form of 3D or other visualization techniques such as virtual reality and the collaboration around and coordination of digital data by using workflows, processes, and standards.

The definition of digital innovation made by Nowicka (2019) is the one that perfectly fits for an innovative newborn company:

“Digital innovation requires innovations for new platforms, products, services, customer experiences and ways of delivering value by using digital technologies. The results of these innovations may not be in digital form. Digital innovation occurs from using digital infrastructure and tools such as blockchain, mobile data processing, 3D printing, cloud computing and data analytics. Digital innovation effects may be disseminated, adapted, or adopted to applications such as digital platforms”.

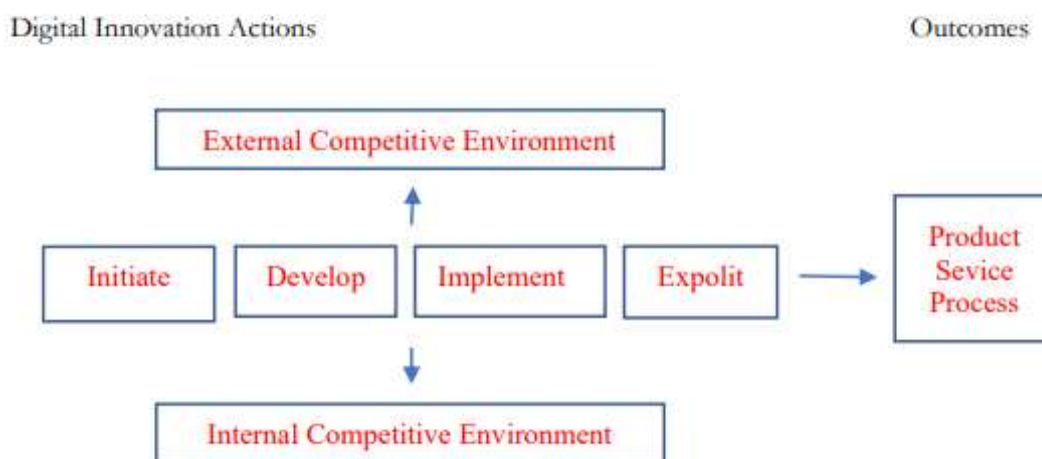
1.5.1 Theoretical framework for Digital Innovation

Digital innovation brings new perspectives and frameworks to the innovation process (Grover and Kohli, 2013; Nambisan et al., 2017). Digital innovation has a catalyst role for industrial convergence because it initiates collaborations among actors which used to be autonomous in different branches in the industries (Yoo et al., 2012). It is essential for the researchers to understand the expectations from and contributions to the solution provided by innovation. Digital innovation is created due to industrial requirements and engaged market actors into innovation and needs compatible technologies (Parker, Van Alstyne et Jiang, 2017).

Digital innovation is a strategic initiative effected and organized within the function of information technology (IT) services. The organization which is a backdrop of digital innovation has business strategies, cultures, and methods affecting digital innovation can be shaped by digital innovation initiatives and shape them (Pentland et Feldman, 2008). Digital innovation can change the company by enabling new business models

(Fichman et al., 2014) (Kohli et Melville, 2019). Digital innovation diffusion focuses on complex elements of a business model or individual solutions. It is connected with the digital business transformation process which uses digital technologies for changing the business model and providing opportunities for value and income. It is the process of converting the business model to the digital enterprise model including cooperation (Nowicka, 2019). The scheme below has the aim to provide a theoretical framework for digital innovation that could be applied for a profit oriented approach in a competitive B2B or B2C environment.

Figure 1.3 Digital Innovation Actions and the Outcome(s)



Source: Author's processing

On the left are explained the actions needed for the digital innovation process influenced by the internal and external environment, while on the right (simplified) there is the outcome shaped as product, service or process improvement/innovation.

In the following lines are explained the constructs of the previous scheme.

Initiate → identifying, applying, and assimilating valuable knowledge from outside and inside of a company pertaining opportunities and problems amenable to digital

innovation.

Develop → developing and designing a new information system, customizing an existing solution, adopting a pre-existing solution.

Implement → maintaining and installing tools from an organizational and technical perspectives consisting of training, new governance processes and systems.

Exploit → leveraging existing tools for maximum value. Reusing systems and data for new purposes.

Internal competitive environment → the organizational backdrop consisting of strategies, knowledge management, cultures, and methods.

External competitive environment → the competitive marketplace where the company is embedded consisting of consumer segments, fashion and fads.

It is useful to briefly introduce the main types of digital innovation which companies implement to have and sustain their competitive advantages: product innovation, process innovation and business model innovation . Digital product innovations are intended as new products or services which are enabled by or embodied in information technology.

The examples are a new enterprise platform such as Customer Relationship Management (CRM) and the Enterprise Resource Planning (ERP), new consumer products (smartphones) and existing products enhanced by adding a digital technology (Fichman, Dos Santos, et Zheng, 2014). Digital product innovation focuses on companies producing digital products, institutions, supply-side processes, structures, and market dynamics which support development and diffusion of new products. An easy and recurring example is using social media to affect customers and getting their ideas for open innovation or using warehouse automation to manage inventory.

Companies which apply digital innovations can develop or deploy them by themselves or adopt them from the market. Digital process innovations affect processing of transactions, making decisions, dealing with new and existing suppliers and customers. Digital process innovations lead to administrative changes such as governance and organizational structures (Swanson, 1994). Digital process innovation encompasses core technology with organizational technician elements to support the business strategy (Fichman, Dos Santos, and Zheng, 2014). Business model innovation is considered by several researchers as a distinguishing type of innovation. Teece (2010) believes that a business model “*defines how the enterprise creates and delivers value to customers, and then converts payments received to profits*”. Digital business model innovation is a new approach to create and capture business value which is enabled and embodied by ICT (Teece, 2010). When companies use digital technologies in business model innovation, they are involved in external knowledge integration (Yoo et al., 2012), benefiting their abilities to do so in the future (Cohen and Levinthal, 1990). The openness afforded by digital technologies drives an absorptive capacity of the company.

Digital innovations led to rapid scaling by using digital platforms. Companies should respond to changing demands to profit from digital innovation scalability. Bharadwaj et al. (2013) and El Sawy and Pereira (2013) believe that digital innovation is a vital factor to innovate digital business models effectively.

I.6 Digital Transformation

The current paragraph has the aim to explain the way digital innovation facilitates digital transformation of companies. Companies which conduct digital innovation can

have and sustain long-term competitive advantages in the marketplace. Digital product innovation, digital process innovation and digital business model innovation are major phenomena of digital innovation. The following lines will highlight the concept of digital innovation, explain its variants and focus on its advantages for organizations. Digital innovation is using information and communication technology (ICT) to create new and improved products, processes, business models, marketing and organizational methods and networks. It has three main types namely digital product innovation, digital process innovation and digital business model innovation. Its benefits can be explained as reducing costs, improving productivity, developing better relationships with stakeholders, and increasing competitive advantages, market share, sales and profit. (Karabulut 2020)

No matter how similar they sound, digitization and digitalization are quite distinct. Digitization is focused on converting physical things into digital format (i.e. audio, pictures, books, video, etc.) Digitization essentially refers to taking analog information and encoding it into zeroes and ones so that computers can store, process, and transmit such information (Forbes). To make it as simple and clear as possible, *Gartner* gave the following definition: “*Digitization is the process of changing from analog to digital form*”.

Unlike digitization, digitalization doesn't have a single and univoque definition. These two concepts are closely associated and often used as they are synonymous in a broad range of literature. Digitalization, on the other hand, has a much wider scope. It is intended as the process through which a company uses digital tools, technology and ecosystems to provide bigger and better value for customers and clients usually through new solutions, customer experiences and business processes.

According to Gartner, digitalization is “*the use of digital technologies to change a business model and provide new revenue and value-producing opportunities.*” Digitalization happens and evolves every time a business uses digital tools and services to reach their clients and in a different way. It happens every time they develop a new product which provides greater value to a customer. And it happens every time a business adopts a new technology which lets them be better than the competition using digital based technology. We talk about digitalization any time a product or service changes in a way that the customer experience or interaction model is restructured around digital communication and media infrastructures. For instance, a local SME, Design Italian Shoes, digitalized its supply chain side in order to allow their customers to have a Made to Order and fully personalized shoes in just ten days. This switch in business process was made possible by the platform, a 3D configurator, called nowadays “*MTO suite*” due to a much wider integration of services available for the customer.

1.6.1. Digital Transformation and Digital Technologies

Digital technologies are a company’s necessity in order to achieve digital transformation. Thus, companies need to implement digital innovation by using digital technologies to achieve digital transformation. The concept of digital technologies is a wide one; for our research it will be intended as a composition of information, processing, communication and technology. Each person uses in a everyday life (private and professional) some of the following digital technologies: automation, digital platforms, mobile technologies, cloud computing, social media, big data analytics,

artificial intelligence, blockchain, the internet of things (IoT), the internet of everything (IoE), 3D modeling, 3D and 4D printing, robotics, autonomous vehicles, machine learning and augmented reality. According to Nowicka (2019), Digital technologies are the reasons for comprehensive changes in the management and company functioning.

New digital technologies such as big data analytics, application program interface (API), distributed ledger technology (DLT), cloud computing and machine learning are used to collect, store, exchange and analyze information in digital format. After a dedicated sub-paragraph to Digitization and Digitalization, it is possible to use those terms without confusing their meanings and applications. Digitalization is drastically transforming entirely or primarily physical contents, processes and objects to be entirely or primarily digital (Fichman, Dos Santos, and Zheng, 2014). Digitization is a non-stop convergence process of the virtual and real world, and is the driver of innovation and change in several sectors (Nowicka, 2019).

Digitizing processes improve efficiency and make processes more controllable and tailorable. Some of the advantages of digitized contents such as text, video and images are as follows: printing unlimited (digital) copies, transmitting, duplicating, decreasing costs, improving analyzing, searching, improving and correcting contents. The process of digitizing includes new properties to objects like addressability, programmability, memorability, communicability, sensibility, associability, and traceability to manufacture malleable digital products and create new domains of potential functionality (Yoo, 2009) (Fichman, Dos Santos, and Zheng, 2014). There is a digital gap between expectations of customers and abilities of companies to meet them. Companies which can adapt to digital changes fast can survive, like Design Italian Shoes, which implemented and integrated own and third party technologies to allow a

fully personalized manufacturing of shoes in a B2C, B2B and B2B2C environment. Competitive pressure leads organizations adapting the process of digital transition to customer expectations (eg. personalized shoes and a fast delivery) and business conditions (technological and financial resources availability). Companies are willing to change their business strategies and models in an environment where market entry barriers are low and information is their resource.

Digital transformation affects competition and market structure between enterprises and the competitiveness among companies in the digital environment is stronger especially when the elasticity of substitution is highlighted (high product interchangeability) and when building customer relationships and post-sale assistance is important. Digital transformation is the core theme of the business strategies and company development, due to the fact it is a way to reach better business results by using new technologies. Digitization leads to the use of new technologies to transform a business model to customer needs and adapt to market demand. Digitalized enterprise increases automation of business processes to eliminate redundant and repetitive jobs, decrease operating costs and human error risk, connect business functions, automate communication with stakeholders, and perform jobs in a reliable business information system. The digitization process is a technological advancement which will empower everyone and especially the customers; it will increase competition, create added value, enable to reach customers directly, and price of product is decreased.

I.7 From Innovation to a Solution: developing, producing and using setting

The embedding process of a new venture can be categorized into three contexts based on the predominant type of activity that connects an organization to a network: the development setting, production setting, and using setting. In the development setting, all new ideas are developed; in the production context, the new ideas developed are produced; and in the utilization setting, the ideas produced are commercialized (Håkansson et al., 2009). Start-ups are typically not yet integrated into the pre-existing networks within these settings.

However, embedding is crucial for the survival and growth of a startup (Bliemel and Maine, 2008), as it always relies on resource coalescences, activity patterns, and the preexisting network of actors (Snehota, 2011). Furthermore, a start up's resource value relies on its interconnections with the resources of others, and the output of its activities is interrelated with the activities of its counterparties (Håkansson et al., 2009).

Start-ups do not initially have commercial relationships, but they rely on interaction with others to develop their products and technologies. Business start-ups often seek to commercialize a discovery or scientific invention to be transformed into a commercial product. The start-up's research and development (R&D) efforts have to be linked to those of other actors, and various types of external inputs may be needed in this process. To handle this with limited resources, collaboration with various external partners in technology development has become a necessary condition. Besides making the product function in a development context, the invention or discovery must adapt to usage and production contexts.

The main issue is the nonlinear nature of innovation paths due to the complexity of embedding a technology in the setting of development, production and use. Vessel is a metaphor, identified by the authors to identify any type of organization, such as start-ups, project units and established businesses, that deliver technologies along the innovation path. Under the theoretical strand, it is pointed out that start-ups can be seen as the main vessel that propels technologies on their journey; however, they must network with other actors to find a wider support for science to be transformed into a viable product to be commercially viable. Therefore, the transformation process of science into solutions for their users does not necessarily happen all within the same organization, but occurs within the business relationships being formed between different ships.

Due to the high failure rate, however, it is particularly challenging to predict if start-ups will succeed in commercializing their technology or not. Over time, a variety of barriers have surfaced at the individual, financial, organizational, and technological levels (Markman, Siegel, and Wright, 2008).

The development of early relationships with customers and suppliers is not an easily or simply done process. It is challenging and involves developing the offer and its various components, which go far beyond the main product. Solutions need to be found for delivery and distribution of the offering, marketing management, and ensuring further development of the business. A set of technical, sales, and administrative matters need to be addressed as well as solutions need to be found. Likewise, the development of initial relationships demands that customers and suppliers recognize the existence of the start-up and place it in their mental map and environment. The seeming steadiness of the current business relationship does not imply that the business relationship has a

stable content or is immutable. Rather, it is more correct to state that the enduring relationships between customers and suppliers are continuous, whereas the content and different solutions within a given relationship are constantly changing. These changes occur for various reasons and are to be expected.

As an example, product characteristics, logistics and administrative solutions are being constantly changed both for internal purposes within the two organizations involved and also external to their relationship, with the intervention of other parties (Hallén, Johanson, and Seyed-Mohamed, 1991). No matter what the origin, problems and opportunities that emerge between the parties have to be approached and solutions have to be found if the relationship is to endure. The development and deployment of new solutions demands extensive interaction between those who are involved. This interaction is necessary for both creating the solutions and dealing with their consequences. The wide interaction in customer-supplier relationships is the second hallmark of business and commercial markets. Adjustments in the resources, activities and attitudes of actors in seeking viable solutions in a relationship result in the creation of particular interdependencies across the two organizations.

An incoming player must be "admitted" into the business network. The development of new relationships involves two issues: first, it requires the connection of activities and resources of different enterprises and second, the newcomer must gain significance for other actors in the network, who are likely to benefit or otherwise suffer from the development of new relationships. Setting up initial connections for the aspiring new venture has elements of innovation, as it means putting in place new and somehow "better" solutions for the parties involved. Initiating a new business is innovation-related, as the new entities imply new business relationships and thus new

solutions. New Solutions are always combinations of unreleased resources, and the combination of different resource elements into a new solution has a tendency to be burdensome because it demands the creation of practicable interfaces between the several resource elements (Baraldi, 2003). Basically, the development of new relationships is subject to the acceptance by incumbents, who have to welcome the new entry and adjust to be part of it. This is therefore not a one-sided bargain.

A new entrant will be "admitted" depending on whether it is perceived to be able to solve the problems of some of the incumbents or to benefit them in some way, e.g. by positively influencing their assets. The implementation is reciprocal, which makes it necessary to progress through trial and error and experiment with different solutions. Indeed, much effort is required, as we argued earlier, to adapt and modify arrangements to maintain a functional relationship. In a sense, paradoxically, relationship development is never over, it is never achieved.

Adopting a network perspective on the startup process has a tendency to reduce the importance of technological drivers and "superior" supplies as prerequisites for success. On the contrary, it foregrounds the importance of the relationship process that develops over time. The new venture entity is not born outside the network, but inside it and is endogenous to it. In a dynamic network of businesses, the positions of all firms are subject to a constant evolution, and the aspiring new firm is no exception. Consequently, this means the acquisition of a position is not a one-time event, but more a process continually built on past and present achievements. A position that an individual firm acquires in the business network is a valuable asset, as well as a liability. When it comes to the negative sides of the development of new business relationships, Håkansson and Ford (2002) point out that business relationships always matter. The

authors debate multiple reasons, motives, and factors that adversely affect the development of business relationships. For example, the more the business depends on a small number of relationships, the more the burden of those relationships will be. Since they are not yet consolidated in the business network, start-ups rely on the few other counterparts with whom they have initiated relationship building: as a result, the disruption of a key business relationship may have excessively negative effects on the start-up at this very early stage. Moreover, an initial relationship development should take place in tandem with the development of organizational and technological solutions that enable the aspiring new enterprise's offerings to be "produced." The management of relationships as well as the development of the technological system and the internal organization of the new enterprise both demand a significant amount of time and effort.

Relating in a business network means expecting reciprocal benefits and constraints that can have either positive or negative consequences for the parties engaged. Expectations of mutual benefits and perceptions of the costs involved are contingent on how the parties are able to gain a meaning of each other and on the actual understandings put in place between the two of them. Within business networks, the "business" aspect of the relationship is dominant and is largely concerned with the short- and long-term financial and economic outcomes of the relationship.

Dealing with motion in the business network entails more or less seamless accommodation of the solutions underlying the relationships. Interaction continuity and a commitment to develop and unceasingly maintain initial relationships are key to the development of the new venture. Not recognizing the need for more or less continuous adaptations of business relationships over time leads to an underestimation of the

resources and capabilities required and can jeopardize the very survival of the new enterprise. Managing the development of a new business initiative is a challenging task, since both the acquiring of a partner identity and the solution-building behind the offering in an ever-changing landscape require extensive interaction.

In such a dynamic environment, the identity and solutions offered cannot be first designed and then executed but rather only enacted in interaction, and the logic is one of effectiveness (Sarasvathy, 2008). In a shifting entrepreneurial landscape, the critical capability on which the development of a new business initiative depends is the ability to interact with other actors, who in turn are constantly evolving.

CHAPTER II.

HOW WEB3 IS SHAPING THE METAVERSE.

II.1. Metaverse: is it a new word?

When referring to the metaverse nowadays, careful attention needs to be paid not to fall into misguided definitions that have little to do with the technological and revolutionary phenomenon we are dealing with. From the late 1970s, members of the technology communities have envisioned the Internet as well as its futuristic successor, one that is a conglomerate of all the digital worlds and items built up over the years. The term was first coined in the early 1990s, and the notion of an immersive digital reality in separation from the physical world can be traced back to the video games of the 1980s. The word metaverse is a mashup of the Greek word Meta and the English word universe. The term first appeared in 1992 within the novel "*Snow Crash*" by Neal Stephenson. Here, in true cyberpunk style, the story is about the United States sometime around the early 2000s, a country out of control after an economic collapse. Below is the quote about the metaverse:

"The sky and the ground are black, like a computer screen on which nothing has yet been drawn; it is always night in the Metaverse and, with its bright lights, the Road shines like a Las Vegas free from the constraints of physics and finance."

cit. Neal Stephenson, *Snow Crash*, 1992

The metaverse is a space designed to escape an oppressive and unbearable reality. A synthetic three-dimensional space within all human activities are transposed, with its

own specific rules. Yet another definition:

"Hiro is nowhere near where he is, but instead in a computer-generated universe that the machine is drawing on his glasses and pumping into his earphones. In industry slang, this imaginary place is called the Metaverse. Hiro spends a lot of time in the Metaverse." Snow Crash

Something similar to Stephenson's metaverse was already conceived in William Gibson's 1984 work *Neuromancer*. Here it is referred to as "cyberspace" or "the Matrix," as an infinite electronic space that can be accessed for the purpose of storage, exchange, and seizure of data/information.

It is useful to highlight some key historical milestones that have led to where the innovative phenomena is today as the Web 3.0 technology is taking its space.

Everything began in 1838, as the scientist Sir Charles Wheatstone mapped out the idea of "binocular vision," where two images - one for each eye - are matched to create a single 3-D image. This concept resulted in the early development of stereoscopes, a technology that uses the illusion of depth to create an image. This is the same concept used today in modern VR headsets.

In the mid-1930s, American science fiction writer Stanley Weinbaum published the book *Pygmalion's Spectacles*, where the protagonist ventured into an imaginary world using a pair of glasses that provided sight, sound, taste, smell and touch. In this case the author refers to human-recreatable synthetic worlds and gives a description of the invention of magic eyeglasses that allow one to enter a kind of virtual reality (*Pygmalion's Spectacles*, Stanley, G. Weinbaum, 2007).

In the 1950s, Ray Bradbury imagines in his story "*The Veldt*" two parents living in an automated house that relieves them of any duties and has a special playroom that can

materialize the fantasies of the couple's children. But when the couple realizes that the toy may be dangerous, the children do everything in their power not to allow it to be deactivated. Still in 1953, Philip K. Dick, described in "*The World in a Bubble*" a product called "*Worldcraft*" that allows people to build their own world inside a "world-builder" bubble, with human lives to be raised inside. All to cushion the disappointment resulting from the inability to find new inhabited planets.

Following the evolution path of the metaverse, Morton Heilig developed in 1956 and created the first VR machine, the Sensorama Machine. With this machine, it simulated the experience of driving a motorcycle in Brooklyn, which combined 3D video with sound, smells, and a vibrating seat to immerse the viewer. In 1960, Heilig likewise patented the first head-mounted display, combining stereoscopic 3D images and stereo sound. In the 1970s, MIT devised the Aspen Movie Map, allowing users to enjoy a computer-generated tour of the city of Aspen, Colorado. This was the first time it was possible for VR to be used to transport users to another place.

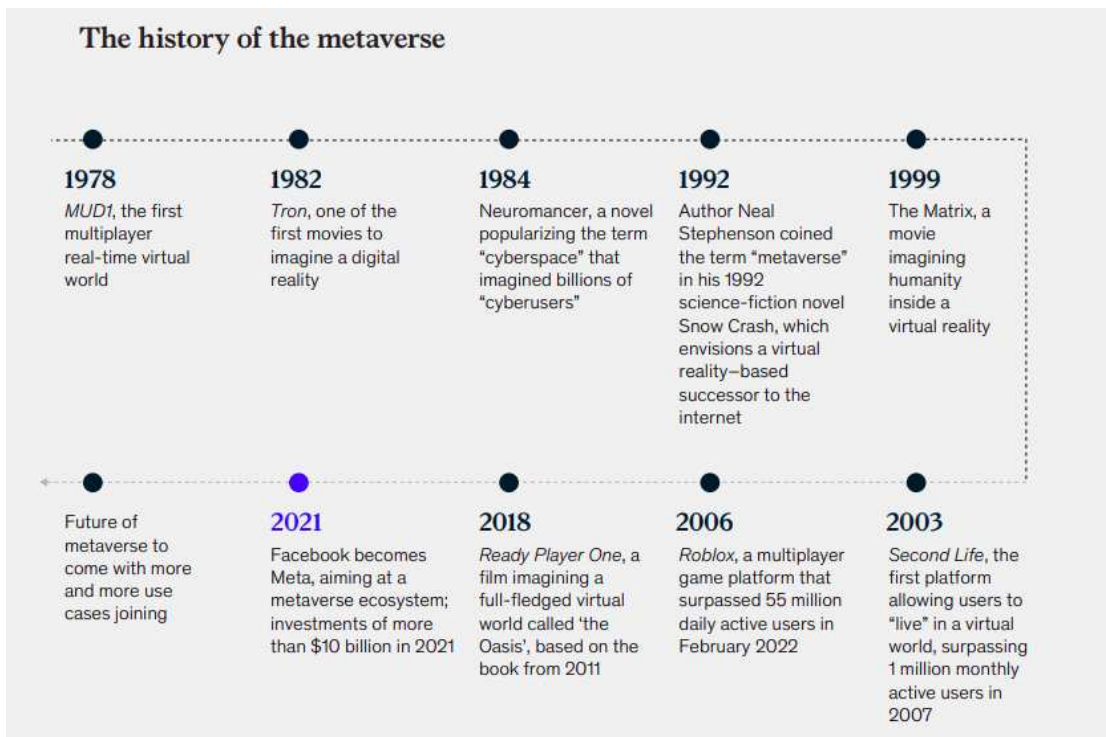
During the early 1990s, Sega brought VR arcade machines like the SEGA VR-1 motion simulator, that fans appreciated in many game rooms. In 1998, Sportsvision broadcast the first live NFL game with a yellow yardage indicator, and the idea of overlaying graphics with images from the real world quickly became widespread in other sports broadcasts. In 2010, Palmer Luckey, an eighteen-year-old entrepreneur and inventor, made the prototype Oculus Rift VR headset. Featuring a 90-degree field of view and leveraging the processing power of computers, this revolutionary headset rekindled interest in VR.

Ernest Cline published the book *Ready Player One* in 2011, providing another peek inside a fully immersive world that one can enter to escape from reality. The book has

since become a massive hit, and director Steven Spielberg made a film of it in 2018. Facebook later acquired Oculus VR in 2014 in a US\$2 billion deal. Back then, Facebook founder Mark Zuckerberg declared that Facebook and Oculus were going to work in tandem to build the Oculus platform and develop partnerships to support more games. Still in 2014, Sony and Samsung unveiled their own VR headsets, whereas Google released its first Cardboard device and the Google Glass AR glasses.

In 2016, Microsoft's HoloLens headset arrived on the market, giving for the first time mixed reality (AR and VR). Using HoloLens, one could create a holographic image in front of him or her, then place it in the real world and use augmented reality to handle it. As well in 2016, people worldwide ran around their suburbs trying to capture Pokémon with the Pokémon GO augmented reality game. IKEA, the Sweden-based furniture retailer, joined the metaverse in 2017 with its pioneering Place app, enabling users to select a piece of furniture and visualize what it might look like in their home or office. In 2020, Apple introduced Lidar (Light Detection and Ranging) to iPhones and iPads, setting up improved depth scanning for better photos and AR and clearing the way for mixed reality headsets in the coming future.

Figure 2.1 The History of the Metaverse, Value creation in the metaverse



Source: McKinsey (2022)

In short, after 30 years since it first appeared on paper, the term metaverse is beginning to have more defined contours, although it will still take a long time to figure out what its final form will be. In other words, we should not expect a single, all-illuminating definition of the 'Metaverse'. Especially not at a time when the Metaverse has just begun to emerge and technology-driven transformation is too organic and unpredictable a process. Moreover, it is this disarray that enables and leads to widespread disruption. Many of the features of Stephenson's metaverse are being reflected in today's vocabulary:

- a) the metaverse is three-dimensional

- b) the metaverse is a real-world metafora
- c) the metaverse can be accessed by users wearing goggles, such as today's VR headsets.
- d) individual visitors experience the metaverse from a firsthand perspective
- e) the virtual avatars of users are partially customizable

Interestingly, Snow Crash was released just a year after the official emergence of the Internet in 1991. Whereas the term metaverse remained limited to the technologic communities, the innovations thereafter established the first foundations of what the metaverse is set to become in 2022 and beyond. The 1990s witnessed the rise of blockchain in theoretical discussions and primary conceptualizations of feasible AI. In the 2000s, the technology advanced in giant strides to give birth to digital twin technology in 2002 and Second Life in 2003.

Lastly, Satoshi Nakamoto published a paper in 2008 that converted blockchain into an executable and usable technology. In the years since, books such as Ready Player One, games like Pokémon Go, and trends like NFTs have blurred the boundaries between virtual and real even further-the basic premise of the original Snow Crash metaverse. Mark Zuckerberg's keynote lecture at Connect 2021 may have brought the concept into the mainstream, but the metaverse is not a brand new idea. Nowadays we portray the metaverse as a totally immersive Internet, in which we are going to get access to augmented and virtual reality and interact with all kinds of environments using innovative lingering avatars and digital technologies.

The Metaverse is best understood as the successor state to the mobile Internet, as the Metaverse will not basically be replacing the Internet, but rather relying on it and iteratively transforming the Internet. The Metaverse will be equally as transformational

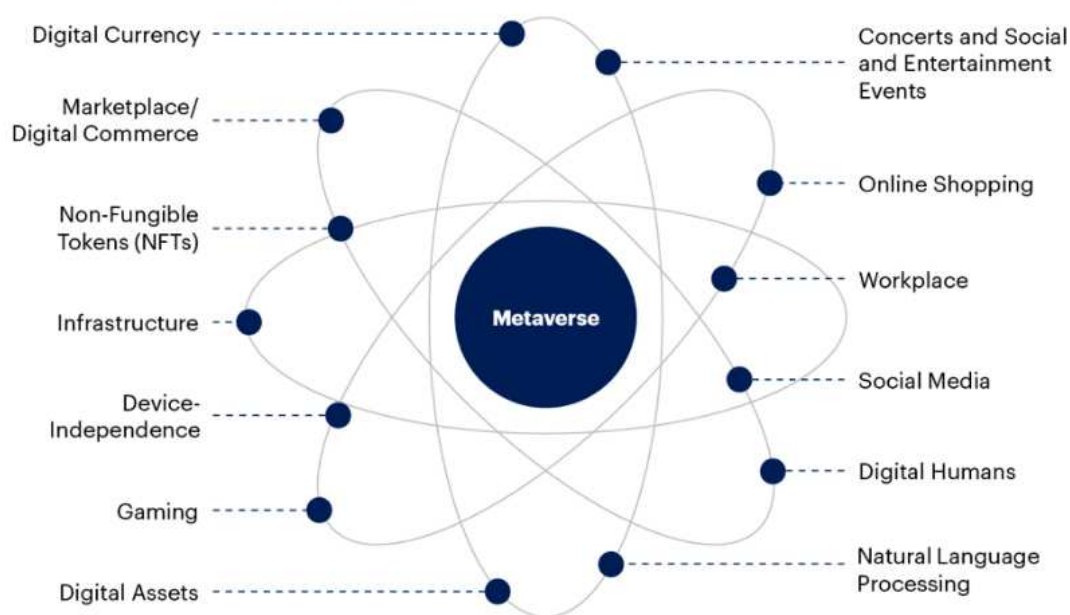
as the mobile Internet, as it also moves forward and shifts around the role of computers and the Internet in many of our lives. Fixed-line Internet from the 1990s and early 2000s prompted many to purchase a personal computer. Yet, this machine was for the most time confined to our office, residence, or bedroom. Consequently, access to and use of computing resources and Internet connection were occasional. Meanwhile, the mobile Internet has propelled most people on the global level to buy a personal computer and Internet access service, resulting in almost everyone having continuous access to computers and connectivity.

The progression listed above is a useful outline of what the Metaverse changes. However, it gives no accounting of exactly what it is or what it means to experience. For this purpose, a definition from the Matthew Ball:

“The Metaverse is a massively scaled and interoperable network of real-time rendered 3D virtual worlds which can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payments.” (“Framework for the Metaverse”, June 29th 2021. Retrieved from MatthewBall.co.)

The Metaverse, just like the Internet, the mobile Internet and the electrification process, is an interconnected network of experiences and applications, devices as well as products, tools and infrastructure. Nowadays, the metaverse has stretched into nearly every industry including real estate, gaming, fashion, events, and education—thus attracting plenty of users along the way.

Figure 2.2 Elements of a Metaverse



Source: Gartner

II.2 The evolution of the Internet: from Web 1.0 to Web 3.0

After an initial phase of the Internet's evolution, Web 1.0, associated with the emergence of browsers and commercial activities on the Internet, and the following one, Web 2.0, distinguished by the rise of social and participatory culture on the Web, Web 3.0 constitutes the phase now being experienced. The term Web3 is increasingly featured in common talk and can be defined as the evolution of the Internet we have come to be familiar with. It is a concept related to new technologies, including

blockchain and decentralized finance (DeFi), but also the Metaverse. We are looking at a new ecosystem in the making that could shape new social and economic paradigms, just as happened in the past with Phase 2.0.

The digital age comes with its own terminology. Many of these new terms have become a part of everyday vocabulary, despite the fact that meanings often get mixed up and confused. For instance, many people use "Web" and "Internet" interchangeably, when they are actually two different things. Moreover, there exists more than one version of the Web. The Web, formerly called the World Wide Web, refers to the pages/sites one sees when connecting online. The Internet is a series of interconnected computer systems on which the Web operates, as well as enabling the transmission of files and e-mail. In other words, the Internet is the interconnecting highway system for many cities, and the Web is the collection of parking areas, gas stations, minimarkets, and other stops. All versions of the Web have used and continue to use the Internet to connect users to Web sites and to each other. This feature remains constant.

When it comes to Web 1.0, this early version of the Web involved a few people creating content and Web pages for a wide group of readers, providing them with access to facts, information and content for them from sources. Or Web 1.0 can be summarized this way: it was meant to help people find information better. This version of the Web was intended for users looking for data. This version of the Web is oftentimes called the "*read-only Web*" because it does lack the forms, images, controls, and interactivity one enjoys in today's Internet. The term "Web 1.0" is used to describe the earliest form of the Internet. The users viewed the first sample of a worldwide network that portrayed the future potential of digital communication and information sharing.

Here are a few characteristics found in Web 1.0:

- a) consists of static pages connected to a system via hyperlinks
- b) contains HTML 3.2 elements like frames and tables
- c) HTML forms are sent through email
- d) the content comes from the server's filesystem, not a relational database management system (it is not possible to interact)
- e) has features like GIF buttons and graphics.

A crucial point that generated a need for the change was the content issue provided by the Web 1.0. Since Web 1.0 protocols at the time were open and free, there was no intrinsic financial stimulus for developers or creators to actually build on them. So anything on the Internet was basically open and accessible. In other words, the early Internet was not an environment where content, applications, and services were considered "businesses" as much as they are today, of course. Together, given the technical challenges associated with creating content on the Internet and the lack of financial incentives for those who had the ability to do so, Web 1.0 had an obvious content problem. (Murray, Kim and Combs, 2022).

If Web 1.0 used to be made up of a small amount of people producing content for a larger audience, Web 2.0 is actually made up of large crowds creating even more content for a growing audience. Web 1.0 focused on reading, whereas Web 2.0 focuses on participation and contribution. This form of the Internet emphasizes user-generated content (UGC), ease of use, interactivity, and improved compatibility with other systems and devices. Web 2.0 is centered on the end-user experience. As a result, Web 2.0 has been accountable for the creation of community, collaboration, dialogue, and social media. Thus, Web 2.0 is considered the primary form of Web interaction for most users today.

Whilst Web 1.0 was referred to as "the read-only Web," Web 2.0 is known as "the participatory social Web." Web 2.0 is a better and upgraded version of its precursor, embodying Web browser technologies like JavaScript frameworks. Some of the typical features of Web 2.0:

- a) Provides free ordering of information, enabling users to retrieve and classify data collectively.
- b) Holds dynamic content that responds to user input.
- c) Uses developed application programming interfaces (APIs).
- d) Encourages self-usability and allows forms of interaction such as: Podcasting, Social media, Tagging, Blogging, Commenting etc.
- e) Used by the society at large and is not limited to specific communities.

Access to the Internet through mobile devices and the rise of social networks have contributed to a burst of Web 2.0 growth. In addition, the growth of Web 2.0 has made possible the expansion of applications like TikTok, Twitter, and YouTube, making it possible for them to dominate the online landscape.

Concerning Web 1.0 and Web 2.0, these two versions of the Web are the iterations with whom most users are most familiar. Older users are no doubt aware of the "old" Internet (Web 1.0), while Web 2.0 is a default standard nowadays, so everyone has experienced it in one way or another. There are Web 3.0 elements here and there, but it has still not been rolled out as a complete entity. The best way to accurately compare Web 1.0 with Web 2.0 is by analogy. Imagine someone gives a book to read. The user reads but cannot change any of the words in it-this is what Web 1.0 was like. On the other hand, if someone offered a different book and a red editor's pencil and said that you can not only read the book but also use the pencil to make changes or additions to it, that is Web 2.0.

So, Web 1.0 information cannot be modified, while Web 2.0 information can. Web 1.0 is a static Web with linear information and, on the other hand, Web 2.0 is a dynamic Web that contains nonlinear information. A linear information is intended to be read in the traditional linear format, from beginning to end. Nonlinear information, on the other hand, has no such restrictions and can be read in any order the user wishes. Web 1.0 is a static form of the Web, while Web 2.0 is a dynamic entity. If you then add Web 3.0, it shows how this takes the user experience to the next level.

Web 3.0, also called Web3, is rooted in the fundamental ideas of decentralization, accessibility and usability for users. Web 1.0 is the "read-only Web," Web 2.0 is the "social collaborative Web," and Web 3.0 is the "read, write and execute Web." This phase of Web interaction and utilization shifts users away from centralized platforms like Facebook, Google or Twitter and toward decentralized, nearly anonymous platforms. The inventor of the World Wide Web, Tim Berners-Lee, originally called the Web 3.0 the Semantic Web and envisioned an intelligent, autonomous and open Internet that would use artificial intelligence and machine learning to act as a "global brain" and elaborate content in a conceptual and contextual fashion. This idealized version has not yet been fully achieved due to technological limitations, such as the cost and complexity of converting human language into something easily understood by computers.

II.3. Metaverse Attributes and Core Enablers

As previously mentioned, an unambiguous definition of the metaverse has not yet been agreed upon, but there are certain characteristics that are expected to be commonly found in all virtual worlds. The famous venture capitalist Matthew Ball gave the definition of the metaverse and was also among the first to predict the rise of the metaverse, pointing out some very interesting attributes necessary for a phenomenon like the metaverse to work.

The research summarizes some of the metaverse characteristics:

- a) *Persistent and synchronous* - it will be a synchronous life experience to those living within it. There will be all activities performed within a virtual world that will exist and change in real time. Moreover, a virtual world will have no way to stop or reset it, making it a continuous experience.
- b) *Immersive* - Regardless if users wear virtual reality headsets, AR glasses, or simply their smartphones, they gain access to a new degree of immersion and interactivity in the metaverse, where viewers can perceive a sense of both individual and social presence. Through artificial intelligence, a virtual world also will feature adaptive capabilities that will allow environments to be shaped based on interactions with users.
- c) *Decentralized* - There will be a metaverse not owned by a one individual or entity, but rather by all users therein. This is made possible by the contribution of blockchain technology.
- d) *Interoperable* - One day, users will theoretically be able to browse through different virtual worlds, experiences, and transactions alike as if they are all part of the same platform. To this end, users of the metaverse will need to have one digital wallet or one

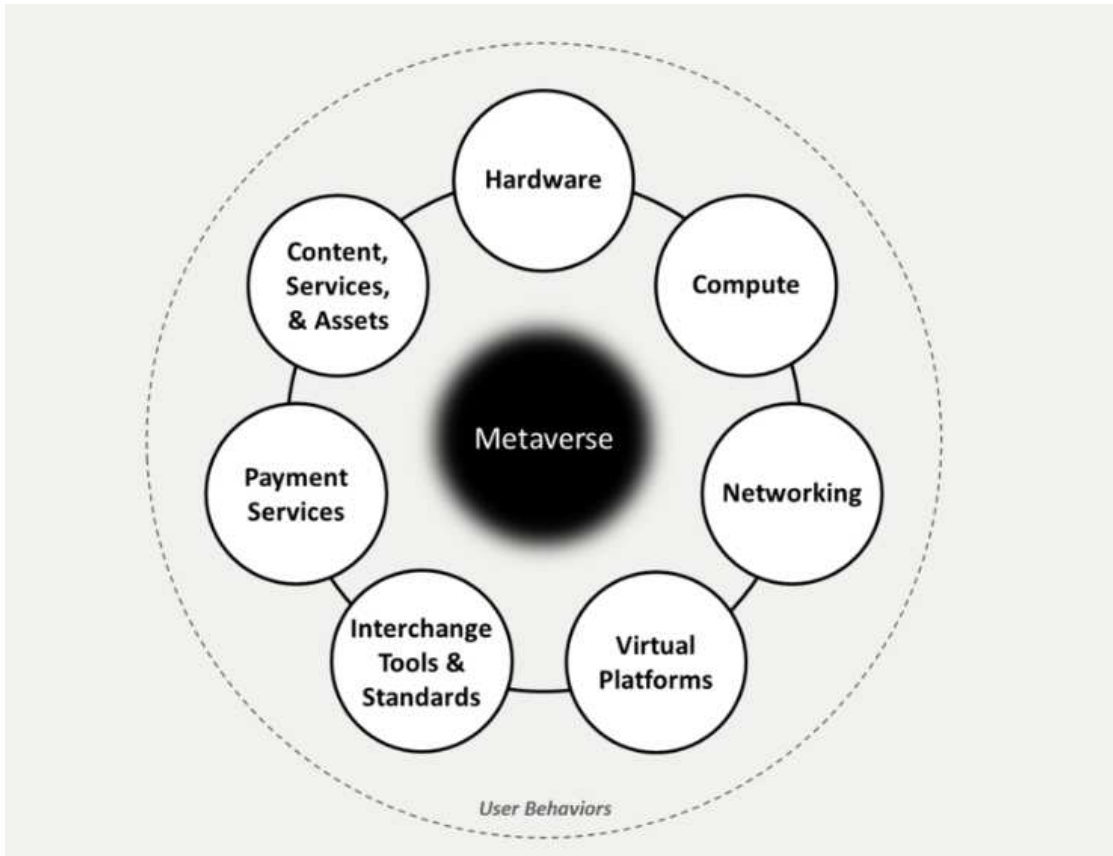
avatar, that can be used for all activities within the metaverse.

e) *Functional economy* - Individuals may join a free and secure metaverse market where digital assets can be exchanged for a fair amount of value. Generally, the assets in the metaverse are NFTs (non-fungible tokens) to be traded in exchange for a cryptocurrency. This enables users to hold complete possession of their digital assets, track their origin and history of transactions, and certify the authenticity and uniqueness of these goods.

f) *Accessible* - Virtually shared worlds hold the hope of democratizing access to digital commodities and experiences from any place and to any individual in the world. However, just an interface, such as a smartphone or a virtual reality headset, is all that is required.

The metavision is gradually gaining momentum, opening the way for far-reaching transformations in various experiences and settings, some of which are already in place and others that have yet to surface. As mentioned above, the complete vision of the metaverse is still far away. It will require extraordinary technical advances and quite possible regulatory implications. Furthermore, this will demand an audit of commercial policies and consumer behavior modifications. According to Matthew Ball's writings, it is possible to track and simplify the emergence of the Metaverse around eight base categories in the figure below.

Figure 2.3 Core Enablers of the Metaverse



Source: Ball Metaverse Index by Matthew Ball

It is useful to explain in brief each enabler from the figure above:

a) *Hardware*: The sale and sustainment of technologies and physical devices employed to enter, interact with or develop the Metaverse. Such includes, but is not confined to, direct-to-consumer hardware (like VR headsets, cell phones, and haptic hand gloves) and enterprise hardware (like those used to operate or create virtual or AR-based settings, such as industrial cameras, projector and tracking equipment, and scanner sensors). Also not included in this category are computing-specific hardware, Such as GPU chips and servers, and networking-specific hardware, like fiber optic cabling or wireless chipsets.

b) *Networking*: The delivery of persistent, high-bandwidth, real-time connectivity and

decentralized data forwarding by backbone providers, networks, exchanges, and the services that manage their routing

c) *Compute*: Enabling and providing computing power to support the Metaverse, by supporting functions such diverse and demanding as physics calculation, rendering, data matching and synchronization, artificial AI, projection, motion capturing, and translating.

d) *Virtual Platforms*: Development and management of immersive, frequently three-dimensional digital simulations, environments, and worlds in communities where users and companies can explore, create, socialize, and participate in a wide variety of experiences (for example: race a car, paint a picture, take a class, listen to music) and involve themselves in economic activities. These activities are distinct from traditional online experiences and multiplayer video games because of the presence of a large ecosystem of developers and content creators who provide most of the content and/or capture most of the revenue built on the underneath platform.

e) *Interchange Tools and Standards*: Instruments, protocols, data formats, services, and engines that serve as effective or de facto interoperability standards and provide for the creation, operation, and ongoing upgrades of the Metaverse. Such standards support activities including rendering, physics, and artificial intelligence, and resource formats and their import/export from one experience to another, compatibility management and updating, authoring tools and activities, and information governance.

f) *Payments*: Supporting digital payment processes, platforms, and operations, including fiat currency ramps (a form of digital currency exchange) to digital pure-play currencies and financial services, by including cryptocurrencies, such as bitcoin and ether, and by other blockchain technologies.

g) *Metaverse Content, Services, and Assets*: The design, selling, reselling, storage, safekeeping, and financial management of digital assets, such as virtual assets and currency, linked to user identity and data.

h) *User Behaviors*: Observable changes in consumer and business behaviors, including spending and investment, time and focus, decision-making and capabilities, that are directly linked to the Metaverse, or at least empower it or mirror its principles and philosophy.

II.4 A Decentralized Web 3.0: Features and Infrastructure

The Web 3.0, which is also referred to as the Semantic Web or read-write-execute, refers to the phase initiated in 2010 that hints toward the future of the Web. AI (artificial intelligence) as well as machine learning (ML) enable computers to evaluate data in the same way that humans do, leading to the intelligent development and distribution of useful information based on a user's individual needs. There are several key differences between Web 2.0 and Web 3.0, as faced in the previous paragraphs, decentralization is the defining benchmark. Developers of Web 3.0 hardly design and distribute programs that run on a single server or store data in a single database, usually hosted and managed by a single cloud vendor. Web 3.0 applications are based on blockchains, which are decentralized networks of many nodes or peer-to-peer servers, or a composition of both. Such applications become known as decentralized applications (DApps), to which the term is commonly referred within Web 3.0's framework ecosystem. Network participants who are the developers are remunerated for delivering the best quality services in order to maintain a strong and safe decentralized network.

Web3 provides decentralized access to linked data, as opposed to Web 2.0, which mainly keeps data in centralized storage locations. Web3 empowers individuals to interact with data by combining it with artificial intelligence and machine learning technologies, merging an idea of a semantic Web. (Berners-Lee T., 2004). Web3 will empower decentralized applications in the near future to replace centralized social networks, letting users retain control of their data.

Envision an Internet actually built, fueled and owned by users rather than by a few large technology companies. Social media users might monetize their data. The content creators would be able to receive payments in crypto straight up every time someone sees their latest post. This is the intent of Web3: a decentralized Internet built on an open, permission-free blockchain network. Today's Internet is centralized: data flows and is archived in data centers belonging to a few companies. Powerful handfuls control the most widely used services and platforms. In Web3, on the other hand, the storage and flow of data occurs on networks that run on many computers without a single entity controlling them. Online services, ranging from e-commerce and social media to games, are both provided and controlled through democratic groups of developers, creators, and users. Metaverse intended as shared worlds driven by virtual products and highly immersive and interactive digital experiences. A Web3 metaverse is blockchain-based and built on open standards, and it is referred to as an "open metaverse" at times. There is no single entity that is meant to control an open metaverse. For example, an idea of a metaverse is Decentraland, a world governed by its users through a DAO. By utilizing Decentraland's software development kits, users are allowed to build their own spaces, experiences, content, and collectibles in the virtual world. NFT represents the ownership of these assets, and transactions are carried out via Decentraland's MANA

token. Fashion and gaming companies pioneered the metaverse, frequently collaborating to create in-game skins and accessories for limited-edition characters. Within Blankos Block Party, a metaverse open game, it is possible to socialize at a Burberry-themed resort and purchase Burberry-branded outfits for their avatar. Users may also create and sell their own unique characters and accessories as NFTs. Meta, the successor to Facebook, is investing heavily in the development of immersive 3D worlds, virtual reality (VR) headsets, and augmented reality (AR) glasses, Apple also looks set to enter the race: the company is reportedly building a headset that will provide users with AR and VR experiences.

NFTs do have use cases that extend past art and gaming Non-fungible tokens (NFTs) are yet another popular Web3 application. NFTs provide a blockchain-based record of ownership of digital assets that can range from pictures as well as songs and videos. Every NFT accounts for a unique and unchangeable ledger entry and can operate much like a property act. Swapping NFTs allows the "ownership" of digital assets to be traded. Creators can sell NFTs straight to their followers in order to monetize their work or offer them for sale on NFT marketplaces such as OpenSea or Rarible. Through using Smart Contracts embedded in an NFT, creators could also add certain terms, like setting the system up to automatically receive royalties each time their NFT is swapped, regardless of the number of times it is bought and resold. There are many different ways NFTs can be used, even though the very first use cases have been focused on art and gaming. Web3 gaming models would typically feature a play-to-earn (P2E) aspect enabled by NFTs and tokens. Players can shop for NFT-related goods like game skins, arms, characters, and avatars. Gamers may then sell or trade these goods on NFT markets or even exchange them for cryptocurrencies on DeFi exchanges. But the

intended use cases for NFTs in Web3 go beyond art and entertainment: some academics in the field think that professional certifications or DAO membership, for instance, could be facilitated by NFTs.

II.4.1 The Advantages of Decentralization: DAOs & dApps

Web3 aims to return the ownership of data to their end users through decentralization. Web3's goal is to build new web protocols and infrastructure that empower developers to design applications into which users carry their own data and where identity is no longer tied to a specific platform. The decentralized Web is based on a peer-to-peer network built on a community of users; instead of a group of powerful servers, the nodes connected to the Internet in this group host Web sites or applications. Any website or program is scattered among thousands of nodes on a variety of devices. This procedure reduces the likelihood of server failure, site closure by hackers, or an oppressive government seizing or limiting views. Decentralized web is linked to the dark web, a web designed by the U.S. government to allow outspoken individuals and journalists under repressive regimes to freely express themselves, safeguard informants, and help keep users safe by keeping their identities. However, the anonymity and decentralized structure of the dark web also allow cybercriminals free reign to operate, which presents an avenue for the Web3. One of the world's biggest nonprofit libraries of information and culture, including books, music, movies, software, and free websites, the Internet Archive has been instrumental in guaranteeing that the Internet remains free and open. For this reason, since 2014 it has been one of the main organizers of DWeb events, which bring together groups of people who are laying the foundations for a

decentralized Web.

Decentralized applications (dApps) aim to eliminate the middleman. Such is a straightforward purpose with huge entailments. A ride-sharing app conceptualized by Web3, for example, would link riders directly with drivers. Payments would flow straight to the driver with no app getting a cut. Giants like Uber would be cut out of the market. The middle man operator then would be succeeded by a decentralized app, or dApp. These apps are operating on peer-to-peer networks, like blockchains, and utilize code-based smart contracts to simplify deals among parties with no need for a set trust. Theoretically, these apps would not be owned by a single person or company.

To be qualified as decentralized, an app must satisfy the following criteria:

- Completely open-source, having the data hosted on an open blockchain where no particular party owns the bulk of the tokens in the app.
- Token generation , those are necessary to use the app and are assigned to users in exchange for their contributions.
- Protocol changes solely upon majority consensus of its users.

A crucial and critical point is who and how will govern Dapps and other Web3 born organizations: the answer relies on Decentralized Autonomous Organizations or “DAOs”. A DAO is a blockchain-based method of managing a group. The rules are scripted in smart contracts which may include self-executing code tied to specific events or conditions. Therefore, the DAO structure personifies the collective ownership and decentralized features of Web3. Under the comprehensive Web3 framework vision, DAOs are going to supersede corporations as the organizations that administer online platforms. Many Web3 startups have a roadmap for transitioning to a DAO structure. Web3 platforms actually store data on distributed networks rather than on

central servers. The concept here is that decentralization over data means that few companies are prevented from controlling the Internet. One of the most popular peer-to-peer storage networks is the InterPlanetary File System (IPFS), where computers all over the world plug into the system and act as nodes that store data and get them available to users when they request one.

II.5 The stage of the metaverse in figures (end of 2022)

A McKinsey survey of more than three thousand consumers and executives revealed remarkable enthusiasm for the potential of the metaverse. Nearly 60 percent of consumers using the initial version of the metaverse are enthusiastic about moving everyday activities to it, with people-to-people connectivity being the most important factor, closely followed by the potential for exploring digital worlds. Approximately 95 percent of company heads forecast that the metaverse will have a positive impact on their industry within five to ten years, while 61 percent expect it to moderately change the way their industry operates. Among the sectors most likely to be impacted by the metaverse are consumer and retail, media and telecommunications, and health care, and such industries are also amongst those that have been already committed to metaverse initiatives.

Although estimates of the metaverse's potential economic value vary widely, McKinsey's view from the bottom up of both consumer and business use cases hints that it could generate an impact of up to \$5 trillion by 2030, which is roughly equivalent to the scale of the world's current third-largest economy, Japan. It is emerging as the largest new growth opportunity for several industries in the coming decade, owing to its

potential to enable new business models, products and services and to function as an engagement funnel for both business-to-consumer and business-to-business ends. The potential impact of the metaverse varies by sector, although it will have implications for all of them. For example, it is predicted to have an impact on the e-commerce market in the range of \$2 trillion to \$2.6 trillion by the 2030s, contingent on the realization of a baseline case or a success case. Still, it is anticipated to have an impact of between \$180 billion and \$270 billion on the academic virtual education market, between \$144 billion and \$206 billion on the advertising market, and between \$108 billion and \$125 billion on the gaming market. These effects, however, may manifest themselves in very different ways along the value chain (McKinsey, 2022).

The Metaverse Observatory and Ipsos have conducted the first widespread research to investigate the knowledge and opinions of Italians about the metaverse and its enabling technologies. The first unexpected data emerges in regard to the users and people familiar with these topics. It is mainly those over 36 who declare themselves to be acquainted with, curious about, and inclined to use these new technologies. Overall, 81% of Italian respondents have heard about the metaverse, even though they have little awareness of it. Following virtual reality, artificial intelligence, are the topics about which some knowledge is claimed, albeit superficial. Less heard are the terms blockchain, web 3.0 and NFT. In terms of knowledge, Gen X and Millennials outperform the youngest. The attitudes toward the metaverse are the most disparate. There is a coexistence of opposite feelings, from the uncertainty of losing touch with physical life, to the perception of something exciting that can enable new experiences. Again, contrary to popular belief, a certain positive attitude comes not from GenZ, but from the over-36s. The under-25s are those who are most hesitant as to whether

immersive realities are beneficial or generate the risk of losing touch with physical life. (“Metaverso: la prima ricerca su conoscenza e opinioni degli italiani”, November 18th 2022. Retrieved from Osservatorio Metaverso.)

As anticipated earlier, McKinsey has estimated that the metaverse ecosystem, by 2030, will generate a measurable impact worth between \$4 and \$5 trillion. The new Internet will involve a multiplicity of use cases that are tough to envision squarely at this state of development. For consumers, e-commerce has the largest potential, followed by gaming, advertising, and education. For businesses, the use cases involve a variety of sectors: manufacturing, retail, banking, media, telecommunications, and professional services.

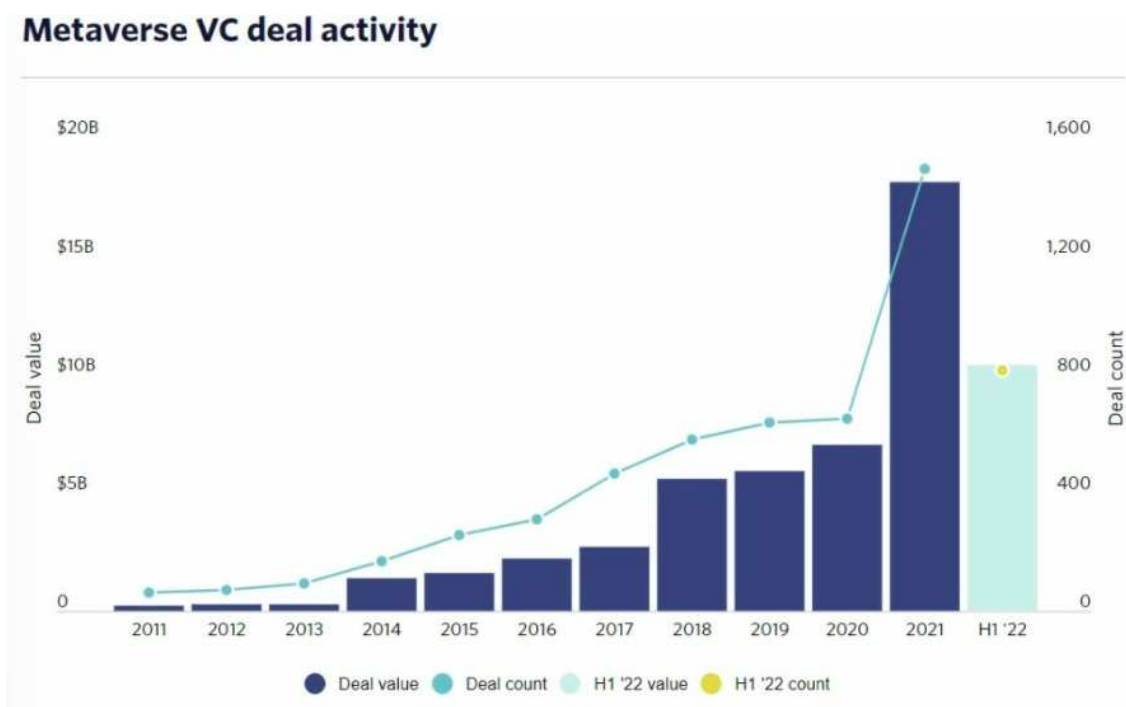
In addition, 65% of respondents think they will have a 5% reflection on company turnover within 5 years, and even 24% of them think of a 15% impact. Then, is there an 89% of early adopters who already report a positive impact on operating margins of more than 5%. But, of course, there are barriers to investment such as uncertainty about ROI (31%).

When one hears about the metaverse lately, the idea always hovers that, after all, one is referring to something abstract. Looking at data from the latest report by PitchBook, a renowned market analysis firm, things are much more concrete than one might think. There are 3,327 companies in the metaverse (including those working on the blockchain), 12,247 investors, and 9,661 deals, for a total collection that has reached \$115.5 billion (from 2010 to year to date).

In terms of geography, the largest investments are in North America, Asia, and Europe. Numerically, there are 1,618 companies surveyed in the US, 1,095 in Europe, and 991 in Asia.

The boom year for investment was 2021, when approximately 1,500 deals amounting to \$18.1 billion were reported. But even in the first half of 2022, the level of commitment stayed high with \$10.4 billion and 815 deals. Some of the most interesting deals in the past twelve months include: the \$300 million round from Niantic that took the company to a \$9 billion valuation, the \$145 million raised by virtual world Rec Room, and the \$60 million round from Nreal, which makes augmented reality glasses.

figure 2.4 Metaverse VC deal activity



Source: Pitchbook Reports (2022)

II.5.1 Future of Metaverse (s): Risks, Challenges and Technologies

The wave of pessimism is not surprising considering that Meta's (formerly known as Facebook) stock has lost more than half its valuation since it switched to the metaverse.

In addition, Meta has announced major job layoffs across the company recently, prompting an industry-wide panic wave. At the same time, however, Meta's current difficulties reflect the problems in its traditional business and are not a pointer to the failure of its metaverse approach. A major concern at this point is the public overall is still confused about what the "metaverse" is and in what manner it may be beneficial to society. Simple definitions of the metaverse are hard to come by. Some influencers approaching the Web3 space generate confusion by describing the metaverse in terms of blockchain, cryptocurrency, and NFT, which are deeply useful technologies but are no more relevant to the metaverse than 5G, GPS, or GPUs. ("The metaverse is inevitable, regardless of what happens to Meta", November 22th 2022, Retrieved from Bigthink)

However, the metaverse is not about any particular infrastructure. The metaverse, contrariwise, is about transforming how humans experience the digital world. Since the very beginning of computing, access to digital content has been primarily achieved through flat media viewed in the third person. Within the metaverse, digital lives have steadily increased to involve immersive media that all appear around us and are experienced in the first person. This will impact everything from the way we work, shop and learn online to the way we socialize and organize. The metaverse is the transition of the digital world from flat content to immersive experiences. The Metaverse requires and will require countless new technologies, protocols, companies, innovations and discoveries to function and be successful. And it will not emerge directly, there will be no "Before" and "After" of the Metaverse. On the contrary, it will emerge slowly over time as different products, services, and features will integrate and blend together.

CHAPTER III.

HOW AND WHY FASHION & LUXURY BRANDS ENTER THE WEB3 BASED METAVERSE.

III.1 What makes the Metaverse attractive? - Seven Layers

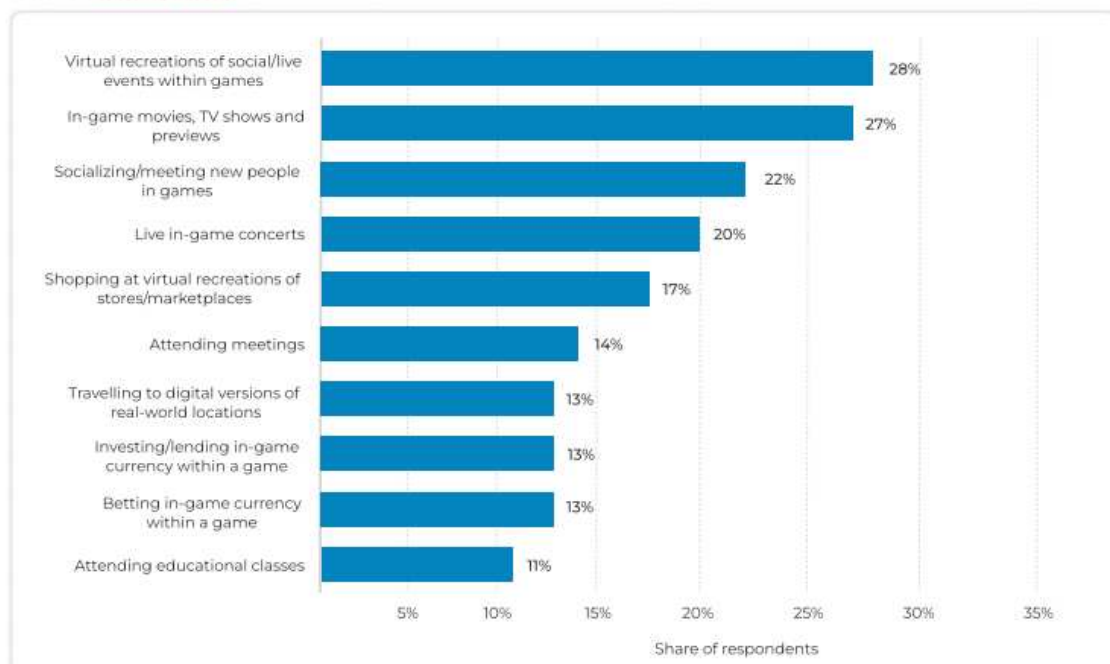
The Metaverse is a repository for all the virtual worlds generated by blockchain technology. These could be game worlds, NFT malls, edited lands, or digital roads. The key aspect of the Metaverse to fully realize is that it is not a single place. Media enterprises, musical editors, clothing brands, and bitcoin analytics tools are all located in the Metaverse. However, what differentiates the Metaverse from other online social platforms including Second Life and Minecraft is the gap that exists between centralization and decentralization. Formerly, the digital habitats were tightly controlled by a single company from their servers. Whenever one left their domain to enter another, one had to register with a new identity. The Metaverse enables one to travel through the network of developing virtual environments while using a unique identity. That makes it more similar to a mirror to reality. When traveling to new cities and countries, there is no need to obtain a new passport each time. This shift has been pushed forward by different sets of activities composed by multi-sectorial and cross-sectorial businesses.

Indeed, in 2021, non-gaming activities made up a significant part of the online gaming environment. In the past year, about 60 percent of players in the United States engaged in non gaming activities, the most popular of which were virtual recreations of in-game

social or life events. In second place came online meetups where players jointly watched movies, TV shows, and in-game previews. Overall, 20 percent of the survey respondents reported that they attended in-game live concerts, like the Travis Scott concert for Fortnite.

Figure 3.1 US Inquiry on Metaverse activities

Source: Statista 2022



Source: Statista (2022)

In order to get an overview of the purposes for the brands to enter the metaverse this research will refer to “Seven layers of the Metaverse”, February 20th 2022. Retrieved from Building the Metaverse blog by Jon Radoff.

Lead entrepreneur and author Jon Radoff suggests that the Metaverse is sub-divided into seven distinct layers, each of which influences one facet of the user experience:

- 1) Experience: Understanding the seven layers of the Metaverse With the dematerialization of physical space in the digital world, this means that the limitations of physicality will be removed. The Metaverse will offer people a variety of experiences that they cannot currently enjoy.
- 2) Discovery: Through this layer, customers can learn about new platforms by means of app stores, search engines, and evaluation websites. This crucial step is necessary for the discovery of new technologies and communities.
- 3) Economy of creators: Developers use several design tools and apps to build digital resources or experiences. Several platforms, as well as drag-and-drop tools, are gradually developing more user-friendly creative methodologies.
- 4) Spatial computing: This technology blends mixed reality (MR), virtual reality (VR) and augmented reality (AR). A significant technology category has evolved that enables users to interact with 3D environments toward better experiences over time.
- 5) Decentralization: The Metaverse will not be governed by a single entity. As the Metaverse grows, thanks to blockchain technology, scalable ecosystems will help entrepreneurs to provide a more comprehensive portfolio of specialized digital assets.
- 6) Human interfacing: the hardware layer of the Metaverse has to include human interfacing. The body of a person can be accepted as a 3D and realistic avatar in any virtual world.
- 7) Infrastructure: the infrastructure layer includes the technology that fuels people's devices, interconnects them to the network, and hands out content. Over time, 5G networks will significantly increase the capability of the Metaverse.

When it comes to the operational aspect of achieving one or more goals in the Metaverse and Web3, it is imperative to mark those activities in different sets. The The functioning of the Metaverse is based on the following key properties:

- a) Avatar Inclusion : One of the fundamental principles of the Metaverse is the creation of digital avatars of oneself as a way of expressing one's emotions and feelings in a unique way. Each individual has his or her own digital identity, which can be static or animated and is original to them. Avatars are a personal self-expression because besides being exact reproductions of one's physical form, they can also be recreations of one's favorite famous figures or something completely original. The gamification comes in when users are given the possibility to customize their avatars, making the experience more engaging and dynamic. Avatars are often edited and may closely resemble users' real-life counterparts in some respects. Sometimes avatars can be computer programs. The users can control their avatars through the use of computer keyboards, joysticks, mouse, and specialized human-computer interface (HCI) devices. More realistic avatars can offer a more immersive experience to users or anyone interacting with them.
- b) Blockchain-based operations: Blockchain protects consumers' virtual assets and provides digital proof of ownership (DPO), becoming an essential constituent of the Metaverse. The Metaverse is witnessing an increase in the volume of data, its value, and the significance regarding security and trustworthiness. To ensure the validity of data in the Metaverse, blockchain expertise and technologies are needed, and artificial intelligence (AI) is being used to protect the diversity and the wealth of material. The Metaverse concept is incomplete on its own without

blockchain because of the many disadvantages of centralized data storage in systems such as database management systems (DBMS). The blockchain-based Metaverse allows access to any digital location without the influence of a centralized organization.

- c) The use of virtual land (parcels)The demand for virtual land in the Metaverse is over the moon. Everyone can purchase parcels of land in the Metaverse in exchange for cryptocurrency. Land is a non-fungible token (NFT), a type of asset on the blockchain that cannot be exchanged for other types of goods. The basic number of pixels in a piece of real estate in the Metaverse is defined as size. On the virtual plot, individuals can engage with digital showcases, virtual games and perhaps even entertainment. Size and location determine the use cases of the land. Parcels of land next to a VR road, for instance, may be beneficial for the ability to display advertisements.
- d) Immersive AR/VR Experiences: Through the use of mixed reality and AR/VR technologies, Metaverse stakeholders can enjoy more immersive experiences that converge reality and the virtual world. Thus, it is simple to see why the Metaverse is becoming increasingly popular: it brings games, concerts and theater performances to life, as well as professional or educational meetings. AR and VR are the principal building blocks of Metaverse projects. Connectivity between real and virtual environments, real-time interaction, and highly accurate rendering of 3D objects are three key components necessary for augmented reality systems to work.
- e) Artificial Intelligence entrance: AI is instrumental to the Metaverse as a leading driver of enterprise research in fields including content analysis, auto-supervised

speech processing, robotic interactions, computer vision, and whole-body posture estimation. AI may be utilized to provide business applications in the Metaverse in several ways. AIOps, a subsurface of AI, uses machine learning to assist companies in managing their IT infrastructure, soon to be applicable to Metaverse systems. In addition, AI-powered chatbots are getting more and more popular among companies. AI bots with realistic avatars can be used for various purposes in the Metaverse, covering sales, marketing and customer service.

- f) Decentralized Autonomous Organizations (DAOs) for governance: an DAO is a governance entity, similar to a board or committee, that utilizes blockchain and smart contracts to drive decision-making. Treasury Wallet, following DAO governance guidelines, supplies money for farming in multiple networks. Any decisions in DAOs are again regulated by proposals and voting procedures to make sure that all members of the organization have the opportunity to take part in the governance process. Procedure are key to assist participants in voting on important resource management decisions in the Metaverse.
- g) Usage of Human-Computer Interface (HCI) technology: the Metaverse is an online bulk computing platform that encompasses a wide array of platforms, devices, and single users. The application of HCI in the creation of the Metaverse, in particular, the way in which user activities are incorporated into the virtual world, is critical to achieving this goal. In order to take part in given activities, a human and a computer share information through a process referred to as HCI. The most important benefit of human-computer interaction at this point has been that it services groups that need formal training and information about how to interface with computer systems.

- h) **Emphasis on Social Interactions (Communities):** avatars and visual portrayals of users are employed by humans to interact and participate in communication in the Metaverse. Users can engage in interactions with the Metaverse and other users. Those interchanges take place in cyberspace, acting as a representation of the real world. Nevertheless, differences exist between the economic and physical limitations of real venues. Thus, the physical experiences within our real world could merge into a single virtual environment. Individuals will be empowered to surf the infinite world through this holistic experience that will combine all these disjointed gatherings.
- i) **Web3 Support:** the goal of Web3 is to unveil a new epoch of the Internet. This involves the unfolding of user ownership and control over their online content, digital resources, and online personalities. Web3 and Metaverse technologies complement each other. Since the Metaverse is a virtual environment that prefers a decentralized Web, Web3 can provide the basis for the connectivity.

III.2 Where is Fashion at in the Metaverse: Advantages in numbers

Both brands and their customers can greatly gain from combining the worlds of fashion and the Metaverse. However, many people will find it hard to comprehend the concept of digital fashion because buying/trying items that exist only in a virtual environment initially seems weird. Yet as this niche industry continues to gain ground, many experts are taking up seriously the suggestion that the Metaverse may change the future of fashion. A recent study found that garments existing solely in the digital world are much more environmentally friendly compared to their physical equivalents, producing

97 percent less CO₂ and using about 3,300 liters of water per item. In addition to this, it has been shown that replacing physical samples with digital samples during the design and development stages of a firm can cut a brand's carbon footprint by up to 30 percent. Moreover, the use of digital clothing can be very useful during the many processes that precede the physical creation of a garment. Such virtual objects, for instance, have the potential to be leveraged for modeling, sampling, and marketing purposes prior to their physical iterations being sent to production, sharply lowering the overall environmental effect of a fashion garment's entire lifecycle. Lastly, on the sales side, digital garment models can help alleviate the problems associated with excess production, commonly seen as a key obstacle in today's fashion industry. According to Cathy Hackl, Chief Metaverse Officer at Futures Intelligence Group, the metaverse is *"the progression of Web 2.0...where people, spaces, and assets can [exist] in a totally virtual synthetic environment."* Whereas Web 1.0 allowed information to flow from one user to another and Web 2.0 focused on connecting individuals and creating the sharing economy, Web 3.0 allows these connections to be explored at a more participatory level. It will be possible to interact with content not only through sight and hearing, but also through touch, taste, and smell. The metaverse is purely a sensory extension of our experiences on the Internet. While our digital identities change and the use of our senses expands within the metaverse, fashion, a form of self-expression and autonomy associated with a certain time and place, appears natural to make its way into the metaverse. From a cultural perspective, as well, there is a shift away from rapid fashion to industry sustainability. Given the speed with which trends arise, fashion companies are under continuous pressure to manufacture new and fashionable things, which often results in environmentally harmful waste. Add to this lack of sustainability the supply chain

difficulties we are currently experiencing globally as the result of a global epidemic, and it gives the perfect pretext for experimenting with other types of fashion. The window of opportunity in such a circumstance is digital fashion. Digital fashion removes the necessity for companies to produce physical goods, allowing them to save on production costs and appeal to a more eco-conscious consumer. Since all that is needed to develop and market digital designs is access to a computer and the Internet, the metaverse would also facilitate entry into the market for smaller designers.

According to Technavio, the scale of the overall metaverse market in fashion is forecast to rise by \$6.61 billion from 2021 to 2026. The market is forecast to grow at a CAGR of 36.47 percent during the forecast period. In addition, the growth momentum is expected to accelerate. The increasing number of fashion brands entering the metaverse platform is a key contributor leading the market growth. Fashion brands, as well as apparel brands, are heavily dependent on appealing labels and brands for sales. Apparel brands employ metaverse platforms to improve brand awareness. Launching virtual products will improve brand awareness and interaction with consumers. (“Metaverse in fashion market size is set to grow by USD 6.61 billion from 2021 to 2026, Growing number of fashion brands entering the metaverse platform to boost the market”, March 14th 2023 Retrieved from Technavio.)

By geographic area, the global metaverse market in fashion is divided into North America, APAC, Europe, South America, the Middle East and Africa. The report details useful information and estimates the contribution of all regions to the current growth of the global metaverse market in fashion. North America will represent 38 percent of the market growth over the forecast period. The United States is a major player in the metaverse market in fashion in this region. In addition, market growth in this region

will be faster than that of South America and countries in the Middle East and Africa. Attracting key providers, growing AR technology investments, increased adoption of technologically advanced applications, and significant research efforts all will guide the growth of the metaverse market in fashion in North America during the forecast period. It is estimated that the metaverse market in e-commerce will have a 39.65% growth CAGR between 2022 and 2027. The market size is expected to increase by \$85,885.22 million. This report broadly covers market segmentation by market platform (computer, mobile, and headset), technology (AR and VR, blockchain, mixed reality, and others), and geography (APAC, North America, Europe, South America, and Middle East and Africa). In entertainment, the metaverse market is projected to grow at a CAGR of 9.07% between 2022 and 2027. The market size is predicted to increase by \$33,323.31 million. Extensively, this report covers market segmentation by end user (film production, music labels, OTT platforms, TV broadcasters, and others), components (hardware, software, and services), and geography (North America, Europe, APAC, South America, and Middle East and Africa).

III.3 Fashion in Metaverse: Case History full of Partnerships and Networking

The simplest approach to understanding how fashion plays out in the metaverse is to look at the fashion brands already involved. To date, most of the fashion industry's investment in the metaverse has been in the form of video games, a \$40 billion-a-year industry. Balenciaga was one of the early fashion labels to adopt virtual reality. The

company recently unveiled plans to create a dedicated metaverse business unit within the company to research potential windows of opportunity in this space. In autumn 2021, they presented their seasonal collection through a game app and collaborated with Fortnite to natively develop a series of "skins" for the game's characters. One other fashion brand that is entering the fashion metaverse is Dolce and Gabbana. In September last year, Dolce and Gabbana released a nine-piece tech drop of digital apparel on the USXD marketplace, which is available for purchase in Ethereum, one of the most popular cryptocurrencies in the metaverse. NFT's first collection from the company sold at auction for about \$6 million.

Gucci and Vans, a VF Company have collaborated to unveil an exciting gaming experience within Roblox. They have joined forces to create a scavenger hunt spanning both worlds. According to Jessie Hauser, *"players can take part in a special scavenger hunt, navigating and skating obstacles to collect fabrics and patterns scattered in both worlds, moving through dedicated shoe box-inspired portals."*

Combining "Gucci Town" and "Vans World," the activation would engage community groups in a hunt for treasure to collect textiles and patterns, moving through the two worlds via shoebox-like portals. When all the samples are gathered, special items can be ransomed in each world to be wearable by Roblox avatars, including a shoe accessory or a skateboarding backpack. The activation marks the first time two global fashion brands of this size have partnered on the platform to connect their respective worlds.

Figure 3.2 Gucci and Vans collaborate on Roblox



Source: Fashion Network (2023)

What is the aim for such partnership? To enable players to experience first-hand "the lifecycle of fabrics and patterns which they can recycle for exclusive avatar accessories" while learning about sustainability, through gamification. Gamification is so important for brands to engage users and increase customer experience.

Some key points to understand the benefits in adopting gamification:

- it encourages, and so increases, engagement (many will complete the challenge just to find out if there's a prize).
- it's fun and the more enjoyment a user has it means the more memorable the experience.
- it enhances engagement time, and takes shoppers past products they may otherwise not have explored.
- storytelling: customers are more likely to tell a friend about the experience.
- this experience is educating their users on important global topics.
- It can give brands valuable data about user behavior, preferences and interests.

This can be used later down the line to personalize marketing efforts or ecommerce experiences.

Bridging different metaverses together has been made possible thanks to Tommy Hilfiger introducing a multi-metaverse hub for Metaverse Fashion Week 2023 edition. At the second edition of Metaverse Fashion Week, Tommy Hilfiger presented a multi-metaverse hub, managed by Emperia, across several virtual platforms. The virtual experience features participation from DressX, ReadyPlayerMe, Spatial, Roblox and Decentraland, according to a statement sent to Retail Dive. Tommy Hilfiger has brought both digital and real-world garments, available for sale in both wearable forms, to the metaverse fashion event. The attendees have the chance to purchase garments to be shipped to their homes, or to wear the exact same piece in online gaming environments. Cross-platform interoperability is indicative of a broader trend arising from the concept of the metaverse. With the debut of several Web3 platforms and startups, their ability to work together is being scouted.

Figure 3.3 Tommy Hilfiger's Multi-Metaverse experience



Source: Retaildive (2023)

The iconic Tommy Hilfiger "TH" monogram appears high and in the center of all virtual areas. At the center landing space, users can either head to the retailer's website to buy directly or browse other virtual commerce opportunities on several of the metaverse's platforms. Such include digital fashion garments made by DressX, a photobooth, AR features, a collaboration with Web3 artist Vinnie Hager, and an AI fashion contest. Jemma Spiers-Ware, Senior Director 3D Product Experience (3DX) Tommy Hilfiger & Calvin Klein, highlights that by *“exploring opportunities at the intersection of fashion and technology, we can test and discover what the community expects from us while inviting the first wave of movers to join this exciting journey with us.”*

An exclusive four items are being offered by Tommy Hilfiger for Metaverse Fashion Week in both digital and physical form. The varsity jacket is made available to be worn

in real life through Tommy Hilfiger's e-commerce space, connected and accessible through the Emperia multi-metaverse hub. In digital form, the jacket can be worn on the Ready Player Me avatar creation platform and in various gaming environments with the wearable provided by DressX. Olga Dogadkina, Co-Founder and CEO of Emperia, adds that *“one of the major problems with the metaverse, as a concept today, is the distribution across multiple platforms, none of which speak to each other or integrate into brands’ existing digital channels. By creating an interoperable approach, we’re able to bridge this gap and bring multi-world experiences into the brands’ Web3 and e-commerce strategy — while keeping their existing Web2 user base involved.”*

With the growing popularity of the metaverse, platforms such as Emperia are emerging to create virtual spaces. Emperia recently partnered with Japanese luxury beauty brand Tatcha to create its virtual store promoting a collection of body care products.

Bulgari launches its *Scentsorial* experience in the Dubai Mall, providing customers with a unique, immersive way to discover the Le Gemme Tygar fragrance. The Italian maison pursues further its dive into technological innovation by launching the exclusive Scentsorial project, a futuristic pioneering experience where guests will discover olfactory artwork, revealing Bulgari's desire to engage, ever so slightly, with new technologies. Scentsorial offers each guest a truly unique Immersive Experience, a multi-sensory journey unlike anything that has ever existed in the world of fragrance. To uncover the Bulgari Le Gemme Tygar fragrance, Bulgari fashioned a unique exploration of human thoughts and emotions. While the experience was unveiled during the Tax-free fair in Cannes last year, it will open to the public from March 15 to 26, 2023 inside the Dubai Mall in the United Arab Emirates. Bulgari customers got the

chance to 'discover the olfactive realm' of Le Gemme Tygar fragrance, created by Jacques Cavallier.

Figure 3.4 Bulgari's Scentsorial experience: Dubai Mall in the United Arab Emirates



Source: Bulgari (2023)

Bulgari is adopting web3 tech into their practices. How does web3 technology create such an experience for the customers?

Using wearable tech, the multi-sensory journey tracked guests' brain waves, heartbeats and emotions. Each visitors' reaction was turned into a downloadable digital collectible, based on specific personalized data. Providing guests with NFTs is another way of building communities and driving loyalty. These digital collectibles could be used to host exclusive events, product launches, feedback sessions, reward schemes etc. The experience is also more memorable for the consumer as they have got a proof of attendance token. It is also providing Bulgari with a heck of a lot of numbers and data. Having more data means thanks to more personalized, crafted communications and

products, resulting in an important increase in revenues and conversion rate.

Nike is the pioneer in approaching web3 based technologies and concepts merging brand awareness and sustainability with the better customer experience. A clear example of that is the “Move to Zero” campaign which utilizes augmented reality (AR) storytelling and creates a 3D experience in order to drive awareness of many sustainability commitments Nike is involved in. Nike is deeply committed to sustainability, and this activation supports promoting its journey to zero carbon emissions and waste to helping protect the future of sports. As a consumer scans the "Move to Zero" box, an AR experience is triggered that visually tells the story of Nike's commitment to sustainability.

- AR plays such a strong role in educating consumers for two main reasons:
- It is entertaining and memorable: users are educated in a new and immersive way. Customers are much more likely to remember what they see because it is exciting and engaging.
- It gives life to the story: storytelling is very important for brands seeking to resonate with audiences and engage users on an emotional level.

The Web3 and Metaverse story for Nike began with the acquisition of RTFKT in December 2021, when sneaker culture underwent a huge shift and sneakerheads experienced a new hybridization of sneaker collectibles across a combination of physical and digital experience. By means of the CryptoKicks, digital editions of Nike's officially licensed sneakers, Nike was able to source more than \$184 million from the sales of digital collectibles, which is only a small part of the \$49.1 billion the company generated in the year after the end of November 2022. In November. Nike also debuted "Swoosh," which now serves as the home for all of Nike's virtual products, as well as

housing all of Nike's digital collectibles that are collected through its online gaming and immersive experiences. Nowadays, Nike is on the front lines of promoting high-end sneaker culture on the Web3.

An example of education and Social Responsibility thanks to augmented reality is the collaboration H&M has with Zappar. The aim of the project is to engage families outside the store with something new and convince them to go inside to explore the back to store collection and discover more fun experiences. Zappar Creative Studio's team collaborated with H&M kids for the "back to school" recreational campaign. Rolled out via QR codes on store windows, the AR experience gives parents and children the opportunity to virtually open locker doors and reveal cute animated characters. This interactive experience keeps children entertained with an amusing game and prompts parents to be more sustainable. Immersive experiences, such as AR, are a playful and interactive way to bring a story or source of information to life. Children find this technology (visual and sound stimulation) particularly engaging and incredibly novel. The more engaging, the more unforgettable the experience. AR experiences are often gamified, just like this one. Incentives, rewards, and gamification elements encourage participation and engagement. More engagement most often means more learning on the part of the audience. Children will associate the H&M store with the interactive experience in a positive way, thereby in turn possibly encouraging brand loyalty from their parents. One evolution of this experience is a recycling rewards program in which children can be incentivized to recycle their clothes and in return earn "green" points that give them digital rewards. Kids may be guided on a journey through the process of clothing production, from sourcing materials to manufacturing and distribution, to help them learn about the fashion industry's impact on the environment.

Creating partnerships between fashion brands and schools, where children are educated about fashion and sustainability through workshops and competitions, could be really empowering. Asking kids to participate in designing an object as part of a contest encourages involvement and social responsibility.

Another innovative collaboration is between Valentino and UNXD, a specialized luxury web3 platform. Together, they have announced a partnership meant to extend the iconic Maison into web3 and the metaverse. The pairing seeks to lay the groundwork for Valentino's web3 adventure. In conjunction with UNXD, the Maison will explore the crossroads between virtual fashion, physical craftsmanship and curated community experiences. Building on UNXD's expertise in fusing digital, physical and experiential touchpoints, the partnership will identify ways in which consumers can interact with the Valentino brand-through products, stories, events and other experiences. The brand intends to extend its creative vision to a new world, in this way Maison Valentino continues its commitment to foster and support a community based on empathy and shared values. *“Valentino is one of the most iconic luxury Maisons, and truly a brand in and of the moment. We’re thrilled to bring Valentino’s unparalleled creativity and narrative into web3: opening doors to never-before-seen digital and physical hybrid experiences. Together, UNXD and Valentino will write luxury’s next chapter,”* suggested Shashi Menon, CEO, UNXD. (“How Valentino wants to step into the metaverse”, February 22th, 2023. Retrieved from The Spin-Off.)

Luxury Italian fashion brand PINKO has unveiled a metaverse store selling both physical products and digital collections with the goal to create a unique shopping experience for their customers. To mark the kickoff of its new store in Milan, PINKO has launched an immensely animated virtual experience, together with Emperia, to help

familiarize women's communities with the brand even more. But potentially most exciting is the availability of the NFT "Meta Love Bags" collection, accessible inside the outlet.

Figure 3.5 PINKO's first Metaverse store



Source: Mobile Marketing Magazine (2023)

Deployed on two bright and futuristic pink levels, the virtual store displays an array of brand new and specially designed bags. Shoppers will be able to buy them from the brand new Pinko Galleria, unique to this experience, straight from the store's metaverse, experiencing, interacting and learning about them through 3D modeling. Playing an important role in this is Emperia, which develops immersive virtual stores for the retail and fashion sectors. Using a virtual store development and management platform, its technology enables the creation of highly differentiated virtual experiences that extend physical spaces into the metaverse, adding a layer of interaction, personalization and data monitoring. All this aligns with retailers' omnichannel approach, which enables a

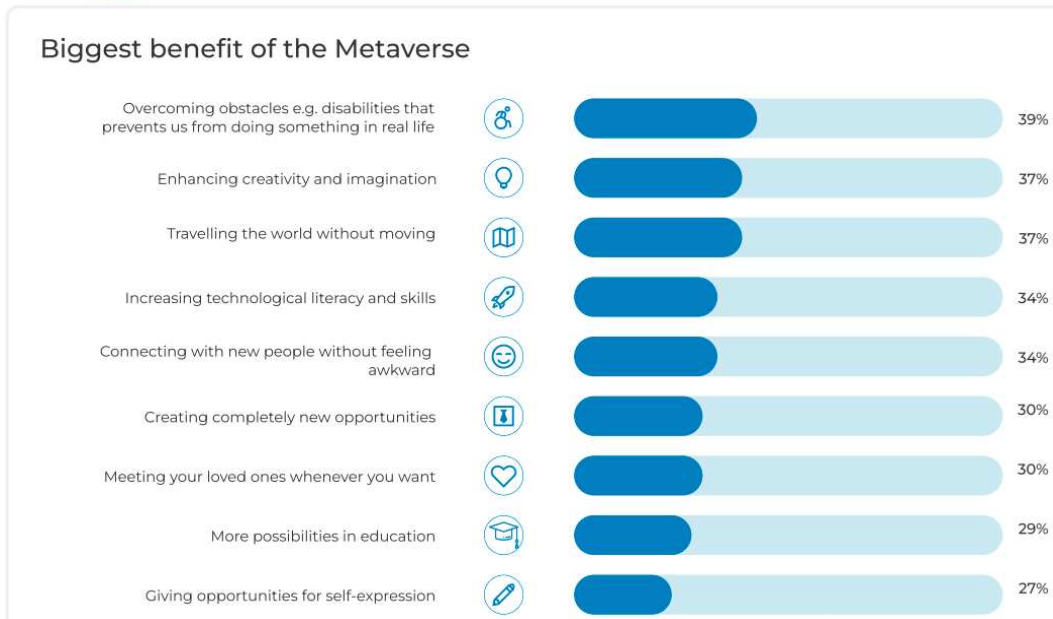
smooth transition from physical to digital. As opposed to standard e-commerce sites, where users spend about two minutes exploring, Emperia had reported that visitors to its virtual stores spend an average of 14 minutes exploring.

III.4 Web3 based Metaverse is Cross-Industry

The Metaverse today is far beyond an emerging technology part of today's hype cycle. Rather, it is the finish line of years of research into artificial intelligence and immersive interactivity and will transform companies in many ways. Companies can use the Metaverse to offer customers a whole new level of immersive experiences and entertainment options. If your company is one of the first to offer customers an experience in the Metaverse, it would achieve a competitive advantage and public attention. On-brand gaming experiences, virtual objects, and AR/VR showrooms on the Metaverse are all ways to propel the company. Organizations themselves can leverage the Metaverse to create immersive 3D marketing experiences that grab the attention of potential customers in new and engaging ways.

Figure 3.6 Biggest benefit of the Metaverse

Source: Tidio



Source: Tidio (2022)

Hosting a conference or live event which can be both watched online and in person is not uncommon: most people are prevented from traveling to a professional conference or lecture, but that is not an excuse for not being able to learn more. A conference in the Metaverse, unlike a simple Zoom or Google Meet stream, can be a fully featured VR experience, with adequate opportunities for networking and participation, instead of just another video in a small window with comments below it. With VR and the Metaverse, viewers will feel more inwardly present and engaged in the experience. Companies can promote and sell their products, since several firms are already using augmented reality to enable customers to virtually try on clothes or glasses, get a look at how a new furniture might fit in their space, or get a makeover with new hair or cosmetics. In the Metaverse, it is possible to experience the same things, but in a better way. If one has the ability to rent or buy commercial property, one can set up stores and showrooms in

the Metaverse, where users can see more of your products. Users keep gushingly buying virtual clothes and apparel accessories, proving that digital fashion is having an important time. Using the Metaverse opens up a new advertising vehicle. Within an e-commerce business, brands can target a huge global audience through the Metaverse's platforms. Companies should anticipate seeing new brand storytelling and general advertising methods introduced into the Metaverse. Indeed, an efficient way to increase brand awareness and identification is via storytelling. Individuals love to hear stories that narrate about a firm's values and beliefs far more than just slogans. Storytelling will develop into "story living" when audience members themselves grow into active players or even characters with a voice in events rather than just being passive bystanders.

Teamwork and process creation can be improved because everyone has come to grips with the new realities of remote online meetings and collaborative networking. While these methods have been imposed on us, they worked just as well in a face-to-face work environment. The use of the Metaverse can help to enhance workflows even better. Meetings will be visualized as a group of people sitting in a room, instead of Zoom calls, with Meta having an early start in providing VR work rooms. The Metaverse offers employees a digital space for communication, plus the possibility to interpret the emotions and body language of others and maintain an emotional connection.

Cryptocurrencies, e-wallets and the Metaverse are all inextricably linked to the ease of business transactions. Yet even at this early phase of uptake, it will be challenging to grasp the benefits of the digital world without a cryptocurrency purse. Metaverse equally underpins digital wallets, enabling companies to monitor transactions in their virtual ecosystem. Perhaps this concept may frighten some business users, blockchain technology and cryptocurrencies have more benefits than drawbacks. Individual users

and businesses may be able to carry out any online transaction with more convenience using cryptocurrencies. They do not have to link their bank accounts to virtual worlds as payments are as straightforward as a few clicks and all transactions are fully transparent.

III.4.1 Retail Industry

Over the past ten years, the retail sector has embraced an omnichannel focus, where brands have been considering integrating physical and Internet retailing. In order to address the mismatch between physical and digital retail experiences, companies are exploring the use of the metaverse to provide customers with an immersive, multimodal shopping experience that is currently absent in the digital environment. If combined with augmented and virtual reality (AR - VR) devices, it has the power to meaningfully revolutionize the retail industry. The retail industry is now facing several problems and intensive competition, including customer service, proactive customer engagement, retention, and loyalty growth. To tackle these issues, marketers are eyeing the metaverse as a solution to recreate the in store experience of not only physical clothing stores, as well as furniture and automotive showrooms, among other venues. There are three broad and possible settings for retail brands as they explore these emerging technologies:

a) Full immersion: The aim of most metaverse advocates is mass adoption, whereby most people spend their entire days and nights taking part in the interactions made possible by the metaverse. Suppose waking up to a hologram broadcasting a personalized news feed and the day's priorities.

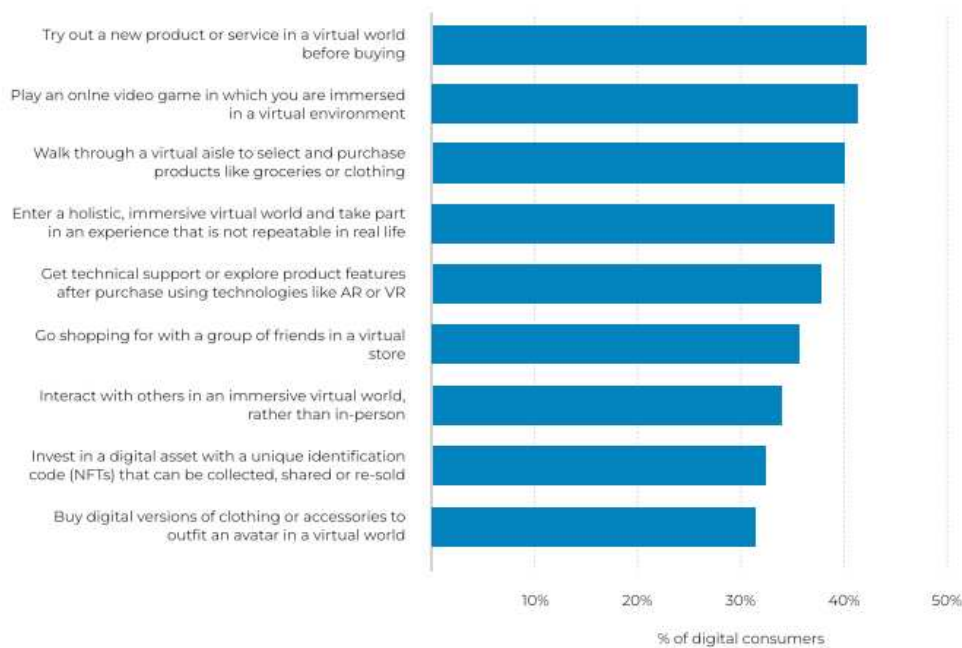
b) Separated Generation: At the moment there is a group of early adopters willing to play as much time as technology permits in the metaverse. They dedicate not only their time but also their intellect and money to the metaverse. In the future, the uptake of the metaverse will be mainly restricted to this group of users, while the general population will only rarely participate. This tiny group of the demographic has significant buying weight that piques the interest of RCP companies. It also has specific characteristics that can be taken into consideration, particularly a predilection for the metaverse environment, which can assist retail companies in the metaverse to deliver new offers to customers successfully.

c) Improved lives: the metaverse in this era will focus on integrating the physical world with more sophisticated technologies to aid and complement the daily activities of the population. In some instances, these improvements will be mainstream (e.g., a voice assistant on every daily commuter train). In other cases, they will be reserved (e.g., advances in telehealth).

Although enthusiasm for the metaverse is likely to wane, it is expected that investment in the field will continue to move forward, with a possible direction toward "augmented life" and "isolated generation" settings. Existing limitations may restrict the full immersion in the metaverse that some dream of, yet enough growth will be visible to make it a vital component of any forward-looking retail strategy. In fact, several have already taken steps to try to mine value from a variety of use cases for the retail metaverse. Elsewhere, as in the case of NIKE retailing branded NFTs or Forever21, which has a virtual storefront in the metaverse, these ventures are consumer-driven; new business concepts have also surfaced. The Flyfish Club, for instance, is one of the few new restaurants that exclusively serves customers with certain access-oriented

NFTs. Several examples of immersive marketing also exist that use augmented reality to deliver hyper-personalized experiences. However, consumer interactions are not the only use cases of the metaverse. Such technology is also used to enhance efficiency and increase the employee experience.

Figure 3.8 Consumer Interest in Virtual Activity



Source: Rejolut (2022)

Unilever, for example, is utilizing digital twins to generate a representation of its manufacturing facilities, while Volvo has created a digital driver simulation that enables the company to conduct ethnographic research in a virtual environment. In addition, several uses of talent engagement that have been accelerated by the epidemic have been seen, such as enhancing virtual training, on-boarding, and mentorship. Having so many opportunities, retail companies should turn their attention from whether or not to sell in the metaverse to how to do it differently. An appealing part of the metaverse, as

opposed to many earlier technological innovations, is that companies are not forced to bow their strategy to technology. Therefore, companies may not have to change their key strategic differentiators, but instead move beyond the boundaries of how that strategy will be deployed. To realize all these use cases, companies must be equipped to use the technologies underlying the metaverse, adapting quickly to its high degree of change. For example, attempting to enter new markets with NFTs is unlikely to be successful if a company does not have access to the necessary technology and design expertise.

III.4.2 Other Industries

Despite the fact that the Metaverse is still in its relatively infancy, it has turned into a serious game changer for major industries. Through its unlimited opportunities, it has the potential to revolutionize our lives, our work and our future. It has created new windows of opportunity for companies to interoperate, commercialize and monetize their digital products, services or goods. Moreover, the Metaverse technology has improved the way we generate and consume several games, music and movies. It has also made it possible for us to experience virtual tours of homes and hotels, online lessons, and live health counseling.

“Top 10 Industries Augmented by Metaverse”, January 23th, 2023. Retrieved from Cryptoflies).

Disney, for example, is not just creating a specialized collection of NFTs or branching out into the world of filter creation, but is drawing on the fantasy side of the metaverse; last December 2022 it submitted a trademark for a real virtual Disney World. The

virtual world itself will replicate one of Disney's famous themed parks, be "highly immersive," and will not necessitate a pair of AR headsets. Although the Disney team has implied that this patent is only a hint of what will happen in the future, and that it will not happen right away, they are interested in bringing the storytelling aspect of the Disney franchise to Web3. Back when the metaverse was just an abstract concept for most of us, Mark Zuckerberg announced an etymological shift from Facebook to Meta. Yet it was not just a name change; it was a change of focus for the social media monopoly. Following the Meta announcement, Zuckerberg specified that his goal is for Meta to bring the metaverse into being and help enterprises. The automobile company Hyundai entered the metaverse last year by launching "Hyundai Mobility Adventure," a metaverse based live-in Roblox space featuring Hyundai's most forward thinking products. The platform also provides users with digital characters and avatars, enabling them to interact with each other inside the web3. Not unlike hundo, their purpose is to innovate the company's relationship with young people using this virtual world. Staying in the automotive field, Honda's HR-V, launched late last year, can be viewed using an AR hologram-type filter, as well as through a virtual showroom within their ecommerce site. The AR filter allows users to explore the car in quite a lot of depth, looking at colours, wheels, the different versions, the interiors and much more. It is excellent for showing potential buyers more about the car, the shape, the feel of the interior, etc., helping drivers save time when it involves an in-person walk-through. This virtual showroom allows consumers to view a somewhat more lifelike version of the cars, with videos illustrating the most important features and parts. This, in addition to the AR filter, gives further information about the car's key features, allowing drivers to learn from the comfort of home and save time and money. This instrument will not entirely

replace the test-drive process and the need to visit a dealer, but it will speed up the car selection process and make appointments shorter.

And for the end of this paragraph there is the famous flight company Lufthansa that approaches Metaverse and Web3 for job training practices. Lufthansa Aviation Training GmbH's student pilots use VR (virtual reality) technology to enrich their flight training, and by taking flight simulators to the next level, Brunner Elektronik AG's Varjo XR-3 Focal Edition headset, together with the NovaSim MR DA42 simulator, offer students a much more immersive, pleasant but also cost-effective training experience.

The problem with using real aircraft is that the number of instructors is limited, so the number of pilots and the frequency of training are quite low. In addition, pilots in training cannot fly in low visibility conditions, and this kind of time can often last for a long time. The solution consists of an innovative mixed-reality flight simulator to complete the training and a high-quality pass-through video that allows trainees to view their own hands and body, operate all switches, controls and instrument panels with perfect visibility. Offering a 360-degree view, as opposed to the 180-degree view of a traditional simulator, is much cheaper to operate, does not require a large number of instructors, and can be used when visibility is poor.

CHAPTER IV.

KEY FACTORS AND IMPLICATIONS FOR BUSINESS

RELATIONS IN THE METAVERSE: THE CASE OF

FUTURE FASHION.

IV.1. Introduction to Future Fashion

The following chapter will examine the case study based on the data collected by the Italian innovative SME (Small Medium Enterprise) "Future Fashion". To achieve the purposes of the thesis, qualitative research was conducted. The main feature of this investigative method, which differentiates it from quantitative methods, resides in the fact that it is very suitable for small samples and offers a complete description of the research topic. In fact, qualitative surveys gather information (e.g., opinions, impressions, or views) to describe, rather than measure, a topic. The motivation behind the choice of this methodology is that the goal was to collect data related to the motivations, thoughts and behaviors of the company under consideration; nevertheless, although this allows for a deep understanding of the survey, on the other hand it makes the analysis of impressions and final results more challenging.

In-depth interviews were conducted for the scope of this research to collect data on individuals' personal experiences and perspectives. These one-on-one interviews demand personal and direct contact between interviewers and respondents and are most effective in suppressing no-answer rates. They were intentionally half-structured to both collect specific data and to provide flexibility in terms of interview flow. Meetings with

co founder and CEO Andrea Carpineti and co founder and CCO Francesco Carpineti were held between November 2022 and May 2023: the interviews took place both physically at the company's headquarters in Corridonia (MC) and virtually via videoconference and lasted approximately 45-60 minutes. Notes were taken during the discussion and voice recordings were made to support the researcher in any analysis of the data collected. In addition, participants were given freedom to express their opinions even on topics not covered in the program, so the conversation ran smoothly.

Future Fashion is an innovative SME that helps fashion and other brands to virtualize and customize their collections in 3D, reducing the cost of producing physical samples and improving the customer experience. The new context of phygital, digitization and the development of new technologies have shaken up the fashion industry and laid the foundation for new forms of business. 3D technology has taken on a relevant role, and although its development goes back decades, in recent years-and especially in the aftermath of the Covid19 pandemic-it has showcased its true application potential, which is not limited to the design and product creation phases alone but extends to all functional areas of a business. Brands such as Gucci, Nike, Adidas, Tommy Hilfiger, Armani and others are already savoring the benefits and advantages of using 3D in sales and marketing strategies. Fertile soil for Future Fashion, a company from the Marche region that, thanks to many years of experience in the use of this technology, provides businesses with high-quality web-optimized 3D solutions.

IV.2 DIS: the origin to the digital and technological innovation

Future Fashion is an innovative SME that aims to transform any business into 3D. It all began with DIS - Design Italian Shoes - a custom footwear brand that combines Italian craftsmanship excellence with the most advanced digital technologies, putting them directly at the service of the customer. DIS is an Italian startup born in late 2013 from an entrepreneurial idea of three founding partners: brothers Andrea and Francesco Carpineti and Michele Luconi. The brand's main goal is to preserve the tradition of made in Italy through innovative digital solutions that enhance the craftsmanship tradition of the Marche region.

The company was formally established in February 2015 in Civitanova Marche, in the Marche footwear district, also known as the Fermo-Maceratese footwear district. Home to the production of shoes by famous brands, this district-with a hub in Sant'Elpidio a Mare-represents made-in-Italy footwear craftsmanship around the world. Although the district's origins date back to the 15th century, it was only in the first decades of the 19th century that one can speak of a footwear cluster. In those days the localities involved were Sant'Elpidio a Mare, Montegranaro, Monte Urano and Monte San Giusto, but in the post-war period the activity of the area's shoemakers and shoe factories was transformed into a unique industrial production capable of maintaining very high quality standards. Nowadays, the Marche district includes three production poles specialized by product type:

- a) In the Montegranaro area, mainly men's shoes are made
- b) In the Monte Urano area, children's footwear
- c) In the district Civitanova Marche - Sant'Elpidio a Mare - Porto

Sant'Elpidio the women's shoes.

The district's footwear sector accounts for 76 percent of total manufacturing employment in the same areas and even 42 percent of its workforce (Anna Castiglioni “Il Distretto Calzaturiero Marchigiano: storia, numeri, prospettive” September 17th 2017, Retrieved from Artigiano in Fiera).

With this tradition under its belt, the DIS brand was born to be distributed worldwide through the website www.designitalianshoes.com, where Michele Luconi, owner of a software development company, has implemented a 3D configurator that gives customers the opportunity to become the real protagonists of the handcrafted production process. In this way, consumers are able to virtually design and assemble the features of their shoe model through a wide variety of choices in shape, color, fabric, size, materials and other details, representing a total of more than 60 million combinations. The result is a customized and unrepeatably pair of shoes with unique identity.

The defining feature that sets DIS apart from other footwear companies, whether online or offline, is the way the customer can unleash his or her imagination and translate it into a custom-made shoe thanks to the 3D configurator, and see that configuration before buying the shoe through photorealistic renders. The customer is the real protagonist in the process of co-creating the shoe, which is then made entirely by hand by master craftsmen in the Marche region in just 10 working days.

The initial concept envisioned by the founders depicted DIS as a digital platform connecting designers, artisans, and end customers; the latter could find the collections designed by the designers and give them to the artisans who would make them for them. It was as ingenious as it was difficult to accomplish.

Marketing costs were razing to attract and recruit designers to the website and especially to find and train good craftsmen willing to use this new platform; it was also very expensive to channel end customers into the platform.

The number of players was high and so was the cost and time to produce the products; the founders quickly realized that it was impossible to continue with that business model. In particular Andrea, who came from academia with a long background in economics, realized that not all potentially innovative ideas could be easily turned into reality. This organization as conceived was complex, needed to be simplified and streamlined, and so they chose to initially enter into a partnership with a single local artisan to produce footwear.

The supplier was put at the center of the project because DIS's goal was to innovate the traditional production process by switching to custom manufacturing. To achieve this goal it was necessary to reorganize the workflow of master craftsmen and change their daily routine. It was not a simple matter to find shoe companies willing to adapt their production to these new standards: shoes made in Italy, of quality, customized by the customer and with low production times. This kicked off a process of screening and searching for master craftsmen that ended with a careful selection of them. Meanwhile, Andrea and Francesco began to commercially promote the DIS brand, leveraging several institutional players and different communication channels, and after participating in several competitions, the first successes came. In July 2014, at the SMAO event in Florence, the first DIS brand 3D configurator was unveiled. Five footwear models available and a value proposition that guaranteed one of the fastest services in the world with only 10 working days for delivery of the product as configured.

The revolutionary element, beyond record production times, was the 3D configurator at the heart of the business model. Highly innovative technology that ensured real-time customizations and gave the customer the ability to observe shoe details from every angle. The customer could then express his or her tastes and personality. Moreover, just by registering an account, the user could save his or her preferences in a wish list, while the configurator tried to combine all possible suggestions based on previously expressed choices. The structure was so high-performing that it became a full-time job for the two brothers Andrea and Francesco, who from that moment on focused all their efforts on the DIS project. This first business model was based on a single channel. DIS, in contrast to the traditional footwear industry scenario, had adopted a strategy that included an online presence only. While many businesses start out by opening a physical store and later take the opportunity to spill over to the Web, DIS was born as a company producing custom-made footwear made in Italy online. Underlying it is the belief that that digital system, with that 3D configurator was the fastest way to get great returns. However, the returns from the online channel alone were not enough.

IV.3 Business model transformation from 2013 to 2023

Since day one, DIS has constantly reinvented and readapted its business model and proposal according to the changing environment. The goal of this work is to describe and analyze each change, as the interviewed Andrea Carpineti and Francesco Carpineti narrated them. In order to vehiculate the empiric problem of this research, which is understanding how the evolutions are connected among them. Being a startup, DIS' life is characterized by a lack of resources, competencies and time, so each step can be

considered an evolution, not a revolution. Indeed, according to Mr. Carpineti, innovation does not necessarily mean inventing something, rather it implies rearranging something in a different way even though that already existed. It might involve the recombination of a production process (e.g. from standardized to customized process) or the change of purpose of an internal element. Innovation thrives from internal skills and key resources: many enterprises do not recognize the hidden potential of their capabilities and leave them unexpressed and unevolved. Nonetheless, through R&D activities, firms should start rethinking their processes and dynamics to adapt them to new unmet necessities in the market.

IV.3.1 The initial idea: from BM0 to BM1 (2013-2015)

The original vision, envisioned by Andrea even before the actual startup, portrayed DIS as a digital platform connecting designers, artisans, and end customers with the ability to find the collections designed by the creators and connect them to the artisans who would make them.

This platform would incur three marketing costs, according to the founder:

- a) The cost of attracting and recruiting the designers on the website;
- b) The cost of the commercial development of conveying numerous artisans into a platform;
- c) The cost of channeling the final customer into the platform.

Perhaps, in fact, the presence of these many parties and the costs and time required to effectively implement the products made the founders realize the inability of pursuing this specific business model. That was the moment in which one of the founders,

Andrea, coming from an academic background, became conscious that not all potentially innovative ideas can be easily transformed into reality: the involvement of many designers could have been a significant comparative advantage in the market and would surely have given visibility to DIS. However, to financially survive, the organization needed to be simplified and slimmed down, so, eventually, they chose to arrange a partnership with only one artisan and came up with the next and evolutive business model: BM1.

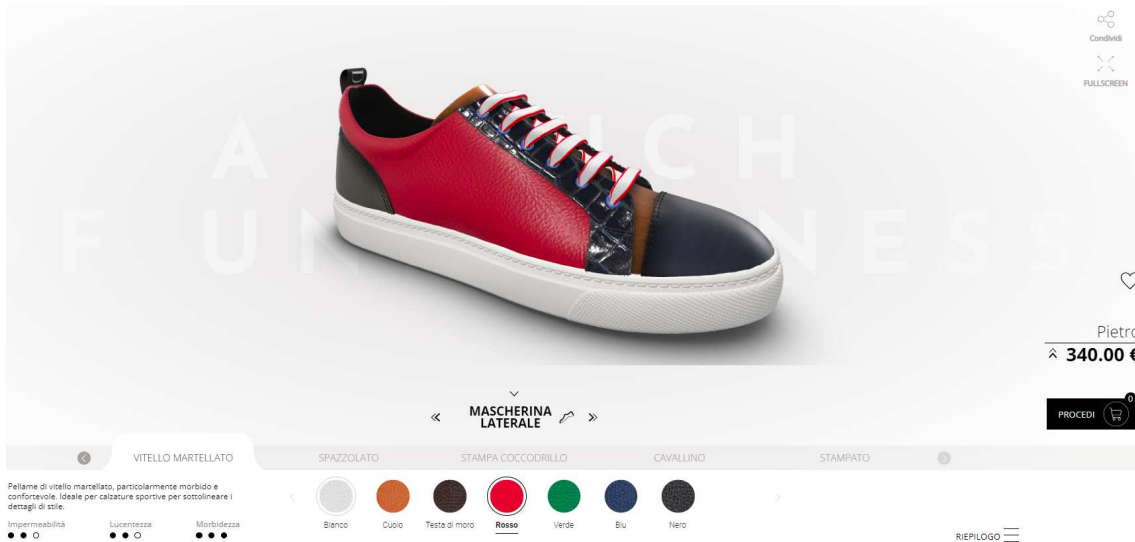
Business model number one is the logical adjustment to the assumed failure of the previous business model. It was developed through the Business Canvas Model by the team consisting of Andrea, who is in charge of the company's business set-up; Francesco, who has worked for years in the footwear district and brought practical skills and direct experience; and Michele, owner of a web development company. From the combination of each one's expertise, they elaborated a minimum value product (MVP): a first functioning prototype. In this new scenario, the key subject was the supplier, since the BM1 had the aim to innovate the traditional mass production process, switching to a tailor made production. In order to effectively and efficiently achieve this purpose, they had to reorganize the whole production workflow and implement a change in the cultural mindset of the artisans in the shoe district area. Therefore, the key operation, that would have determined the effective start or failure of the project, was to take into consideration all the shoe making companies that were willing to adequate their production processes to their standards. To effectively achieve that, the team carried out a screening questionnaire in which the candidates should have specified their terms on pricing, delivery time, manufacturing, etc. Eventually, they narrowed down the selection to about 50 firms and, after visiting the plants, they decided to rely on just one

of them. The launch included a mini collection whose aim was to understand if the BM1 could have had a positive response in the market. At the same time, they started promoting their business proposal to various institutional actors and relying on different communication channels: they took part in numerous competitions and started gaining approval and success. Among the diverse accomplishments, there was the winning of Capital competition, Unicredit startup contest and the achievement of finalist position at the Intesa San Paolo and Marzotto event. As a result in that year, they won or at least became finalists (with the accomplishment of an award) in almost all the Italian start competitions.

Therefore, in the wake of the approval received during those times, in July 2014 they presented their first 3D configurator (one of the two main solutions included in Future Fashion' MTO Suite nowadays) at the SMAO event in Florence, where they displayed the first functioning version of the site with five available models. Since that, an initial investment of 5.000 euros was made by the founders and destined for 3 months of online advertising. Thenceforth, the business model became active and shoes were starting to be sold. The value proposition promised one of the fastest services offered all over the internet: only 10 working days to deliver the product once ordered thanks to the real time access to information by each stakeholder. time access to information by each stakeholder. The revolutionary part characterizing the 3D configurator (fig. 4.X), at the base of DIS business model and completely integrated within all DIS marketing platforms, is the fact that it provides a perfect sample of the pair of shoes that the customer idealizes: it offers different angulations from which the client is able to explore and study each minimum detail. Surely, it gives the customer the freedom to express his tastes and personality. Furthermore, by simply registering an account, the

user is able to save his preferences in a wishlist, while the configurator tries to combine all possible suggestions based on the choices expressed before.

Figure 4.1 DIS 3D Configurator



Source: designitalianshoes.com

Therefore, having on their side such a performing infrastructure, the owners were constantly looking for new investors that were willing to support their entrepreneurial idea. That is why in November 2014 DIS participated in a television show called “*Shark Tank*”, based on the Japanese TV format “*Dragons’ Den*”, in which aspirant entrepreneurs present their business idea to potential investors. On the first night of the show, Andrea closed a deal worth 300.000 euros with the investors and on the same night, the website sold 100 pairs of shoes online. That was a crucial moment for DIS: since that night, the business became a full time job for the two brothers Andrea and Francesco, who resigned from their previous jobs and focused their efforts only on DIS projects.

The first business model from which they started was based on a single channel strategy

including exclusively an online presence: in fact, initially, they strongly believed in the power of the online business model. In contrast with the traditional shoe sector scenario, DIS adopted an inverse strategy compared to the majority of its competitors in the same geographical area. In fact, Design Italian Shoes was born as an online shoe manufacturing company, while others traditionally start by opening a physical store and, only after a period of time, take the chance to commit into an online business. Surely, at the base of this strategy there was the strong belief that it was the fastest way to make great returns.

Even if it was the easiest way to reach a greater variety of clientels, it proved to be difficult to manage as a result of the huge financial investments needed to oversee the online activities. Although having internal and external skills and the proper budget to implement their plan, as time went by, the return on the investments made (mainly on online advertising) was taking too much time to reenter the balance sheet: DIS management realized that building an online business from zero was anything than trivial, even when there is solid financial and expertise background.

IV.3.2 From B2C to B2B2C business: the shift between BM2 to BM3 (2016-2019)

Between December 2015 and January 2016 DIS management decided to sharply change the route and focus on the business model number two. As mentioned above, the quick shift was mainly due to unsatisfactory revenues: the enthusiasm left by the participation in the Shark Tank contest reduced over time and the sales started diminishing. The investments in advertising were taking too much time to return in opposition to what

they had planned; therefore, the company started to struggle: the business plan would have failed in 6 months.

Hence, in 2016 DIS decided to cut some costs: they temporarily suspended the online advertising for few months and dismissed two employees, while focusing the majority of investment into the strengthening of the offline channel, which was the only option left to make the company survive.

In this new scenario, Andrea and Francesco Carpineti for the next months had to quickly focus on a new strategy to stimulate a new demand in the market. This led to a new revelation: the understanding that the main offer of their brand was not a customized product, rather a customized service. Indeed, DIS quickly changed its value proposition from a B2C business to a B2B2C one. Since there was a new necessity of integrating the digital component with the physical stores, the new omnichannel strategy included the offline channel: they brought the same customization service inside chosen stores, creating corners inside selected shops, in which they could combine the traditional store experience with an innovative customer journey.

DIS management preferred not to found their company owned stores; therefore, among the different categories of shops among which DIS could have been placed (big departments stores, shoe making shops, clothing stores, multi brand stores, etc.), they targeted multi brand stores, which were more appropriate for the kind of service they wanted to deliver and more cost effective for what concerned the financial plan.

While continuing the development and the improvement of the online activities, in that period the strategy focused particularly on the B2B business. Specifically, in order to implement the offline business model, it was necessary to find and acquire new commercial partners through fairs and exhibitions, which are the most effective way to

discover new clients in the shoe manufacturing sector.

Furthermore, the new business model was strategically interesting under the logistic point of view: since every order is carried out just in time, the firm does not risk unsold stocks of products that can be a cause of costs and uncertainty during market crises. Basically, DIS is the only Made in Italy brand to solve the huge problem of the unsold goods at the end of the season: in fact, the order made by the retailer is processed only once the payment is fulfilled, without having to stock products or semi finished materials. This implies also the significant advantage of cutting the CO2 emissions by 30% with respect to the average performance. Surely, it must be mentioned the fact that, in contrast with the traditional formula “ready to order” to which the customer is accustomed, the use of the “made to order” binds the client to wait a certain amount of days until the delivery of the product. However, this is a necessary compromise when there is a customization process involved.

Once the strategy had been planned, the staff of the affiliate shops were trained in order to acquire the needed skills to handle the 3D configurator inside the shop (fig. 4.2): the latter was located through tablets or laptops in the DIS corner together with a foot scanner, whose aim is to provide detailed information on the foot size and suggested shape, while collecting the information into the DIS database.

Figure 4.2 DIS Corner



Source: designitalianshoes.com

Moreover, each product has a QR code that allows the totem to recognize it and instantly start the customization. Nonetheless, the QR code provides the customer with a complete tracking of the production process. This is advantageous both for the client, who feels empowered and in control from the starting order to the delivery, and for the value chain management, which is made stronger by the communication and interconnection between each step.

In fact, from this experience, DIS realized that the real added value of this new proposition lied in their supply chain. During those years they have been investing in the digitalization of the whole process: each time an order was made through the configurator (whether in the physical stores or in the online platform), the order was notified and transferred into the production process in real time through a backend application that daily reports all the transactions to manufacturers. Thanks to this service, the management was able to overall monitor the workflow while promptly detecting eventual bottlenecks.

The new value proposition provided a win-win situation for both the seller and the

buyer: for what concerns the seller, this new business model solved the problem of the unsold at the end of the season, while offering an innovative experience inside the shop. On the other side, for what concerns the customers, it gave them the possibility to receive the help of the staff when needed or to individually create their own model without any further interaction.

Moreover, for the company there is a great advantage coming from this kind of commercial relationship with the stores: in fact, DIS could easily reduce the costs of the customer acquisition process while offering a seamless purchasing experience to the consumers that can have the same shopping experience both online and offline. Furthermore, they cut the investments in B2C marketing, since they could take advantage of the existing clientele of the physical shops while increasing the brand awareness, reaching a wider range of users under the geographical point of view.

DIS now relies on a solid network of commercial partners spread worldwide among Europe, Asia and America (fig. 4.3). Moreover, not all their commercial partners are shoe sellers: the majority of them sell tailor made suits and take advantage of DIS sale solution to offer an additional service to their clients, allowing them to pair their customized suit to matching custom made shoes.

Figure 4.3 Worldwide distribution of DIS commercial partners



Source: designitalianshoes.com

However, according to Mr. Carpineti, the only sustainable business model that can survive is the one that involves a direct omnichannel strategy: indeed, the “hybrid” solution they came up with readily started to cause doubts since the company was not in direct control of the offline channel.

In fact, analyzing the BM2, there are few negative aspects that pop up: for instance, there is no touchpoint with the final customer, since it was not possible for DIS management to be physically present in the shop to monitor the effective development of the sale. Moreover, even if properly trained, the affiliated staff was not directly employed by DIS, causing the correlated potential risk that they could not push their products appropriately: just imagine the consequence if a new employee is hired without being properly trained on how to use the configurator.

This business model, except for a few adjustments that refined some raw implementations, has basically remained unchanged until the end of 2019, when the need for something more effective began to make its way, and then definitively in

March 2020, when the COVID 19 pandemic shocked the certainties of physical retailers.

While the time interval between BM1 and BM2 was very narrow, the evolution from BM2 to BM3 took almost three years. The reason why the management hesitated to make a further step beyond was that they truly believed that the B2B2C strategy was the winning one. However, while the 2019 business plan expected a consistent growth for the enterprise (with the possibility of great revenues through partnerships with big chains), the reality reserved a different destiny for the entrepreneurs.

Indeed, the need to evolve was mainly due both to internal and external factors: from the internal point of view, the business model was no longer financially sustainable since the revenues were not satisfactory; on the other side (outside), there was a changing environment that certainly pushed the evolution.

In fact, according to Mr. Carpineti, in the year 2019 there has been a drastic change in the market of the department stores mainly due to the strong takeover of the internet as the main channel of fashion purchases. Moreover, he foresees the disappearance of the wholesale channel in the next few years, while those who will not fail will eventually evolve. This change is already happening in the US, while it will eventually reach the European market with a certain delay.

Regarding the business model formula, DIS's manager stated that the BMs that will be working for the future are direct to market models with omnichannel strategy. Given these premises, the initial idea thought by DIS was to go back to the combined online offline experience with a new interactive and technological physical store in which the customer lives a truly innovative purchase experience that allows him to buy instore or online at the same price. On the other hand, DIS recognized an opportunity in

developing partnerships with luxury brands that will have more chances to survive the incumbent revolution.

Since DIS describes itself as a fashion tech start up that works in fashion, but that invests also in marketing and technology, they recognized the value that the owned technological platform could deliver. Therefore, the new business model provides the same service developed in the past but delivering the value proposition to a different customer: this time they decided to partner with other brands through a white label service. In this new scenario, a luxury company (e.g. Dolce&Gabbana) can buy the personalization service from DIS together with the different modules that the firm offers (manufacturing ERP, the foot scanner app, the management system of the selling corners and the customized made to order flux), respecting the same delivery time as before.

The difficulties linked to this new project, according to the owner, could be linked to adversities connected to the communication with foreign countries or complications during the registration of the orders or time effectiveness. However, Mr Carpineti believes in the positive outcome coming from the synergy of an open innovation between big enterprises and small startups: in fact, he is ready to make at their disposal their technology and know-how on the digitalization of productive and sales processes. To date, the major concern in the market for companies is to sell the project and reach the final customer: however, as a matter of fact, this kind of complication can be easily avoided if the seller finds another intermediary that deals with these tasks for the firm.

For what concerns the suppliers, the consequence should be an increase of the volume of the orders and the workload; however, this is considered an “happy problem” by the company. Nonetheless, it requires a new and revised organization of the communication

in the relationship between supplier and buyer.

Starting from January 2020, the management has been mainly focused on the commercial development of this third business development, rather than on other projects; reporting the first delivery in March 2020. Moreover, DIS has already gained more than one customer on a private label contract and is still dealing with big luxurious brands. Indeed, the sole approval that these brands are showing towards the projects represents a great satisfaction for the company.

IV.3.3 From BM4 to BM5 (2020-2023)

Despite having focused their strengths on the development of the BM3, the company still struggles to find new ways of becoming more and more competitive in the market and constantly keeps working on side projects. Following the recent trends in the US, a further evolution could have been represented by an affiliation with online personal stylists that will become the intermediate subjects between the physical store and a tailor.

According to this new entrepreneurial idea, these subjects would be equipped with a sartorial kit (worth about 500 euro) with which they will personally visit the customer at home to find their size and shape and eventually customize their shoes with the help of a professional.

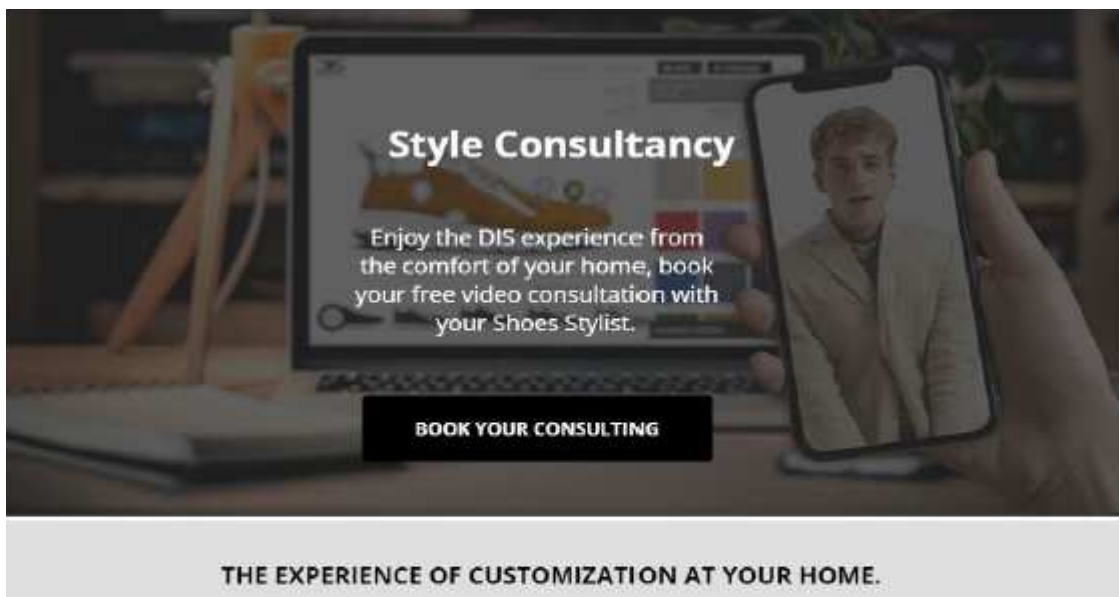
Furthermore, in order to train the personnel, the idea is to find an online “DIS Academy” that will officially certify professionals as “DIS stylists”, allowed to carry out their services anywhere. The online academy can let DIS quickly scale up without significant material investments, other than video contents. Once the initial costs are

sustained, additional expenditures include online advertising.

The aim was to build a network of 100 personal stylists all over the Italian territory: the customer would look for the nearest assistant among the ones available. Although the Italian plan could be potentially successful, the company thinks that the ideal launch of this initiative should firstly occur in the US, whose market is more receptive and ready to embrace this kind of service. In fact, Americans have already developed similar activities in the tailoring business: DIS wanted to fit in already existing networks of shopping assistance businesses that offer a home service of image consulting (including clothing, shoes and accessories).

Data and materials have been collected in the first months of 2020 and the first pilot tests started in May 2020: at the moment the service consists of a 15 minute free web conference that can be easily booked online with a company's dedicated shoes stylist. The video consultation aims at the personalization of the shoes in order to perfectly match the customer's style and outfit. (fig. 4.4)

Figure 4.4 DIS virtual style consultancy interface



Source: designitalianshoes.com

In order to avoid problems due to the sizing, which previously forced the owners to provide a shoe sample in physical stores, the management took advantage of its technological apparatus to develop a foot scanner application easily downloadable on mobile devices.

After 18 months of research and development, DIS released on the market its app, currently available just in the iOS version. The application was based on a standardized algorithm that elaborates the measures of the foot (length, circumference, instep) and suggests the correspondent size and model to purchase.

The process should occur in a well illuminated place and it requires the customer to use a piece of paper in the format A4 to shoot three photographs for each barefoot (right inner, outer and back side) while the technology does all the rest.

Technically speaking, Mr. Luconi, who is the one in charge the technological development of DIS app, elaborated two different algorithms: the first aims to perform a mathematical reconstruction of the user feet through the use of the photographical material; the second, unique of its kind, matches the consumer 's feet to the correspondent DIS shoe model, suggesting which size to purchase for each model.

Therefore, this second algorithm brings a huge added value to the company: in fact, it can be easily standardized and offered as a service to other shoe brands, customizing it with their shapes and models. The procedure is very simple, and it only requires whichever company to insert the standard shape parameters. The release of this app represents the ultimate step towards the digitalization of the whole purchase and production process. Therefore, considering this ulterior improvement, it will be easily offered the possibility to return the product, an option that is currently not available on the website.

In the meanwhile, a new possible path is emerging for DIS: the opportunity for a whole differentiated business based on the ownership of a data platform.

Indeed, since the very beginning, DIS has been storing hundreds and hundreds of data about final customers and the characteristics of the shoes sold. This amount of data could represent a potential service that can be placed at the disposal of numerous companies or private individuals which are willing to conduct a research on the shoe market.

Furthermore, the bulk of data collected highlights not only trends on future seasons but offers also real data on what is in the fashion market in real time.

Doubtlessly, markets are changing very rapidly nowadays and fashion companies are struggling to stay on track: since the rise of fast fashion, seasons are not determining the rules in the market anymore and there are continuous sales, presales and collections, which are designed with the solution of continuity.

Considering that DIS has internalized the technological asset, implementing this new kind of business model might not require a huge financial investment.

The project considers the implementation of the foot scanner mobile application, which was developed by the internal IT department of the company, in order to distribute it on a large scale among the big chain partners that will buy the white label service by DIS. Once the amount of data is collected, they are subsequently matched with the already existing data coming from the sales managed by DIS.

The main idea is to create a data analysis platform that aggregates all the data collected in which, whoever wants to subscribe, can do it through the payment of a monthly membership. Moreover, the subscription will allow the customer to get access to a

dashboard (named “*DIShboard*” by the company) in which it will be possible to combine data according to the necessity.

The potential advantage for the customers consists in the fact that often most data reports can be downloadable online under a single payment that can reach sometimes over five thousand euros: on the contrary, the proposition elaborated by DIS has a competitive price and offers a particular formula that does not bind the consumer in the case he decides to unsubscribe once his needs are fulfilled.

However, this option has not been researched properly by the management yet and the current amount of the data collected is not sufficient to successfully implement such a project. In fact, the strategy of the owners is to work to the construction of this possible business model during the development of collaborations of the BM4: partnerships with big chains and luxurious companies will allow them to lay their hands on a critical mass of data that will prove to be useful during a subsequent phase. (Maglianesi Sara, Business Model Innovation in small companies: The case of Design Italian Shoes [Master Degree thesis]. Ancona: Università Politecnica delle Marche “Giorgio Fuà”, 2020)

The latest developments are the reason why DIS is implementing what it has been just a project so far and which effectively becomes a spontaneous transformation from the BM3. In fact, the next step for DIS is to become owner and seller of the pure technology exploited until now. They already projected a demo version of what will be the new 3D configurator that will allow B2B clients to project and customize whichever item from whichever industrial sector (e.g. accessories, furniture, etc.).

The accurate renderings allow a perfect real time and photorealistic visualization of the project thanks to the new WebGL technology. As for the shoes, each detail and

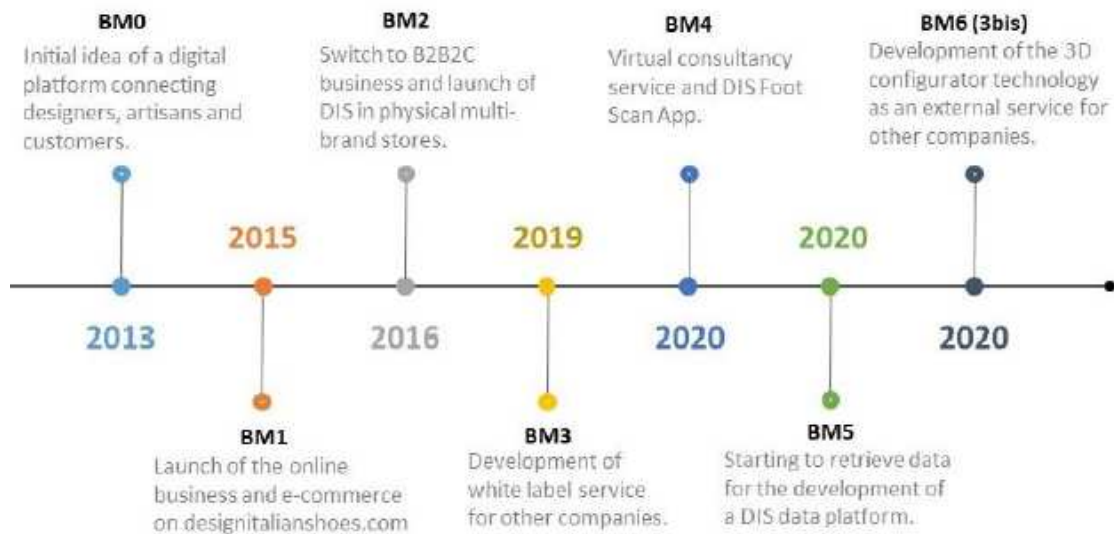
characteristic can be customized: colors, shapes, engravings, personalized images etc. Consequently, the final step is to resell the pure technology and its services to external firms willing to customize their products.

Moreover, riding the wave of technological opportunity, which constitutes a crucial internal core resource for DIS, they linked this new project to a new business unit that consists in the implementation of a virtual showrooming that will give the buyers the opportunity to purchase remotely. This system offers to B2B customers a 360 degree view of the collection through photorealistic renderings and catwalk videos.

Clearly, due to the limited size and resources, the project has been developed in partnership with other enterprises in order to take advantage of the crowdsourcing innovation power and create more value for the final customer: on one side DIS offers the technological asset, on the other the network partners deal with the production process, ending up with a final shared output in the market.

After a short, however full journey started in 2013, Design Italian Shoes came out with around six official (with more slight modifications) evolutions and refinements of the initial business model (fig. 4.5).

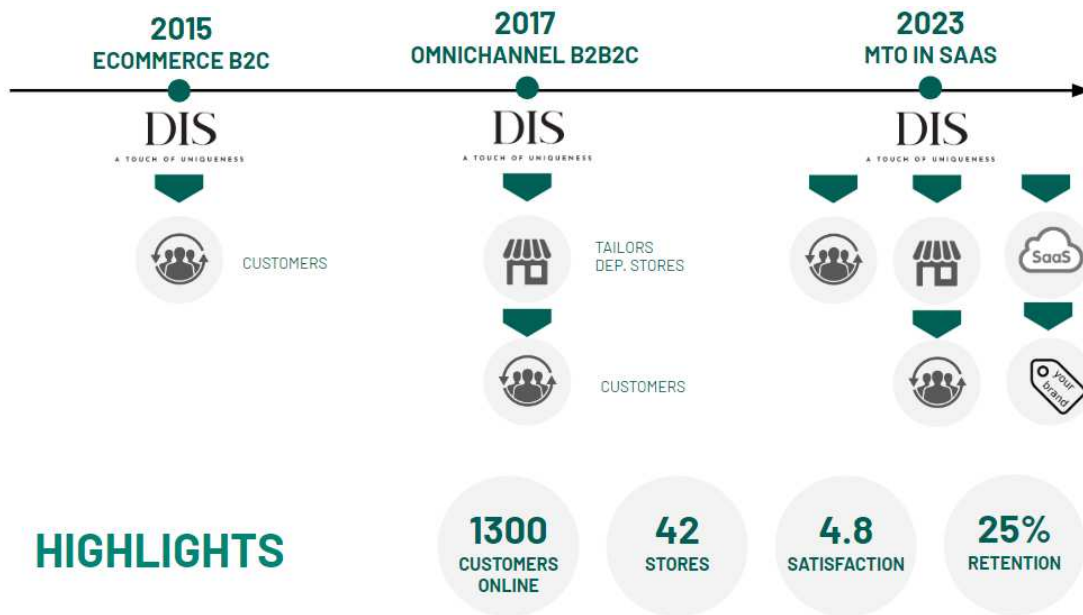
Figure 4.5 DIS Business Model evolution timeline



Source: Maglianesi Sara, Business Model Innovation in small companies: the case study of Design Italian Shoes, 2020

The Figure (4.6) has the aim to summarize 10 years of continuous evolution. Today DIS has more than 1300 active online customers and is present in 42 stores scattered around the world. Despite providing customization service in 10 working days, customer satisfaction is very high (4.8/5) and the retention rate stands at 1 in 4 customers (25%). The challenge DIS is facing nowadays is to provide its customers with Made-to-Order (MTO) service in SaaS (Software as a Service) mode.

Figure 4.6 DIS History and Perspectives



Source: Author's processing

IV.4 Metaverse ready Business Model: Business Relationships allow scalability and global presence

Future Fashion's evolution was a natural one, where the tech startup was born with the global crisis generated by the Covid-19 pandemic and the fact that DIS's business model found itself generating zero revenue. From there arose the need to rethink a new way of doing business, namely enhancing key resources and key activities. The result was that the core business consisted of a technology platform that could be attractive to fashion brands. The next step would be to validate the platform toward fashion and luxury brands, also considering that in the past, before the pandemic, some brands had already approached DIS for its technology. Thus was born the new business model based on selling the technology platform in SaaS (Software as a Service) format.

IV.4.1 Entering Zakeke Group

At the beginning of 2023 Zakeke and Future Fashion, two complementary platforms have come together to answer customers' needs better and achieve our main goal: creating a single all-in-one Visual Commerce platform.

Zakeke enables brands and retailers to provide consumers with seamless personalization and product customization options through 2D, 3D and augmented reality. And its suite of tools can be blended into any ecommerce platform or a brand's back-end to improve the consumer shopping experience and boost sales for customers in industries ranging from fashion to jewelry, games to gadgets and sports equipment. Founded in 2017, Zakeke has over 7,000 customers globally in hundreds of industries that seek to involve consumers with an interactive, visually appealing shopping journey. Zakeke is cloud-based, cross-platform and multi-lingual, making it easy for customers of all sizes to easily adapt and grow sales.

The Future Fashion' 3D Asset Management solution is going to be integrated into Zakeke's Visual Commerce platform and launched globally. The integration of Future Fashion into the Zakeke Group is part of Zakeke's journey to develop an all-in-one visual platform for merchants worldwide. The inclusion of the 3D asset management platform complements its offerings and strengthens its presence in the fashion and luxury industries.

The entrance of Future Fashion, an omnichannel platform that helps fashion brands virtualize their collections, into Zakeke Group, a world-leading SaaS company in Visual Commerce space that helps eCommerce brands and retailers to simultaneously offer customization, 3D configuration, Augmented Reality visualization, Try-On, and NFT

menting to their customers, gives the group all the assets to enter Web3 and Metaverse space.

The deal, which includes an initial phase of investment by Zakeke in Future Fashion and the following outright acquisition, will contribute to establishing a stronger international leader with Italian roots and a team of 60 people. It will thus consolidate Zakeke's Group role as a category leader after a long partnership that has successfully managed clients such as Valentino and A. Testoni. (Visual commerce: Zakeke Group acquisisce la PMI marchigiana Future Fashion”, January 20th 2023. Retrieved from Network Digital 360)

Nowadays, eCommerce is experiencing a profound revolution that is impacting physical retail as well, with consumers demanding more and more of a new customer-brand relationship model based on 3D visualization, visual personalization, Try-On, NFTs, and holograms, which in a very quick period of time, as evidenced by the data of the incredible growth in conversion rates and loyalty of the brands already using them, will become a sine qua non to exist and establish themselves in the physical world, in the eCommerce channel, and in the emerging metaverses.

The hybrid deployment of generative AI and photogrammetric scanners is also opening the space for an astonishing improvement in the cost of creating 3D assets and a simultaneous increase in their quality, which is now as good as the old photographs, all through simple, shared management that Zakeke and the 3DSuite platform developed by Future Fashion will provide to all their customers worldwide, contributing to better workflow management for 3D model creation, a collaborative approach to managing and maintaining 3D catalogs, even very massive ones.

Zakeke, has over 7,000 active clients worldwide, 50% of which are based between the United States and Canada, including many world-class brands such as Ubisoft, HP, Sandro Paris, Bauli. Such number of customers is based on having plugins that connect to all eCommerce platforms such as Shopify, Woocommerce, Magento, Prestashop, Bigcommerce, Salesforce Commerce Cloud, Wix, Etsy. The plugin portfolio is focused on making it accessible, easy and intuitive for customers of all sizes, to have a completely new shopping experience that is based on deep interaction with the product, while riding the waves of mass customization and Visual Commerce. (www.zakeke.com)

Right after the officiality of the deal closing, the two main actors, Andrea Carpineti (CEO & Co-founder of Future Fashion) and Angelo Coletta (CEO & Co-founder of Zakeke Group). *“The needs of the digital consumer, as well as those of brands and retailers, are constantly evolving. With the entry of Future Fashion into the Zakeke Group, we respond to these changes by strengthening the completeness of our technology platform and continuing on the path of creating a single all-in-one platform for Visual Commerce,”* says Angelo Coletta. *“We are confident that the combination of our expertise in the field of customization and management of digital assets will lead to great successes and tangible value for our current and future clients.”*

“We are convinced that 3D will become the standard for object visualization within 5 years. With Zakeke, we want to create a single end-to-end platform for the 3D world,” stated Andrea Carpineti. “Our platforms are complementary: while Future Fashion is focused on the automated and massive generation of 3D assets, Zakeke will continue in the development of a vertical platform for customization, with the goal of consolidating and strengthening its role as a reference player in the international landscape.

IV.4.2 Key Technological Partnership: the needed synergy for the Metaverse

Any process within a company can be innovated and digitized. And this can help to define clear objectives and monitor them at all times and in all places. The availability of documents in digital form is now a crucial aspect of running a business, but limiting oneself exclusively to digitizing them may not only not be enough, but may even be counterproductive. A technology partner is responsible for developing platforms that best manage the organization of documents, processes and goals in order to make the business machine run in a coordinated manner and make everything easily accessible by every member.

To date, Future Fashion generates Digital Twins that are compatible with the metaverse, so the company, through its technology, serves as a bridge or layer between the real world and the virtual world for fashion and luxury brands. The vision, according to CEO and Co-founder Andrea Carpineti, is to make 3D the standard of visualization for an eCommerce platform. Thus, the first step is to standardize 3D in every user's shopping experience and then make it compatible with the countless platforms in the Metaverse. Blockchain and Web3 will be of fundamental support to the vision by enabling interoperability between several existing and emerging metaverses.

Big tech players such as Meta and Nvidia will be enablers to accelerate the building of the Metaverse infrastructure, while Future Fashion and other tech companies, on the other hand, will be enablers of the infrastructure itself that the big tech will build. The players, both big and smaller, are and will be few in number as the development of these technologies requires very specific skills and resources, so it will be even more

essential for the future to make synergy between technology providers. To compete internationally and meet the needs of big fashion brands or even the marketplaces themselves will be costly and not possible for individual players. This is precisely why Future Fashion, according to Andrea Carpineti, decided to join the Zakeke Group and build a more solid platform and make it affordable to spread its joint solutions internationally.

Since a brand wants to build a product, in this case a platform, given that the time on the market is as tight as the resources themselves available, the strategy is to verticalize on a small part of a technology. Once you get customers on board, you go and integrate an extension of your commercial offering by going in and integrating already existing platforms. The concrete example of what has just been enunciated are the DAM (Digital Asset Management), 3D modeling and the viewer of Future Fashion, i.e., the proprietary layer; to this layer is added the 3D Configurator of Zakeke as well as for the Virtual Try On, Avatar and NFT there is integration with the services of other partners. The key is to have a technology partner ready for any real need or problem of a customer, to be a system integrator and to stand as a solution containing different technologies required by a specific market.

To understand the complexity and intertwining of several nodes within a network, one can consider the world of Virtual Try On where for each type of asset there is a specialized player for implementation. Considering that the assets that can be reproduced in 3D are potentially unlimited, so are the several technology providers that specialize in implementing any given asset (eg. shoes, bags, watches, jewelry, eyeglasses etc.)

IV.4.3 Building Networks for the Web3: Metaverse x Luxury Symposium

Networking is the activity of creating and maintaining professional relationships with people who share interests, goals, or job opportunities. Networking is essential for career development, acquiring new skills, discovering new markets, and generating innovation. Networking is based on communication, trust, and reciprocity among members of a network.

Networking in the metaverse is important for several reasons:

- a) To expand one's network of contacts globally. The metaverse allows you to connect with people from all over the world, without geographic or time limits. One can meet potential customers, partners, suppliers, investors or collaborators in virtual environments dedicated to business, such as conferences, trade shows, workshops or meeting rooms. One can also participate in social or recreational events to create more informal and spontaneous relationships with people who share common interests or passions.
- b) To improve one's communication and professional image. The metaverse allows one to communicate more effectively and engagingly than the traditional web through the use of avatars, gestures, voice, and virtual reality. One can better express one's personality, skills, and values through the choice of one's avatar's appearance and attire, the objects and NFTs that accompany it, and the environments in which one has it interact. One can also create original and innovative content to showcase one's portfolio or resume.

- c) To access new job opportunities and professional growth. The metaverse makes it possible to discover new markets and new business niches by exploring different virtual environments and interacting with different online communities. One can find new sources of income or funding through the use of cryptocurrencies or smart contracts, which facilitate transactions and collaborations between users. One can also acquire new skills or upgrade existing ones through access to courses, webinars or mentorships offered in the metaverse.

The examples of Metaverse applications that have been listed above are just some of the implications of building a technological infrastructure made by different actors to build the Web3.

The Metaverse X Luxury Symposium is the first event powered by Limitless Innovation led by Stefano Galassi and Metaverse Fashion Council initiated by Anna Karenina. This exclusive event took place on 26th January at the UniCredit Tower in Milan and has connected the best web international 3.0 innovators with top global Luxury Brands. Less than 30 startups were selected to participate as fashion tech pioneers and Future Fashion has been selected among them.

Limitless Innovation is an elite advisory firm that offers a wide range of services to scaleups and companies in the Fashion and Luxury industries. With the presence in 6 countries, our multidisciplinary team of open innovation advisors operates at the intersection of Fashion, Business, and Technology. With a very unique methodology and technological strategies, their aim is to support companies to solve their innovation challenges and the most pressing problems in the industry, from idea to execution.

The other co-organizer, Metaverse Fashion Council founded in 2022, is a decentralized autonomous organization (DAO) that aims to create and sustain an Open Metaverse Fashion System. It curates a decentralized sovereignty of Selves, fosters and invests in businesses in the form of mApps and self-bound tokens, and provides decentralized financial solutions for creating value, establishing reliable reputations, and protecting against sybil attacks.

Andrea Carpineti was there and has shared his thoughts and perceptions about the event within the company. Below is the concept summary of what he shared.

The Metaverse ecosystem, as strange and contradictory as it may seem, is relatively very small. There were 30 players at the event; perhaps there are 30 more in the world who were not selected for the Metaverse X Luxury Symposium. The motto to follow for the near future is that unity is strength, especially at this stage when the metaverse does not exist but we are all building it together, each with their own role. So my approach is to collaborate with everyone, even those we see as competitors.

“We as Future Fashion are among the top 5 in the world. Of the 30 in attendance, few have solid technology, customers of our caliber, and most importantly vision to build a platform. Most of them think with a service perspective. Building the platform will be our distinguishing factor” Andrea said.

Thanks to Limitless (who organized the event), Future Fashion can reach out to anyone from Meta to Unity to Clo for example. It takes a lot of ambition as the company has the relationships to be able to connect with top players coming from different industries. In the coming months of 2023 Future Fashion will participate in other such events around the world, one of the next will be in Paris in conjunction with Viva Tech,

Europe's most important technology and innovation fair.

IV.5 Future Fashion solutions: 3D as a standard of visualization

After two years of evolution and transformation, Future Fashion has verticalized its value proposition into two main solutions: 3D Suite and MTO Suite.

The company's vision is to make 3D an accessible visualization standard for both the big brand and the small retailer. For this to happen, the product must be attractive in terms of price, enjoyable from all devices, and integration by the customer (e.g. into their own e-commerce) must be smooth.

IV.5.1 3D Suite

3DSuite is a platform where a user can create, manage and visualize its products in 3D.

This platform has its core in the 3D Viewer with Augmented Reality (AR).

One of the most cutting-edge technologies of recent times is the object viewer three-dimensional; it is a tool that allows companies to display the 3D models of their products in an interactive manner. It is a tool that can be integrated into multiple contexts, from the online store to e-commerce platforms B2B, such as Joor or NuOrder for instance. It is a useful tool for brands to dynamically display their collections, show new products to retailers, or support buyers in their sourcing processes. The 3D viewer allows the user to "take a tour" of the product, view it from all angles, rotate it, zoom in, and evaluate features and details. Some allow not only to view the model in three dimensions, but also to send the digital asset into augmented reality by scanning a QR

code that activates the camera of the smartphone or tablet and projects the model into the real world. All of this before you even buy the product.

3D Suite is divided into three main functionalities to meet the needs of their users:

1) Create: generate scalable low poly 3D models from 2D images, any 3D file or sending a physical item to a service point.

- a) Upload: 2D images of a product or sending physical items and receive a quote for each 3D model
- b) Quality Assurance: review, exchange feedbacks and approve the 3D models with the internal team of the clients' company
- c) Deploy: 3D models for eCommerce, advertising, virtual try on, social media, 3D configurator and the metaverse applications seamlessly

2) Manage: 3D Digital Asset Manager (3DAM) enable a collection to live forever, by having a single space where a user can have a single space where to work on hundreds of 3D assets and digital contents such as GIFs and videos of a product

- a) Manage 3D assets in a central repository: the platform allows to upload 3D models or to request assets; to organize 3D assets with unlimited storage; search and add tags/filters to file; generate automatically 360° GIFs and videos; export to any platform in the main 3D formats; to switch on/off your 3D assets.
- b) Collaborate with the team, brands and customers: is it possible to invite team members and manage access rights; to assign editing and publishing permissions; to review and comment in real time; to approve the 3D model frictionless and to manage different brands in the account.

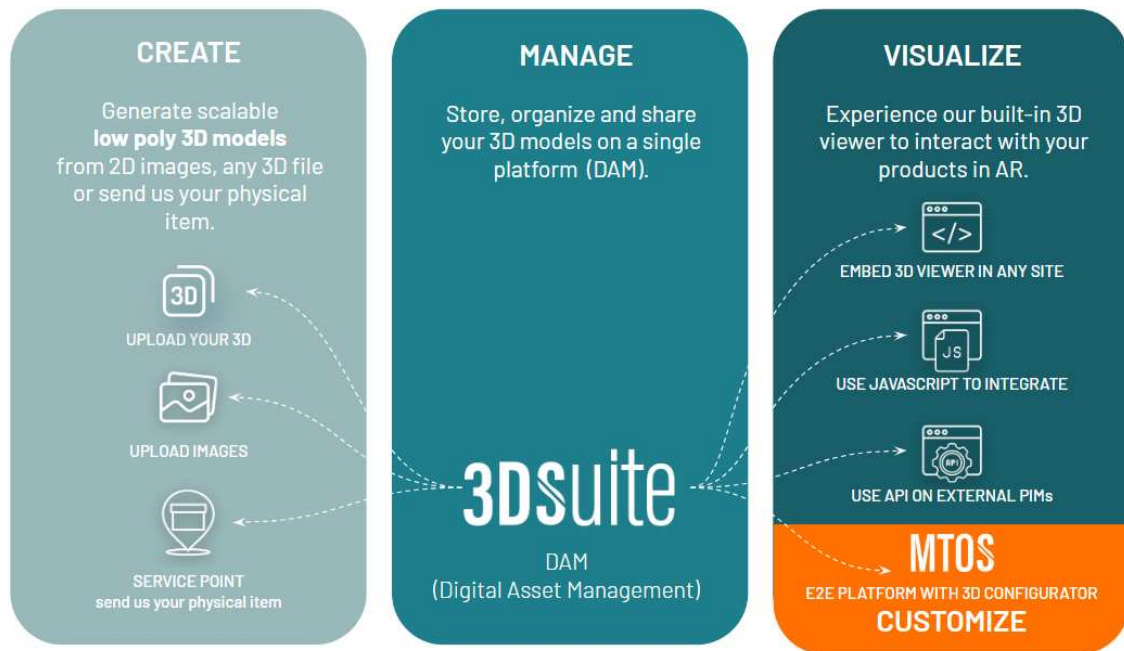
- c) Analyse the performance of a 3D product: a user is enabled to filter by stock keeping unit (SKU), date, time period and oversee the total views and impressions.

3) Visualize: see the products in 3D and AR

- a) Showcase 3D models with ultra realistic quality 3D viewer in any browser or device
- b) Embed the 3D viewer in any website by simply copy and paste of an iframe
- c) Integrate with API in existing infrastructure such as Digital Asset Manager (DAM), Product Information Manager (PIM), PLM, B2B sales tools, eCommerce and metaverse stores and showrooms.

The essence of 3D Suite is to be integrable everywhere and easily, these are the must have characteristics to be ready for a Web3 based Metaverse.

Figure 4.7 3DSuite



Source: Future Fashion internal documents

The figure (4.7) is shown a scheme of the 3D generation process and integration in the 3D Suite platform.

IV.5.2 MTO Suite

A 3D configurator is a software that allows any user to customize a product to their own specifications and see the chosen configuration in real time.

The 3D configurator is a tool that can be used by companies to meet the needs of customization and greater customer involvement during the purchase phase. The software provides a user interface and allows numerous product combinations to be created virtually. Anyone can use it to adjust a wide range of options and get the configuration they prefer, whether of colors, materials, or item sizes.

It is possible to create real-time product customizations and see the finished product even before buying it or even producing it. Extremely versatile solution that sees large application areas especially in the Made To Order and Made To Measure world. It can be used both in the online channel, to give customers the ability to customize an item directly from e-commerce-whether it is footwear, a bag or any garment-as well as a tool to be used in the retail channel or to support the sales network. Integrating a 3D configurator within the B2C ecommerce platform seems the most natural solution. Online shopping is evolving rapidly, and the proven model of displaying photographs and product descriptions is no longer sufficient to keep up with customers' tastes and needs. Customers want to be in control of the experience and want to be the real protagonists of the purchase journey. But before completing the purchase they want to

visualize in great detail what they are actually co-creating. Product visualization in three dimensions offers this possibility. Customers can examine their creation in great detail and from all angles. This interactivity is really the next phase of e-commerce and before long will become as commonplace as 2D photographs are today.

MTO Suite is an end-to-end platform for the Made to Order and the 3D configurator is the heart of the process, where a customer can customize its product, streamline the entire made-to-order flow and integrate the platform with web app, plug-in or API in store, online or directly to the production ERP.

The first benefit of MTO Suite consists in a reduction of sample and photography costs by 70% thanks to the possibility to customize the product and see the chosen configuration in real time. In fact, the customer has the chance to:

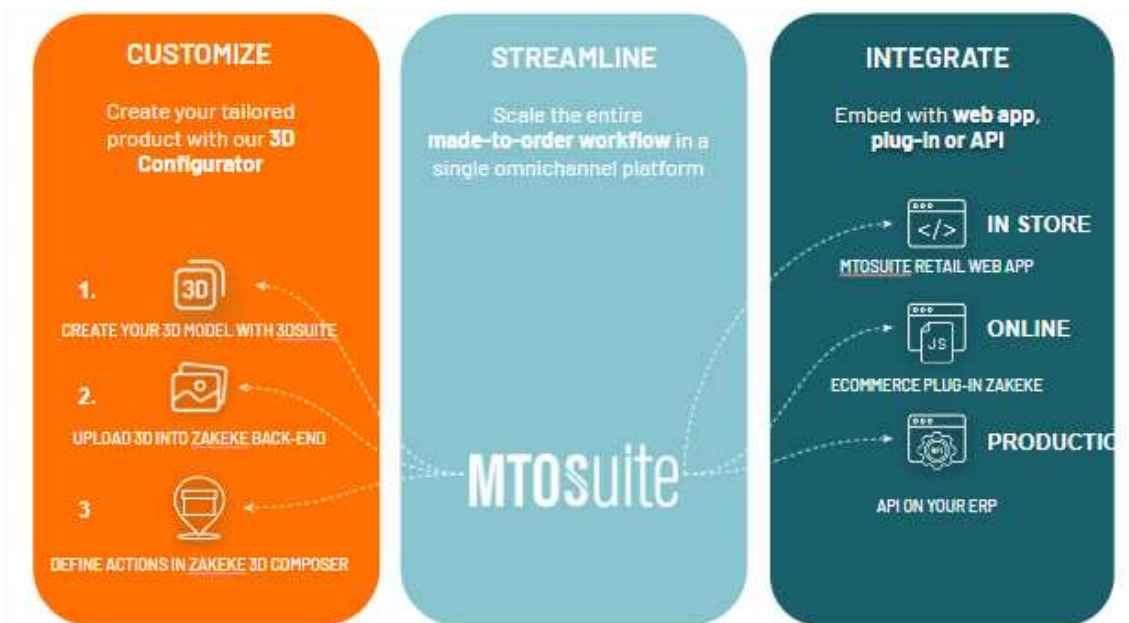
- a) Create a 3D model with 3DSuite or upload 3D files according to the platform guidelines. It is important that the 3D model has the requirements of the low poly model: maximum of 200.000 polygons and 7mb of weight
- b) Upload a 3D model into Zakeke 3D scene editor to have infinite product combinations in photorealistic HD quality. Is possible to set up: objects (3D models and parts), materials, lights, cameras, settings and environments (augmented reality included)
- c) Define actions inside Zakeke Composer where a customer can establish: attributes, options, actions, prices, rules, groups and steps of the personalization.

The second main benefit of the MTO Suite consists in simplifying a very complex made-to-order workflow for the companies. Digitizing the production process with such

an omnichannel platform can increase the operational efficiency by 300%. Giving that MTO Suite is a streamline platform, the user can:

- a) Innovate the customer experience by mixing the digital world with the real one, thanks to the real-time 3D configuration with AR. The 3D Configurator has 480° view interaction, where any part of the item is customizable
- b) Improve the sales with the Order Management System (OMS), generating automatically a specific Stock Keeping Unit (SKU) for any item as soon as the order is completed, with the possibility to check orders from different customers, admins and stores. The item can be produced immediately through a transcoding system integrated with any ERP.
- c) Analyse and assess the sales performance, filtering by geographic area, sales funnel, most clicked configuration, best-selling material and more. Stores and eCommerce performances can be monitored through real time insights and different user dashboard.

Figure 4.8 MTOSuite



Source: Future Fashion internal documents

Third but not the least benefit consists in a 100% of sell out thanks to the Made to Order process connecting orders with production using Future Fashion’s CMS, Plug-in or API. A user can active both modules for an omnichannel experience and connect the platform with its company’s software having separate channels of orders:

- 1) In store with a stand-alone retail web app (application); the Web App could be easily distributed through all the devices with the Mobile Device Management (MDM).
- 2) Online with the Zakeke eCommerce plug-in by installing Zakeke into the online store via plug-in
- 3) Production via API integration with ERP where the 3D configurator can send the item to the production systems as soon as the item is personalized.

In summary, MTO Suite can increase operational efficiency and reduce at the same time the human error by reducing its activities. Moreover, the platform boosts customer loyalty and lifetime value; thanks to the 3D configurator an eCommerce manager for example can analyze comprehensive data which can help make better decisions.

IV.6 How will Avatars dress in the Metaverse

Future Fashion has supported a well-known brand in the beauty world in its decision to create a project to go out and engage its customer base, consisting mainly of GenZ. The project consists of allowing the user to create their own personalized avatar with which they can do social engagement and sharing. So, the user once created their own branded avatar with the brand's logo, may send it in augmented reality, take a picture with it, share it on social media and invite other peers to do the same thing. What is interesting is that the brand at this first stage gives the avatar to the user for free and also allows them to download their branded avatar and upload it to several platforms in the Metaverse. In this case, Future Fashion used a Ready Player Me avatar technology partner precisely to jointly generate an avatar compatible with all platforms.

The evolutionary phase of this project will consist of a digital collection based on branded clothing and accessories that can be worn by the avatar; the brand will consider whether to monetize or just do branding indirectly with this strategy.

About the way avatars will be dressed in the Metaverse, Andrea Carpineti was interviewed by the well-known blog and podcast "Cronache del Metaverso" which deals with all issues and technologies related to the Metaverse and Web3.

"The Metaverse," says Andrea, "to date is not fully defined, we talk about parallel

worlds, or rather different universes parallel to the real world. We like to go in and out, but it is very difficult to go from one metaverse to another. We will start having virtual parallel universes of the metaverse." In fact, he continues, "From 2021 Future Fashion within the metaverse landscape helps fashion brands to virtualize and digitize 3D collections, lowering sample costs, increasing customer experience."

When asked about the state of fashion tech in the Italian scene, the interviewee points out that there is a very recent trend to approach the world of 3D and augmented reality. There is an increasing awareness of the fact that the digital twin increases the conversion rate for the brand and improves the customer experience for the user browsing the site or visiting the store equipped with 3D and AR technologies. In Italy there is a skills problem in 3D modeling, both in terms of quality and quantity of output, almost all style offices do not design in 3D. For this reason, the transition to 3D takes a little longer as there is a lack of skills in 3D modeling software. Andrea believes that in 5-10 years 3D will be the standard of visualization not only in Fashion and Luxury, but in all areas where visualization plays a role. It will be normal to view an object via 3D, there will be more and more mixed reality experiences amplified by augmented reality, the latter also needing the 3D asset to exist). As the Italian landscape is mainly composed of small and medium-sized enterprises (SMEs), to be precise they are 95.2 percent of the total active companies, Future Fashion is also moving in that direction. ("I numeri delle aziende italiane nel 2020", May 24th 2021. Retrieved from D.A.S. Spa)

For the needs of small companies, the Research and Development (R&D) department is working to automate 3D generation, and in parallel there are experiments in generative AI with the aim of reconstructing 3D model files through image acquisition. The artificial intelligence research project will take place in steps: at the moment there is a

proprietary algorithm to create a draft 3D file from the photographic capture of the product. Currently the physical product is still needed, and the goal is to be able to do this from photos only with the support of generative AI (“Andrea Carpineti: come vestiremo i nostri avatar”, April 5th 2023. Retrieved from Cronache dal metaverso Spotify Podcast).

DISCUSSIONS AND CONCLUSIONS.

The gaming industry, the demand for an increasingly better user experience, and Covid-19 have given a big boost to the metaverse phenomenon.

The gaming world, to date, dictates the timing for the metaverse due to the increased number of users in its platforms and video games: high revenues and a large community. In fact, Roblox, one of the biggest players in the gaming world, a global platform bringing millions of people together through shared experiences, released its first quarter 2023 financial and operational results today. Revenue was \$655.3 million, up 22% year-over-year, and up 24% year-over-year on a constant currency basis while bookings were \$773.8 million, up 23% year-over-year, and up 25% year-over-year on a constant currency basis. The finding shows how this industry is a driving force for all other sectors, including Fashion. (“Q1 2023 Report”, May 10th 2023, Retrieved from Roblox.)

The Pandemic had a significant impact on the Metaverse's eventual realization. The combination of the health crisis and the need for businesses to undergo digital transformation has increased interest in the metaverse as a business opportunity. The pandemic accelerated the metaverse technology, according to 92% of companies polled. 55% of industries believe the metaverse is a risk worth taking. When asked why they started investing in it, the surveyed companies said it is "the future" (22%). (Statista)

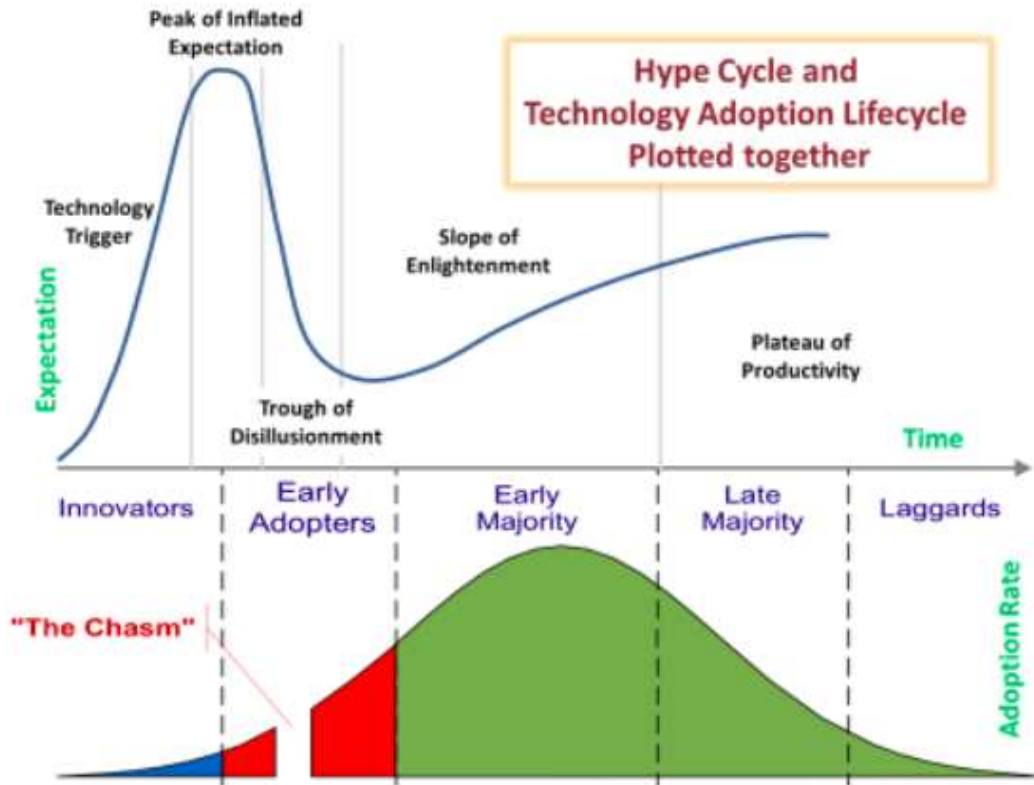
Brands are so confident in the metaverse that only about 3% believe it will take more than ten years to reach global consumption. The majority (68%) believe it will boom in the next five years. 76% believe that the virtual world will provide opportunities for all industries. 33% of brands invested 10-20% of their budget in the Metaverse. When

asked what percentage of their budget they set aside for metaverse projects, one-third of businesses said it was between 10% and 20%. At the same time, however, according to Francesco Carpineti, CCO and Co-founder of Future Fashion, after the mandatory closures during the pandemic period of Covid-19 people have finally returned to getting out of the house and attending in-person events. This factor went to indirectly penalize the propensity toward immersive experiences such as attending an event in the Metaverse rather than in physical presence, for example. In fact, according to Francesco, "during the 2023 edition of Netcomm, Italy's pivotal trade show with the focus on eCommerce technologies and platforms, we saw a large turnout of people compared to the previous edition." In fact, the fashion and luxury sectors benefited greatly in terms of reopenings (+77% in Europe) thanks to post-pandemic reopenings and the return of the large international public to their stores. (Davide Fogato, "L'Europa cavalca la ripresa degli opening dei luxury store (+77%)", May 17th 2023. Retrieved from Pambianco News.)

It is evident from the data collected and analyzed during this research that the Metaverse, like many other technologies (e.g. world wide web) also follows a non-anomalous path. By no means all technologies have become mainstream. All of this data refers to a company's perspective. Consumers have played a very limited role in this life cycle. This underlying theme emerges in both the "Hype Cycle" model used by Gartner since 1995 and the "Technology Adoption Lifecycle" model popularized by Everett Rogers and Geoffrey Moore. (Udayan Banerjee, "Technology adoption - 2 beliefs you need to undo", May 28th 2012. Retrieved from Technology Trend Analysis.) The metaverse is in the "Trough of Disillusionment" stage where only those brands remain that really intend to invest strategically in the metaverse, going beyond the hype

of many others who are stuck in the NFT generation.

Figure 5.1 Hype Cycle and Technology Adoption Lifecycle Plotted together



Technology Trend Analysis (2012)

Many technologies at this stage die out, while those that survive go on to build the infrastructure that will give the solidity and standardization to the technologies needed for the metaverse.

In fact, the recent Metaverse Fashion Week organized by Decentraland had only 26,000 attendees, thus suffering a 76 percent reduction in attendance compared to 2022 (108,000), despite the presence of brands such as Gucci, Dolce and Gabbana, and Tommy Hilfiger. (Stuart Dredge, “Only 26,000 people attended Decentraland’s Metaverse Fashion Week”, April 6th 2023. Retrieved from Music Ally.)

For these reasons, precisely that technologies are being built and that there is a need to

make synergy and networking among tech providers, where event organizers come into play that facilitate the diffusion and contamination of the resources and skills needed to build layers in and for the Metaverse. To substantiate this, it is enough to see that the Luxury Symposium is the first event in the Italian scene to be born with this intent and was inaugurated only this year with the first edition on January 26 in Milan. The mistake not to make when talking about the Metaverse and its development lies in the fact that the hours in a day will still remain 24 as before, so inevitably the time spent in the virtual and real worlds will overlap. In order to have a solid future, the Metaverse must give a concrete benefit in real life and not be a mere entertainment, otherwise it will risk remaining a hype confined to specific areas where it brings concrete value in real life (eg. Job Training Simulations, Healthcare).

The Metaverse can only burst forth if it becomes detached from the real economy. The individual could go and instruct their avatar in the virtual world through emerging technologies (eg. AI) in living a life detached from the real one and thus avoiding the overlap of the real economy with the virtual economy. The ingredient to make this happen lies in making the various Metaverses to date centralized communicate and offer the "inhabitants" of several worlds an engaging and innovative experience. At that point we go to the concept of Mixed Reality (MR), where the Metaverse becomes an immersive extension and not an overlay of the real world.

The key for Future Fashion to establish itself as a transitional player to the metaverse will consist of:

- having an increasingly automated 3D asset generation pipeline
- being integrable across all technology platforms

- having a Digital Asset Management, which is a platform to manage all the assets generated

Only by satisfying these three points is it possible to be the benchmark in moving brands into the metaverse by providing a platform that allows the user to generate, manage, and view 3D assets in one place that can be easily accessed from any device and integrated into each technology platform.

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