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# Intrapreneurship Discovery: Standard Strategy to Boost Innovation inside Companies

Chiara Mansanta, Daniela Sani

***Abstract*—**This paper studies the concept of intrapreneurship discovery for innovation and technology development related to the manufacturing industries set up in the center of Italy, in Marche Region. The study underlined the key drivers of the innovation process and the main factors that influence innovation. Starting from a literature study on open innovation, this paper examines the role of human capital to support company's development. The empirical part of the study is based on a survey to 151 manufacturing companies that represent the 34% of that universe at the regional level. The survey underlined the main KPI's that influence companies in their decision processes; then tools for these decision processes are presented.

***Keywords*—**Business model, decision making, intrapreneurship discovery, open innovation, standard methodology.

## I. Introduction

MODERN companies face a though competitive environment. Trends such as Industry 4.0 or intelligent factories require enterprises to innovate continuously in order to remain competitive in the European and global scenario. Industry 4.0 was for the first time introduced in Germany at the Hannover Fair in 2011 as "Industrie 4.0" by a group of representatives from different fields (such as business, politics and academia) under an initiative to enhance the German competitiveness in the manufacturing industry. The term represents the fourth industrial revolution and it has been coined by Klaus Schwab, founder and executive chairman of the World Economic Forum.

Miller [9] described the fourth industrial revolution as a completely new environment, where people will use new technologies to communicate and manage their lives. This fourth industrial revolution is focused on physical and digital technologies that will influence all economies and industries. For the first time, technologies will be embedded within societies. These technologies include a huge number of fields such as artificial intelligence, robotics, internet of things, cloud, 3D printing. The technologies should communicate and interact between them, exchanging data and information.

Subsequently in a short time, due to economic and other ties to Germany, this concept was introduced also in Italy. However, we can see it in other countries as well. In Italy, Industry 4.0 includes production based on technological progress, which wipes out boundaries between the digital and physical worlds and enables companies to implement smart interconnected systems supporting activities throughout the whole production value chain; it includes the smart world of industrial devices that communicate with each other. In other words, production is transformed from stand-alone automatic units into fully automatic and continuously optimized manufacturing environments. Production facilities will be connected to make cyber-physical systems (CPS), which will be basic building components of so-called smart factories. These new approaches should change the vision of companies. Usually the entrepreneurs focus in the process or the product; they think that to acquire a new robot, or a new technology is the same to innovate. On the contrary, if they really want to innovate and be competitive in the global scenario, they have to generate new ideas, entering new markets and developing new opportunities for business.

Developing new products, services and processes is vital to profitable and sustainable growth. And these tasks have become more and more urgent and taxing today than in previous years. In this scenario, companies need to develop an innovation and technology strategy and system, a common methodology which supports their business objectives and enables them to develop new products, services or processes to ensure them long life and sustainability in the long period.

Seshadri et al. [13] called this process intrapreneurship discovery and they defined the intrapreneurship as the starting point for the analysis of a successful project.

The objective of this paper is to present the characteristics of intrapreneurship discovery and how it can be applied inside companies.

## II. The Conceptual Framework of the Human Capacities for Innovation

One of the most difficult points inside companies is to have clear support and encouragement from the top management.

The development of information and communication technologies (ICT) is influenced by the globalization that affects costs and quality of ICT, and also affects society [5].

The acceleration of technological progress and Industry 4.0 require higher innovation capacity, integration and an interoperable system.

Akintude [1] emphasized the importance of know-how and highly specialized personnel, constantly updated, with the desire to grow and to know, to discover, and able to use these technologies with extreme awareness.

It is human capital that develops technology, makes improvements and therefore decrees the success of the

Chiara Mansanta is with the DIISM, Department of Industrial Engineering and Mathematics, Universitàt Politecnica delle Marche, 60131, Ancona, Italy (e-mail: c.mansanta@pm.univpm.it).

Daniela Sani is with the DISES, Department of economics and social sciences Universitàt Politecnica delle Marche, 60131, Ancona, Italy (e-mail: d.sani@univpm.it).

company. It is always human capital that has the intrinsic power to generate value for the company itself. To be competitive in the world market, companies must invest in human capital, focusing on skills.

The training necessary to make the best use of new technologies is still far from complete, but the current scenario shows that we are in a phase of experimentation [2].

A trained and gratified staff, investing in what they do, is more productive and generates ideas that can lead to new products, processes or services.

The complexity of the technologies can be overcome through the close collaborative relationship between research and industry, between the productive and scientific sectors, which guarantees innovative, competitive and dynamic, extremely flexible technologies that can operate in different contexts [3].

All these elements have changed the economic and business scenario, moving from a competing system to a collaborative and cooperative system, fostering cohesion and economic integration. Chesbrough [6] defined this phenomenon "open innovation".

## III. What Exactly Is Open Innovation?

The term is widely used by business and academia, and most of the world's 500 largest companies talk about open innovation in their strategy. Despite the large diffusion of this term, there are many different academic definitions of "open innovation" and companies use this word in many ways and to varying degrees.

Chesbrough [7] defined "open innovation", as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation, respectively". The main concept at the basis of the open innovation model is the fact that firms explicitly cooperate with other actors, including customers, rivals, academics, and firms in unrelated industries, to create innovations.

West and Gallagher [14] argued that "the premise at the basis of the open innovation paradigm is that all the knowledge necessary for creating innovations is no longer present within the firms' boundaries". This concept means that companies are looking for external sources to support them in the acquisition of knowledge. According with this idea, open innovation is a tool that helps companies to define and shape their business.

Going back to the central question, open innovation is about to outsource part of the innovation process to actors outside the company.

The process of innovation could be a long process. It starts with the analysis of customers' needs, verifying what are the main risks and the possible solutions. Once it is decided to go ahead with a promising idea, it is generally required to perfect the idea in a viable technology.

Parida et al. [11] affirmed that the part of the process that can be wholly or partially contracted to an entity outside of the company is the open innovation.

The intrapreneurship discovery took the concept of open innovation and elaborated it. Companies should be supported in their innovation processes through specific tools and methods, but the manager still plays a key role to define and elaborate ideas, transforming them into prototype [4].

## IV. Empirical Study

Since the intrapreneurship discovery is a completely new approach, and the implication of its scalability on value creation for companies is still a new phenomenon, a survey was created to define the most important factors of the technological innovation processes and analyses of the main target. The survey studies the degree of knowledge, the needs and expectations of the Marche companies and the opportunities offered by Industry 4.0.

This research is based on a survey to 151 manufacturing companies, set up in Marche Region; meaning a response rate of 33% in the face of 420 questionnaires sent to companies.

The research focused only in manufacturing companies. According with the European strategy [8], Marche Region developed in 2014, the Smart Specialisation Strategy (S3); the document was formalized on 5 December 2016 and underlined the main area in which Marche should invest.

The European Commission promoted the "Europe 2020 strategy" to create new jobs and guarantee the economic growth of all the European state members.

The main objective of the strategy is to guarantee a smart, sustainable and inclusive economy. These three main priorities support the economic development and will guarantee social inclusion, high levels of employment and high performance.

The European strategy asked to all regional and national authorities to define the main priorities in which they want to invest. According with these priorities, the European Structural Investment Funds (ESIF) will steer the investment.

Thanks to the smart specialisation strategy, Marche Region identified the unique characteristics and assets of the local actors, highlighting competitive advantages, and rallying regional stakeholders and resources around an excellence-driven vision of their future. It also means strengthening regional innovation systems, maximizing knowledge flows and spreading the benefits of innovation throughout the entire regional economy.

The regional S3 highlighted the main priorities in which Marche has to improve their business, as reported in Fig. 1.

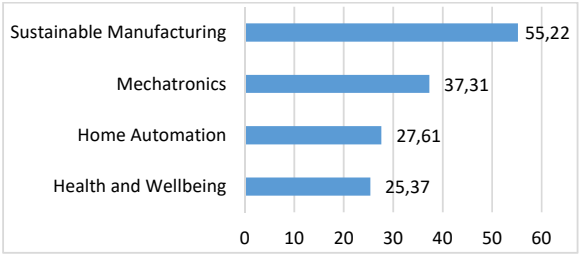


Fig. 1 Regional Smart Specialization

The results of the survey identified sustainable manufacturing and mechatronics as the main specialized area

of interest. Companies that work in one of these two priorities are the target of the research. For what concern Sustainable Manufacturing, the main topics are mentioned in Table I. For what concern Mechatronics, the main topics are the mentioned in Table II.

TABLE I
TOPICS S3- SUSTAINABLE MANUFACTURING

| Topics S3 | % |
|---|---|
| Production technology | 69.23 |
| Energy efficiency | 56.41 |
| Eco-sustainability | 55.15 |
| Integrated design | 38.46 |

TABLE II
TOPICS S3- MECHATRONICS

| Topics S3 | % |
|---|---|
| Systems for the industrial automation | 58.97 |
| Modular and reconfigurable products | 46.15 |
| Smart and eco-sustainable products | 41.03 |
| Robotics systems | 41.03 |

Companies active in one of the two priorities are the target of this research. The survey confirmed the composition of dimension by company:

- 116 small companies
- 21 medium companies
- 14 large companies

## V. RESULTS

The mapping started with the examination on the degree of knowledge of Industry 4.0. Companies should give a score, between 0 (not known) and 5 (well known). 43% of interviewed companies answered that they have a medium-low level of knowledge (between 0 and 2) of Industry 4.0. The level of knowledge of Industry 4.0 increases with larger companies of the manufacturing sector (Fig. 2).

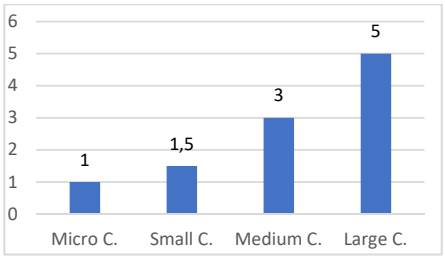


Fig. 2 Awareness on Industry 4.0 by companies' dimension

Then, an analysis on the most important factors of the technological innovation processes was done. From this analysis, companies underlined three main factors that influence their economic growth and their need to innovate:

- Globalization of technological development;
- Flexibility and dynamic environment in which companies work and operate, which requires qualified and specialized skills from workers;
- Increasing competition that requires more investment in R&D.

In this field, intrapreneurship discovery is understood as a task, a tool independent from the way that it is performed but essential for testing an idea's value and feasibilities.

Content analysis of the interviewed companies revealed that 65% will raise their competitiveness in the global scenario in the next five years. To reach this goal, the capacities for innovation are driven by:

- Information and communication technology (54%);
- Internet of everything- information exchanges and devices more and more interoperable and interconnected (44%);
- New jobs skills (41%).

After analyzing the key drivers for innovation, companies underlined the main barriers, as reported in Fig. 3.

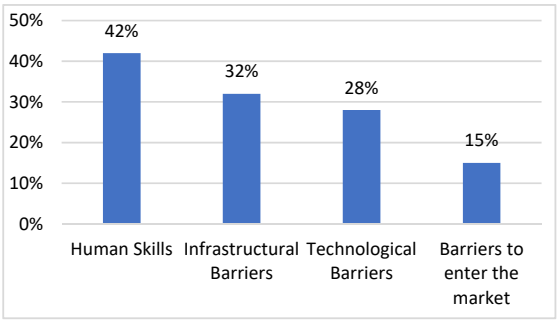


Fig. 3 Barriers

The survey underlined that the main problem is the lack of human competences. Often companies received lots of grants to introduce innovative technologies inside their processes, but they do not have the skills or competences to use it.

The lack of competences is one of the main challenges that regional companies have to face. Our region, Marche region, has to implement its regional smart specialization in order to have qualified experts. In this sense, it will be very useful to introduce mentoring activities in regional policy. In this scenario, intrapreneurship discovery can be the key factor to guarantee successful innovation strategies inside companies. A standard methodology, presented by external experts, will allow to define the strengths and weaknesses, and to outline in advance the main risks for companies, and if there exists the economic and long-term sustainability of the innovation. Companies are stimulated to take the risk to think outside the box and move towards a higher degree of externally oriented collaboration for innovative development.

To demonstrate the feasibility of intrapreneurship discovery, the research identified the target to test and validate this methodology. To identify the best target, some KPI's have been defined.

Investment in R&D was one of them. Only companies that invest at least 5% of their turnover in R&D can successfully face processes of intrapreneurship discovery.

They are mature to go deeply in innovation processes and understand the new business approach promoted.

The survey also underlined that other important criteria should be taken in account to test the methodology inside

companies, as shown in Fig. 4.

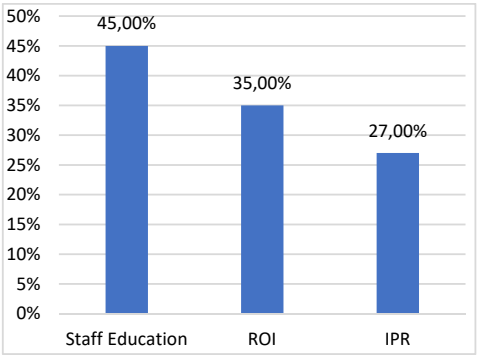


Fig. 4 Quantitative Criteria

The first quantitative KPI to consider is the number of graduate employees; 10% of companies declared they have no graduated employees in the enterprise. The second one is the Return of Investment (ROI) to analyze the importance to invest in innovation. And then, the intellectual property rights (IPR), that include the number of trademarks, licenses, copyrights, and design or industrial models used to protect the IP.

The activity of mapping was extremely useful to define the main target in which test the methodology. Hypothetically, all companies could be part of the target. With this activity, it was well-defined the target through specific and measurable KPI. Thanks to the definition of standard KPI, three groups of companies were obtained:

Group 1- companies that already invest in R&D (focus group) and consider innovation a key topic to guarantee their long-term sustainability; group 2- companies that are now facing innovation (interest group); and group 3 companies that are focusing only in production and view innovation as a plus, rather than a key factor. While companies that belong to group 1 and group 2 in the last three years have increased their turnover or have maintained their market position, companies that belong to group 3 have problems to keep a competitive advantage.

According to the results, the processes of intrapreneurship discovery in these companies are associated to internal capacities (professionalism of the manager and the recognition of the human capital), and to external capacities related to the application of a standard methodology that allow to discover and validate the idea proposed and to transform it into new product or service.

## VI. Methodology- Visual Thinking Strategies

Before open innovation, a company's development was done via long, tedious business plans, reports and documentation which hindered innovation and made development cumbersome, incomprehensible and prohibitive. Intrapreneurship discovery proposed a simple and intuitive methodology that can be applied in all companies [13].

Different tools can be used for this open approach, but all of them are based on visual thinking strategies (VTS) [3].

VTS are the major expression of design thinking, an interactive, nonlinear, visual way of looking at how things connect. VTS are used for mapping ideas, underlining patterns and relationships. Through these innovative models, companies plan, strategize and solve problems.

From the analysis of VTS, we catalogue VTS in two main groups:

i. Pioneers VTS [10], for example Business Model Canvas; companies have heard about this type of VTS and have a little knowledge of them;
ii. Extension of VTS, they were experimented and created from the study of the pioneers.

TABLE III
Classification of Visual Thinking Strategies

| Pioneers VTS | Extension of VTS |
|---|---|
| Business Model Canvas | Value Discipline Tools |
| | Spark |
| | SME Instrument Approach |
| RISE: Translucent Innovation | MELT Frame Canvas |
| | Double Diamond Design Process |
| | I Do Arrt |
| Visual Tool Boxes | Pentagonal problem |

VTS is about visualizing and imagining something that does not currently exist and would take care of users' needs. It is about prototyping, giving the product to the consumer and then improving it.

## VII. Conclusion

In the last decades of the 20th century, according to Rawlings [12], companies have to deeply modify their strategies. To guarantee economic growth and sustainability in the long term, companies have to use a common methodology, a standard approach to guarantee innovation.

Companies should take the risk to think outside the box and move towards a higher degree of externally oriented collaboration for innovative development.

The study demonstrated that innovation is not a process that takes place within the boundaries of the company, but it is a process that involves all stakeholders that influence innovation.

The innovation can be in the process, in the product or in the service offered by companies. The aim of the VTS is to understand the feasibility of the innovation. From the study of the ideation process, it is possible to understand if there is potentiality for the idea promoted by the companies or not.

From the empirical study, the following characteristics influence companies' innovation and allow them to be competitive in the global scenario.

First, innovation should be considered as a crucial element to increase revenue and companies should invest in R&D at least more than 5% of the annual turnover to be competitive in the sector.

Second, companies need a structured and organized methodology to really face disruptive innovation. Without a defined approach they get lost and do not achieve the objective. Third, human capital and a well-organized top

management play a key role to organize the innovation process.

Certainly, there is no one universal and smooth sequence of steps to be adopted, from the initial phase of the generation of an idea, to the final implementation. However, the intrapreneurship discovery allows companies to identify the main stages of the idea, defining a common strategy to validate the idea. For the first time, entrepreneurs can test and validate the idea before investing on it.

## REFERENCES

[1] Akintunde, S. (2012) "Intrapreneurship development as a human resources management function", Journal of Business Economics and Management, Singapore, 2012.
[2] Amabile, T. M, "A Model of Creativity and Innovation in Organisation" Research in organizational behavior, Vol.10, pages 123-167.
[3] Ambrose, G (2015) "Design thinking for visual communication" Bloomsbury Publishing PLC.
[4] Bonvoisin, J., L. Thomas, R. Mies, C. Gros, R. Stark, K. Samuel, R. Jochem, and J.-F. Boujut. (2017) "Current state of practices in open source product development". 21st International Conference on Engineering Design, Vancouver, Canada, August 21-25.
[5] Briones Peñalver, A. J, Santos, J. A, Bernal Conesa, J. A., Santos, M. C., (2018, August) "Innovation management and strategy", Journal of Scientific & Industrial Research, Vol. 77, Portugal.
[6] Chesbrough H., (2003) "Open Innovation: The New Imperative for Creating and Profiting from Technology" Boston: Harvard Business School Press.
[7] Chesbrough H., (2006) "Open innovation: researching a new paradigm" Oxford University Press.
[8] Foray, D. (2015) "Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy" Routledge, New York.
[9] Miller, D. (2016, September) "Natural Language: The User Interface for the Fourth Industrial Revolution". Opus Research Report.
[10] Osterwalder, A., and Pigneur, Y., (2010) "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers." Wiley, Losanna.
[11] Parida, V., Larsson, C. T., Isaksson, O., & Oghazi, P. (2011) "Towards open innovation practices in aerospace industry" Research Publishing, Bangalore.
[12] Rawlings, T. (2016) "How microsoft's "garage" keeps its innovative spark burning" ,Journal for the Whartoon School, Pennsylvania.
[13] Seshadri, DVR and Arabinda T. (2006) "Innovation through Intrapreneurship: The Road Less Travelled", Vikalpa, Londra.
[14] West, J. and Gallagher, S. (2006), "Challenges of open innovation: the paradox of firm investment in open-source software", R&D Management, Vol. 36 No. 3, pp. 319-31.