
**Creativity, Control and Communication in New Product Development:
a case study**

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Biographical Note

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Abstract

Creativity is considered an essential force to drive company's successful performance. For Product Development Processes, creativity is thought to be an indispensable factor, but it also needs to be controlled. Communication in particular, appears as an interesting mechanism of promoting and controlling that creativity.

The objective of this qualitative, interview-based research is to understand how communication as a control practice orients and affects creativity in new product development processes, in innovative companies. In order to do so, a case study was carried out on a Service and Product Design Company based in Porto, Portugal – called IDEIA.M. To develop this research study, qualitative data was obtained from multiple interviews with all relevant organizational members, internal documents, and direct observations.

This research study contributes to the literature on Management Control in a creative industry, by examining how exactly communication underpins and is intertwined with management control.

This study provides four main findings: 1) various types of meetings constitute the main method to encourage and promote creativity inside the company; 2) the communication inside the company is highly visual and the tools used in that communication are self-generated; 3) the company, naturally and unconsciously, started building their own Interactive Control System, which inherently supports multiple organizational learning activities; 4) the creativity-control tension described in the literature is, in fact, a false dichotomy, and both successfully co-exist in the case study company.

This study analyses the communication processes and tools (and its effects upon creativity) used in the case study organization (IDEIA.M), The analysis is concluded by providing alternatives and guidelines for future use. Specifically, suggestions are made regarding how information is transmitted inside of the company, the process of this transmission and its effects upon their creative employees.

Keywords: Communication, Creativity, Control, Interactive Control Systems

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List of Abbreviations

CLMS – Closed -Loop Management System

DCS – Diagnostic Control Systems

ICS – Interactive Control Systems

LOC – Levers of Control

MC – Management Control

MCS – Management Control Systems

NPD – New Product Development

1. Introduction

The subjects of Creativity and New Product Development are the focus of several studies (Malmi and Brown, 2008; Davilla and Ditillo, 2016; Brown and Eisenhardt, 1995). In studies of organization-level characteristics promoting creativity, communication has been highlighted as an important characteristic (McKinney *et al.*, 2004), arguing that communication assures goal alignment, and facilitates interaction, knowledge-sharing and information flow. Similarly, communication can be described as a particular prerequisite for interaction to occur that steers organizations and organizational actors. In this sense, communication can be considered an interactive management control (Simons, 1995; Tessier and Otley, 2012). Research literature has suggested a balancing act between certain traits associated with creativity (such as freedom of action) and the need to direct that creativity, by means of management control systems (Malmi and Brown, 2008). Similarly, research literature provides evidence the usage of management control system can result in both positive and negative effects on creativity, depending on the particular management control tools used the ways they are used and the areas upon which they are used (Davilla and Ditillo, 2016).

Communication appears as a particularly interesting research area, since it does not only operate as a vehicle for management control, but it also requires to be controlled itself in order to align with the strategic goals and purposes of the firm. Surprisingly, however, no research study thus far has explicitly focused on the topic of communication and management control systems. As the context for searching ‘communication as management control’, New Product Development processes are selected being one of the most ‘creativity intensive’ areas within an organization. As a result, the following overarching research question has been formulated:

How does communication as a control mechanism affect creativity in product development processes?

In order to promote the capture of empirical insights relatively unhindered by a strict and narrow theoretical focus, the research question has been purposely kept broad. The research design matching this research question consists of an explorative, in-depth case study (cf. Yin, 2009) of an innovative, product and service design company. The case data gathering enabled to identify a number of tools deployed in the design stage of the product development process. We observed particular ways to structure and focus communication,

including a number of relatively novel control tools which were self-generated by the organization. Building upon established management control research literature (e.g., on levers of control, interactive control systems and management control as a package), this study contributes by a particular focus on communication as control, revealing where communication can be found, what forms it takes, and what its management and control antecedents are. The results of this research study will further our understanding how communication as a control practice directs and affects creativity in New Product Development processes.

2. Literature Review

Both control and creativity are considered indispensable for today's organizations. Creativity is essential for companies ability to achieve sustainable performance (Zhou and George, 2003), while management control is crucial for the efficient functioning and growth of every organization. However, some literature explicitly states that control systems, by their very nature, restrain and limit creativity (Amabile *et al.*, 1996). Because of that, this paradox, representing a difficult relationship between those two factors - control and creativity - is challenging to reconcile. The argument is that controls are constructed to directly influence employees to deliver a specific output in a predetermined way (Zhou and George, 2003); the bigger the company, the more complex control processes become, which may result in a more rigid control system ensuring that employees deliver what is expected – and nothing beyond that.

On one hand, high creativity and the development of new ideas is strongly expected, but on the other hand, this is involuntarily limited and constrained by the existing control processes inside the company.

Notwithstanding, research study shows that control systems may actually be useful for creativity and, counter-intuitively, may encourage it in organizations (Speklé *et al.*, 2014): boundaries, self-limitations and restrictions may be, in fact, encouraging creativity (Ortmann and Sydow, 2017). Accordingly, it is proposed that managers can balance the control levers (Simons, 1995) to generate a tension necessary for the support of organizational capabilities, and therefore no trade-offs between them are needed. This finding suggests that control and creativity can successfully co-exist without one crowding out the other. Moreover, Speklé *et al.* (2014) show that managers can introduce control systems that build an environment suitable for creativity, while still maintaining control.

The topic of communication is significant when discussing control, as effective communication enables managers to control their subordinates. It also helps to plan activities and organize tasks. Communication is omnipresent in organizations, and so is Management control. The many shapes and forms that management control takes (from tasks instructions, through financial indicators and budgets, to outcome specifications) warrant a broad conceptualization. This is the 'management control as a package' idea, originally developed by Otley (1980) and then expanded by Malmi and Brown (2008).

The ensuing section reviews literature on the relationship between creativity and control, paying attention to the Levers of Control (LOC) framework and particularly to the role of Interactive Control Systems (ICS), and the notion of Management Control as a package. The second section explores the notion of Creativity in greater detail. This literature review is concluded with a third section on New Product Development, with a special focus on communication in development processes.

2.1. Creativity and Control

2.1.1. Managing the creativity-control tension

Organizational creativity requires teamwork and a suitable organizational environment, fostering collaboration between the project-team members. Managers are confronted with a challenging task – how to control creativity without killing it with control. In other words, to define what control practices to adopt in order to promote an efficient functioning of the organization, but also to encourage the creativity of employees. *‘The best manager is the one who can create an environment in which free collaborative improvisation can flourish, and this requires an almost Zen-like ability to control without controlling’* (Sawyer, 2006, p. 293).

Managers, in order to stimulate creativity inside the company, need to be as clear as possible on the purpose of creativity, by communicating the vision, mission and goals of the company – directly informing what the company is focussing on, what issues and topics are of essence for the organization (Amabile, 1996). To understand how creativity can thrive, one has to take a look at the kind of social and organizational environment. The working environment has to be stable enough to allow the employees to show their effort, but at the same time diverse and open-minded to encourage creativity (Florida, 2012). There is a paucity of research in this area; however, the contextual theories of organizational creativity and innovation provide us with different elements of work environments that are linked with creativity (Amabile *et al.*, 1996; Nonaka, 1991). One line of thought presents them consecutively as: challenge, organizational encouragement, work group supports, supervisory encouragement and organizational impediments (Amabile *et al.*, 1996). This research study concludes that the type of people hired, their skills and personalities, as well as individual creativity, play a secondary, but still and important, role in comparison with the work environment: the context these individuals work in should be paid attention to; and if managers want to follow the path of innovation, they need to foster the organization culture (Amabile, 1996).

To solve the long-existing tension between creativity and control, the Levers of Control framework, developed by Simons in 1995, present the idea that these tensions should be managed by opposing forces and compares them to the Chinese yin and yang. The tensions between limitations and freedom are managed by balancing the four levers of control, that are divided into positive (yang) and negative (yin) control systems. The 'levers' refer to the actions that managers use to transmit and process the information within the company, and they are separated into the beliefs systems, boundary systems, diagnostic control systems and interactive control systems. Beliefs systems are used to inspire and guide the search of the opportunities; boundary systems set limits on those opportunity-seeking actions across the organization; diagnostic control systems motivate, monitor, but also reward achievement of specific predefined targets; the last lever, interactive control systems, stimulates organizational learning for the emergence of new strategies and ideas. The belief systems and interactive control systems fall into the positive category, while boundary systems and diagnostic control systems are classified as negative. The positive control systems are compared to the light and the sun; they are responsible for motivating, rewarding, guiding and learning, while negative control systems are the punishments, prescriptions and 'cold' control tools (Simons, 1995).

What needs to be highlighted, is the fact that the term 'negative' may be wrongly perceived as unfavourable. The negative control systems have the same importance as the positive systems and are not considered detrimental for the organization. These two forces need to balance and coexist in the same environment to 'create dynamic tensions which in turn ensure effective control' (Tessier and Otley, 2012, p. 172). The strength of Simon's (1995) framework lies in the assumption that four control systems complement each other; used individually, they will not produce equally satisfying results and the desired 'balance' between creativity and control will be impossible to achieve. The proper selection and utilization of these levers is crucial for company's management. Managers must select them appropriately to their own context, as these levers will most likely affect the chance of achieving their goals, as well as influence the overall prosperity and future of the organization.

The notion of 'balance', however, was questioned by some studies, which concluded that all the levers are necessary to achieve balance, that 'balance does not mean equal weight, and that it can be achieved through different combinations of emphasis' (Kruis *et al.*, 2016, p. 40). Organizations exist in different contexts and face different challenges, therefore the levers

should be introduced differently as well, in order to fit the strategic objectives of each organization.

Interactive Control Systems (ICS), which are particularly relevant for the topic of this research study, deal with strategic uncertainties, and help to adapt the strategy to competitive environments and focus attention on what is of importance, stimulating search and learning processes, that can result in the emergence of new strategies (Tessier and Otley, 2012). ICS, supporting innovation and opportunity-seeking activities, are opposite to Diagnostic control systems, which by their nature, focus on the critical success factors of the organization and work towards well pre-defined goals. What characterises ICS is the personal and regular involvement of managers in the decision-making behaviour of subordinates, but at the same time this involvement is not undermining worker's decision autonomy. ICS indicates managers' involvement in the critical phases of the decision making process through formal and informal information systems, in order to create a dialogue, without intervening too much (Bisbe *et al.*, 2005). In fact, this episodic involvement (setting the milestones or reviewing the monthly or weekly progress) is a trait that makes the control systems 'interactive'. The aim of their involvement is to focus attention and learning on the most pressing strategic issues. The information that derives from this involvement (e.g., through meetings) sets the stage for new opportunities (Simons, 1995). Top managers are to encourage information sharing between the organizational parties and look for the changes and the opportunities. In ICS, the term 'strategic uncertainties' is placed in the spotlight, as those uncertainties are the ones that threaten the current state and strategy pursued by the company.

ICS possess some properties that differentiate them from other management control systems. Firstly, they are intensively used by senior managers, who dedicate considerable amounts of time to involve themselves in the activities and the decision making processes of their subordinates, and the information gathered during those activities is classified as important. Secondly, they are frequently used by operating management at all levels of the firm, which occupies itself with issues related to formal control. Thirdly, top and middle management interact frequently and have face-to-face debates in meetings with both superiors and subordinates, to discuss and interpret the information generated. The intensity of this communication is crucial, as well as the content of the meetings. The company needs to generate and gather information that relates to the strategic issues of the firm. This leads to

the fourth characteristic of the ICS, that the system by itself serves as a catalyst for the recurrent challenge and debate of the data gathered, assumptions and action plans. Top management needs to strongly participate in the process by being present and needs to avoid being invasive in the decision-making meetings. Their involvement is characterised as facilitating and non-interfering, carried out as a dialogue rather than a command, while creating the positive environment that encourages information-sharing. *'Through ICS, top managers force issues on the subordinates' agendas and demand their attention, but nevertheless top managers' involvement through ICS is empowering rather than overtly intervening'* (Bisbe *et al.*, 2005, p. 15). By attending the meetings and be present during the decision-making process, top managers send clear signals of what is important and where the focus of the team or the organization is, and by the result of that action, new strategies emerge.

Moreover, ICS serve as a guideline for innovation by focusing and seeking new opportunities and on learning (Bisbe and Otley, 2004). ICS are used by top managers to inspire experimentations and evolution of innovative initiatives, they *'help to satisfy innate desires to create and innovate'* (Simons, 1995, p. 155). ICS aim to result in adjusting the organization's strategies and take advantage of the learning process between top and subordinate management. The result of the meetings may be a new idea that has a potential of becoming a new, ready to implement strategy, that was not considered before (Simons, 1995). In conclusion, by focusing companies' attention on strategic uncertainties, ICS can lead to and develop those organizational learning processes.

Any control system can be used as an Interactive control system, as long as certain conditions are met (Simons, 1995). Firstly, if the control system is to be used interactively, the continual forecasting of future states, based on the revision of current information is indispensable. Managers need to ask critical questions such as 'what has changed and why?' in order to anticipate patterns of potential change in the future (Simons, 1995). A second condition is that the information gathered, while using the control system, needs to be easy to understand and easily accessible to all. The focus is on the implication of the obtained information rather than on how it was reported. Thirdly, in order to serve as a catalyst, the control system must not only be used by the top managers of the organization but by all the managers regardless of hierarchical level. It also needs to trigger revised action plans – the discussion needs to be followed by the solutions and conclusions to apply in day-to-day business operations. Lastly, a control system needs to gather and generate information that relates to the effect of

strategic uncertainties on the strategy of that respective business, as the uncertainties vary depending on the market and industry in which the organization is operating. ICS systems need to show the best way of reaction to the presented information.

There are usually a few ICS in the company, for a number of reasons: from an economics perspective, ICS are rather costly – both top and middle level managers are engaged in multiple tasks in the same time. Those systems require continuous attention, and, therefore, generate high opportunity costs (Mundy, 2010). Another issue is the limited human ability to process large amounts of diverse information at the same time. Using many ICS simultaneously would potentially result in information overload and undermine the decision-making process, as managers would not be able to process all the data and to create a dialogue at the same time. It would be followed by a superficial analysis, lack of perspective and, in the long term, potential paralysis of the decision-making process. Usually, the number of MCS used interactively by managers equals one (Mundy, 2010); as a result, it is of crucial importance which control systems are selected for interactive use and *how* they are used. Commonly, ICS are used for organizational learning, internal knowledge-sharing and discovery of new ideas, but too many interactive systems would cripple the operations, stress the employees, and prevent them from achieving their goals.

2.1.2 Management Control as a package

The Levers of Control framework enables organizations to choose a combination of control tools, depending on the firm's own context. Dynamic tensions arising from the interrelations between the Levers of Control guide the organizational development of capabilities, facilitate learning, promote market orientation and, when used together, contribute to a better organizational performance (Mundy, 2010). The way managers use available control systems to empower and control, create these dynamic tensions. This critical role of balance has been acknowledged in several studies (for example, Mundy, 2010; Kruijs *et al*, 2016) and the findings show that its existence is directly determined by managerial uses of MCS – which need to create the best environment for those tensions to arise and to unfold.

Therefore, the existence of different elements of the framework, of relations between those elements, and its usage in its entirety, suggests the notion of Management Control as a package. Historically, researches mainly focused on one specific MC tool or activity related closely to the diagnostic control systems, such as Balanced Scorecards or budgets. Because of that, there is a scarcity of explicit empirical evidence on MC systems examined in

interdependence, rather than independently from one another. This reductionist approach was criticised in the literature, and two sets of constructs were developed - MC as a system and MC as a package (Otley, 1980). The differentiation between those two terms causes a certain misunderstanding, as the notion of MC as a package and a system should not be used interchangeably (Grabner and Moers, 2013). MC as a package describes a full set of control tools and activities in the organization, without taking into consideration whether those practices are really interdependent or not. MC as a system proposes that the MC practices are interdependent and the managers, while designing their MC strategy, should mind those interdependencies. A 'system' implies conscious decisions of the design of these interdependent controls, while a 'package' can be simply composed of a set of MC systems and MC practices taking care of unrelated control problems (Grabner and Moers, 2013). Interdependence, in that sense, refers to the fact that the value of one MC practice stems from the usage of another.

Grabner and Moers (2013) propose to examine MC from a 'system' perspective in order to analyze and understand the relationship between adopted MC practices. In the first place, the understanding of different MC systems in a package is important, before examining MC as a package itself. *'Before we address the entire control environment of the organization, i.e., the control package, we first have to understand if and how certain control practices form control systems in order to solve a specific control problem'* (Grabner and Moers, 2013, p. 418). This system approach proposes two choices: first, to select MC practices that fit to the context and contingencies that the company is facing; and second, making sure that these adopted practices are, in fact, internally consistent. After the analysis of all the possible explanations and definitions of MCS as a package, we can summarize it as follows: *'The concept of a package points to the fact that different systems are often introduced by different interests groups at different times, so the controls in their entirety should not be defined holistically as a single system, but instead as a package of systems'* (Malmi and Brown, 2008, p. 291). Nevertheless, there is no clear evidence whether the control systems found to be significant when analysed independently, hold the same importance and prove to be as effective when inspected in a set of MC practices - that is, as a package (Bedford *et al.*, 2016).

There are many MCS configurations and analysing them is important as, from a managerial perspective, designing well-functioning MCS to produce specific outcomes is a key to success (Malmi and Brown, 2008). MCS do not operate in isolation, although some literature analysed

them one by one, in separation from the whole, broader perspective (Chenhall, 2003). As the accounting part of control systems (such as a Balanced Scorecard) is typically studied in greater depth, there is scarce information about the impact of other control systems. Analysing MCS as a package will help to understand better other control systems and will guide knowledge on how to exactly design them to fit a given context. The main focus of the MCS theory is the question ‘How to design the specific MCS for it to give expected results?’, which means which combinations of MC practices are effective in various strategic contexts (Bedford *et al.*, 2016).

Also, the presence of concept of Equifinality has been shown to exist in MC combinations (Sandelin, 2008; Bedford *et al.*, 2016). Equifinality states that it is possible to achieve the same outcome (e.g., the same level of effectiveness) by using various configurations in control elements and systems, in the face of similar contingencies that the organization is facing; therefore, different sets of equally effective MCS can be applicable (Doty *et al.*, 1993). In practice, it means that managers possess a large degree of freedom in designing the MCS for their companies; i.e., there are many ways of designing the MCS to reach similar strategic objectives. Empirical evidence for this proposition was provided by Bedford *et al.* (2016) in their study of organizations that operate in the defender and the prospector strategic contexts. However, the same study emphasized that the choice of the MC practices is not fully determined by the strategic context of the company; they may simply be limited by the availability of alternatives. Nevertheless, the usefulness of the majority of MC practices in a package seems to be determined by the context rather than by their interdependence (Bedford *et al.*, 2016).

2.2. Creativity: a closer look

Defining creativity proves itself to be a challenging task, and many myths around that concept appeared. The agreement exists, that without creativity, the progress of humanity, whether social, cultural or organizational, is impossible. Creativity is occasionally erroneously perceived as a distinctive personal trait of a few, selected, mostly young geniuses. However, the ability to ‘create’ is present in every single human being and is, in fact, what differentiate us from other species – it is not an exclusive trait of some individuals (Florida, 2012). By the 1970s, psychologists reached the conclusion that creativity is not a unique personality attribute, that it does not depend on intelligence, and cannot be measured with tests.

This finding helped to develop a more scientific definition of creativity. Sociocultural investigations defined the concept as a ‘novel product that attains some level of social recognition’ (Sawyer, 2006). Following that rationale, one of the closest definitions comes from the Handbook of Creativity, which explains creativity as the ability to produce work that is not only novel (i.e., original, unexpected) but also appropriate (i.e. useful, adaptive concerning task constraints) (Sternberg and Lubart, 1999, p. 3). This is the concept of Creativity commonly used today; the ideas have to be appropriate to the task at hand, the problem presented, different from what already exists, and above all, the solution to the problem cannot be outlandish (Amabile, 1997). In other words, the ‘novel’ idea is not enough to be considered creative, it also has to be appropriate and recognized by the society, the community it is developed for - it has to fit in a certain context. Creativity can only be recognized, if there is a public to positively receive it. In addition, the task has to be without only one single solution and has to be heuristic (open-ended) and enable learning (Amabile, 2012).

The ideas above may be supplemented by adding the findings of Csikszentmihalyi (1996), who stated that creativity needs a system of three elements: a culture that contains symbolic knowledge (a domain); a person who brings novelty into the symbolic domain; and a field of experts who recognize and validate the innovation. In fact, he agreed that creativity does not depend on the individual but on the acceptance of one’s idea in the specific field (Csikszentmihalyi, 1996). He claims that individuality may indeed be helpful in creating novel ideas, but it is definitely not crucial to do so. Creativity is established with the interaction between those three elements: domain, field and a person (Csikszentmihalyi, 1996).

Drawing from another research study, creativity is considered as constructed by three elements: expertise, creative-thinking skills and motivation (Amabile, 1998). Expertise simply means all the knowledge that a person possesses in a certain field – and the broader that field is, the more numerous suitable solutions to a certain task or an issue are possible. Creative-thinking skills is about *how* the issues and solutions are dealt with – how they put existing symbols together in order to create an absolutely new combination. The third factor differs essentially from the first two, as while expertise and creative thinking are individual, motivation is the link to what will be done in real life – it determines whether the action will be taken or not. There are two types of motivation – extrinsic, the one that comes from the

outside and can be influenced by others, and intrinsic, which translates to an innate desire and interest to do something (Amabile, 1998).

In addition, research studies came to classify creativity as a kind of mental activity, some sort of insights that happens in people's minds (Csikszentmihalyi, 1996). However, it adds that, in fact, this definition is too short to be absolutely true – creativity does not entirely happen in people's heads but rather 'in the interaction between a person's thoughts and a sociocultural context' (Csikszentmihalyi, 1996, p. 23). Therefore, he states that creativity is a systemic matter, not really an individual trait. This addition brings us to the field of Cognitive Psychology which focused on a creative mental process, rather than a creative individual himself. The field argues that for a creative process to be finished, only the development of a creative thought in one's mind is not enough – that idea has to be implemented. Creativity happens with time and the creative process consists of four different stages: Preparation, Incubation, Insight, Verification – with two substages – evaluation and elaboration (Sawyer, 2006). The first step of the creative process, preparation, means hard work, familiarizing oneself with everything that came before in a certain domain, all works and symbols. Then, the creativity happens when an individual is able to connect those already existing elements into something new. For some studies, formal schooling appeared to play an important role in creativity - passing the knowledge from one generation to another and getting to know the basics, those symbols and works. For others, however, this does not play any important role (Amabile, 1998). They all agree, however, with one thing: in order to be successful in one field, the person has to internalize that domain first (Sawyer, 2006).

The second stage, Incubation, is believed to be an unconscious process, where all the mental elements combine and insights come up to the surface of consciousness. The already existing thoughts merge into one. Then the Insight is defined as an 'Eureka' moment - a sudden burst of insight. Afterwards, the creator makes sure whether the creative idea may work in reality – a stage called Verification. In the end, not every novel idea is a good idea - or the one that should be implemented. The evaluation stage happens under full consciousness, where one checks the appropriateness of the emerged thought. After evaluation, the substage of elaboration follows, in which the creator works consistently on its idea and develops a finished output (Sawyer, 2006).

Nonetheless, the Verification stage brings us to the notion of Innovation. Creativity is strictly linked with Innovation as one does not exist without the other. As stated previously,

creativity consists of a development of novel, appropriate ideas – Innovation is simply their successful implementation (Amabile, 1997). Creativity is perceived as the beginning of Innovation, its very core. These two terms seem to be correlated with one another – creativity is considered to be a ‘generation of new ideas’ to improve the ways of action, whilst innovation is the implementation of those ideas in real life (Styhre and Sundgren, 2005).

2.3. New Product Development

Discussing the ‘generation of new ideas’ and their successful implementation leads to consider New Product Development (NPD) in organizations, also known as product innovation, which concerns itself with the entire process of bringing a new, or improved product to the market, and may be described as transforming a market opportunity into a product available for sale (‘new product development’, 2009). It can be either a physical object (e.g., a new phone) or an intangible object, like a service. New product development is essential for the existence of a company in order to successfully compete and generate new revenue streams that guarantee continuity of the firm. Product development is essential for organizational success not only because of the competitive advantage it produces, but also because it is a critical means by which members of the company diversify, adapt, and, often, reinvent their work environment, including the company itself, to match evolving markets and technical conditions in fast-paced and competitive markets (Brown and Eisenhardt, 1995, p. 344).

The NPD literature is a vast one and has been divided into three streams, each focusing on different aspects of product development. The first ‘generative proposition’ evolved from studies which concluded that a successful product development comes from rational planning and execution; that is, when the product possesses a significant product advantage (increased quality, low costs, and other intrinsic values of the product) and when its development is well executed thanks to internal organization. Overall, a set of dimensions necessary for achieving success and potentially improve the process, and those with no impact were identified (Cooper, 1979). A second stream of studies perceives product development as disciplined problem solving originating from the analysis of Japanese product-development activities in the 1980s. This research study presents NPD as a balancing act between relatively autonomous problem solving by the team and the discipline of a strong, superior top management – usually a leader - and an overarching product vision (Brown and Eisenhardt, 1995).

Finally, the last Product Development concept has communication at its core, a subject of particular importance for this dissertation. Organizational communication can be defined as *‘the process by which individuals stimulate meaning in the minds of other individuals by means of verbal or nonverbal messages in the context of a formal organization’* (Richmond *et al.*, 2005, p. 20). Communication serves several functions, and is used to inform, integrate, regulate, manage,

persuade and socialize (Richmond *et al.*, 2005). The work of Allen (1977) at MIT states that the communication within the team-members of the product development project and their communication with the 'outsiders', that is all the other relevant people related to the project from outside of the firm (e.g., manufacturers, suppliers, agents), stimulated the performance. Therefore, the increased success of the development process heavily depends on a good connection among team-members and with the key people from outside of the team. The study shows that intra-organizational communication is strongly related with Research and Development performance. Additionally, for problem solving engineers more often use their colleagues as a source of information, than other sources (e.g., literature) (Allen, 1977). Moreover, the importance of networks was highlighted: '*when there is social contact between any two individuals, the probability of technical communication is significantly higher than when no social contact exists*' (Allen, 1977, p. 207). It also formulated the concept of a 'gatekeeper' - a person who is performing very well and who communicates much more frequently with both her or his team-members and with the key outsiders who are important for the overall success of the project. In communication literature, especially the ones analysing the communication trends in media, the role of the gatekeeper was presented as an individual role, of a person who selects information and decide whether that information should be passed on or not (Levingston and Bennet, 2003). Hence, the person holding the informal role of gatekeeper is connected internally with the team but also to the external sources of information (Katz and Tushman, 1981). They gather and translate necessary information into the organization and share it with their team, but also facilitate the external communication of their teams with the outside world. The conclusion of the study shows that those teams who had a 'gatekeeper' among them performed better than the teams without it. The gatekeeper's role is valuable for the R&D team as it facilitates the external communication for the entire team and reduces communication barriers. Other studies equally highlighted the importance of external and internal communication and the pattern of the external activities presenting the idea of 'boundary spanning' which means establishing and managing interactions with people inside the company, who are also outside of their closest work group or team (Ancona and Caldwell, 1992), which is an aspect of effective collaboration inside the organization. The term 'boundary spanning' is understood as a situation where one individual crosses the boundaries of their social group. It also describes these individuals, who adopt the position of connecting the organization's internal networks with the external sources of information (Tushman, 1997). The notion of boundary spanning brings the study to the term of boundary

objects, which, in simple words, describes an information (in any available format, e.g., map, note, photograph) used and interpreted differently by different entities (Star and Griesemer, 1989). They are media that help to connect different groups of individuals. Those objects adapt to different needs because they are plastic enough to adapt to the needs and constraints, but still strong enough to keep a common identity; boundary objects are have weak structure in common use, but become robust when in individual site-use (Bowker and Star, 1999, p. 296) They may be abstract or concrete, but their structure, their identity is common; they can be material (ex. ERP system) or immaterial (ex. corporate vision).

3. Methodology

This research study follows an inductive approach – moving from empirical data to theory – looking for theoretical generalization rather than empirical verification of a hypothesis.

The dissertation uses a single case-study method of a Service and Product Design company, called IDEIA.M, in which creativity is assumed to be an important requirement for performance and overall success. This research method obtains a contextual understanding of events and allows gathering insights in the antecedents, consequences, and causalities of processes and practices. The case study method provides an in-depth understanding of the decisions that were taken and changes that occurred; why they occurred, how they were introduced, and what results these decisions brought. The case study method works especially well when the boundaries between the occurring phenomenon and the context are not evident, nor clearly observed.

‘The case study as a research strategy comprises an all-encompassing method with the logic of design incorporating specific approaches to data collection and to data analysis. In this sense, the case study is not either a data collection tactic or merely a design feature alone but a comprehensive research strategy’ (Yin, 2009, p. 13).

The case study approach is considered a comprehensive research strategy, as it brings to light a high number of variables, relying on different, multiple sources of evidence.

A single case study is particularly useful for this dissertation as it identifies the relationships connecting day-to-day practices, and observes these in their natural environments (Stake, 2006).

This dissertation uses three different data collection methods: interviews, archival documents, and direct observations, and by their triangulation assuring the validity and credibility of reported empirical evidence.

Interviews are used to obtain in-depth insights and decision motivations from the top managers and the designers and engineers of the company. Given the nature of the topic, data collection from surveys or questionnaires would not capture longitudinal processes as well as behavioural patterns and motivations, all of which cannot be collapsed into the discrete design of survey questionnaires. The observations, provided further visual evidence of the interview answers obtained as well as complement the limited formal documentary evidence used by this small organization (Stake, 1995).

In total, seven different sets of interview scripts were prepared aiming at management (five sets) and at the designers and engineers (two sets – one for the Project Manager, another for the designing/engineering team members), representing the ‘formal hierarchy’ and the work floor’s opinions on the topical phenomena at stake. The nature of the interviews was semi-structured (Yin, 2009): the pre-developed scripts were distributed in advance with the interviewees being welcomed to add their own comments, spontaneous notes or observations as well as their personal insights, including comments on situations beyond the posed questions and main topics. Simultaneously, the data triangulation’s purpose was to validate and confirm the different aspects of the same event or process, undiscovered during these interviews.

In the first three interviews, conducted in July 2017 with the management of IDEIA.M, a general overview of the company was presented, strategic plans for the future were revealed, and the departmental and team activities and hierarchy were explained. The interviews with the Founder-CEO in the beginning of 2018, revolved around the topic of their future plans, their definition of control, and the communication and control processes.

The interview script developed for the designers and engineers focused on their role in the company, the nature of their work, how their work is structured and guided, their opinions and impressions about the processes in the NPD, and the control tools used by the Founders-CEOs.

As for the interviewee selection criteria, the goal was to interview the management as well as the NPD team members, as all the employees of the company pertain to different project development teams. Given the small number of employees in the company (10 people), the

initial idea was to interview the two top managers and one person from each current project development team. Later on, it was concluded that the best option would be to interview people who had spent more than two years in the company, in order to gather valuable insight regarding the past and the present of the case study firm. Based on this selection criteria, 6 people were identified as potentially suitable (including the Founders-CEOs) and all were successfully interviewed.

In summary, this study builds upon a set of 9 interviews with 6 different people, corresponding to the different 'hierarchical' levels in the company, and having different tasks and daily jobs. It generated insightful information about the communication in the product development processes, the tools used and the extent to which they are used. The interviews also allowed to analyse the influence of the-above-mentioned factors upon the creativity of IDEIA.M's employees. To keep the interviewees anonymous, no distinction between the designers and engineers was made (see Table 1). The first set of interviews was conducted face-to-face in July, 2017, and the follow-up interview via Internet was held in February, 2018. It was followed by face-to-face interviews with the management, designers and engineers in early March, 2018.

Table 1- Conducted interviews

Code of the interview	Data Gathering Round	Date	Duration	Topic	Type
CEO1#1	Round 1	04/07/2017	1:00:36	Introductory	Face to face
CEO1#2	Round 1	14/07/2017	1:06:46	Strategic plans for the future	Face to face
CEO2	Round 1	19/07/2017	0:52:53	Departmental and team activities explanation, tools presentation	Face to face

PM1	Round 2	28/01/2018	1:25:23	Team activities, communication, nature of the work	Skype
CEO1#3	Round 2	18/02/2018	1:43:06	Communication, tools explanation	Skype
CEO1#4	Round 3	5/03/2018	1:23:14	Further discussion regarding communication	Face to face
Designer1	Round 3	05/03/2018	1:02:45	Overview of the company, tools, communication processes, future of the company	Face to face
Designer2	Round 3	06/03/2018	1:13:24	Overview of the company, tools, communication processes, future of the company	Face to face
Designer3	Round 3	7/03/2018	1:20:00	Overview of the company, tools, communication processes, future of the company	Face to face

Secondly, direct observations within the company took place on two different occasions – July, 2017 and March, 2018 – when a tour of the facilities was made. The work environment and the work space was observed, and the usage of the SCORO software was shown. In July, 2018 the company’s products stored in the facilities were also introduced (e.g., AVA model of an electric guitar, the small model of the plane) including the physical tools the company is using to test their designs (e.g., 3D printing machine). In March 2018, a further explanation of the usage of the Subway Map was given, along with the explanation of the Inspirational

Boards; on that occasion it was also possible to observe the wall with the Inspirational Boards and take multiple photos.

Interviews took between 1 hour to 1 hour and 30 minutes, and were recorded and transcribed for data collection and further analysis. By July 2017, relevant documents were already obtained, such as the strategic process development plan in a form of map (Subway Map) and photographs of the firm's product design process. At the same moment in time, an e-mail exchange further clarified doubts and asked for further information. The means and objective of that contact is described below, in Table 2.

Table 2 – Additional follow-up contact made with the company

Code of the contacted entity		Date	Purpose	Obtained data
CEO1	Founder-CEO	15/07/2017	To obtain necessary information and documents	Further information about the IDEIAM's products and the overview of the company, Subway Map
CEO1	Founder-CEO	25/01/2018	To obtain further financial data and pictures of the Inspirational Board	Information such as sales turnover, Annual Company Information, pictures of the Inspirational Board

4. Case study

This chapter provides an overview of the company and the practices used to manage their internal processes, as well as a view on how they organize and manage their communication within and outside of the team. The chapter begins with the introduction of the company, then the human resources of IDEIA.M are analysed, followed by project work, work organization and the Total Quality Management. We observed several axial topics to emerge from this empirical chapter, each of which will be discussed further in the later Discussion chapter.

4.1. Introduction of the Company

IDEIA.M is a company established in 2008 at the Science and Technology Park of University of Porto, which is a subsidiary of the University of Porto solely dedicated to incubating start-ups and supporting their growth and business innovation. The idea for IDEIA.M was born one year before, in 2007, when the two founders were working on a project at the Faculty of Engineering related to composite materials for building musical instruments. When the graduation time came, the duo started wondering whether it would be possible to start a company related to similar issues - new products related to design and composite materials. Nowadays, in 2018, it is an agency consisting of 10 people, both designers and engineers. Their main focus is on innovation in engineering and design by following a three-steps process: discover, develop, deliver. They design and develop new products for new or existing markets, as well as create services for their clients. The main idea is to develop creative innovations across different sectors and markets, to create products valuable for the end-users. Projects originate from diversified sectors – musical instruments, medicine and aircrafts are just a few items on a long list. Being presented with a certain problem, the main job is to provide a solution – a creative and original solution. *‘Good design solves the problem. Great design solves it and looks pretty damn good while doing it’* says the motto of IDEIA.M. *‘There are very different cakes, made with different ingredients’* – adds the CEO2. Sometimes the problem is defined clearly, sometimes it is very broad and has plenty of room for improvisation. The company sells the creativity of its employees, through the creative outcomes of their teams, excelling in product design and development projects.

To present to the clients the full range of what the company is capable of doing, they created a tool called the ‘Subway Map’, where the main services are presented in a form of horizontal lines, just like a map of a Subway. The main 5 lines are as follows: ‘Capture Value’; ‘Service

Thinking'; 'Advanced Service Design'; 'Strategic Design'; and 'Advanced Product Design'. These lines represent the company's products, and are based on the firm's experience that some services are combined to provide an augmented and complete 'bundle of services' - which they sell as a package called a 'product'. Along these five 'subway' lines we can see the main stations which represent the work process. They are as follows: Organizational Alignment; Ideation; Design Research; Product Design; User Experience; and Service Design.



Figure 1 - Subway Map (source: company material, translation by the author)

Each of the five products will be described in more detail later, in section 4.4. The Organization of Work, but a brief description at this stage is considered useful. The first product, focusing on the early stages of an innovation process, is Capture Value, which focuses on immersion in a given challenge to generate ideas. The steps taken during this process are : Organizational Alignment, Ideation, and Design Research.

The second product, Service Thinking, occupies itself with research and definition of user experience of the products or services that will reach the end users. The Subway stations are : Design Research and Service Design.

The third product, Advanced Service Design, aims at service conception or restructuring, and can be focused on innovation, new idea generation or customer loyalty. It starts with Ideation, continues through Design Research and Product design, and ends with User Experience.

Strategic Design, the fourth product, is a comprehensive process of developing a product/service and starts with an understanding of the organization and its internal processes and focuses on building meaningful solutions for the business. It contains Organizational Alignment, Ideation, Design Research, Product Design and Service Design. Finally, Advanced Product Design is useful for all the clients who want IDEIA.M to design a product with a focus on the commercial market, including the product's usability, style and ease for manufacturing. The Subway stations on that line are Ideation, Design Research, Product Design and User Experience.

The client can choose one of the subway lines to match what he or she is looking for in particular. For example, if the client aims for the complete development of a new, innovative product, (s)he will choose the Strategic Design line. If the client needs to see how the public reacts to the new product or service that is currently in development stage, the choice will fall on the Service Thinking line. However, the Subway Map has been designed in such a way, that the client does not have to buy the whole line as a 'bundle of services', but also just one Subway Station. Another use of a Subway Map is for the client, accompanied by the suggestions of IDEIA.M, to choose his own mixture of stations that (s)he finds the most useful for the project.

The Subway map is intended as a tool to explain the products of the company, to communicate the way IDEIA.M works, what is capable of doing, the processes it has and to find a suitable mix or a Subway line representation for a presented problem. It also often happens that the firm sells a station smaller than a Subway station to a client who may be only concerned with one specific activity such as design, without involving himself in the design research nor ideation nor user experience. Sometimes the company sells a product that does not even appear on the Subway Map.

IDEIA.M has a wide client base in many different sectors all over and outside Portugal. Their clients vary in size. Many are big firms with years of experience on their specific markets. Some, however, are relatively small or start-up firms. The majority are from the private sector and operate in many different industries, like retails, textiles, aerospace, science, musical instruments or automotive manufacturing.

IDEIA.M is still a small company (see Appendix 1 for the turnover from 2008 to 2017) that aims to grow in size, but the main strategic focus is on the projects they receive. In the future they intend to receive bigger and more visible projects; preferably product development

projects that are directly related with the consumer or with which the customer/end-user can create a personalized bond (e.g. a coffee machine, a plane or a bike), rather than working on something that is a depersonalized item, like a machine inside a factory, or a minor machine component or part.

The management's priority is to create the best conditions for their workers, in order to provide the best service to the customers. They emphasize the importance of the workplace, also because they want to have a company with a good working environment. The managers believe that for the firm's future growth, more people need to be hired, to take care of the non-financial side, such as Human Resources, while also develop a more professionalized management team, not centralised around the founders (as it is the case at the moment). The short term focus is on adding people in the creativity and strategy teams, as all the people currently hired originate from a design or engineering backgrounds. Presently, the company has many projects in the engineering or industrial design area but in the near future aims to work more on design thinking, strategic design and design research. Further in the future, within a one or two years' time, they aim to add more people from technical fields that the firm does not work with right now, like electronics and software, to expand their portfolio of products.

Another big challenge for the company is to position themselves as a service design and a product design innovation development company, as they are mostly recognized right now for their engineering work.

Presently, a project team consists of one project manager to supervise the process and one or two additional team members. However, the two Founders-CEOs are the main people responsible for all the projects, without absorbing the role of a Project Manager. Both the team members and the team project manager report progress directly to the Founders-CEOs. Apart from the Project Manager reporting to one of the Founders-CEO's, the team members of a project also consult their designs with other colleagues and ask for an opinion after each task, or for the managerial confirmation, if the design can be sent to the client.

People at IDEIA.M may be working and actively involved in multiple assignments and projects, and hence form part of multiple project teams (depending on the projects' size), performing different tasks in different projects. This transition of tasks is most visible with respect to the Project Manager's role in a team, since this role can change depending on the project. In other words, while person A is a member of a team with person B as a Project

Manager, person A can also be a Project Manager in a team where person B is merely a team member. Specifically, when one of the employees is a specialist, for example, in bikes, and the project aims to develop a bike, that expertise means he or she will be the Project Manager of that assignment. The reason behind this transition is that the firm is still relatively small and growing; management does not want to limit people's ability to grow, and wants to challenge them, learn to work on new positions and try out new roles.

Also, when one designer already worked with one specific client in the past, he will stay as a Project Manager for all the future projects coming from that same customer, regardless of his prior experience in the topic.

However, right now most of the design projects are being managed by one person who has the longest experience in IDEIA.M. With regard to formal financial control tools, the company uses feedback control, based on internal budgeting. The main budget categories are people, materials, laboratory items, services, and suppliers (ex. cork or other raw materials suppliers). Another budget category is AVA - the spin-off brand of IDEIA.M and the very birthplace of the company - where they invest 10% of sales every year. AVA refers to the brand of guitars and violins made from carbon fibre composite materials, and was a very first project of the company. At the moment, AVA is also treated as the basis for the future steady financial returns, as the company plans to go out to the market with the AVA products soon and expects its success. The budget also includes usual categories such as sales, general administrative costs, and capital expenses, for example, software or shop floor equipment and tools. However, most of the company's budget consists of project-driven variable costs. When the CEOs provide a sales quotation, they always consider all these costs, such as variable costs and an overhead charge, while acknowledging the inherent difficulties: *'It is always difficult to estimate it perfectly. Based on our experience, we may assume some variation on costs'*, says the CEO1#3.

4.2. The organization of people

Employees in IDEIA.M are hired straight after graduation and most of the designers are recruited from the same University. What the founders look for in their employees, above all, is a set of soft skills - communication and presentation skills. Moreover, at the time of selection, in addition to the hard skills necessary for the job, the hobbies of candidates are crucial. Because of the diversified nature of the projects and the multitude of fields the firm is operating in, unique and distinct hobbies are valuable at IDEIA.M.

‘Those are things that they do for pleasure, and usually they know them better than the other ones. So, we may have a person who likes motorbikes, another who likes music and another who likes yoga... During next year, we might have projects that will touch those areas somehow and it is easier [...]. A guy who will start in September has a background in mechanical engineering and studied classical guitar for 8 years. Maybe it is a good match.’ (CEO2)

There is no onboarding nor a training process for the newcomers, neither are there any work instructions; however, many employees start in IDEIA.M as interns, doing an internal project in order to finish their degree. In IDEIA.M, the constant learning process is considered very important. Every big project contains a phase in which the employees learn about and study the problem. The best example comes from the very first project of the company - to design an ultra-light aircraft from the scratch. The team of three had to create everything from the beginning, from the cockpit to the style of the plane. They had to research and talk with pilots to know what kind of aspects they value and want in a plane, how they feel in the air. Some of the prior knowledge came from the customer, but most of it was obtained from the team’s own research in that area, e.g., research for manufacturing or benchmarking other products in the market. In the initial stages of the research phase, the designers try to find any possible helpful information, mostly on the web. After the research phase, they split that information into some major steps to further work on; for the airplane example, this was: cockpit, fuselage, aerodynamic surfaces, engine, landing gear and flight control, and then the team defines which step should be taken first. A lot of time was invested to understand how to build this machine and the team had to challenge themselves, their skills and knowledge to develop a feasible proposal for such an aircraft.

When assigned to a project, an employee enters with his/hers basic knowledge and a set of design and engineering skills, but has to do a lot of related research on his/her own as part of entering specific team. The learning process also includes visits to the client’s facilities,

talking with their employees to learn about the strategy, the organizational culture, and the clients' products. Sometimes, people from outside of the company are hired to train the employees in the area they are currently researching.

Another characteristic of IDEIA.M is that the CEOs strongly support learning process and learning activities of their employees. Whenever a designer or an engineer needs for example, a book, or an online training, all they have to do is ask. *'They invest a lot in people's development, this is one of the coolest things. Back in the day it was difficult to have capabilities of developing without having anything. Right now, they want to do next step, next step, it gives you a thrill about how the future is going to be.'* (Designer3)

4.3. The organization of projects

Projects are limited not only in time and budget, but in many cases also by the end-user experience and manufacturing possibility. The final outcome has to fit the customer's vision, and in many cases the customer's idea of the final result is already defined at the start. The company is proud of its fully integrated design work process, with both designers and engineers working in the same space, to be able to brainstorm quickly. Integrating engineering and design, and the ability to be in every stage of the project allows the company to follow the project, from the beginning until the end.

After receiving an order for designing the product, the team defines a scope - which is the first step in the process and which is not represented in the Subway map. When initiating the work, there are certain guidelines that the developing team has to consider. Designers usually receive a document with the restrictions; for example, to stay below a specific price because of the competition, or the design only to be done in one colour, black, in order to lower the manufacturing costs. These guidelines are known and understood upfront, as usually they are being given by the customer or they are being developed together with the customer by understanding what he/she is aiming for. The designers are therefore not only concerned with the style and the design of the product but also with its functionality, the logistics concerning the product, the manufacturing, the pricing of the future product and all the costs involved.

'Designers usually don't like restrictions. But that is the main thing that ignites creativity. Because if you don't have restrictions, you can do anything, make style, but when you do design, you don't do only style. You do style and function and feasibility and certifications and manufacturing and process and process and customers and logistics. This is design. Creativity has to look at all those points. We define the scope, we determine restrictions, and we rely on designers to challenge and study the problem.' (CEO1#1)

In rare cases some customers only want the project done without getting closely involved during development - the customer only appears at the end of the process to see how the product looks like, how it is designed, and how they can manufacture it. However, in most situations this is not the case; that is why almost every station along the 'subway line' has its own validation point (i.e., another interaction event, including feedback). For example, the Design Research station will end with a design research report that is shared with the customer to confirm if it fits his vision; it is a milestone/stage gate before starting to design and sketch. The report contains all that the team learned during that research phase; for

example, if the customer wants to develop a product and the Design Research report shows that there are many products out there that are exactly identical, then the customer needs to be informed.

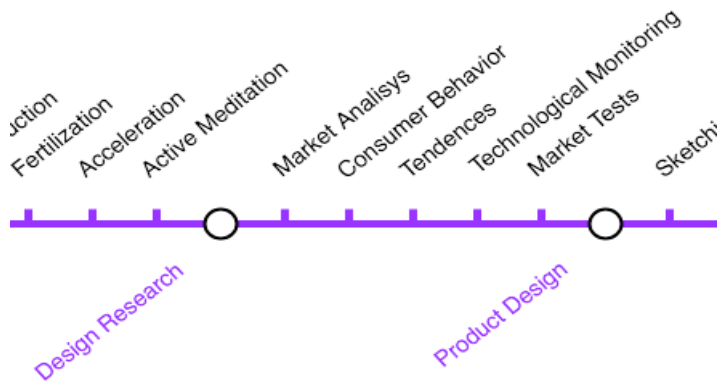


Figure 2 - Subway Map, Design Research station

Source: company material

As mentioned, the work of the team starts with receiving a briefing, in the form of a file that describes what the customer wants to have developed, including all the guidelines and all the prior research that the customer already did in the area, as well as the customer's personal thoughts and opinions. Those inputs and the customer's vision of the product are the design space of the team. However, after receiving this briefing, the designers try to think 'outside the box' and, in this phase, they are more than allowed to do so. They learn about the product on their own and conduct their own research. The designers are usually given four to five days to come up with an acceptable idea or a set of ideas to present to the CEOs and to the customer. After that research phase, the team has usually two or three versions of a product concept for the customer to choose from. The project rarely comes with a large autonomy of what to design (e.g., 'if the customer wants a coffee machine of a round shape, the designer cannot take the freedom to design one that is square or cubic' (CEO1#3) and when it comes to the final decisions, in the majority of cases, it is the customer's decision that prevails. At the end of the Ideation stage (first concept delivery) of the project, the customer is consulted for the first time to understand whether the expectations are met or not. The team believes that, if the connection to the customer is too close at the beginning of the project (before the Ideation station), it would influence the final outcome and the design work too much, overly limiting the potential solution space.

'In the beginning, in the sketching phase, I don't contact them [customers] very often because I start, I have ideas, and I only contact them when I have 3 ideas to send them.(...) In the beginning we start sketching and we don't contact them, just in the end to deliver things' (Designer1)

After the Ideation milestone, the interaction with the customer deepens and the team consults the customer regularly, via email or by phone, asking varying questions as the project progresses. At any time, the customer's opinion may reverse the entire project and, as such, also acts as a type of constraint. Sometimes the design is re-worked multiple times, until it satisfies the customer, the Founder-CEOs, the project manager and the customer's end-users.

A crucial point of the design project work is the end of the Design phase, which is placed within the Product Design station on the Subway Map. It is crucial because this station combines creative design and sketching with engineering - the transition from the pure design to the model; it is a very delicate process, since it transitions from the intangible into the tangible. Therefore, specific and explicit, customer validation is required in order to turn the design into a model.

In terms of communication, an important characteristic is that it is the Project Manager who contacts the customer directly, for example, in case of doubts or if in need of a meeting. The company believes that the closer the team interacts with the customer, the better his problems can be understood. Receiving directives directly from the customer is viewed as a better and more empathic way of communicating and problem solving as compared to the customer following the hierarchy, contacting the CEOs, who then communicate the customer's feedback to the team. After the Ideation stage and the first delivery to the customer, the Project Manager steps back and hands over more communication autonomy to the team members. If need be, a team member can then contact the customer directly, to understand problems and expectations better. If such a direct contact occurs, the team member shares the information with the Project Manager and the rest of the team.

Regarding the tasks distribution, the employees are given their tasks and projects by the CEOs but they are free to allocate their time between tasks anyway they want. Therefore, they have high autonomy in their work. Only the deadlines are set clearly, but their time and activities in-between the deadlines can be managed by the employees themselves.

Another important characteristic is that the CEOs have a high tolerance for differing opinions, as well as do not place hierarchical boundaries between them and the rest of the company; that is, the team is encouraged to work with them as a team of 'friends'. Moreover,

the interactions with the CEOs depend on what kind of work the person is doing - Project Managers who are directly responsible for a project and designers working on the most crucial/biggest projects have the most frequent interactions with the CEOs, as they need their feedback and opinions more often.

4.4. The organization of work

The company has a set of routines and formal tools that helps it organize the work and facilitate the flow of information. These tools consist of a Calendar and Project Planning Software (SCORO), Inspirational Boards, Validation tools, and a Subway Map, as described below.

4.4.1. Calendar and Project Planning Software

In early 2017, a software package called SCORO (<https://www.scoro.com/>), was adopted as an organizing and planning tool. It includes a calendar and a planner, in which every single team member, Project Manager and the CEO introduce their tasks, events and meetings they attend. The aim is that everyone inside the company can follow what the others are doing, which project they are currently working on, and how many hours each specific person has already spent on a project. This allows unobtrusively following the progress of everyone's work, which otherwise would not be possible even though the entire team is located in the same room. It is a visual map of everything currently going on in the company.

Before the introduction of SCORO, every day in the morning, the CEOs used to write on a whiteboard the tasks for each team member and indicate the projects status. SCORO eliminated the need for these daily 15 minutes, follow-up meetings. There was a perceived need to eliminate this particular daily routine, as both team members and CEOs found it ineffective, and more visibility, clarity and control was needed over people's tasks. SCORO automated this approach and further increased project transparency in terms of tracking what each person is working on and how much time he or she is spending on the task. The tool also allows for some indication when it comes to a general account of overall expenses, but it is not used extensively for that purpose; however, when a user checks the project, the full project cost is also provided. At the moment SCORO proves itself to be useful, as it helps accumulating necessary data for future reference, as well as better organizing the work and eliminating inefficiencies.

4.4.2. Inspirational Boards

At the initiation of a project, at the Design Research station, the firm uses the inspirational board tool, to track a specific kind of view that the designer is pursuing. When the project starts, the team together with the CEOs create an 'inspirational board' to understand which direction to go with the design or, at least, which direction will be perceived best by the

Source: author's photo of company material

The Mood Board defines the whole mood for the project and includes the whole 'world' around that project, such as a target, a designing person, the colours. If it is about a specific country or a city, these also should be included as an image or a texture. In other words: everything that brings the world of the project closer to and directly in front of the designer. As for the Trend Boards, they show in pictures the common trend/pattern of design for a certain object. As the designer progresses with the work, he or she has everything in front of his/her eyes, to serve as an inspiration and to help stay on the right track. Figures 2, 3 and 4 provide examples of Mood and Trend Boards used for particular projects.



Figure 5 - Bike Frame Trend Board

Source: author's photo of company material

The Inspirational Boards are created when at the Design Research station; however, the team uses it throughout the entire design process to stay on track. Therefore, when the team starts a project where the Design Research station is needed, the customer is informed about the existence of the Board, as it is a part of the firm's creative process. It is shared with the customer to discuss it further in order to get the customer's feedback. The customer can directly influence it and take part in the process; if the customer disagrees with the Inspirational Board, the process of creating it starts all over. Therefore, another use of Inspirational Board, apart from its inspirational function, is to point everyone in the same direction.



Figure 6 - Inspirational Board

Source: author's photo of company material

After collecting relevant inspirational themes, pictures and drawings is completed, the designers start the sketching process. They make multiple sketches that fit the Inspirational Board and iterate towards the final one, by first designing two or three concept suggestions with the customer deciding the winner. If the designer's proposal does not fit the image board, it is usually discarded and the styling and sketching process begins anew. The team also shares with the customer the reasons behind designing this particular Inspirational Board and the story that is behind it, as it can be used by the marketing department later on. From time to time, if the designer thinks that the customer and end-user may like what he developed, even in the situation where the design went into different directions than shown on the Inspirational Board, they can talk it through with the project manager and convince the CEOs to the alternative point of view.

4.4.3. Validation

The company describes itself as “pragmatic” when it comes to the creative expression of their employees. For a company whose main product is creativity itself (the creative designs and innovations in particular), it is very important to produce something that fits the needs of the customer. Therefore, the firm created some internal procedures in order to confirm the compatibility between customer’s needs and the firm’s delivery. In order to do so, ‘checkpoints’ were introduced to evaluate conformity with customer needs, in the form of several types of meetings.

First, there is a stand-up meeting followed rigorously 3 times per week. Every morning on Monday, Wednesday and Friday at 09:15 sharp all the teams and managers gather to briefly discuss what they are doing, what has been done, and what everyone will do from then on. It usually lasts for 15, 20 minutes. It is a meeting point for sharing opinions, asking questions and communicating doubts, and in case something has been overlooked before, it is being taken care of during that meeting.

This stand-up meeting also serves the purpose of not letting things get ‘out of hand’; therefore, it also serves the purpose of error correction. For example, when a project lasts two weeks and it is discussed only after one week, instead of immediately in the same week—the whole week would have been lost, if it didn’t go in the right direction. The decision to briefly discuss the status of a project and its interrelated tasks originated from the past experience of the CEOs: they arrived at the conclusion that more frequent meetings would enable to spot and correct any errors much sooner. *‘I don’t see how we could manage the company now without those short meetings’*, said CEO1#3.

The second type of meeting is held on Fridays, at 17:00. During that meeting, the managers and team members present certain themes, which are selected beforehand. The themes are usually chosen based on people’s own suggestions, earlier in-team discussions or on some challenges that they experienced in their work. The employees can also be invited to make a presentation about a topic related to their current project or their area of specialization. It is also a kind of a challenge from the management to the team members. Sometimes, the challenge comes from well outside the company’s immediate customers; for example, in January 2017, the company was asked by the municipality of Porto to suggest challenges for the Porto City. The managers forwarded the challenge to their teams, and used two consecutive Friday Sessions in order to debate the challenge.

Frequently, external people are invited to the Friday Sessions. Typically, the employees from the customer companies provide a speech about their companies. Sometimes, it serves a purpose of creating overview. For example, when working with a specific product for a customer that has already multiple products in the market and a lot of ongoing projects, IDEIA.M might not be aware of all the ongoing activities or their strategy.

Sometimes, instead of inviting people, the Friday Sessions consist of a field trip to the customer to learn about their internal processes and production activities. For example, IDEIA.M works often with cork as a material; in the beginning, the company organized many trips to cork factories to understand how the cork processing was done. When they find out that one of the employees does not know how the process looks like, they organize another trip during a Friday Session, to educate the employee.

'One day, one of the designers shared with us that he didn't even know how the blocks of corks were made. We said: 'hey, we have to visit our customer', it is both our customer and our supplier, because we need to see how those things are done for you to know how to work with these materials.' (CEO1#3)

Occasionally, external specialists in certain areas are invited to talk about predefined topics and teach the teams. Sometimes, external experts discuss their particular jobs. For example, one of the invited people was working with Artificial Intelligence as related to aeroplane and airport crisis management. That topic had nothing to do with an ongoing project or tasks at IDEIA.M at that very moment, but the opportunity presented itself to invite someone to speak about such an interesting topic. The management treats it as an opportunity to create curiosity, to learn together as a team, and to open employees' minds. Most of the time, however, Friday Sessions are directly project-related. For example, when one of the teams had to work with wood, the question arose which types of wood exist – and the idea to invite a wood specialist was born.

The Friday Sessions are neither strict nor formal in their format or organization, and benefit from the autonomy that is introduced. The CEOs encourage a relaxed atmosphere mixed with a focus on knowledge-gathering and knowledge-sharing. For example, employees are welcome to bring beers to the meetings. Even though the Friday Sessions are being repeated consistently every Friday, the content of the meeting varies with need, and with the opportunities that present themselves. The Friday Sessions emerged naturally and, over time, became a weekly routine, largely because of the results it is providing. The thoughts and

challenges of the ideas that arise from the Friday Sessions are seen as an opportunity to find new customers or new projects, and also to motivate people.

'People like to think about the Friday session, to think about what to organize for the next Friday session, and they like to participate and it is important for everyone to be participating. And I think that is the most important aspect of everything'. (CEO1#3)

Equally important, it provides a moment for everyone to come together and share their points of view about the projects or share their knowledge and their insights. Curiosity and motivation are key purposes with all the team's sharing their current project progress or talking about their speciality, and with external people invited to give speeches. concerns three instances of Performance Evaluation. A first instance of performance evaluation is carried out in a meeting held every 6 months, where the CEOs evaluate the performance and the strategy of the company. An accountant is present at this meeting at least once a year, to put more focus on the financials of the company. In the beginning, more meetings with the accountant were held; however, the number was reduced to one and, maximum two meetings per year. Nevertheless, there can be some unplanned meetings with the accountant, if something important or unexpected happens in a project.

As a second instance of performance evaluation, every 3 months there is a meeting where the CEOs share the financial aspects of the company with the teams. During that meeting they communicate the financial goals, and if in that quarter the company makes a profit, 5% of it is shared with employees. During this meeting an entire team is present and usually it involves the plans for future activities or for the financial goals. The last (fourth) quarter of the year is usually used as an overall close of the year meeting, where the founder-CEOs evaluate the entire previous year and share plans for the next year in terms of strategy, activities and financial aspects. By the end of the year, during that meeting IDEIA.M shares 10% of the annual profit with the employees, distributed on top of the previous 5%.

A third, and final instance of performance evaluation is carried out in a daily meeting with each individual person in each different project. This meeting focuses on project organization, work-in-progress monitoring and specification and scheduling of the individual tasks.

4.4.4. The Subway Map

The company is operating in many functional domains where it tries to achieve innovation. As mentioned before, it works with various products, from different sectors and areas. With

such a wide scope of projects, the company established their own, unique process of product development called the ‘Subway Map’ (see Figure 1). The Subway Map is used only during the meetings with customers, for explanatory purposes, to explain what IDEIA.M does and how do they do it; it is never used internally. While the basic explanation of the Subway Map was provided in the beginning of this chapter, a more detailed explanation of this tool is now provided. The Subway Map basically illustrates the different services and product the firm has to offer, as well as their development process – the stations show the competences that the firm has to offer. For example, when ordered to “capture value”, they end their work at the design research phase, delivering style and for instance, technology monitoring. Another example is “Ideation”, which offers the creation of a new product in the absence of a clear idea of what the customer is really looking for.

The Subway Map consists of a main line named Strategic Design and four other lines called Capture Value, Service Thinking, Advanced Service Design and Advanced Product Design, which represent multiple subsections of the main line, representing more focused projects, with a smaller scope (Figure 1).

For each service offer, each line, there is a series of “subway stations”. Those small steps are carefully executed, monitored and assessed along the product-development trajectory. IDEIA.M uses the Subway Map for organizing the work and understanding the scope of the project. It is also a tool to understand where to start and where and when to stop. The “subway lines” can also be referred to as proper “product lines” offered by IDEIA.M. Even though the subway lines were designed as a “one-way traffic only”, it is very possible to go back into the process which is not followed rigidly, and many iterations may exist.

‘Of course the more fluid the process is, the better. But usually when we plan the process, we always do one iteration, two iterations. Of course, the depth of the design research in the second iteration sometimes is only to narrow the field of research’. (CEO1#2)

However, before the whole process starts, and apart from the Subway Map, the team receives a briefing, a file that defines the project scope, containing all the guidelines, restrictions and details. Sometimes the company helps the customer to develop a briefing, in order for it to be as clear as possible.

Strategic Design

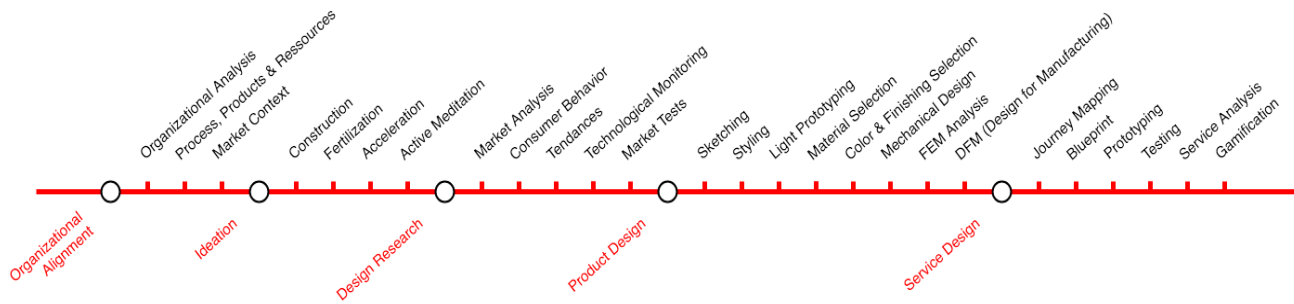


Figure 7 - Subway Map, Strategic Design Line

Source: company material, translation by the author

As mentioned above, Strategic Design (Figure 7, the red line) is a main Line on the Subway Map and describes the complete, broad process of developing a product/service, starting from the understanding of the customer organization and its internal processes to the definition of the end-user's involvement and attending to their needs. It is a complete design process focused on providing solutions and consists of Organizational Alignment, Ideation, Design Research, Product Design and Service Design. However, as Figure 1 shows, it can also start with the Learning Tools. That preceding station means methods of training to help IDEIA.M in the whole process. A good example for this Line is the aircraft development project.

The order of substations on the main line is predefined and rarely changed (with only one exception of Ideation and Design Research, as explained below). However, some stages, depending on the project, may happen in parallel. If the team works on the service design, it will probably happen at the same time as the product design, because the product and its relation to its the service is very important and is considered simultaneously, with user experience.

Organizational Alignment is most of the times a non-paid, complimentary service, the firm wants to provide to the customer. It constitutes learning about the customers' company, their strategy, how they work, in which countries they are present and how the structure of the company actually looks like. Part of the customer-learning process includes observing the management of the customer company, their facilities and their machinery, in order to understand the customer's problems and expectations and get aligned and involved with the customer. The utility of Organizational Alignment is best pronounced when the team in IDEIA.M proposes a project for a new product, and they need to be sure the customer has

the capabilities to produce it in the future. *'For us to be aligned with their own organization. In every aspect or at least the ones that are important for the project we are developing. [...] So it is not for every project, it is for every customer'.* (CEO1#4)

Organizational Alignment is followed by Ideation, which is considered to be the most creative phase. In this stage, small prototypes of the team's ideas are sketched and created in paper or cardboard. During Ideation all team members gather either internally or invite a customer, and create a focus group to come up with the best solutions. In this stage, there are no restraints and everyone can come up with suggestions on what they feel is right for the project.

Design Research sometimes comes before Ideation to be aware what kind of design may be the most suitable for the product, in order to clearly point the state of the art. It is basically all the research done gathering information for the development of the product. Secondary information is collected through the Internet or primary information from the customers through observation, interviews, pictures, visits to company stores, etc. Teams need to be prepared, have specific information, create ideas and have clearly defined *'a state of the art'* before designing a product.

It is important to mention that sometimes the two previous stages – Ideation and Design Research – happen at the same time, although the founder-CEO stated clearly he prefers the Design Research to happen before the Ideation.

Product Design and Service Design are very similar in their structure – however, while Product Design means recreating things, in Service Design deals with creating intangibles. They can create a service or a business model, which is more related with strategy. For example, if the customer has a store and wants to sell the product, the questions that IDEIA.M tries to answer are : How do we sell? How do we design the store? In which colours do we design it? Which would be the best strategy to make people come to the store more often? If a customer has a bike store, and wants to sell bicycles, in Service Design the team would think of what would be the best service to go with that product – it may be designing a mobile application.

Capture Value



Figure 8 - Subway Map, Capture Value Line

Source: company material, translation by the author

The Capture Value (Figure 8) line is used to generate new ideas in order to solve a problem, and usually focuses on team building, conceptualization, and alignment. The substations that are present on this line are: Organizational Alignment, Ideation and Design Research. The Capture Value Line may be suggested to a customer who would only like to do technology monitoring or style a product. Moreover, the firm uses this line to provide their feedback, or insight about a new technology the customer is currently studying. Another usage is to evaluate the feasibility or the opportunity on which the customer cannot decide whether it is positive or negative for their business. Hence, this line is used to understand and provide suggestions to the customers about their business potential.

Service Thinking

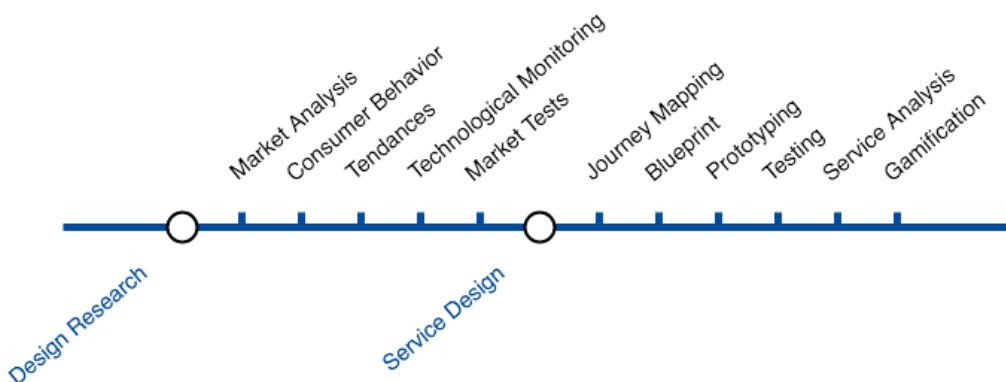


Figure 9 - Subway Map, Service Thinking Line

Source: company material, translation by the author

In the Service Thinking line, the team focuses on the research and definition of the user experience of products and services that have an explicit user interface. This Subway Line is usually proposed to customers that already have an idea of what they want to have developed. The substations are Design Research and Service Design, aiming to maximizing the best possible service design fit. It is the basic line when it comes to service design. The *Advanced Service Design* subway line, presented below, captures the whole process, notably including also Ideation, which is not part of the Service Thinking line.

Advanced Service Design

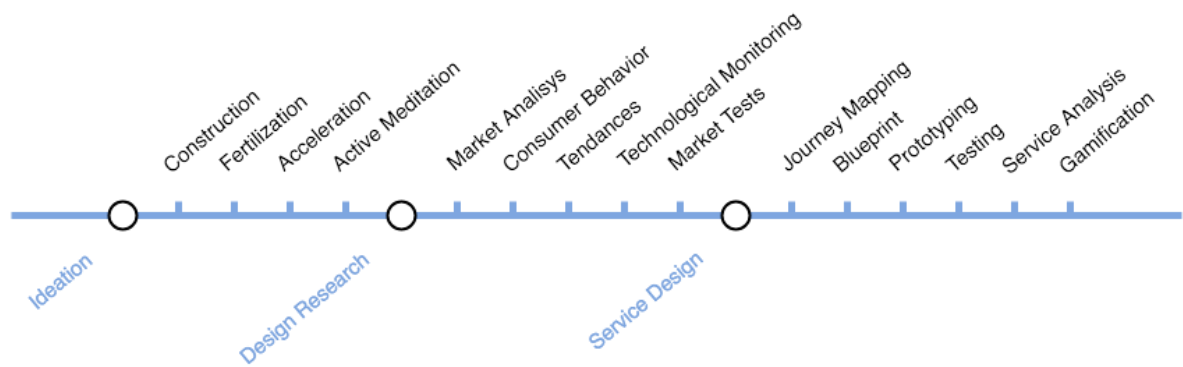


Figure 10 - Subway Map, *Advanced Service Design*

Source: company material, translation by the author

The *Advanced Service Design* line provides an in-depth aim for service conception and its restructuring, with a focus on innovation, and taking customer loyalty into consideration; it can also be used to create new business models. In *Advanced Service Design*, idea generation is the necessary first stage that initiates the subsequent stages and is, therefore, best suited for customers without a clear idea of how the service should look like. It provides a comprehensive thought process, from the very beginning until the very end.

Advanced Product Design

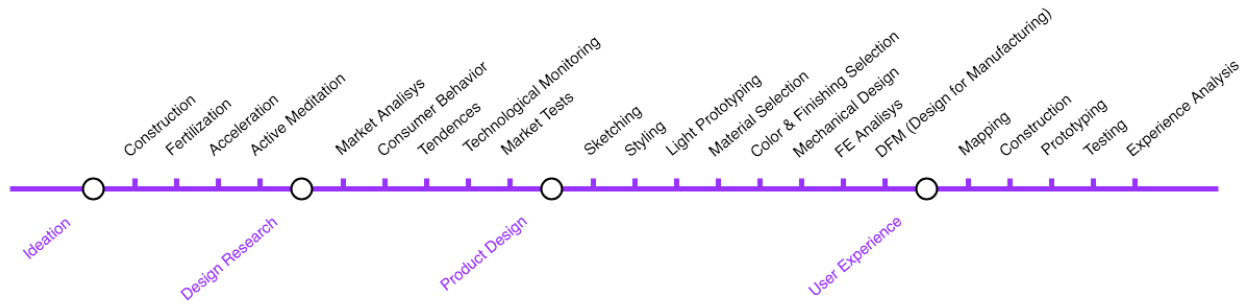


Figure 11 - Subway Map, Advanced Product Design Line

Source: company material, translation by the author

Advanced Product Design line aims at thinking, designing, and developing a tangible product with a focus on a specific market. It does not take into account the service option around the product; therefore, this line is usually proposed to the customers who come with a broad, non-defined idea. It takes into account the usability, style, feasibility and the manufacturing process of a product, and, therefore, emphasizes the material characteristics of the product.

4.4.5. Total Quality Management

To support its future growth, the company perceived the need of implementing new mechanisms to scale up and control their internal processes. As a result, the managers started to use a quality management system standard ISO-9001 to rethink their internal processes and how to improve them. However, the CEOs is reluctant when it comes to adopting external management mechanisms- they prefer to grow and develop managerial tools organically to make sure they will fit their specific context. Management believes that adopting routines and constraints from outside the company, without considering the specific strategy context of the firm, may be detrimental for the company in the long run. Implementing Total Quality Management is a deliberate attempt towards organizing and formalizing the processes inside of the company. The first tools that were introduced before the TQM were Six Sigma and Kanbans. The management found this technique very useful for organizing and controlling the small factory that runs right next to the office - the shop floor. Since the beginning of 2017, the Quality Management System is being implemented and the employees, little by little, try to get used to the new practices of process formalization and monitoring.

5. Analysis and Discussion

In this chapter, the preceding empirical results will be discussed in comparison to the Literature Review, in order to match findings of this single case study against concepts from the existing literature. However, after examining the highlighted empiric material I found that there is a need to supplement the initial Literature Review, as there were some unusual findings and results from the analysis that were not considered before. As a result, additional and new literature will be reviewed in this chapter along with the development of the discussion.

Based on the insights generated during the interviews, I will answer the research question *'how does communication as a control mechanism affect creativity in product development processes?'*, and tackle topics such as the relationship between growth and control, the communication process, and the Management Control Systems. I will also describe how the company has developed and acquired certain characteristics of a Learning Organization (Senge, 1990; Wang and Ahmed, 2003).

IDEIA.M developed a set of Management Control tools that organizes its project work and facilitates internal communication. These tools are as follows: the Calendar and Project Planning software package SCORO, Inspirational Boards, Subway Map and various types of meetings.

The software named SCORO is a planning and organizing tool that visualizes information on everyone's tasks and responsibilities as well as deadlines and coordination meetings. It aims at informing all organization members of the on-going projects, their progress, their duration, and the costs incurred thus far. SCORO serves as a visual representation of everyone's agenda and overview of currently ongoing activities in the company. The introduction of this software in late 2017 replaced a daily 15-minute, follow-up meeting (that was dealing with every ongoing project), which the employees found time-wasting and useless; hence, it was considered a welcome improvement upon the existing way of coordinating.

The second tool, the Inspirational Boards, consists of two main types: Mood Boards and Trend Boards. The Inspirational Boards are designed by the entire project team to show what kind of design or what kind of approach is expected to be followed for this particular product. Its purpose is to ensure that everyone has a shared understanding where the design

is going and what it is expected to look like to satisfy the customer and the end-user. Sometimes for one single project, multiple Inspirational Boards are created to ensure the shared approach in achieving the outcome.

The Subway Map is an in-house made visualization of internal collaboration and combines IDEIA.M's employee efforts, over the entire product development process, from initiation till completion. Used exclusively during the meetings with customers and created in order to explain the complexity of the firm's abilities, the Subway Map pictures the different products and services that the firm provides to its customers, represented as five different 'Subway Lines'. These Subway Lines start with the main Line called Strategic Design and bifurcates into four other lines called Capture Value, Service Thinking, Advanced Service Design, and Advanced Product Design, each of which represent subsections of the main line, and capturing a focus on projects with a smaller scope.

The final set of Management Control tools are the meetings, each of which coordinates a different set of interactions and project activities. The shortest meeting is a stand-up meeting held 3 times per week on Mondays, Wednesdays and Fridays in which all teams and the Founder-CEOs briefly discuss the progress of everyone's work and makes sure everyone knows their tasks. In this townhall-type meeting employees share their opinions, ask questions, address their doubts, and communicate their thoughts and opinions to everyone.

The second type of meeting is the one held each Friday at 17:00, and typically called the Friday Session. The Friday Sessions aim to support teams to build their knowledge base. The Founder-CEOs invite speakers from the outside, usually professionals in their field, to teach IDEIA.M's employees about the topic of their expertise.

The Friday Session also serves as a brain storm and a solution discovery meeting. For example, when one of the Founders-CEOs was asked by the Municipality of Porto to think about the future challenges for the city, he put the topic on the agenda of the Friday Session to discuss, brainstorm, and come up with creative solutions.

The topics for the sessions are often selected as the result of wondering at work about certain topics and emerge from the creative flow embedded in the design work. For example, when an employee was wondering how the printer works, the team took an old printer and disassembled it, thus learning how it works, what does it need to work properly, from which materials it is made, and how it is made.

5.1. Visions of the future: growth, control, and professional management

IDEIA.M has the goal to grow, both in terms of organizational growth (understood as increasing its headcount), and in terms of business growth (understood as increasing its sales revenues). Achieving growth and scaling up is a logical strategy for a small company and a natural objective, as it increases its chances of survival (Phyllis & Kirchhoff, 1989). However, they envision reaching this goal by formalizing the internal processes by 'conventional' (textbook) means, such as implementing Kanbans, using budgeting, and putting a stronger emphasis on the financial control aspects.

The Founders-CEOs associate growth with more formal control and stronger managerial practices, to strengthen capabilities for increasing returns to scale. In contrast, this section will discuss whether the adoption of 'managerialism' should be taken as a key issue or top priority of the firm. Does growth necessitate more formal, conventional control? Do they require increased professional 'textbook' management in order to grow, and are these conditions a necessary requirement at all?

Managerialism, an ideology originating from a 'for-profit' idea of organizational management, shows the confidence in professional managers, the concepts and methods they use to form up and manage an organization, and is usually associated with hierarchy, control, accountability and measurement, holding a belief that an organization should be managed rather tightly (Diefenbach, 2013). It is an assumption that organizations possess more similarities than differences; hence, the performance of all organizations can be optimized by applying generic management skills and theory. Locke and Spender (2011) define it as an expression of a group called 'management' that takes a privileged position in the company, claiming all the decision-making power.

The Management Control system was described in the literature as the use of administrative devices - such as management accounting, formal and informal controls to motivate, monitor, and reward employees (Merchant, 1997). The conventional control systems work best in stable predictable, and programmable environments (Anthony *et al.*, 1992). The conventional approach to MCS indicates that the purpose of management control systems is to ensure efficiency in resource utilization when executing strategy. The resource that is predominant in conventional MCS is the financial resource, while it simultaneously emphasizes the use of formal control approaches such as hierarchical reporting, budgeting, performance measurement, and incentive systems.

People are vital to the firm's organizational structure but in creative organizations human resources are crucial for the overall success and are a key component of successful new product development process. For such companies to outperform their competitors, whether locally or internationally, the right people on the right position are needed. In the literature, this is referred to as a 'creative class' (Florida, 2002) and is considered an essential category of human capital in creative industries. Hence, acquiring the appropriate human talent facilitates achievement of organizational goals.

Taking in consideration that making the best use of available resources is how organizations achieve their strategic objectives, in creative companies making the best use of the most critical resource – employees – also links with management control of that resource. Human resources can be subject to different forms of management control, such as results controls (indirect form of control using financial and non-financial rewards to influence behaviour and empower employees to take actions that will lead to better performance) or action controls (the most direct management control scheme, by directly influencing the behaviour and actions of employees), personnel controls (focusing on an trusting workers' inherent tendency to control and intrinsically motivate themselves, enabling self-monitoring) and cultural controls (created to introduce mutual monitoring by putting a group pressure on employees who do not follow their respective group's norms and values) (Merchant and Van der Stede, 2003). IDEIA.M appears to be using some of these, but does not follow the textbook strictly, and in the next sub-section (4.1.1.) it is described how exactly the firm is controlling their workers. For example, the strict personnel controls and action controls do not take place.

5.1.1. Controlling the creative employees

The organizational context of IDEIA.M is one of high dependence on employee creativity, working in a highly competitive environment, and with uncertain customer demand. As creativity researches studies suggest, creativity flourishes best in work environments with little to no formal control, based on employees' intrinsic motivation and the self-control originating from that intrinsic motivation (Amabile, 1996). Others argue that, even if the organization depends highly on creativity, there may still be the risk of dysfunctional employee behaviour as linked to the organization's dependence on employees innovation, the combination of which necessitates instituting a formal control system (Grabner and Speckbacher, 2016).

The two conflicting schools of thought – whether to leave the control aspect out of the organizational picture, or to adopt formal control mechanisms - are difficult to reconcile. When it comes to real-life practices in the company, it is a question of managerial perception of human agency; should people be strictly controlled and no trust given to them, or are they capable of self-direction and self-control in the context of organizational goals? Are they able to commit themselves to these objectives? Douglas McGregor (1960) suggested two theories, by which managers view their employee's actions and motivation. Theory X presents a rather pessimistic view of employee's attributes, assuming that they inherently despise work, lack motivation or ambitions, must be always persuaded, instructed, warned and punished, and require constant, close supervision by their superiors. Theory Y assumes the opposite – people make efforts in their work and can self-direct, and self-control their behaviours and dedicate themselves by using their skills and talent to contribute to the organizational objectives. They view the job as rewarding and satisfying, learning and recognizing their responsibility. Theory X and Theory Y corresponds to different management control practices – this of a rigid supervision and tight managerial authority, and this of an employee empowerment. It is indisputable, however, that Management Control Systems serve as the interface in achieving firm's strategic and operational goals (Tessier & Otley, 2012).

The belief in rigid control does not have a place in IDEIA.M, at least NOT in practice. That is, the Founders-CEOs are not directly influencing the behaviour of the designers. IDEIA.M enables self-monitoring and self-organization of their employees, with only two limitations – to keep to the deadline and to satisfy the customer. To ensure that these are respected, IDEIA.M created their own unique product development process tools (the Subway Map, described in the beginning of this chapter, and earlier in the Empirical Chapter), with the milestones that the designers have to follow. The Founders-CEOs control the outcome of designer's work (the results being the designs), which is, in fact, an extensive span of control as every design, before being delivered to the customer, has to be approved by Founders-CEOs first. This control of results is not followed by any individual performance measurement (no data or analysis of their individual performance is being collected). Thus, the designers are not rewarded individually for their designs - better designs do not mean increase of wages, promotion or recognition. Every team member receives the same amount of financial recognition: 5% of company's profits every 3 months, and at the end of the year a 10% profit share. Moreover, the Founders-CEOs understand the difficult task of controlling their employees, without impeding their creativity; they claim to trust them, and

to trust their feedback and opinions. They value their employees skills and knowledge, constantly supporting their learning activities, thus adhering to Theory Y of managerial perception of human agency.

Conversely, the designers themselves, seem to take pleasure in their job, being driven by their intrinsic motivation and ambitions, taking pride in their work. Based on the conducted interviews (Designer1, Designer2, Designer3, PM1) the team members seem to motivate themselves mutually, learning together and striving for excellence in their projects. Designers stress that they want better, bigger, more recognizable projects, but they are not being encouraged to do so by a monetary parameter. During the interviews (Designer1, Designer2, Designer3), the interviewed entities agreed, that working in IDEIA.M is a good experience, admitting that they are committed to the firms objectives and that they all want to be part of that future growth, envisioned by the Founders-CEOs. Both designers and managers engage in an open organizational dialogue, about things that are happening in the company. The Founders-CEOs themselves present an open attitude when it comes to the company's situation; for example, by sharing the financial information with the team every 3 months. Additionally, the interviewees (Designer1, Designer2, Designer3, PM1) showed the appreciation for their freedom of work and, implicitly, for the "Theory Y" mindset of the Founders-CEOs (especially emphasizing the freedom of discussion and open-minded, learning supporting environment).

5.1.2. Management Control Systems as a package

The type of managerial control has undoubtedly a strong effect upon human resources, but also on the achievement of organizational goals. To increase performance and reach these operational objectives, companies are suggested to develop their own package of Management Control practices to successfully implement their respective strategies (Otley, 1980). The issue lies in the usefulness and effectiveness of the introduced control practices – the more does not mean the merrier. Thinking about the company's specific context and environment, and tailoring such package of management control practices that would best support the uniqueness of the company itself may be probably the best receipt for success in the managerial control field of the company.

Management Control in a package describes a full palette of control practices inside of the organization. MCS as a package literature state that the control system practices suffer from the absence of internal consistency, which refers to the interdependency between them (the

use of one practice depends on the use of another, and so on). In order to effectively address a control issue (which is the case of IDEIA.M), the complete set of organizational control practices should be taken into consideration (that is, treat them interdependently). MC as a package focuses on a full set of control practices and tools regardless their internal consistency; a system of control practices in MC packages are developed gradually, sometimes without it being a conscious decision or without any strategic plan of their development. Thus, this ‘interdependency’ may simply fail to be acknowledged in the organization, while MC as a system focuses implicitly on treating these control practices interdependently and claims that this interdependency is important characteristic, if thinking about the suitable MC system for the company (Otley, 1980).

Companies are suggested to design their own set of control practices, instead of focusing on one or two internally inconsistent and random control methods (Chenhall, 2003). Moreover, practices proven effective when used alone may not be equally effective within a package (Bedford *et al.*, 2016). Interestingly, the same study, analysing the differences between the MC practices in prospector organization (that adapts to changing environments, looking for new opportunities) and in defender companies (focusing on controlling internal processes, relying on few customers and emphasising operational efficiency), found out that that in prospector firms the organic structural controls and the interactive control use of accounting have reciprocal effects. These results mean that accounting control and structural control need to be adapted to a certain strategic context and fit with each other, in order to be fully effective. Instead of focusing on one single tool (i.e., internal budgeting) research suggests to analyse the MC practices and tools as a whole and see how they work in interdependency; in the same line of thought, managers are advised to take these MC interconnections into consideration, while consciously designing their particular MCS (Grabner and Moers, 2013).

Literature also introduced the concept of Equifinality; there are different sets of MC that can help a company to achieve the same outcome or to achieve the same goal (that is, possess the same level of effectiveness in reaching the final objective) (Sandelin, 2008; Bedford *et al.*, 2016). However, even if different MCS packages may be characterised by the Equifinality concept, their elements need to be internally consistent to produce good results (Sandelin, 2008).

The Founders-CEOs of IDEIA.M introduced some formalization into the company by way of using the conventional, finance-oriented MCS, and by way of the project work process

using the Inspirational Boards, Subway Maps and the intensive reporting and meeting structures and formats. Purposely, the Founders-CEOs are envisioning to create a middle-management layer to take over many day-to-day tasks of managerial communication, especially related to project monitoring and control. What they did not yet do, however, is take into consideration the interdependency of all the above mentioned control tools and activities. Therefore, instead of focusing on extensive formalization and the introduction of isolated control elements, it may be advisable to analyse and design the entire package of MC practices as a whole.

The purpose of introducing MCS is the successful implementation of strategy. In the case of IDEIA.M, that means to help achieve desirable growth. An informal approach to managing the company becomes more difficult as the organization grows, therefore formalization of management activities should be considered to achieve the objective of growth (Davila, 2004). In IDEIA.M, MCS are also being developed in order to liberate the Founder-CEOs from a multitude of decisions and to assist in sharing responsibilities among mid-level management, as well as creating new businesses and business opportunities while simultaneously contributing towards planning and investment evaluation. In the remainder of this chapter, alternatives to the conventional way of perceiving and designing MCS will be illustrated as, given the setting of the company, there are more suitable alternatives available as solutions for the future.

IDEIA.M is developing their control practices in a rather organized and thoughtful manner, as they tend to listen to their employees feedback regarding these practices, and consider actions that do not work well, or that may not be as efficient - and as a result, eliminate them. They also think about better ways of addressing the communication and control problem and introduce new solutions (which was the case of the SCORO introduction in late 2017). They do not 'borrow' external MC methods, rather they develop their own (as the literature suggests), tailored for their specific context, while using frameworks and methods to re think their organizational activities (for example, with the usage of Total Quality Management or ISO certification). None of the control activities in IDEIA.M is random, but it does not seem that they have been developed to be internally coherent.

5.2. Interactive Control as an alternative to installing formal, conventional MCS

In IDEIA.M, the Founders-CEOs consider the implementation of conventional control indispensable for scaling up and for the future growth of the company, which is the present,

main goal of its management. Conventional control works best in stable environments but considering an unpredictable and dynamic environment of IDEIA.M, it may not be the best fit, as standardization is not the goal. It is therefore a challenge to introduce control that will support flexibility, innovation and creativity that IDEIA.M needs. Levers of Control framework, that include one of the topics of this research study; Interactive Control Systems (ICS), introduced by Simons (1995) propose a solution to the perennial struggle between control and creativity by suggesting that managers should encourage their subordinates to begin process improvements and proactively respond to customer needs, but not in a random, free and unstructured way.

The framework consists of four levers: Diagnostic Control Systems, Belief Systems, Boundary Systems and Interactive Control Systems, each one of those systems serving different purpose. Diagnostic control systems refer to measuring progress against plans (such as revenue growth or market share) in order to guarantee the predictable, efficient and effective achievement of objectives. In other words they build up and support clearly defined targets. Belief systems give employees an opportunity to actively look for new opportunities They transmit company's vision, mission and values by motivating individuals to commit to the common organizational goal. Boundary systems specify the rules and determine actions that must be avoided. Interactive Control systems open organizational dialogue to encourage learning, allowing managers to focus on strategic uncertainties, determine threats and opportunities and respond to them in a proactive way, while the competitive conditions change (Simons, 1995).

Interactive Control Systems (ICS) aid managers and the company to handle unexpected contingencies; ICS provide company with a way to handle uncertainty because it makes strategy for adaptive to competitive environments, stimulating learning processes along the way (Simons,1995). Constant engagement of management (i.e., introducing and checking the milestones, reviewing the progress regularly)makes the system interactive; this involvement provides continuously updated strategic feedback and quick information that allows for swift responses and flexible organizational behaviour. The ultimate effect of ICS is that it cultivates organizational debate on core assumptions by means of its communication and interaction focus while facilitating learning at all the levels of the organization. A multitude of studies have confirmed that ICS are relevant and have direct effect on innovation and strategic change (Davila, 2000; Bisbe & Otley, 2004).

Diagnostic Control Systems (DCS) are the opposite of ICS as they serve to monitor and correct variations from the present strategic goals of the company. In other words, DCS set standards and make sure everyone follows the rules towards the common pre-established goal (Langfield-Smith, 2007). It is the Diagnostic approach to management that fosters plans and budgets, introducing more rigid project monitoring and strategic planning systems; for example, by means of the Balanced Scorecard or rolling forecasts. DCS focuses on setting standards for the employees, measure outputs against these standards and then connects incentive programs to the under- or over-achievement of the set goals.

However, DCS could also result in limitation of business opportunities and restraint innovation, as the main function of its tools is to ensure the achievement of the objectives set by the higher levels in the company's organizational hierarchy (Mundy, 2010). With a frequent use of Diagnostic Systems, the focus is on improving the efficiency of financial resource utilization, not on emphasizing opportunity seeking activities (Davila, 2005).

Simons (1995) stated that both diagnostic and interactive systems are necessary to manage the tension between open-ended value creation and narrow-focused control of activities. However, Agbejule (2011) examined the effect of the interactive and diagnostic management control systems combined and found that, if used frequently, it is the use of the interactive system that has a positive effect on performance, rather than the diagnostic systems. In the existing literature, ICS are often positively identified with technological innovation, as interactive systems transform innovation initiatives into enhanced performance (Simons, 1995), especially in product innovation (Bisbe & Malaqueno, 2009). In other words, ICS are suggested as key drivers of innovation performance.

ICS may provide an answer to IDEIA.M's wish of growing, controlling and supporting the creativity and innovation, as ICS deal with strategic uncertainties and help focus attention on innovation performance by stimulating effective communication, dialogue, search and learning processes in the company. ICS allows managers to control organizations while simultaneously benefitting employees who need flexibility in their creative and innovative work process (Simons,1995). In short, IDEIA.M's needs seem to match the aims of the Levers of Control model. The ICS focus is on the interactive processes, which, in the creative environment of IDEIA.M are best expressed in terms of project collaboration and daily visual communication. The key tools used for ICS in IDEIA.M are the Inspirational Boards, Subway Map, and the various types of meetings.

When it comes to the meetings, which play the most crucial role in developing ICS, the Friday Sessions are the most effective for opportunity-seeking activities and stimulating learning processes inside the company. Because of weekly presentations of people from the inside and from the outside of the company in the Friday sessions, helps building and introducing new knowledge to the company as well as encourages opportunity-seeking activities and encourages the employees to step forward with their learning initiatives. It also serves as a team building activity, with their relaxed atmosphere, group discussions, and employees deciding on the topics to present. Another important trait of this meeting is that the management is always actively involved with this activity and supports it, by giving it a priority in the Friday's agenda.

Other types of important meetings for the ICS is the Performance Evaluation meeting happening every 6 months, to evaluate the performance and the strategy of the company, and the meeting with the employees that takes place every 3 months and involves the plans for the future activities.

At the heart of IDEIA.M's interactive management practices lays reinforcing the feedback, that is visible in the company's feedback loops which support their communication processes. Feedback loops serve to inform about occurring problems, as well about the successes that are happening in the company, but they also seek to improve the overall organizational performance (Goetz, 2011). It can be described as a cybernetic cycle of monitoring and improvement. Constant dialogue between the Founders-CEOs, project managers and team members during the project cycle is one of the examples.

Another example of a feedback loop in IDEIA.M is that every major decision during the project has to be discussed and reviewed with the Founders-CEOs or/and the Project Manager. For example, when the designer finishes one part of a project, or one design out of many, it always has to be discussed and approved by the supervisors, before sent to the customer.

These systems were introduced early in the lifespan of a company, to ensure proper flow of information and clear communication; ICS may work well and be used across the organization, probably because of its size (10 people). All of these tools are supporting innovation, and we can observe that probably without realizing it, the Founders-CEOs started implementing the ICS that have helped the company grow until now, without killing its potential. If managed carefully, these tools are most likely to aid their objective and further

reinforce their feedback processes in the future as well. Interaction of Founders-CEOs with the team members is self-evident and indisputable, and that characteristic allows fast response to changes and uncertainties, that can be also described as IDEIA.M's key competitive strength.

This observation is relevant, because it indicates that the creative company in a field of product innovation, strongly reinforces communication and collaboration, by unknowingly pursuing the ICS, but is still at the beginning of its way to fully use their potential. With such a strong basis in ICS, it would be probably inadvisable for IDEIA.M to follow with their strict DCS introduction plans. Investing only in the DCS from now on, may potentially impede the opportunity seeking activities and empowerment of the employees. The environment of IDEIA.M is constantly changing, with the introduction of new, ground-breaking technologies that the designers and engineers have to be always up-to-date with. For such a special environment (emphasising flexibility), the interactive use of their controls system may prove itself to be more effective. The Diagnostic use of control systems may limit innovation, make the creative processes unnecessarily complex. For IDEIA.M, it is thus far more advisable to stimulate learning and communication (by creative dialogue through the use of ICS), rather than focusing on achieving plans (through the DCS).

From analysing the empirical material, the dominant observation that emerged is that the managerial control, as it is being understood by IDEIA.M as the introduction of financial control (and further introduction of the Diagnostic Control Systems), may be detrimental for the intensive (visual) communication, crowding out their idiosyncratic control systems, which may potentially break or destroy the uniqueness of the organization that is locked within it. It is because the company (most likely) unknowingly, but naturally, pursued the ICS since the beginning of its managerial journey, and changing the way drastically to conventional MC, may impede the processes and leave the designers confused.

5.3. Communication in Learning Organization

Next to the human resource, another critical resource driving the competitive advantage of creative companies, are its learning abilities and the knowledge gathered inside of the firm. Categorized under the umbrella term of Learning Organization, it has received attention in the existing literature, indicating its (growing) importance (Allameh and Moghaddami, 2010; Saadat and Saadat, 2016). Some studies go as far as to suggest that organizational learning

may be the only sustainable competitive advantage and a best way of utilising firm's resources (de Geus, 1988).

The Learning Organization concept was introduced by Kurt and March (1963) and popularized by Peter Senge(1990). It defines learning as an ongoing, creative process that is including all of the members (despite their position in the organizational hierarchy), who are allowed to increase their capabilities to produce results, both individually or collectively. Learning organizations also develop, adapt and transform themselves in response to the needs of external and internal entities, to respond to an unpredictable and fast changing environment. In a learning organization, all employees constantly create, acquire and transfer knowledge in order to assist the organization to adapt to uncertainties, to react faster to change than its competitors (Garvin, 1993).

Peter Senge, in his book titled 'The fifth disciple', recognizes five disciplines important for organizational learning which are: systems thinking, personal mastery, mental models, building shared visions and team learning (Senge, 1990). Systems thinking encourages to not look at individual mistakes, personalities, events or bad luck to develop understanding about important problems. What needs to be taken in account, are the underlying structures, which shape individual actions, and create the best conditions for best possible events to occur; in other words, systems cause their own behaviour (Senge, 1990). Personal mastery refers to personal growth and learning, to continuously broaden your knowledge and ability to create the desired results. It is the underlying condition and the spirit of learning organization, therefore, all of the members have to practice it, engage in communication, as these people are more committed to their tasks and are more likely to take initiative; but it also means to empower people at all levels. The third discipline - mental models - determine how people make sense of the world, but also how they can take action. Mental models can be simple statements or complex theories about how the world is, but most importantly, mental models are active, in a way that they shape how people act. The most effective people develop their own models, hence are aware of their existence. It brings us to point number four, which are the shared visions – they are vital, as they provide focus and energy for learning and helps get everyone on the same page regarding what the company is trying to create - a common goal for everyone to follow. Shared vision improves relationships between people in the company, but it is in fact only a small part of the vision, purpose or mission and core values of the company. The final step, team learning, is described as a collective discipline, where

teams think in terms of 'we' and 'our' rather than 'me' and 'I'. Team learning is a team skill, developed by a group to be able to see the big picture, that an individual wouldn't be able to find. These groups analyse complex issues and take innovative and coordinated actions. All in all, the five disciplines are about comprehending the big picture, doing your tasks well, while critically questioning old assumptions, arriving at a collective purpose and working together to solve issues.

Garvin *et al.* (2008) takes Senge's theory further and distinguishes Three Building Blocks of a Learning Organization that reinforce one another and make it easier to create a Learning Organization. They are as follow: supportive learning environments, concrete learning process, and the leadership that supports and reinforces learning (Garvin *et al.*,2008). Supportive learning environments provide psychological safety and allow employees to ask questions, make mistakes, formulate unpopular views and opinions without fear of being marginalized. Managers show strong appreciation for the differences and are accepting of alternative views, as they are aware it increases the motivation and stimulates growth and opportunity for learning (Senge, 1990). Third characteristic of a supportive learning environment is openness to new ideas, which means taking risks and exploring and testing the unknown. It is followed by giving employees time for reflection, which is understood as a time when people can come up with fresh, creative ideas and gives a sometime away from the routine of work, while encouraging careful review of company's work process and organizational practices. Second block is about generation, collection, interpretation and dissemination of information, but also experimentation to test new product and services. In order to do so, knowledge has to be share among the company members systematically in all kind of reviews after any important decision or activity took place. However, the Learning Organization cannot exist without a strong leadership that reinforces the learning practices; that is, leaders who listen to employees, spend time identifying problems, transfer knowledge and are open to new ideas and points of view.

The Three Blocks of a Learning organization enhance effective learning, bring commitment to organizational goals and empower the employees, but they also support better communication (which is an underlying base for better performance).

IDEIA.M developed already many important organizational strengths and it was observed during the interviews that one of their very distinctive traits are these of a learning organization. IDEIA.M's uniqueness lies in strong, supportive environment for the

employees and a day to day personal interaction and involvement of the management in problem-solving. It comes from the fact that the employees feel safe to disagree both with the supervisors and with other team members. They also feel free, even encouraged, to share their work with other colleagues, standing up to their mistakes, take risks, explore the unknown, take time to review organizational processes and question all of the above. They are not afraid to ask questions openly, admitting that they are not familiar with some work processes or work related product, just to find their managers absolute support and willingness to provide opportunities for clarify their doubts (or to provide such an opportunity, where the employees can learn and explore by themselves, such as a factory visiting, field trip or supplier/customer's company visit).

'One day, one of the designers shared with us that he didn't even know how the blocks of corks were made. We said, we have to visit our customer, because you need to see how those things are done for you to know how to work with these materials.' (CEO1#3)

What is unique and thriving for their communication and feedback processes, is the atmosphere of sharing, that the managers are encouraging in the company. It comes from acceptance, openness and tolerance of differing opinions and comments. The Founders-CEOs always try to encourage their employees to speak their minds and communicate with them and to them directly in case of doubts, problems or comments. This distinctive trait is important for their Feedback Loop, described earlier (Chapter 4.2).

Moreover, the engineers, designers and graphic designers are not limited to their own area of expertise. Oftentimes, they are given tasks that are out of their area of expertise but while doing so, the Founders-CEOs make sure it is the area where their employees want to grow and to develop different skills and bring new knowledge. For example, a graphic designer was asked to do a web design or provide an opinion about a product design. This idea is in line with taking risks and exploring the unknown.

At the centre of company's learning activities are the Friday Sessions and the managerial dedication in pursuing it every week, with new presentations, new knowledge sharing and group discussions. The Friday Sessions help teams to build knowledge and gather information together, from the outside, by inviting other people who are professionals in their field, to teach IDEIA.M's employees about the topic. This meeting brings knowledge from the outside but also helps to share the knowledge inside of the team. The company

makes time for employees individual exploration, asks about their interests and always looks for the opportunities to learn more and from different fields (e.g., carpentry, electronics etc.). The company also identifies and solves problems and deletes processes that are inefficient and act as a time waster. For example, in the past there was a morning meeting every day at 09:15 in order to keep everyone updated regarding their tasks and to inform everyone about the projects current situation. Many employees agreed during interviews that this meeting was the least effective and efficient meeting during their week, and considered it a waste of their time. As a result, management came up with a more efficient solution to overcome this problem, and introduced the SCORO software package for project overview.

The preceding examples indicate that IDEIA.M developed a supportive learning environment and, as a consequence, the Founders-CEOs unconsciously created a learning organization or, at least, introduced many steps towards a Learning Organization. In other words, by creating a safe and friendly environment where everyone can (dis)agree and where everyone's opinion matters, by taking risks and taking time and effort to develop employees' skills as well as active engagement in problem questioning and listening and introducing Feedback Loops, IDEIA.M created its strongest basis – a Learning Organization that supports creativity. As the company is still small, it already seems to possess communication and learning processes that provide future capabilities for growth. Its openness to new ideas and supporting experimentation in those processes (e.g., Friday Sessions) shows that this may be considered as one of their strongest traits.

In addition, the company looks for ways to empower and enable their employees to make well-informed and better decisions on their own (by means of TQM). It is part of the Founder-CEOs initiative to give some of the responsibilities and decision-making authority to the employees, as they consider them an important core for the company and a source of knowledge that is vital to grow.

5.4. Single-loop and double-loop learning

Argyris and Schon (1974) presented the idea that people possess mental maps regarding how to behave in certain situations. These mental maps are about how they plan, implement and review their actions and only a few people are aware that the maps they actually use to take certain action are not the theories they advocate, in other words, that it is different from how they say they behave, i.e., what people really do does not match what they say or think they actually do (Argyris, 1980). This explicit difference between what people say and what they

do gave birth to two theories of action (Argyris, Putnam & McLain Smith, 1985, p.82) named as the concepts of ‘Espoused theory’ and a ‘Theory-in-use’.

Espoused theory consists of the world view and values people believe they base their behaviour on; hence, what a person claims to pursue. Theory-in-use are the values implied by people’s actual behaviour or the maps people use to take certain action; it refers primarily to what can be concluded from a person’s actions. The difference between the two can be shortened to ‘What I do, and what I say’; or, simply put, a distinction between a theory of action that people espouse (hold) and the one that they use.

Further research by Argyris and Schon (1978) on organizational learning identified two aspects of learning: single-loop and double-loop.

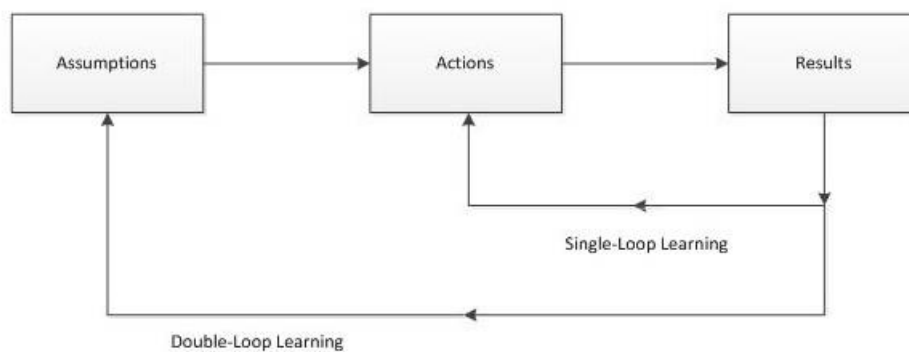


Figure 12 - Single/ double-loop learning (source: <https://organizationallearning9.wordpress.com/single-and-double-loop-learning/>)

Single-loop learning involves error detecting and correcting, and works within the governing variables of the system, i.e., the same words and concepts are used to describe the error and to resolve that error. Single-loop learning follows the same set of existing rules and policies, resulting in improvements of the existing strategies and tools. Argyris and Schon (1978) compare this type of learning to a thermostat that notices the change of temperatures and turns the heat on or off depending on the temperature in the room, i.e., it is a cybernetic (same system) control feedback-loop. The use of Key Performance Indicators (KPIs) and budget variances in MCS are examples of such single-loop learning. Variations are detected in the scores of KPIs or budget amounts in the sense that these are too low or high or ‘over-or-under-budget’. Consequently, managerial action is taken to correct these variations, usually as part of a responsibility accounting routine within the MCS, mandating the responsible manage to take corrective action within a stated reporting period. In other words, Single-loop learning increases efficiency and enables learning through practice.

Double-loop learning encourages questioning the governing variables which may eventually lead to a change in these governing variables, i.e., achieve change *of* the system as opposed to change *within* the system. Double-loop learning takes place when an error or variation is corrected in a way that implicate the modification of firm's underlying norms, rules, objectives and policies, also known as 'systemic change'. It means questioning the strategies, techniques or even routines, reflecting on the underlying assumptions of a company's policies or processes. Argyris and Schon (1978) argue that companies need double-loop learning to make fully informed decisions in uncertain and dynamic business context to require continuous change and adaptation.

For example, when taking into consideration the MCS, the ICS discussed previously in section 5.2. lead to a double-loop learning process in the organization, although IDEIA.M possess a set of a single-loop learning process tools as well. The main examples of IDEIA.M's double-loop learning activity are the Friday Session, Inspirational Boards, SCORO and the daily individual meeting. The Subway Map is also used in a way that supports their double-loop learning mindset. Daily 15 minutes stand-up meeting, and Performance Evaluation Meeting can also be described as a single-loop learning, as they aim at improving efficiency, rather than effectiveness.

The employees are given opportunity to think, question and suggest new solutions for improving their work process. This 'learning from experience' was observed when the organization started questioning the effectiveness of their daily meetings, and as a result of their feedback, when they were cancelled. The same happened with writing the tasks and deadlines on the whiteboard (as it was the case in the beginning); to organize tasks and activities more efficiently, the SCORO software was implemented, which helped with the overall organization and improved efficiency of their communication (making for a substitute of both these activities). The teams often reflect on what works and what does not work well, in terms of internal processes and communication, and then inform the managers directly, sometimes in a daily, individual meeting. These situations prove the existence of double-loop learning processes inside of the IDEIA.M.

In the company, their theory-in-use differs from their espoused theory; what is happening in practice is different from what they say is happening. The Founders-CEOs focus strongly on work processes, shared understanding across projects and among staff, they enhance communication, feedback-loops, and enable empowerment and learning activities. Their

espoused theory, however, states that the main organizational and managerial focus is on emphasizing the financial control aspect (i.e., budgets), as well as developing conventional management control tools in order to scale up. In IDEIA.M the Founders-CEOs introduced a number of work oriented tools that support project work and product development in the day-to-day activities, that are both single- and double-loop learning; we will discuss three of these below in connection with the concepts of theories of action and of single and double-loop learning.

The firm uses the SCORO software package that provides a visual representation of everyone's tasks and progress on the projects, and as mentioned before, was implemented as a result of a double-loop learning process. It serves as a visual control for managers and a status assessment tool for the rest of the team, updating everyone on each other's advances or breakthroughs, as well as informing on relevant events, such as meetings or deadlines. It enhances communication in the company, giving everyone a clear idea of the current events, which in turns supports their double-learning activities.

Another tool is the inhouse-developed Subway Map which visually represents their product development in terms of product lines (represented in a form of Subway Lines) to the clients. On the Subway Map, there are 'subway stations' – milestones that are to be completed, monitored, and assessed as the project continues. The Lines are expressed with different colours, and even though the employees are not working with a Subway Map daily, they all know which steps they should follow and understand the overall purpose and the end point of the Subway. It is acceptable to go backwards and not to only move forwards on the Line; for example, if team members note that something was overlooked or not done according to the client's wishes. The Subway Map assists the Founders-CEOs and the project manager to coordinate and control the project's progress and development, and ensure its on-time-delivery to the client. It is a visual representation of all the new product development process, and it is observed that IDEIA.M uses this tool in a double-loop learning manner – questioning approaches and allowing to go back and forth on the Line, as the designers pleases (as long as it respects the deadline). The designer makes self-assessments in the new product development process, ask for continuous feedback from both, the Founder-CEOs, their team members and other creative employees, and then uses the map accordingly to the result of that feedback. Thus shifts into the double-loop learning usage of the tool. Moreover, the company does not limit itself to only five lines for a client to choose from; if the there is

a need, the client, with the assistance of the Founders-CEOs, chooses the best combination of stations and lines for its own, specific project, which is an example of a systemic view supporting the double-loop learning.

The third tool are the Inspirational Boards (i.e., the Mood Boards and Trend Boards) which are collectively developed by the project team to visualize what kind of view/design/pathway should be adopted for this particular project. It ensures a shared and common understanding of where the design is going and what it is expected to end up like. The Inspirational Board functions as a control (boundary system) for the design part of the project, acting as a safeguard against undesired outputs. Nevertheless, it can still be seen as a double-loop learning tool, thanks to the process of its creation. It gives the team a possibility to explore and question the products they are about to develop. The designers always start with a multitude of questions; or, as one of the designers described:

‘The client can say ‘I want a knife’ and you have to design a knife. But you can go back and ask him - do you want a knife or something that cuts? Then you begin to research what knives there are in the market, and other products that cut, because you can pick inspiration in other things that cut also’ (Designer1).

This mindset allows the designers to create an Inspirational Map of ‘everything that cuts’, exploring many different (creative and innovative) options, rather than just one. The creation of the Inspirational Board is a dynamic process that involves questioning, feedback, and reflection over what is being done.

By analysing the tools IDEIA.M is using, it can be observed that the company employs visual communication as a main MCS parameter. This visual communication as seen in SCORO, Subway Map and Inspirational Boards, serves as an action support for day-to-day tasks and responsibilities. It means that authorizes action by way of establishing a shared common perception and understanding of objectives, facilitates information sharing inside and across multiple simultaneously undertaken projects, and provides agendas for tasks and work distribution; it does not optimize the process, it rather ensure that everyone follow the same rule for the design.

Specific communication processes are at the core of IDEIA.M’s Management Control System. In their innovative and creative work environment, these three tools develop and guide the focus of the organization on what is important, and ensures that everyone knows how to achieve the project goals. By visually articulating and communicating the desired patterns of (collaborative) behaviour, the company is avoiding confusion regarding the

projects and a disconnection between what the client wants and what the designer produces. In IDEIA.M, there are usually two to three people working on a single project, and these tools guide their collaborative team effort. However, these ‘visual communication’ tools also create focus at the customer level, facilitating interaction and communication between both, the company and the client. This visual language of communication that the company developed, established and follows, allows them to clearly articulate current focus/goal, which in return assists to reduce uncertainty and ambiguity.

This observation suggests that a creative (product and service design) company uses visual communication as a main Management Control parameter to support project team actions and to show the ‘correct’ way, aligning everyone involved on the desired outcome for the product.

Following the espoused theory/theory-in-use dichotomy, IDEIA.M claims and tries to follow formal MCS, by promoting budgets and introducing more financial control, but what they already and really practice is the visual communication MCS as made up of the above mentioned tools. Moreover, apart from strongly emphasizing visual communication, the MCS is also self-generated. The Founders-CEOs are not using any external or textbook examples for implementation in their company; they develop the tools and practices in-house, using the knowledge and experience of the collaborative work of their teams and their feedbacks. The company chose to learn from their own ‘mistakes’ and reflects while implementing the tools, as they are aware of their unique environment and need for nurturing creativity and innovation. That is the reason why, for example, the Subway Map is an original tool, developed by the IDEIA.M designers and engineers, that serves its purpose well and fits their internal strategy and processes. The team members admit that, as time passes and the company grows, they will be able to improve the Subway Map, or change it, depending on their own needs and reflections, which provides another example of their double-loop learning mindset.

The tools that IDEIA.M developed and uses enable systemic interpretations and show the entire, big perspective of clients’ projects, with each interpretation expressing and questioning system-specific variables of their work. The way IDEIA.M allows for these interpretations (by highly visualised communication) helps the team to avoid being stuck in a structure of closed interpretations, and supports their open mindset, continuous search, and strengthen and enables double-loop learning across the organization. Based on the

previously described tools, the main example of such double-loop learning challenge can be observed in the Inspirational Boards, which usage allows the exploration of multiple options, translations and interpretations, rather than giving just one perception of a project. It provides depth to their creative exploration and learning processes.

Such tools, introduced by the firm, can be described as Double-loop learning tools and are not found often in the organizations. It is even less common for them to be part of a MC package or a management routine (Gianna Zuccotti *et al.*, 2018).

5.5. Closed-Loop Management system

The closed-management system (Kaplan and Norton, 2008) involves five stages that connect strategy formation to strategy execution (via the MCS) to strategy review. The first stage is about developing the strategy; that is, addressing vision, mission and values, doing a strategic analysis of both external and internal factors, to be finalized with strategy formulation. The second step is to translate the previously developed strategy into objectives and measures in order to communicate it to the organization. In this step, tools such as the strategy map or the Balanced Score Card may serve the purpose to visualise strategy and create a cause-and-effect relationship between strategic objectives. Consequently, resources are identified, authorized and allocated to achieve these objectives. The third stage is to plan the operations – in other words, develop an operational plan in which all the actions that need to be taken to fulfil the strategic objectives are described. It involves the preparation of a sales plan and a resource capacity plan, as well as preparing budgets. Step number four consists of monitoring and learning from the obtained results, by means of different types of meetings, such as operational review meetings, in which management would address problems that unfold, and strategy meetings, in which management reviews the progress and limitations of its strategy execution. This leads to stage number five which consists of re-examining and adapting the strategy. It comprises the assumptions underlying the undertaken strategy and assessing whether these are (in)accurate or (ir)relevant. Decisions whether to improve the existing strategy or a whole new strategy is required, are typically the remit of stage five.

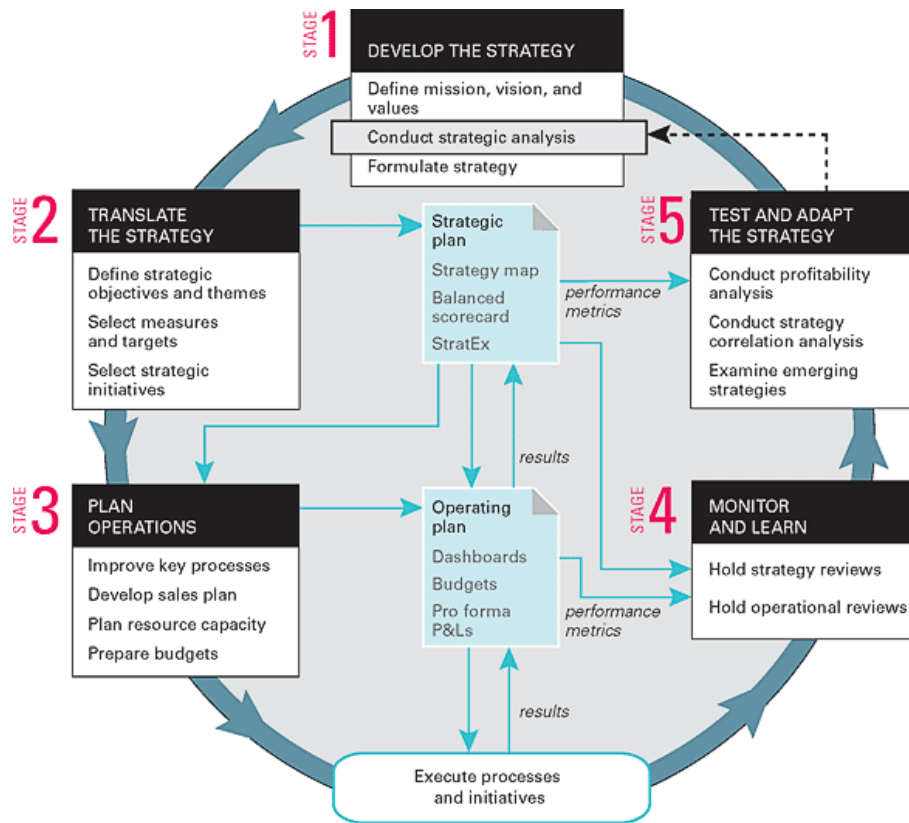


Figure 13 - Closed Loop Management System (source: Kaplan and Norton, 2008)

IDEA.M’s ambition towards growth and the accompanying aspiration for ‘control’ (being their espoused theory) can be approached from a Closed-Loop Management System (CLMS) perspective. As Figure 13 shows, the direction of the cycle goes counter-clockwise (one, two and three) to right (four and five), however the company started developing it counter-loop (clockwise); from right to left, from learning processes to planning tools. Thus, the right-hand stages (stage four and five) are already well-developed and well-functioning, in contrary to the left-hand stages. Many organizations usually follow the closed-loop system in a ‘left to right’ order, focusing on single-loop learning activities and establishing well-functioning financial control parameter, working towards improvements of the system, rather than questioning its assumptions and developing strategically well-adapted structures.

IDEIA.M focused on the right-hand side of the cycle, strongly engaging in a double-loop learning via their visual (self-generated) communication tools (described in detail in a previous chapter) and implicit ICS, which can be argued as a good way to build up their proper MCS, given their highly creative context. These visual monitoring and communication tools and learning system have been developed in step four of the cycle. All of the tools such as SCORO, Inspirational Boards and Subway Map play an important role

in this stage. The firm's uniqueness is located exactly at this step, given the strong emphasis on updating knowledge across all organization members and sharing information.

Nevertheless, basing on their espoused theory, if the conventional MCS is what they are seeking for, the left-to-right, counter clockwise conventional CLMS framework would probably be a useful design of a system to follow. The Founders-CEOs' idea about future growth, suggests developing conventional MCS elements in step two. In these previously described tools lays the competitive strength and advantage of the company; emphasizing the financial parameter and switching to the Left side of the cycle, IDEIA.M may undermine its already established double-loop learning mindset and shift the organizational focus to single-loop learning activities. Leaning predominantly on financial control may (potentially) weaken their core strengths of learning and adjustment. However, CLMS can provide a way to follow their espoused theory, precisely because they stay within the governing variables of a conventional MCS.

In conclusion, IDEIA.M is considered working on the stages four and five of the cycle, but if the Founders-CEOs are still looking for a way to emphasize the conventional MC parameter with the financial control, the CLMS provides a model to do so. What can be observed from the case, is that their MCS design begins with stages four and five, which focus on learning, feedback, and change (and on proactive problem solving), rather than building their MCS on the stage two and three, that is emphasizing financial and conventional control.

5.6. Practical implications/suggestions for management

Based on this discussion chapter, I would like to present some practical implications and suggestions for management.

Firstly, in order to support their wish for growth, following the previously presented ICS, it is advisable for IDEIA.M to further involve their employees in strategy planning activities and empower them in this field more frequently (which was already on the agenda of the Founders-CEOs). This will help track uncertainties, respond faster to a changing environment, and encourage more dialogue and debate in the field of strategy, i.e., what to focus on for the future. The Levers of Control framework, along with the proposed ICS, simultaneously addresses discipline and creative innovation of the employees. As a result and following the analysis in section 5.2., it is suggested that an emphasis on the ICS may work best, notably given how 'natural' it already is for the firm. IDEIA.M does not follow any

conventional top-down approach of cascading rules; instead they employ an ‘striving-for-excellency’ mindset and a flexible and empowered atmosphere of sharing and communicating; as such, it constitutes a good fit with Simon’s ICS.

In order to simultaneously realize both these ideas – to grow and to control - the Founders-CEOs might want to emphasize and enhance the feedback loops and communication within the company further, both visually and, possibly, by introducing KPIs/metrics that would translate project team activities into financial numbers. As IDEIA.M already employs the rudiments of a Total Quality Management (TQM) model, this can be extended and include the visualization of KPIs and metrics, e.g., in the form of a ‘Tableau de Bord (Bouquin, 2008) or any other format of performance charts and ‘operational dashboards (Few, 2006).

Even though IDEIA.M is a small and relatively young company, still building its position on the market, it already possesses an important set of organizational capabilities and strengths (as described previously in sections 5.2. and 4.4.). It possesses a wide range of product offerings and significant flexibility regarding its customization, as controlled and visualized in the form of the Subway Map, the basis to customize their ‘Subway Line’ for every customer. Its uniqueness can be found in their end-to-end project responsibility (horizontal integration) and accompanying accountability, as well as in closed but flexible communication and feedback loops. The company’s flexibility is leveraged in terms of managerial behaviour; the Founder-CEOs actively listen to the feedback of their employees and act upon it. There is an atmosphere of encouragement and support, where they listen to everyone’s opinions and consider different points of view.

After the detailed analysis of their internal processes and tools, IDEIA.M is supporting creativity and innovation with their actions and environment, and it shows that the undertaken management path would benefit the company also in the future.

5.7. Control and Creativity

The relationship between control and creativity is difficult to reconcile, as the existing literature states that control will hamper and disrupt the creative process of the individuals (Amabile, 1996; Amabile *et al.*, 1996). It was suggested to managers to ‘control without controlling’, and focus on creating an environment in which a free collaborative improvisation can thrive (Sawyer, 2006). Ideas such as stable, open-minded work environments, the importance of intrinsic motivation, and work autonomy, little to no formalized procedures, scarcity of rules and constraints were given a priority over the

managerial need for conventional way of controlling human resources (Amabile *et al.*, 1996; Nonaka, 1991).

Recent studies provide us with new ideas about how MCS can enhance organizational performance and contribute to the accomplishment of a firm's strategy while simultaneously documenting a relationship between MCS and innovation (Bisbe and Otley, 2004). Basing ourselves on the Levers of Control Framework (Simons, 1995), it can be observed that both creativity and control are indispensable traits of organizational strategy, and that it is possible to reconcile them without one eliminating the other. The Levers of Control Framework probably is one of the most suitable conceptual frameworks to satisfy the reconciliation of both creativity and control (Simons, 1995, p. 155). For example, Speklé *et al.*, (2014) provides evidence of the Levers of Control system supporting empowerment, motivation and creativity, while encouraging decision and action taking by the employees.

Basing on the case of IDEIA.M, it can be observed that the tension between creativity and control may actually constitute a false dichotomy. Control in this company gets re-articulated in a visual form (e.g., the Subway Map), and, in fact, exists separately from the financial control parameter; but it continuously and simultaneously provides common and shared goals for their daily work activities. The logic continues to be one and the same – deployment of resources. Both creativity and control address the articulation of this company's key resource, and subsequently transpose that articulation into an efficient deployment. Articulation by means of graphical visualization, transposition by means of shared development and understanding, and deployment by means of project collaboration. This line of thought can already be found in the literature and the existence of this idea has more and more supporters within the MCS research domain. For example, Ortmann and Sydow (2017) and Speklé *et al.*, (2014) conclude that the conflict between creativity and control does not exist as such; both can co-exist while the existence of control can have positive effects upon creativity.

5.8. Limitations of this study and suggestions for future research

Despite the novelty of the topic and scarce research literature, this study provided an initial answer to the research question of '*how does communication as a control mechanism affect creativity in product development processes?*'.

However, there are some limitations that need to be highlighted. The answer to that previously stated research question was explorative, it is drawn from the analysis of a single case study from the creative industry. The analytical conclusions drawn from this explorative study merit expansion and analytical replication in other case studies as well as empirical verification of the resulting hypotheses using large database methodology. The relationship between the three topics of creativity, control and communication might be studied more in depth in different creative industries, to replicate the explorative tentative conclusion on the role of visual communication in MCS in NPD processes.

Second limitation of this study originates from IDEIA.M status as a young and a small company (10 people actively working at the moment, in 2018 – excluding the interns). Its micro-company size, thus, its internal environment, allows for direct communication and facilitates the dialogue creation activities between the Founders-CEOs and the employees. This begs for the question of scale – does a bigger company provide different antecedents for use of the visual communication based MCS in NPD? Which one (if any at all) of the constituting tools of the visual communication MCS as well as the MCS package, are scalable?

Thirdly, the case company is based in Portugal, thus the cultural parameter may also influence their MCS design and Theory Y/Theory X mindset. If similar research can be conducted in a company that has its headquarters in a country other than Portugal, the results might be different. Relatedly, IDEIA.M does not expand its services to the overseas markets, and is targeting only the domestic market; therefore its MC design and the influence of visual communication as a control mechanism may vary in depth or application, or require different tools, if expanding internationally.

As to suggestions for the further research, the first recommendation is to tackle the main limitation of this study; that is, to replicate this study in other creative companies, including ones which are in a different stage of their development/life cycle. Conducting similar studies in other companies may provide further empirical evidence for naturally developing visual communication in a creative design companies, which may strengthen or disprove the theoretical contributions of this study.

Secondly, the case of IDEIA.M is believed to contribute to the MC as a package literature in the future, as they experiment widely with their MC practices and listen to their employees' feedback about the MC usages and mis usages. They also tend to call off the control activities that do not work effectively (i.e., the daily morning meetings recall, described earlier in this

chapter). Therefore, they may provide empirical insights on best practices and on dynamic processes underlying the emergence of those practices. It may be also interesting to observe how they progress as a Learning Organization, and how their clockwise double-loop management system evolves, alongside IDEIA.M's learning tools, and how does this process affect communication (and creativity). For the future of the case study company, it may be also important to analyse the connection between their visual communication and financial reporting, and to take this idea further, the Founders-CEOs may be interested in learning about how to connect their visual (self-generated) tools and Learning Organization activities with (conventional) financial control tools.

6. Conclusion

The main aim of this qualitative, interview-based dissertation was to answer the research question of '*how does communication as a control mechanism affect creativity in product development processes?*'. To do so, a case study analysis of a product and service development company – IDEIA.M, was carried out. Interviews provided the necessary qualitative data regarding the firm's various communication tools, that were first described in detail and then analysed. It was investigated what control practices and what communication processes IDEIA.M developed and how these affect its engineers and designers. Keeping the research question open while analysing the case, allowed the capture of many other interesting insights, described in this dissertation and also mentioned below, with four main findings in particular.

As mentioned in the previous chapter, this study agrees with the statement that the creativity and control can peacefully coexists, and even support one another . IDEIA.M's case results also lead to such conclusion, as the Founders-CEOs were found to carefully manage control and creativity, with a help of constant communication and dialogue, and an open, friendly environment.

Firstly, it was discovered that, in terms of communication, the meetings held the most crucial role, and their influence on employees' creativity was the most visible one (Speklé *et al.*, 2014). Control-wise, the validation points with the supervisors after every milestone (or after every finished design) are important and helpful for the designers. Secondly, the Friday Session and related free-discussion time greatly influenced innovation and served as a motivator (as this particular activity was a big success among the employees), Thirdly, the 15 minutes morning stand-up meeting helped managers to communicate important things and ensured that the employees have time to address their doubts. Fourthly, the individual meeting with

the Founders-CEOs at the designer desk was also greatly appreciated among the designers, at the same time reassuring the supervisors that the employees know their tasks and work in the desired direction (thus, that their behaviours match the goals). In addition, the common, open space encouraged the dialogue further and facilitated the flow of idea and doubts clarification. This atmosphere of sharing, openness and tolerance for differing opinions influenced and further promoted communication in the company.

It was also discovered that, apart from the meetings, this communication was highly visual. The existence of self-generated visual communication and control tools (i.e., Inspirational Boards, Subway Map, SCORO) was discovered and its implementation was found to have a positive effect upon the creativity and self-organization of the designers. This finding is the basis of the main theoretical conclusion of this dissertation, that is, *creative companies are highly intensive on visual communication and naturally comfortable with double-loop learning practices, inherently supporting learning and opportunity-seeking activities*. IDEIA.M MCS design focuses on learning, change and communication activities, which also accounts for their uniqueness. This is considered a main finding of this dissertation, as well as its main contribution to the MCS field of literature.

To find an alternative solution to the conventional MCS, the Levers of Control Framework (Simons, 1995) was applied in this dissertation and the ICS were proposed as an opposite force to the DCS. In the research process, it was found that the company inherently started their ICS building, by introducing certain activities, such as Friday Sessions, Performance Evaluation meetings, or feedback loops. This discovery serves as the basis for the claim, that continuing the pursuit of ICS may probably be a good choice, since IDEIA.M started it naturally and unconsciously. Moreover, it was concluded that exclusively pursuing the DCS from now on may be disadvantageous for the firm, and eventually impede its uniqueness (that lies in their intensive visual communication).

There were some other, unexpected findings that presented themselves during the analysis of the empirical material. For example, IDEIA.M was found to have certain traits of a Learning Organization (that further reinforces its ICS practices and the above claim), as managers involve themselves daily in the problem-solving activities of their subordinates and create a strong supporting work environment, where employee group learning is a central focus (i.e., Friday Sessions).

Additionally, the results of this study provide suggestions to the managers of IDEIA.M, as well as ready-to-use models (such as CLMS) and additional suggestions (i.e., focus on ICS, instead of DCS) for their future and their MCS design.

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Appendix 1

Table 3 - Sales turnover in Euros

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
12 000	22000	35000	42000	57000	60000	154000	310 000	224 000	282 000