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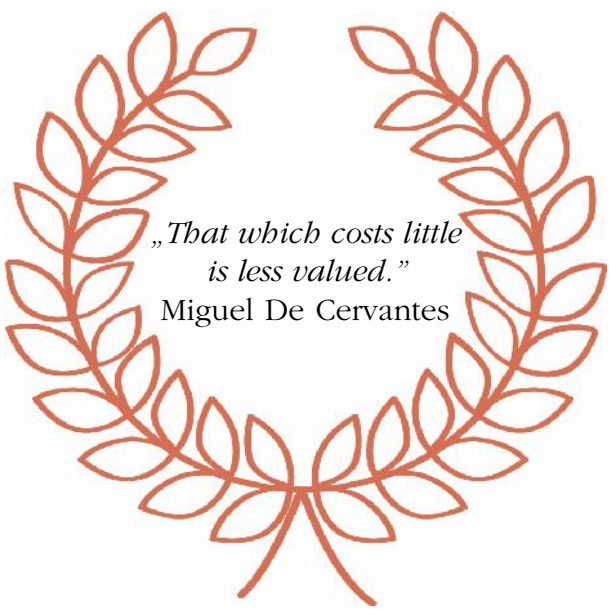
CONTENTS

Value-Based Management

Managers have always focused on the success of their activities, such as, the achievement of objectives (efficiency), minimum consumption of resources (economy) and on the process of transforming resources into products (efficiency). As the market belongs to the customer, managers began to notice that they pay attention to the price of the products (which must cover the costs) and the quality (it is the product image in customer eyes, based on its characteristics). Therefore, the costs and features reflect an attribute of the product, its value.

Value is a potential that an entity has to satisfy a human need. It can be an economic potential, but also emotional, moral or artistic one. Value is a relationship between an entity (commodity, company, deed) and a person, through which the person expresses the importance given to the entity to acquire it, because it satisfies a need. The measure of value is subjective, depending on the importance that the entity has for the individual. In the *Relativistic theory of value*, value is a relationship of appreciation between the subject and the object of valorization. It uses objective data, historical criteria determined by the social practice to which the subject subscribes.

The value has as primary source the quantity and quality of the delivered work, correlated with the economic preferences, the abundance (or rarity), the quality of the goods. The value classification is done, according to the analyzed entity into *economic values* (refers to products, means of production, resources, managerial techniques, work), *ethical*, *legal*, *political*, *religious*, *esthetic values*. Therefore, there are several types of values (the economic value is not including everything) that are expressed approximately by price. Only merchandises have economic value. Happiness, freedom are also values, but not economical ones. For this reason, the price partially reflects the value of an entity.



Value is an indicator used to take decisions and make choices within the company, but also in the market. It can be value for the manufacturer or value for the customer and there is a difference in how the customer and the producer view the value. Moreover, the value can

be *apparent* or *real* (not influenced by inflation). Other types of values are *residual value* (which remains from a depleted resource) and *marginal value* (related to the utility of having or consuming an additional unit from an entity. As the need is met, the intensity of the need decreases and the utility of the entity decreases. Subjectively, the saturation threshold remains. An entity has its value as long is desired. Even, after exceeding the saturation threshold, it is still expected that satisfaction will be obtained and for this reason the marginal utility cannot be zero and cannot be negative, although it is practically not so.

Value can appear through work (Marx), through rarity (Ricardo), through created feelings (Menger), although things should not be treat as absolute. Creating an entity requires the participation of several company departments and several companies. The value flow in a company should be presented as a map, in order to be easy for studying *(VSM – Value Stream Mapping)*. M. Porter defined the *value chain* and the *value system*. The value chain is the sequence of activities in a company, necessary to create an entity that meets the needs of the customer. Each link in the chain must have lower costs than the corresponding link in the competing companies or it must add more value through superior quality. The value system is a succession of value chains from companies that contribute to the realization of a product.

„Anything that just costs money is cheap."
John Steinbeck

Value-based management is a management style that defined by setting goals to maximize value; resource allocation strategies; efficient operational decisions; performance measurement; compensations payment (salary); value development. The European standard EN 12.973: 2000 for Value Management states that we need an orientation towards motivating people, developing skills, promoting synergy and innovation. Value management involves teamwork, satisfaction, communication, helping each other, encouraging change, ownership, a certain degree of freedom.

Sorin Ionescu
Editor-in-Chief

Business Location: From Strategy to Customer Satisfaction

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Abstract

This paper proposes a discussion on criteria related to decisions to be made in order to choose the business location, signalling that approach might be different in case of small businesses (as compared to large companies) as well as in the case of service businesses, in particular small businesses active in hospitality industry (food and drink shops). Based on cases and observations as well as impact factors consideration, the author suggests that success of such a business (usually located in densely populated urban and/or well-known touristic areas) might depend on other factors than simply location. Selected examples from several countries are presented to make the case. The paper conclusions and implications are equally important for theorists and practitioners, as entrepreneurs, small business owners and owner-managers.

Keywords: business location, urban planning, small business, competitive advantage, customer satisfaction

Introduction

According to Porter, the financial success of a company within its industry (i.e. its profitability is above that industry average figure) depends on two types of competitive advantage this company might achieve, respectively: low cost or differentiation (Porter, 1985). If the competitive advantage is achieved on the long run then the company success is sustainable, based on *sustainable competitive advantage*. Combining the competitive advantage and the competitive scope (large or narrow), *three generic strategies* emerge (Porter, 1980: cost leadership, differentiation, and focus

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strategies. Note that focus strategy may be cost focus or differentiation focus (as result of a two-by-two strategy matrix).

Criticizing the popular by-then SWOT analysis – as lacking rigor from scientific standpoint – Porter has also developed the Five Forces Model (suppliers, buyers, substitution products, existing competitors within industry, and new entrants (Porter, 1979; Porter, 2008), known as *microenvironment* (industry environment) since. Along years, Porter's theory of five forces enjoyed both extensions (Brandenburger and Nalebuff, 1995; Bowman and Faulkner, 1997) as well as critiques: Coyne and Subramaniam (1996) argue that the five forces theory is based on questionable assumptions (as suppliers, buyers, and competitors are acting independently).

Reckoning the importance of strategy as path to success, Mintzberg, Ahlstrand and Lampel (1998) identified ten „schools of thought for strategy formation". However, based on sound consulting practice, they confessed that rigid strategic plans do not always work practice.

Aware of the challenges of the new millennium, Kim and Mauborgne have developed the *Blue Ocean* theory on strategy (Kim and Mauborgne, 2005): „Blue ocean strategy challenges companies to break out of the red ocean of bloody competition by creating uncontested market space that makes the competition irrelevant. Instead of dividing up existing – and often shrinking – demand and benchmarking competitors, blue ocean strategy is about growing demand and breaking away from competition." Having the *value innovation* as core concept, Kim and Mauborgne change the rigid classical strategic planning framework and move the focus on *customer satisfaction, demand, and continuous innovation. Blue Ocean* strat-

egy is, actually, closer to marketing strategies as seen in Kotler's newer editions (Kotler and Keller, 2011) rather than traditional strategic planning (which might still be appropriate for large companies). Whereas the research on success key-factors of large companies has offered significant results in seminal books – as Norton and Kaplan's (2001) or Collins (2001) and Collins and Hansen, 2011) – the *literature on small business is rather limited.*

The impact of technology is largely acknowledged – either directly or indirectly (technology accelerators or other types of support services). New business models are „reinvented", focusing on „customer value proposition" (Johnson, Christensen and Kagermann, 2011) and the roles of innovation and intellectual property are largely acknowledged (Peters, 1997; Rivette and Kline, 2000; Davis, and Harrison, 2001; Christensen, 2003).

Starting with Schumpeter (1947) and other followers (Ohyama, Braguinsky and Klepper, 2009; Śledzik, 2013) that shared his view that entrepreneurship is actually innovation, and continuing with Drucker (1985) that reckons the organic link between innovation and entrepreneurship, the „entrepreneurial myth" (Gerber, 1986) was revisited almost a decade later (Gerber, 1995) and, as recently as 2014, the serial entrepreneur Peter Thiel emphasized the role of start-ups in „building the future" (Thiel with Masters, 2014). Most authors dealing with entrepreneurship and small business development *admit that location is important for the start-ups to succeed* (Stokes and Wilson, 2010; Mariotti and Glackin, 2010; Hisrich, Peters and Shepherd, 2012). Consequently, choosing the business location for a start-up is a key-decision, even during the preparatory stage of the business planning (Scarlat, 2017). Thus, the title of this paper contains somehow a rhetorical question: on one side, the company strategy is organically linked to the business location; on the other, the common knowledge (sometimes „the common knowledge" is supported by nothing else than simple but deep-rooted mind-sets) says that „location is everything: location, location, and location". Even so, this paper brings on some counterintuitive, practical examples that contradict the common knowledge; they demonstrate that, besides location, there are other factors that make the business successful. The remaining of this paper is organized in two main sections: (i) Business location in the framework of urban planning, generally valid in any industry; and (ii) Notable differences between different service businesses competing in the same industry (food and beverages service industry in our case), in the same location; as well as conclusions, implications, and further research avenues.

The Importance of Urban Planning

In spite of its criticality, the issue of decisions linked to the business location, is brought – at its best – in case of start-ups and small business management (Stokes and Wilson, 2010, p. 341): „In a start-up situation, or at a critical point of a business, the location and type of premises becomes an important decision. The owner-manager has to answer some critical questions" – as: Where is the business to be located? What types of premises are needed? Are the right premises available? (*Ibidem*, pp. 342-343). The following example (*Example 1*) presents the problem from the opposite side (the owner of the facility who is looking to let it).

Example 1. Bucharest, Romania, mid 90s: A landlord owns a small apartment in a central quarter, suitable for small business activity, free to let. During a period of about three years, a number of different types of small businesses have rented the apartment, and, unfortunately, all of them failed because of small number of clients. Eventually, a medical doctor has opened there her dentistry business, and *this business*, finally, proved to have enough clients and be successful! A follow-up research on the history of that location (interviewing the venerable neighbours) uncovered the fact that there, before the second world war (i.e. before the communist „intermission") a *similar dentistry business was active as well.*

The case presented in *Example 1* made the author think about possible generalization, in that specific situation of relatively crowded urban areas: exploring a database of more than one hundred clients of a business development centre, he has identified other five examples of small businesses (shoe-repairing shop; restaurant; lawyer's office; retailer of construction materials; tailor's) that proved to be successful in the same locations – where quite similar businesses successfully operated before the war (confirmed by interviewing elderly neighbours and/or their heirs). Apart of other numerous non-confirming cases, these positive cases shared a common feature related to location: there were old buildings (more-or-less remodelled and/or renovated) positioned in urban zones that did not suffered major urban construction or demolition works during the communist period.

Wrapping-up: the dynamic process of establishing a small business in a convenient location (i.e. enjoying a sufficient population density to be converted into significant demand) is a result of supply-and-demand economic mechanism, influenced by a number of external factors (Ghiță, Scarlat, 2012; Scarlat *et al.* 2013; Ghiță *et al.*, 2013). The urban planning considers these factors when new residential areas and/or office space are developed.

Opposed to the common knowledge (mind-set?) that earliest (few) businesses reject new comers, *Example 2* illustrates cases of business concentration (agglomerations of many small businesses from the same industry, in the same urban location – regardless the type of business). Visible evidence: the names of the streets in large and relatively old cities that still keep their middle-age names – related to by-then, looked-for occupations. Large population and high density allow concentrations of similar businesses in the same area (even same street).

Example 2. Several traditional names of the streets, in old quarters of Bucharest, Romania: *Cavafi* (Shoe-makers); *Șelari* (Saddlers); *Covaci* (Blacksmiths); *Căldărari* (Pail-makers); *Șepcari* (Tailors); *Blănari* (Fur-coat makers); *Mătăsari* (Silk-traders); *Orzari* (Barley-traders);

Făinari (Flour-traders); *Zarafi* (Money-traders), etc. Similar examples could be found in other old cities as well (in London there are: Butcher Row; Baker St.; Market St.; Food Market; Trader Rd. etc.)

Differences Within the Same Service Industry

If the previous section has spectacularly explained the pattern of successful business combinations (business type & specific location), the urban planning hardly explains the curious situations (Figures 1-3) where same type of businesses (restaurants), in same location (downtown Turin, Italy), at the same point in time (same moment but different hours and days from case-to-case: morning on May 29, 2017 in figure 1; evening on June 1, 2017 in figure 2; and middle of the day on June 4, 2017 in figure 3), have totally opposed results in terms of sales.

Figure 1 – *Two adjoining restaurants in Turin, Italy, on May 29, 2017*

Figure 2 – *Two adjoining restaurants in Turin, Italy, on June 1, 2017*

Figure 3 – *Two adjoining restaurants in Turin, Italy, on June 4, 2017*

One restaurant terrace is enjoying significant number of customers; while the other, just-bordering-terrace, is simply void (in spite of not being closed at all). These different situations (clients *versus* lack of clients) are ultimately leading to different business results: success and, respectively, failure.

In order to avoid an argument that only Turin or Italy is a special place where this curious business phenomenon is happening, and only in the May-June period, other three examples are presented (Figures 4-6): they demonstrate the same strange association of two adjoining restaurants from three different cities from three different countries: one large metropolitan area including a large commercial seaport (Antwerp, Belgium, figure 4); one small but famous university city from extreme Western Europe (Coimbra, Portugal, figure 5); and one touristic city in Eastern Europe (Brașov, Romania, figure 6).

The astonishing differences cannot be explained by impact of external factors – as presented in previous section; they are the results of internal factors, have inner business reasons. Not surprisingly, in-depth observations and interviews reveal deficiencies related to business *low efficiency, poor quality of de service, lack of interest for innovation, and low customer responsiveness.* Further in-depth interviews might offer lots of additional information.

In addition to overall quality of service (people and ambiance included), local or external factors – even weather! – may have a decisive role. For example, the differences revealed in figure 7 (the touristic site of Zaghuan, Tunisia) are simply the effect of shade in hot days! … Or not?! In figures 8 and 9 (La Valetta, the touristic capital city of Malta) the two couples of neighboring terrace restaurants are enjoying about same amount of shade, under pretty similar sun umbrellas.

All cases presented in the pictures refer to a particular type of service business, namely food and drink shops. However, they share a specific characteristic, a certain profile of restaurants: all are terrace-restaurants. The reason behind is that only this category allows to present the two different restaurants *simultaneously* (to take them both into the same photo-frame). In other words, each photograph (figure) is taken in such a manner to display both adjacent restaurants with similar profiles, at the same instant (when the picture was taken).

The photographs show situations from six different cities, from one North African and five European countries. They are picked from a larger collection, taken by author over a period of several years (2011-2017), in different large cities or touristic places with large population density and/or population flow, situated in different countries; *the exposed phenomenon seems to be general.*

Figure 4 – *Two adjoining restaurants in Antwerp, Belgium, on November 21, 2014*

Figure 5 – *Two adjoining restaurants in Coimbra, Portugal, on May 29, 2011*

Figure 6 – *Two adjoining restaurants in Brasov, Romania, on August 12, 2015*

Figure 7 – *Two adjoining restaurants in Zaghuan, Tunisia, on May 7, 2017*

Figure 8 – *Two adjoining restaurants in La Valetta, Malta, on August 2, 2015*

Figure 9 – *Two adjoining restaurants in La Valetta, Malta, on August 4, 2015*

Conclusions

Summarizing, the main conclusions are the following:

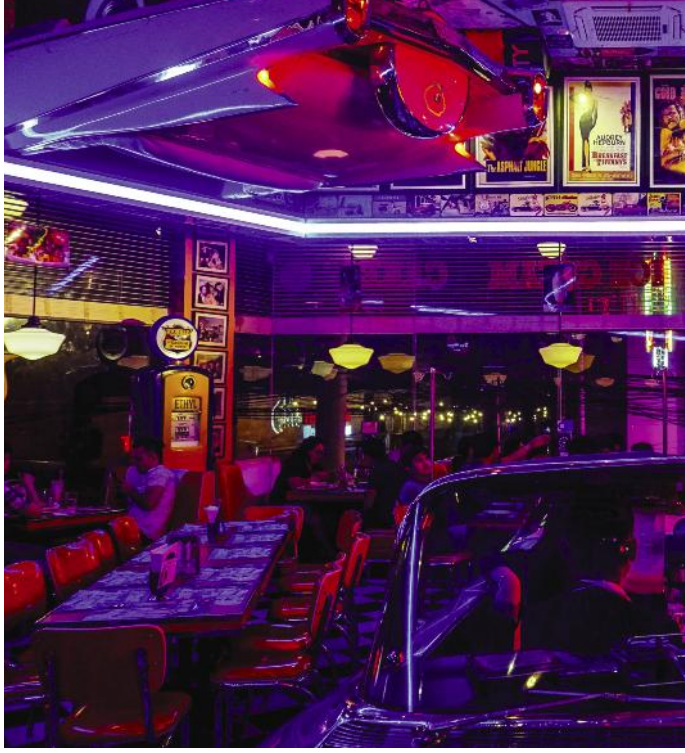
(i) When developing new urban zones, the urban planning plays a key-role in identifying appropriate locations associated to small businesses from different industries (which are under the complex influence of many internal and external factors). When dealing with well-established old urban areas then historic experience and data are of great use (*Example 1*).

(ii) Concentrations of small businesses from the same industry may also be found in well-established urban areas (*Example 2*). One specific type of small business is universally concentrated: in large, old cities, terrace restaurants are usually concentrated in the „old city" quarter.

(iii) As figures 1-9 illustrate, in case of food and beverage industry (terrace restaurants, specifically), other than micro-location, visible or invisible „minor differentiation factors" might have vital effects (*i.e.* the difference between success and failure).

The examples given in this provoking paper highlight the idea that decisions on business location are of critical importance for small businesses to succeed. Unfortunately, there are scores of factors that influence the location decision; yet, fortunately, the urban planning principles as well as new heat-mapping software and GIS-type technologies are of definite help in this respect.

In addition, the service industries whose locations are the very point of client contact and service delivery (as hospitality industry in general and, in particular, food and drink shops) are impacted by softer



factors that can make the difference between business success and failure. The observed results are in line with Hill and Jones (1995) who state that companies build *competitive advantage* through functional-level strategies, aiming at *achieving superior efficiency, superior quality, superior innovation, and superior customer responsiveness*. In this respect, in-depth further research on influencing factors might be an attractive future research avenue. This particular behaviour of service businesses active in hospitality industry might be explained by their position in the service process matrix (Lovelock, 1988, p. 33), characterized by high degree of interaction and customization, and low degree of labour intensity. In such cases as described in figures 1-9, deeper investigation on those „minor factors" that could make the difference between profit/success and loss/failure might be subject for further studies and lessons learnt for entrepreneurs.

A challenging path for future investigation might be to find out if similar types of small businesses in service industry (as for-profit medical clinics) present analogous tendencies.

The paper's conclusions and implications are important for both theorists (Mohd Noor *et al.*, 2012; Chiu *et al.*, 2013; Kasim *et al.* 2013) as well as entrepreneurs, small business owners and owner-managers – helping them to make appropriate location decisions, mostly in hospitality industry (specifically regarding locations for food and drink shops). In addition, existing entrepreneurs could improve the quality of their services, to better satisfy their customers (by actively observing the competitors in the neighborhood).

NOTE: *This paper is based on author's previous research work* (Scarlat, Ghiță and Magano, 2013; Scarlat, 2017), *amended and updated.*

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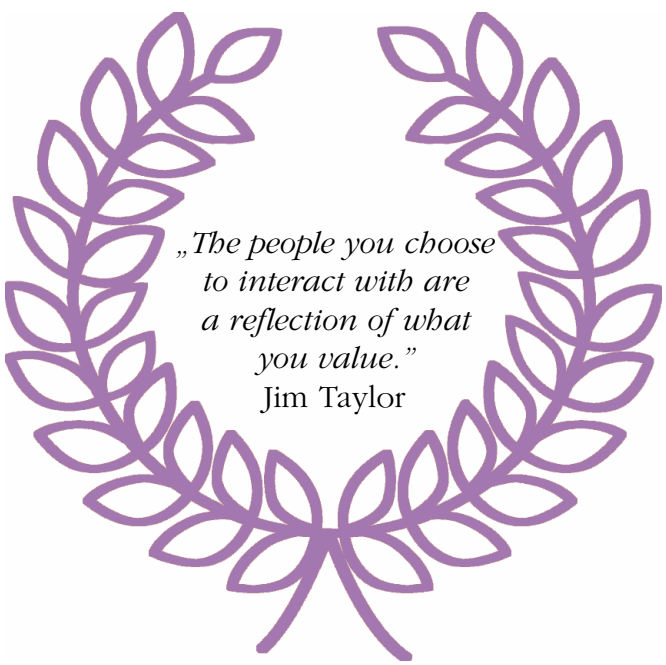

The Integrated Model of Innovation

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Abstract

The paper revises a number of global best practices in innovation approaches and innovation leadership and presents an original structured approach to innovation: Integrated Model of Innovation – IMI. The aim is to provide an instrument for innovation to be approached in a structured manner, using appropriate tools and steering, leading to more effective, sustainable and successful innovation. Innovation is currently a topic of interest for all major stakeholders of the society: academics, business environment, and public policy makers. Innovation affects societies todays more than ever. European Union is mentioning innovation as one of the major concerns on its 2020 agenda. It is therefore most valuable to study and to propose structured approaches to innovations, and to revise tools and methods during this process. Integrated Model of Innovation IMI moves innovation from a fuzzy buzzword to a tangible concept while pinpointing the critical moments of the innovation process. The material presents a roadmap and a toolbox for the current innovation endeavours, at the same time insisting on the importance of the innovation team set-up and innovation leadership.

Keywords: innovation, process, innovation team, leadership, sustainable

Introduction

Innovation is the implementation of something new, and this new thing must have economic implications and the thing will satisfy a specific need in the society. In our view, innovation is the transformation of the ideas in value to the organisation (at macro-level the organisation can be the society, the environment or humanity as a whole). But people define innovation in different ways depending on the scope of the newly implemented things.

„I have learned to value the things others are reluctant to give."
Bernard Beckett

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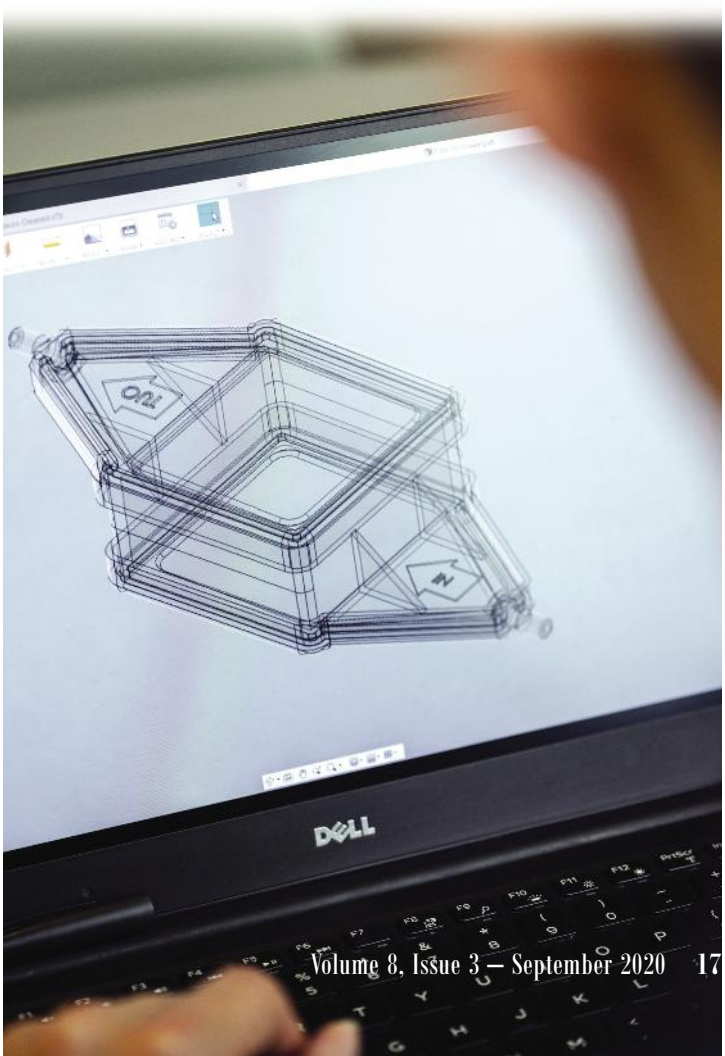
For example, in business concept innovation would refer to turning an idea into a situation that adds value to the customer perspective. Another view of innovation is any variation that goes as long as it addresses customer and organization needs. A technical way of defining innovation is the execution of a brilliant idea and communicating it in such a way that it fully accepts the initial concept. Therefore, innovation is a process which begins with the inception of an idea by an individual then is developed in such a way that it gains relevance as it benefits the members of the community. The aim of this paper is to explore the practices, approaches, models and the process of innovating something and to present the Integrated Model of Innovation.

The Integrated Model of Innovation

There are various practices that managers and individuals apply in order to develop something new that will benefit the whole society. According to Zairi (2010), modern innovation is highly dependent on resources and management practices used in the process. Innovation is a process that requires resources from organization performance to make changes to brands and products in the organization. For better resources of innovation, there must be one of the following practices in the application; learning practices, cost savings, continuous improvements, waste reduction and tight management control. The application of these practices will ensure that innovative process is not stretched to an extent of diluting the efforts applied in the process. Zairi (2010) explained that the best practice for the management to use to ensure that the innovation process is a success is through having a cost-benefit analysis that will ensure that the short, medium and long-term objectives are addressed before developing that new product. Cost analysis practice is done through assessing the side of opportunity, levels of risks involved and the strategic impact of developing that product. Rafinejad (2007) added that managing risk is necessary because mitigation of such actions will serve the intended objectives.

Rafinejad (2007) explained that organizational structure is a good practice that will ensure that the execution of innovative ideas is a success. For instance, one practice in the organization that will ensure successful innovation is through the integration of technologies and resources. Managers ensure the integration of these resources takes place in the right way by




Mihai Svasta

making priorities, tracking changes, holding meetings and performing trade-offs between the various alternative ideas that they have. Managers have a practice of ensuring that the subordinates receive timely direction to optimize their work. The team members have to ensure that they have the same sense of direction that will serve a common objective and make sure that the whole job is done. Other essentials of best practices in innovation are accountability that is in-built at all levels of development, having an understanding of the essence and purpose of the project, have a plan and discovery method and lastly have an agile decision-making process (Rafinejad, 2007). The application of these practices discussed above ensures that there is a logical coordination of the innovation process activities and successful implementation.

An innovation model is a system or template that is followed to ensure that the innovation process is successful. Such a model will show the financial viability, mission or even the process that will be used to yield good fruit. Thus an innovation model is a framework of the innovation process. The topology model adopted by the organization will depend on the type of both the organization and the product to be developed. According to Gallouj *et al*. (2010), one of the most common models used is the R&D based innovation model. This framework bases the process of innovation is separated from the practices of the organization thus giving a logic of activities from the idea stage to implementation of the idea. This form of model ensures that the various processes necessary for the development of the new product are followed to the latter. Godin (2017) said that system model is another kind of innovative framework that focuses on the interactions of actors in the process of developing the new product. It stresses the relationships between organizations in the integration of ideas into something concrete.

An analysis of time and space that is used by subjects developing the product will measure the efficiency of successful implementation of ideas into something relevant. There is also the process model that presents itself in a historical format and the various components of developing the product are arranged in a physical step that must be followed in that order. Godin (2017) explained that there is a linear model of innovation which has an invention to diffusion sequence that is similar to the process model. The difference

between these two is that the linear model is anthropological in nature meaning that the steps of innovation have been in use since time immemorial, while the process model has the various tasks developed by the owner that must be followed for the execution of the idea.

Design Thinking is an approach to innovation that deals with creativity by applying the cognitive capabilities of individuals to come up with something new. It is a practical methodology for actualizing ideas and concepts to create a resolution for problems and issues. Design Thinking attempts to inspire the essential element of creativity, the ability to take an abstract idea and create something with it. It's based upon the fundamental belief that an unexecuted idea, one that is never realized, is a worthless and that developing the idea is equally as valuable as thinking. Mootee (2013) explained that design thinking is integrative in nature and the benefit of using it in the organization is that high quality and unique products are developed.

Sniukas (2015) said that design thinking has five distinct stages before coming up with the product. The design firm IDEO uses design thinking in making its products and apply the model to business. Discovery is the first stage which is a phase of collecting data that will inspire in developing new business model. Data is obtained directly from the customers so that the information is analyzed and used in the second stage of interpretation. This stage involves mapping making sense out of data gathered. Analysis of such data gives clear opportunities for innovative business. The third step is ideation which involves seizing the opportunities and try them out through doing a forecast. The designer moves to experimentation where he tests the alternative business models available against the thought design to know the cost effectiveness of the new venture. Lastly, an evolution process is carried out to determine how fine the design is, and if it is likely to fail a re-design is done again.

An approach to innovation is the way that is used in achieving the objective of the process. Approaches, therefore, represent ways that are used in making something new. An approach to innovation is basically looking for a gap in a product or service and filling that gap in the most efficient way. According to Davenport *et al.* (2006), one approach that works best is having a co-creating mentality. The use of this way ensures that an innovation is based on the conditions that exist between the environments and are coupled with the business and government policies. The approach ensures that there is brainstorming among the parties to innovation, thus making efficient use of avail-

able resources to make something that is unique. Zacharias & Nicholas (2011) added that continuous development of the existing product is an approach to innovation because the old product is modified by adding more relevance to its use. The continuous development is done through improving product design, upgrading business model using and exploiting new technologies to create a new product or service. The innovation process focuses on the identification of opportunities for either new or existing product, and developing it.

Neese (2015) discussed a five-step innovation process that is followed by many individuals in making their products. The first step to innovation is idea generation and mobilization. The existence and creation of ideas by the firm are the first things that happen and then the idea is mobilized or moved to a different form such as logically or physically. Inspiration is key at this stage. The second stage is advocacy and screening of the various ideas that exists. The firm has to scrutinize the alternative ideas that they have because not all ideas are worth implementing. This stage eliminates all risks of loss and failure that may occur in the future. The third stage is experimentation where the idea is tested through piloting to see the viability of the success of such an idea. Various approaches are used at this stage to test the cost benefits of the idea. The fourth stage is the commercialization of the developed idea with an aim of creating a market. Promising potentials are made here to gain the loyalty of the intended audience. The process shifts from development to persuasion. The last stage is diffusion and implementation where the management accepts the innovative idea and sets up everything that is needed in making the idea fruitful.

In this context, the Integrated Model for Innovation IMI propose an integrated and same time circular approach to innovation (Figure 1). It pays attention not just to the process of innovation but also to the human dimension of it.

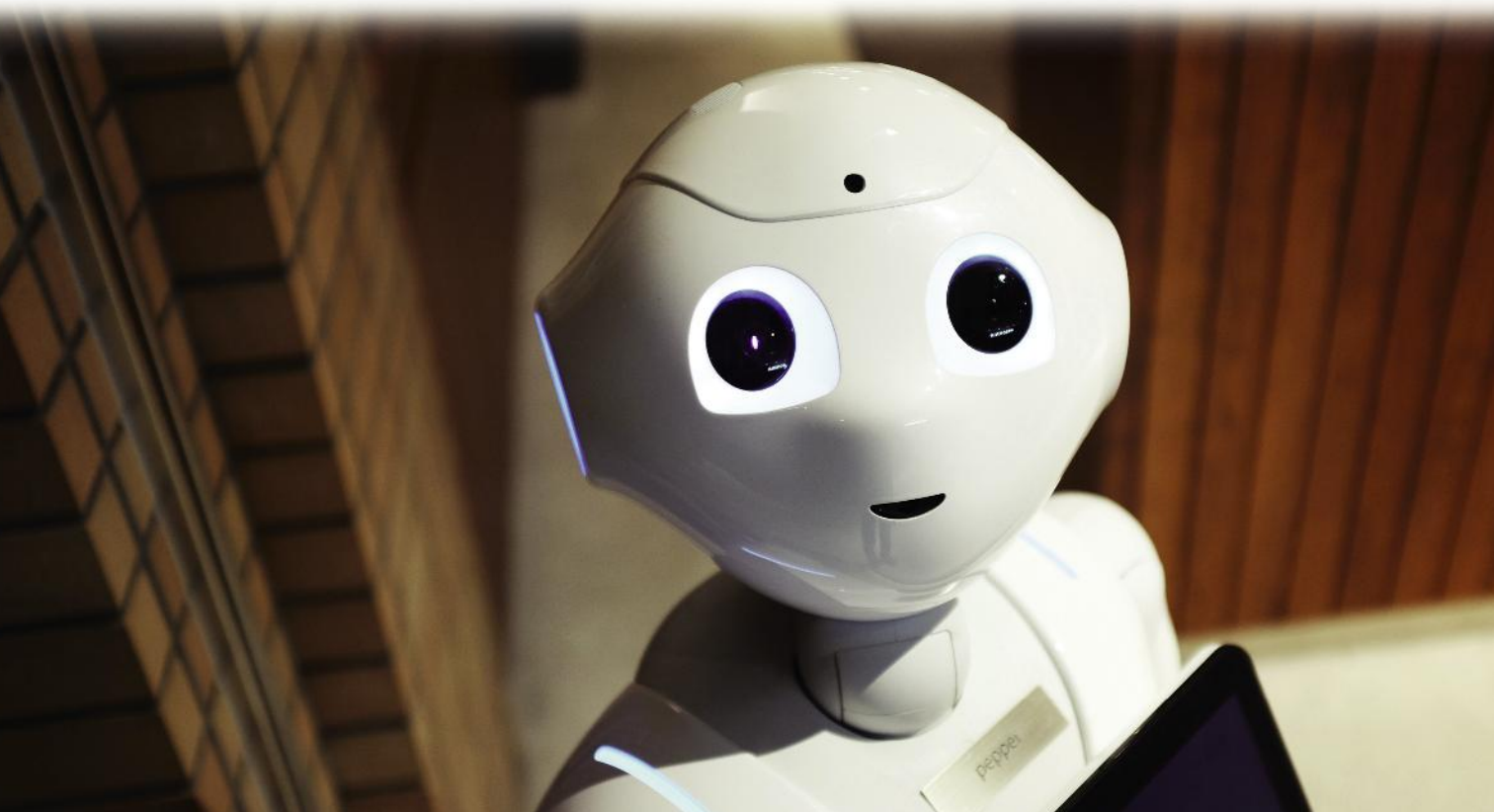
Figure 1 – *An approach of the Integrated Model of Innovation*

Inside the Skin

The reason for a human dimension of the innovation process is that humans lay at the heart of innovation. The command-and-control style of leadership is one that is not acceptable in today's workplace. The world has been transformed a lot, and as such, innovation has become the new tool that an organization should use to succeed in a tough marketplace. The market has continued to change rapidly with the economic environment increasingly becoming challenging. But as far as these tough times are concerned, businessmen and women have come up with new ways that would help them avoid being driven out of the market.

Among all these ways, innovation has been identified as the most needed strategy to move ahead and stay competitive. According to Brown (2009) a purely technocentre view of innovation is less sustainable now than ever, and a management philosophy based only on selecting from existing strategies is likely to be overwhelmed by new developments at home or abroad. As much as innovation is considered as a viable strategy to save many businesses, the way that an organization chooses to implement the innovation strategy is very important. It has been identified therefore that the best way to implement this strategy is to engage in collective knowledge that can be achieved by creating and leading a good innovation team.

As such, to create such an environment that would encourage innovation in the organization, the innovation leader has to be able to mentor the team. The leader should always make sure that the members have the freedom and the confidence of creating and establishing hot groups. Through mentorship, the leaders create an environment of safety that in turn enables the sharing of ideas openly and failure is not only tolerated but celebrated. The members should be encouraged to question the routines, processes, habits and



share their thought publicly. Creation of spaces where interactions and ideas are shared as well as systematic organisation of innovation workshops on specific topics are also vital for the creation and leading of a good innovation team.

But, the leaders need to trust themselves enough before trusting others. Innovation usually requires the breaking down of the older rules of thoughts and creating new ones. And breaking down the old rules of actions as well. Innovation principles should be therefore embedded in the leaders' everyday attitude and action. Leaders must be aware about the innovation process as they should drive the innovation culture. Furthermore, the element of trust should not only apply to the leader but also the members of the team. Through the accomplishment of this aspect, it will enable an individual to become more patient and a better team-player. Over time, the members and the leader will be made more grateful for the new experience and the relationship that has been developed and for the energy that emerged from the innovation process.

The innovation leader is also expected to be a courageous change agent in the sense that they must challenge each team member to think more critically and see things through a lens of continuous improvement. For this to be enabled, courage is usually an important aspect that the leader should have so as to enable him or her to take charge and embrace the role as a change agent. The team should also be equally charged to do the same (Llopis 2014). The acceptance of this role is like taking on an entrepreneurial attitude where risk is embraced as something normal and beginning to see opportunity in everything. But do not worry, innovation is very rewarding, even in its early stages!

The leader should be able to course correct along the way; this will enable him to find a perfect combination of people to build an innovation team. As utopia is related to perfection, course correction usually steers an individual closer to the innovation culture that he or she could be attempting to create. It also keeps the leader and the team members on toes besides teaching those ways of adapting to new environments whereby they can showcase their skills and abilities in different circumstances and situations.

It should be understood that innovation cannot happen in isolation but rather through the collective sharing of ideas. Several renowned innovative companies such as Apple, Microsoft, Google and Intel do not depend on the hard work an individual and his tenacity, but rather a team working together led by a committed leader. As such, the use of innovation teams is very much vital in encouraging innovation in an organization besides having a dedicated and visionary leader. In this vision, Integrated Model of Innovation puts a special focus on the teams, the construction of the eclectic innovation teams and their leaderships.

Outside the Skin

There are no success receipts and guarantees for innovation, and this hinders very often the initiative for innovation. Similar to other innovation approaches, the Integrated Model of Innovation – IMI provides a methodology to start the road to unknown which is innovation, trying to consider the most relevant stages. The model propose 8 stages to be gone through on the road to innovation. They are presented in the Figure 2.

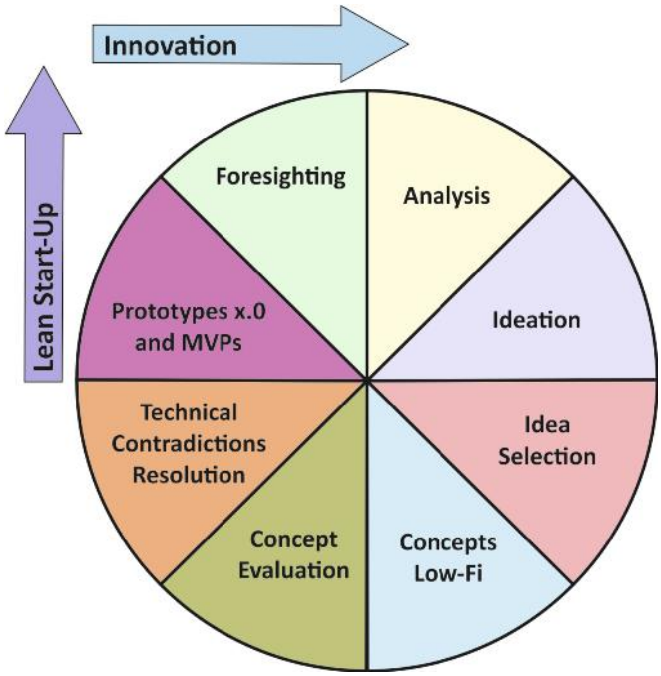


Figure 2 – *Theoretical symmetric model*

In a theoretical model these steps are presented equal; however this is probably never met in reality of the economy. Based on the practical experience of the researcher (although no detailed research was conducted on this) we propose an indicative split pictured in the Figure 3.

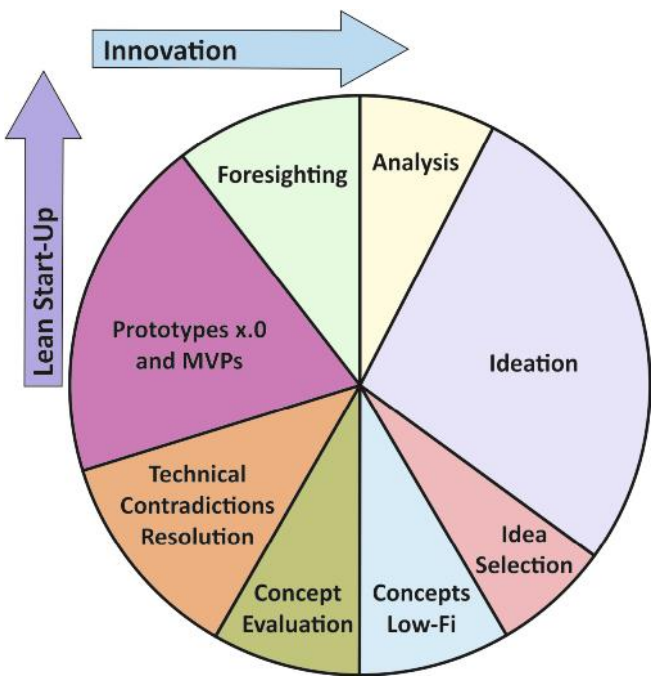


Figure 3 – *Reality based empiric model*

One may consider that the innovation process as imagined by the Integrated Model of Innovation IMI follows a liner circular process. In reality, it is very often that we iterate in our process, coming back to different stages of the model, as requested by the reality of the innovation process.

For instance, the Technical Contradiction Resolution step might require new Ideation sessions and very often the Prototyping phase is sending the researcher and the engineers back to the Analysis or Ideations steps.

In reality, the best way to graphically express the time disposal of the Integrated Model of Innovation IMI is a spiral, a loop (Figure 4). The number of loops is not fixed, the innovation team might iterate several times until they reach a final acceptable and sustainable solution. The figure below represents a proposal for a graphical representation of the innovation process in the acceptance of the Integrated Model of Innovation – IMI.

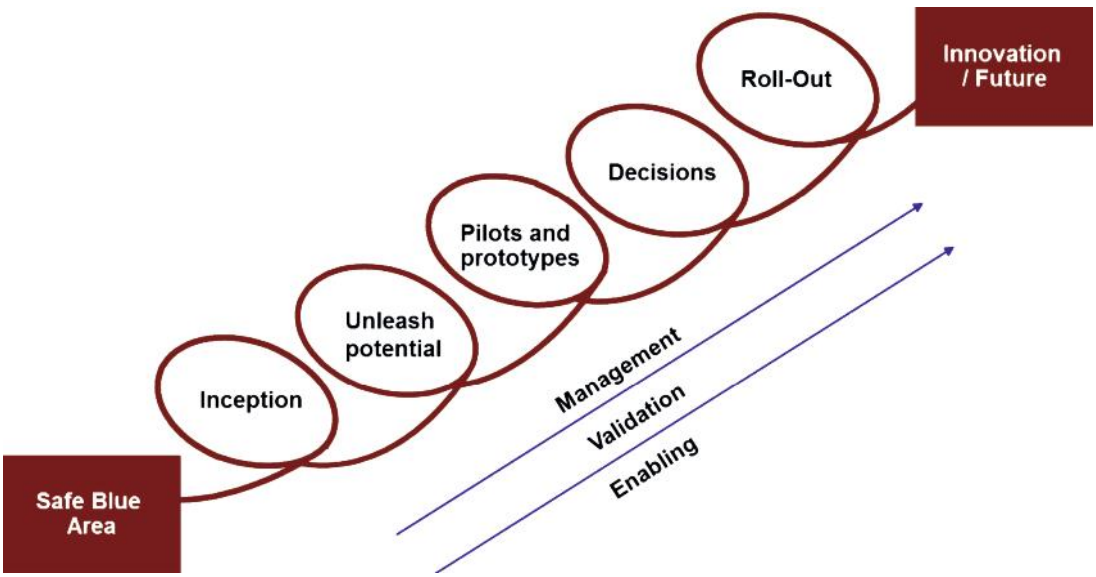


Figure 4 – *The circular approach process*

Conclusions

Innovation is a process that has various components that must be followed to ensure that it is successful. The practices of management and subjects to the process must be looked into. Practices such as resourcing, assuming leadership, setting objectives and making control are key to innovation. Managers adopt various models such as the system based model, the R&D model, the process model and system approach. The combination of approaches, models, and practices ensure that the innovative process becomes successful. What is particular to the Integrated Model of Innovation – IMI is that it attempts to extract the quintessence from all mentioned approaches while proposing a close integration between the human dimension and the process dimension of the road to innovation. This integrated approach leads in the end to a modified culture in the organisations, creating the appropriate ecosystem for sustainable continuous innovation.

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„Value is not made of money, but a tender balance of expectation and longing."
Barbara Kingsolver

Creating Value in the Supply Chain

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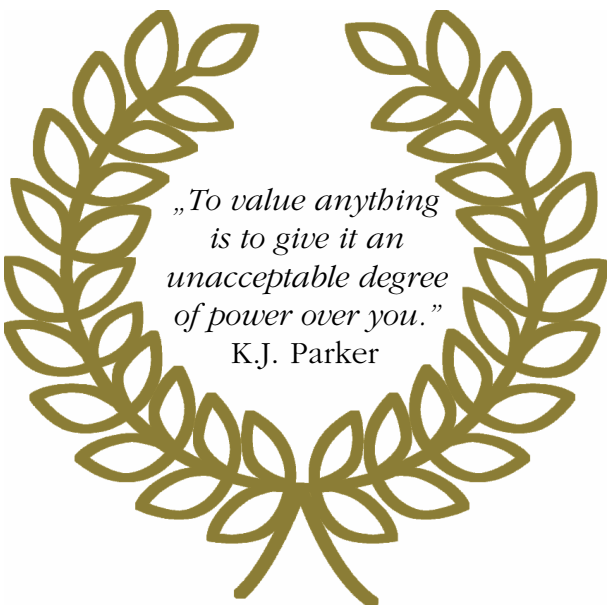
Abstract

The main goal of this study is to understand if logistics performance could contribute to companies' market share value in Romanian Oil industry. The relationship between logistics performance and market share will be analyzed through correlation and regression, used to test the research hypothesis. Results showed that the impact of logistics performance changes according to the company market share value. Based on this, companies should put together SMART logistics strategy, based on unpredictable competitive environment, in order to be able to adapt quickly to the changes coming from the market. Only like this, the market share value can be kept.

Keywords: logistics performance, market share, Romanian oil industry logistics

Introduction

In the modern society, there is a great interest in creating added value, being a key performance company, finding the right combination of pillars used to deliver faster and efficient, with the right strategies that create performance and value. An important focus is on the logistic function, as part of the organization competitive advantage, how to maximize the overall value of the company, through a better using and deployment of resources across the organization. Across the years, logistics has evolved from a simple classic transport function within organization to a key cross-functional, strategic and global discipline (Grant *et al.*, 2006). Since 1950,



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logistics advanced, due to the trend of nationalization and globalization and therefore, the importance of logistics management has been growing in various areas. For industries, logistics helps to optimize the existing production and distribution processes based on the same resources through management techniques for promoting the efficiency and competitiveness of enterprises (Alessandro Vitale, 2014).

Logistics generate performance through the accommodation of customers' requests, respecting the seven-R formula, the organization's ability to deliver the right amount of the right product, at the right place, at the right time, in the right condition, at the right price, with the right information. Logistics performance is defined as the degree of efficiency, effectiveness, and differentiation linked with the accomplishment of logistics activities (Mentzer *et al*., 2004). The logistics function as a whole should strive to reduce the ratio of resources utilized against derived results (efficiency), accomplish pre-defined goals (effectiveness), and gain superiority in comparison with competitors (differentiation) (Tuan, 2017).

In today's global marketplace, keeping a competitive position and a stable market share value are the principal concerns. The face of the competitive arena has changed dramatically due to technological innovations and economic uncertainties. Several industries have developed from slow moving, stable oligopolies to hypercompetitive environments identified by powerful and rapid competitive moves, in which competitors strike rapidly, unpredictably, and unconventionally and advantages are quickly created and difficult to maintain. Nowadays, the period of sustained competitive advantage and stable market share have shortened over time.

A good example of industry, which has the most unpredictable competitive environment is the oil industry. Oil industry has one of the most complex and challenging logistics, as the raw material (crude oil) of this industry in present in way or another in almost all the other industries of the global market. The strike of the competitors in this market are the most unconventional ones compared with any other industry and that's why market share of a company is difficult to keep and improve. Even with these rough conditions, logistics can create performance and contribute to maintain market share.

The trend of focusing on logistics has formed a desire for companies to enhance and sharpen their logistics capabilities. Such capabilities play a role in a company's competitive advantage and market share through generating cost leadership and differentiation. For companies to be able to sustain a competitive position and a certain value of the market share, they

should retain the necessary logistics flexibility to act on to the nature of the altering marketplace.

Research Hypotheses

The research goal is to evaluate the contribution of logistic performance on achieving the market share in Romanian Oil market, following Porter's 3 dimensions: Cost, Differentiation, and Focus (Porter, 2011). The logistics performance areas that the research analyse are: Customers Habits, Infrastructure, Shipments, Competence, Tracking, and Timeliness. Therefore, this research will analyze the relationship between the independent and the dependent variables. Data, for this study was gathered with the help of a survey, that was addressed to stakeholders from Romanian oil industry (Customers, Supplier and Companies Logistics Responsible). The questionnaire had 27 questions and 260 answers were received. In the questionnaire assigned, the questions were adopted to measure the dimensions under study by implementing a 5-point Likert-scale used for all responses with (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

For testing the responses, it was used the hypothesis testing method, as is a form of statistical inference that uses data from a sample to draw conclusions about a population parameter or a population probability distribution. With the help of regression and correlation were checked the regression relationship and the correlation coefficient, from statistical significance point of view. A goodness-of-fit test refers to a hypothesis test in which the null hypothesis is that the population has a specific probability distribution, such as a normal probability distribution. Nonparametric statistical methods also involve a variety of hypothesis-testing procedures. Therefore, the research hypotheses are the following:

- **H1:** There is a significant positive relationship between Logistics Performance and Cost Dimension.
- **H2:** There is a significant positive relationship between Logistics Performance and Differentiation Dimension.
- **H3:** There is a significant positive relationship between Logistics Performance and Focus Dimension.

Research Model is in Figure 1.

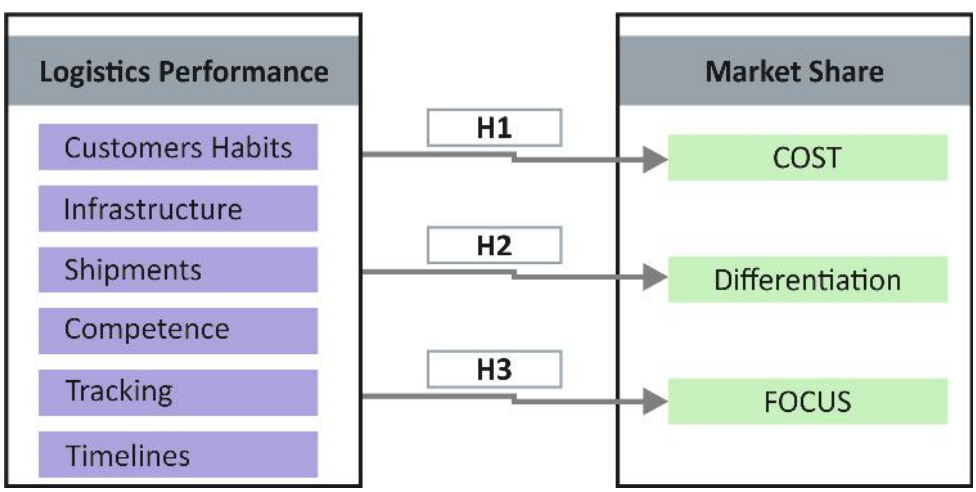

Figure 1 – *Research Model*

Data Analysis

As a first step of the data analysis, were run the validity and reliability checks through frequency. Based on this, for each on the research variables were created the frequency tests. The variables under study are Logistics Performance – Customs, Infrastructure, Shipment, Competence, Tracking and Timeliness against Market Share Cost, Differentiation and Focus Dimensions (Table 1). Frequencies will be a measure of customers opinion towards factors of each dimension with a scale from 1 to 5, where 1 refers to „Strongly Disagree", while 5 refers to „Strongly Agree".

Table 1 – *Frequencies of Logistics Performance Dimensions*

Dimensions	Frequency					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Customers Habits	113	30	50	49	18	260
Infrastructure	89	108	50	10	3	260
Shipments	65	101	45	44	5	260
Competence	97	117	37	8	1	260
Tracking	71	120	45	10	14	260
Timeliness	80	134	43	1	2	260

Analyzing the results of the frequency we could see that there were few responses for „Strongly Agree". Most of the respondents selected „Disagree" for all the dimensions, except for the Customer Habits where the majority responded with „Strongly Disagree". Table 2 is presenting the frequency results for Market Share Dimensions. Most of the responses were for „Disagree", for all 3 dimensions.

Table 2 – *Frequencies of Market Share Dimensions*

Dimensions	Frequency					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Cost	85	122	47	5	1	260
Differentiation	57	101	49	43	10	260
Focus	42	132	33	33	20	260

Hypotheses Testing. Hypotheses testing would be done through Correlation matrix and regression models.

Testing the H1 hypothesis – Impact of Logistics Performance on Cost Dimension.

Table 3 presents the correlation matrix results between Logistics Performance dimensions and Market Share Cost. From Spearman's results we can conclude that the correlation coefficient between Logistics Performance – Customers Habits, Infrastructure, Shipment, Competence, Tracking and Timeliness and Market Share Cost is – 0.401, 0.218, 0.201, 0.073, 0.173, 0.528 respectively with P-value of 0.000 for all dimensions except for Competence with

P-value of 0.173. These values show that there is a positive significant weak relationship between Infrastructure, Shipment, Tracking and Cost while there is an insignificant relationship between Competence and Cost. Also, there is a negative significant moderate relationship between Customer Habits and Cost.

Table 4 shows the results of a multiple linear regression model to test the impact on Market Share Cost, as the dependent variable, using Logistics Performance dimensions, as the independent variables. The coefficient of determination (R Square) is 41%. Such percentage implies that the model explains 41% of the variation in Market Share Cost. The P-value for the model equals 0.000 which implies that Logistics Performance has a significant impact on Market Share Cost at 0.05 significance level.

Base on the results, the first hypothesis is partially supported.

Table 3 – *Correlation matrix between Logistics Performance and Market Share Cost*

		Customers Habits	Infrastructure	Shipments	Competence	Tracking	Timeliness	Cost
Customers Habits	r	1						
	P-Value							
	N	260						
Infrastructure	r	0.134	1					
	P-Value	0.003						
	N	260	260					
Shipments	r	0.045		1				
	P-Value	0.375	0					
	N	260	260	260				
Competence	r	-0.004	0.139	0.141	1			
	P-Value	0.93	0.002	0.001				
	N	260	260	260	260			
Tracking	r	-0.012	0.004	0.149	0.168	1		
	P-Value	0.762	0.903	0.001	0			
	N	260	260	260	260	260		
Timeliness	r	-0.175	0.236	0.192	0.231	0.224	1	
	P-Value	0	0	0	0	0		
	N	260	260	260	260	260	260	
Cost	r	**-0.401**	**0.218**	**0.201**	**0.073**	**0.173**	**0.528**	**1**
	P-Value	**0**	**0**	**0**	**0.173**	**0**	**0**	
	N	**260**	**260**	**260**	**260**	**260**	**260**	**260**

Table 4 – *Regression Model of Logistics Performance on Market Share Cost*

	Unstandardized Coefficients		Standardized Coefficients			R-Squared	F	P-value
Model	B	Std. Error	Beta	t	Sig			
(Constant)	1.315	0.14		8.548	0			
Customers Habits	-0.211	0.021	-0.334	-9.323	0			
Infrastructure	0.152	0.035	0.152	4.123	0			
Shipments	0.077	0.03	0.086	2.397	0.13	0.41	52.858	0
Competence	-0.082	0.04	-0.081	-2.113	0.031			
Tracking	0.081	0.031	0.078	2.304	0.21			
Timeliness	0.445	0.046	0.382	9.835	0			

Testing the H2 hypothesis – Impact of Logistics Performance on Competitive Advantage Differentiation.

For testing the second hypothesis is used a correlation matrix between Logistics Performance dimensions and Competitive Advantage Differentiation. Tabel 5 shows the results where the correlation coefficient between Logistics Performance – Customers Habits, Infrastructure, Shipment, Competence, Tracking and Timeliness and Competitive Advantage – Differentiation is – 0.09, 0.201, 0.354, 0.119, 0.023 and 0.231, with P-value of 0.000 for Infrastructure, Shipment and Timeliness and P-value of 0.044, 0.012 and 0.581 for Customer Habits, Competence and Tracking.

Table 5 – *Correlation matrix between Logistics Performance and Competitive Advantage Differentiation*

		Customers Habits	Infrastructure	Shipments	Competence	Tracking	Timeliness	Differentiation
Customers Habits	r	1						
	P-Value							
	N	260						
Infrastructure	r	0.134	1					
	P-Value	0.001						
	N	260	260					
Shipments	r	0.032	0.287	1				
	P-Value	0.356	0					
	N	260	260	260				
Competence	r	-0.004	0.143	0.145	1			
	P-Value	0.91	0.002	0.001				
	N	260	260	260	260			
Tracking	r	-0.013	0.004	0.154	0.162	1		
	P-Value	0.762	0.901	0	0			
	N	260	260	260	260	260		
Timeliness	r	-0.174	0.228	0.187	0.224	0.217	1	
	P-Value	0	0	0	0	0		
	N	260	260	260	260	260	260	
Differentiation	r	**-0.09**	**0.201**	**0.354**	**0.119**	**0.023**	**0.231**	**1**
	P-Value	**0.44**	**0**	**0**	**0.012**	**0.581**	**0**	
	N	**260**	**260**	**260**	**260**	**260**	**260**	**260**

This means that Customers Habits has a negative moderate significant relationship with Differentiation while Infrastructure, Shipment, Competence and Timeliness have a Positive weak significant relationship with Differentiation. Furthermore, Tracking has an insignificant relationship with Differentiation.

Also, for this hypothesis it is calculated a linear regression model to support the correlation test results where Competitive Advantage Differentiation is used as the dependent variable while Logistics Performance dimensions are used as independent variables. The results of linear regression shown in table 6 below demonstrate that the model itself is significant with P-value 0.000 and coefficient of determination (R Square) equals 17 %. Infrastructure, Competence and Tracking have an insignificant impact on Differentiation. Based on the outcome, the second hypothesis is partially supported.

Table 6 – *Regression Model of Logistics Performance on Market Share Differentiation*

	Unstandardized Coefficients		Standardized Coefficients			R-Squared	F	P-value
Model	B	Std. Error	Beta	t	Sig			
(Constant)	1.336	0.219		5.787	0			
Customers Habits	-0.067	0.027	-0.091	-2.066	0.028			
Infrastructure	0.105	0.053	0.06	1.612	0.078			
Shipments	0.352	0.041	0.311	7.043	0	0.17	16.489	0
Competence	0.051	0.056	0.03	0.903	0.356			
Tracking	-0.076	0.046	-0.057	-1.52	0.125			
Timeliness	0.21	0.071	0,145	3.118	0.002			

Testing the H3 hypothesis – Impact of Logistics Performance on Market Share Focus.

The correlation matrix was calculated between Logistics Performance dimensions and Competitive Advantage Focus and the results are shown in Table 7. The correlation coefficient between Logistics Performance – Customer Habits, Infrastructure, Shipment, Competence, Tracking and Timeliness and Market Share Focus is 0.034, 0.328, 0.701, 0.181, 0.131, 0.148, with P-value of 0.000 for Infrastructure, Shipment and Competence and P-value of 0.004 and 0.001 for Tracking and Timeliness respectively and P-value of 0.31 for Customers Habits. These results indicate, that there is a positive significant weak relationship between Infrastructure, Shipment, Competence, Tracking, Timeliness and Focus while there is an insignificant relationship between Customers Habits and Focus.

Table 7 – *Correlation matrix between Logistics Performance and Market Share Focus*

		Customers Habits	Infrastructure	Shipments	Competence	Tracking	Timeliness	Focus
Customers Habits	r	1						
	P-Value							
	N	260						
Infrastructure	r	0.142	1					
	P-Value	0.002						
	N	260	260					
Shipments	r	0.041	0.291	1				
	P-Value	0.361	0					
	N	260	260	260				
Competence	r	-0.004	0.13	0.134	1			
	P-Value	0.918	0.002	0.001				
	N	260	260	260	260			
Tracking	r	-0.013	0.004	0.154	0.162	1		
	P-Value	0.761	0.905	0.001	0			
	N	260	260	260	260	260		
Timeliness	r	-0.174	0.227	0.187	0.223	0.216	1	
	P-Value	0	0	0		0		
	N	260	260	260	260	260	260	
Focus	r	**0.034**	**0.328**	**0.701**	**0.181**	**0.131**	**0.148**	**1**
	P-Value	**0.31**	**0**	**0**	**0**	**0.004**	**0.001**	
	N	**260**	**260**	**260**	**260**	**260**	**260**	**260**

The coefficient of determination (R Square) equals 50.5 %. Even though the P-value for the model itself equals 0.000 which means that the model is significant, yet, P-values for Customers Habits, Tracking and Timeliness are greater than 0.05 which denotes that they have an insignificant impact on Focus. Consequently, the results show that the third hypothesis is partially supported.

Table 8 – *Regression Model of Logistics Performance on Market Share Focus*

	Unstandardized Coefficients		Standardized Coefficients			R-Squared	F	P-value
Model	B	Std. Error	Beta	t	Sig			
(Constant)	0.55	0.174		0.313	0.737			
Customers Habits	-0.005	0.025	-0.006	-0.205	0.825			
Infrastructure	0.191	0.047	0.141	3.971	0			
Shipments	0.728	0.038	0.648	18.629	0	0.505	80.509	0
Competence	0.11	0.05	0.071	2.142	0.031			
Tracking	0.024	0.042	0.02	0.586	0.548			
Timeliness	-0.041	0.055	-0.025	-0.742	0.441			

Conclusions

The research goal was to identify the relationship between logistics performance and market share in the Romanian Oil industry logistics field. To be able to analyze the assumptions, correlation and regression checks were conducted between the dimensions of Logistics Performance and Cost, Differentiation and focus as dimensions of Market Share. The results show that Logistics Performance has a significant impact on Market Share Cost where the standardized coefficients calculated in regression analysis determine the importance of the independent variables with respect to Cost. Timeliness is categorized as the most important, followed by Infrastructure, Shipment and Tracking. The least important dimensions are Competence and Customers Habits.

Regarding the H1 hypothesis – Logistics Performance impact on Market Share Differentiation, it was found that the research variable as a whole has a significant impact while the dimensions Infrastructure, Competence and Tracking and in the same time, have an insignificant impact on Differentiation. Furthermore, the other significant dimensions ranked according to their more significant impact are Shipment, Timeliness and Customers Habits.

Moreover, Logistics Performance as a whole has significant impact on Market Share Focus, yet, Customers Habits, Tracking and Timeliness have an insignificant impact on Focus. Shipment is ranked more important with highest standardized beta value followed by Infrastructure and then Competence. Comparing R-Squared values, for the three regression models calculated, it was found that Focus Advantage has the highest value followed by Cost Advantage and finally Differentiation Advantage. This means that Logistics Performance has the highest impact on Focus Advantage.

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The Language of Risk Analysis

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Abstract

The aim of the paper is to provide fundamental notions on the methods and tools of risk analysis in reliability engineering with the aim to understand how, why and when a device may not function properly. Failure analysis presents a strong connotation of multidisciplinarity which significantly adds to its inherent difficulty. The components of risk, uncertainty, risk management, decision analysis, and the analytical techniques – usually the most cost-effective means of failure prevention – are thoroughly analysed.

Keywords: uncertainty, risk appetite, risk management, equipment reliability, performability

Introduction

Failure is an unavoidable phenomenon in all technological products and systems. From the scientific and engineering point of view, the investigation of the uncertain and 'obscure' domain of failures entails the exploration of the functional and physical limits of systems, in an effort to understand how, why and when a device may not function properly. In this respect, the required approach is complementary to the traditional engineering viewpoint which focuses on how and when a machine functions in an optimal way. Failure analysis presents a strong connotation of multi-disciplinarity which significantly adds to its inherent difficulty. This entails the acquisition of appropriate modelling and analysis tools as

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complement to the basic and specific engineering knowledge for the technological area of application.

Suppose a component of a dynamic system is undergoing random vibration. This component can fail for many different reasons depending on the material, the geometry and the type of loading. This component is designed so that it functions properly for a certain period of time. The time at which the part fails, T_f, varies from realization to realization, and is a random variable. Empirical evidence clearly shows that T_f, cannot be determined deterministically. „Identical components" subjected to „identical loads" will fail at different times, and the time to failure can only be described probabilistically.

Fatigue failure. When a part is subjected to cyclic loads, damage is done by repeated exposures or cycles. The part eventually fails when the accumulated damage reaches the total damage that a part can absorb. It can fail even at a much lower stress level that the yield strength.

When machines or structural members are subjected to repeated dynamic stresses even below the yield strength, they may exhibit diminished strength and ductility. When the cyclic stresses are continued, cracks in the material start to propagate and the parts may eventually *fracture*. This phenomenon is called fatigue, and the number of stress cycles prior to fracture is called *fatigue life*. Before failure, a fatigue crack spreads from a location with high stress concentration, which is due to imperfections in material, surface smoothness, and structural geometry.

As our society grows in complexity, so do the critical reliability challenges and problems that must be solved. The area of reliability engineering currently received a tremendous attention from numerous researchers and practitioners as well.

The deterministic approach has always provided intuitive and qualitative insights into risk and reliability of systems. The traditional deterministic approach to decision-making has also been risk-informed in nature as the „qualitative notion of risk" forms an integral part of decision-making, even in traditional approach to decisions. There is no explicit and clearly demarcated boundary between deterministic and probabilistic considerations for engineering systems, as these two aspects are overlapping and to some extent integrate into any engineering problem.

Risk and Uncertainty

Risk

The word „risk" has a wide range of meanings. A first, intuitive observation comes from the fact that there is *risk* if there exists a potential source of *damage*, or *hazard*. Generic risk research to a large

extent defines the risk science. Experience has shown that to agree on one unified set of definitions is not realistic. Risk quantification largely relies on the adoption of proxy measures whose reliability and precision is quite limited. Aside from pure financial risks, the perception of simplicity and objectivity disappears, unveiling an implementation process of risk appetite that is as complex and subjective as it is in non-financial businesses.

The first type of risk is to do with catastrophic events. Although such events are rare, their impact can be profound. Not only do they often lead to a totally unacceptable loss of life, major environmental problems, huge economic shortfalls, very bad public relations, civil litigation, and even criminal prosecution. These events also frequently have a major impact on the development of management systems and regulations. The second type of process risk is to do with troubleshooting. In such situations, the facility suffers from ongoing operating problems that eat away at profits and take up the time of key personnel. The causes of the problem are often hard to identify. The third type of risk is to do with what is referred to as RAM (Reliability, Availability and Maintainability, his topic is related to troubleshooting but implies a higher degree of predictability). Based on historical records, the failure rates and repair times of equipment items can be predicted and maintenance schedules can be set up so as to pre-emptively address potential problems. Management systems such as Risk-Based Maintenance and Risk-Based Inspection are often integrated with the RAM program. Investments in availability improvement programs are often very attractive because such investments have a disproportionate effect on profitability.

Risk is the volatility of unexpected outcomes; it is the deviation of expected earnings. Risk is the chance of an undesirable outcome. That outcome may be a loss or the failure to attain a favourable situation. In a certain world there is no risk because every outcome is known in advance. It is uncertainty that gives rise to risk.

Systemic risk research has a dual focus: preventive and curative. Policies and actions as well as data requirements required to prevent systemic crisis differ from those needed to recover from a crisis.

Without a well-defined definition of systemic risk and metrics for measuring the amount and nature of the risks, it would be difficult to effectively target regulatory mitigating action without running the real risk of doing more harm than good.

Figure 1 shows that as funds are initially expended on improved reliability, the incremental revenue is greater than the money spent (when factored over the normal capital investment period). However, there is an optimum point, above which a dollar spent on improved reliability generates less than a dollar in life cycle incremental revenue (i.e., the slope of the curve becomes less than unity). In practice, there is rarely sufficient data to be able to develop a curve such as Figure 1 with precision.

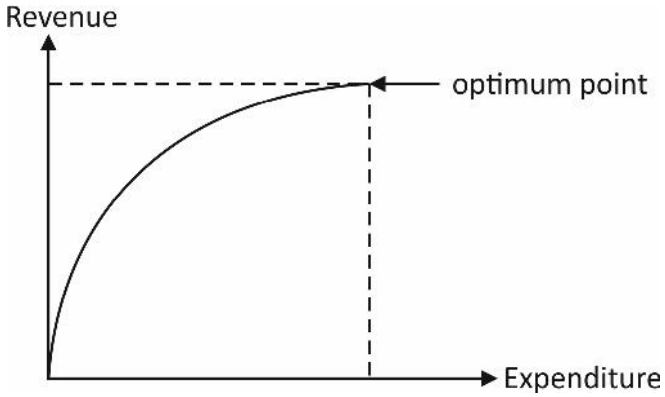

Figure 1 – *Reliability payout*

Nevertheless, it is useful to keep in mind that reliability program is not, in and of itself, its own justification. It has to demonstrate that an investment in reliability will lead to an increase in profits.

What are the *sources of risk*?

(a) Human-created: business cycle, inflation, changes in government policies, wars;

(b) Unforeseen natural phenomena: weather and earthquakes;

(c) Long term economic growth: IT innovations can render existing technology obsolete and create dislocations in employments.

We distinguish between *business risk and financial risk*. In the case of business risks:

(1) Business decision includes strategic risk, product development choices, capital expenditure decisions, marketing strategies;

(2) Business environment: competition and macroeconomic risk. What concerns financial risk, it is possible to have loss due to financial market activities.

The *risk characterization* involves preparing a document that provides the main results of the analysis, conclusions, and recommendations. The document accounts for the assumptions made for the analysis, the uncertainty or variability in the data model, the limitations and strengths of the analysis, and the quality level addressed during each step of the analysis.

Risk can be viewed both qualitatively and quantitatively. Qualitatively speaking, when there is a source of danger (hazard), and when there are no safeguards against exposure of the hazard, there is a possibility of loss or injury. This possibility is referred to as risk. The loss or injury could result from business, social, or military ac-

tivities; operation of equipment; or investment. Risk can be formally defined as the potential of loss (e.g., material, human, or environmental losses) resulting from exposure to a hazard. In complex engineering systems, there are often safeguards against exposure of hazards. The higher the level of safeguards, the lower the risk. This also underlines the importance of highly reliable safeguard systems and shows the roles of and the relationship between reliability analysis and risk analysis.

A *hazard* is something with the potential to cause harm. The undesirable outcome could involve:

(1) Injury to personnel;
(2) Damage to property;
(3) Pollution of the environment;
(4) A combination of the above.

Risks are managed so as to minimise damage or accidents to people, environment or property, and to minimise other losses. Sometimes these efforts to manage risks are undertaken willingly, sometimes in order to comply with the law or other rules and regulations.

As a result of the inherent challenges in data availability and aggregation, and the different types of information available, a multiple-path approach to systemic risk data collection may be most effective, and in fact necessary. Systemic risk regulators should also consider the inherent challenges in establishing the information requirements for systemic risk information to be standardized, timely, accurate, and comprehensive.

Uncertainty

From the perspective of prognostics, the most significant source of uncertainty is mainly because the future is unknown, e.g., unknown loading, operational, environmental, and usage conditions. Hence, it is highly recommended to address this uncertainty when performing prognosis.

In many practical applications, uncertainty representation and interpretation can be guided by the choice of modelling and simulation frameworks. For uncertainty representation, the following theories have been used: classical set theory, probability theory, fuzzy set theory, plausibility and belief theory, and rough set theory.

Uncertainty management attempts to answer the question: „Is it possible to improve the uncertainty estimates?"

The mathematical rigor must be tempered by uncertainties in the meaning of the critical parameters λ and μ. Both are customarily expressed as quotients (failures or repairs per unit time) but the content of the numerator and the denominator is far from standardized. Differences in the interpretation of these quantities can introduce errors that far exceed those caused by use of an inappropriate model.

Components of Risk

Risk, which always implies some type of negative outcome, is made up of three components:

(a) Hazards;

(b) The consequences of the hazards;

(c) The predicted frequency (likelihood) of occurrence of the hazards. These three terms can be combined as shown in equation **(1)**.

$$Risk_{hazard} = Consequence \times Predicted\ Frequency \quad \textbf{(1)}$$

Equation (1) shows that risk can never be zero – a truth not always grasped by members of the general public or the news media. Hazards are always present within all industrial facilities. Those hazards always have undesirable consequences, and their likelihood of occurrence is always finite. The magnitude of the consequence and likelihood terms can be reduced, but they can never be eliminated. The only way to achieve a truly risk-free operation is to remove the hazards altogether.

Once the hazards associated with a process have been defined, the corresponding consequence and likelihood values can be determined (Figure 2). The consequence of an event usually falls into one of three categories:

(1) Safety;

(2) Environmental;

(3) Economic.

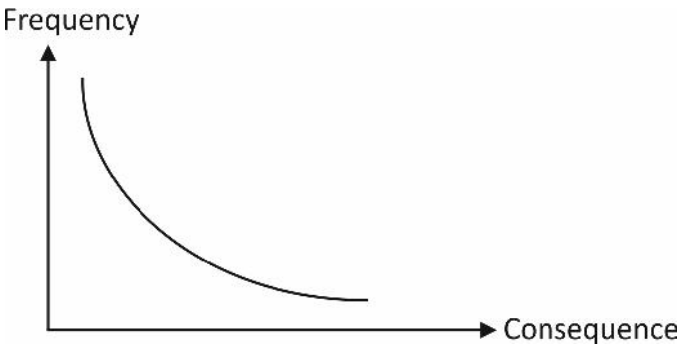

Figure 2 – *Frequency vs. consequence of risk*

'Safety' is freedom from danger *(Oxford Dictionary)*. 'Safety' is a very broad concept, and the understanding of its actual meaning tends to vary widely.

Risk appetite

ISO 2008, in its guide on risk management, defines *risk appetite* as the „amount and type of risk an organization is *prepared* to pursue or take". One guidance associates risk appetite with the *willingness* of management to accept risks, while the other assumes the *preparedness* of the engineers in taking risks. *Willingness* does not necessarily imply *preparedness*.

Most operational risks in non-financial firms can be modelled by linking operational indicators to financial measures. For most operational risks, risk appetite is based on available measurements. *Reporting risks* pertain to the reliability of internal and external reporting and may involve financial and non-financial information.

Myriad external and internal factors drive events that can affect the achievement of strategic objectives. Among the

outside factors one can consider are economic factors, political factors, social factors, technological factors and natural environment factors. An exhaustive identification of associated risky events is almost impossible, thus making any definition of risk appetite conceptually weak.

Risk Analysis

Formal Risk Analysis: Formal risk analysis consists of answers to the following questions:

- **(a)** What can go wrong that could lead to an outcome of hazard exposure?
- **(b)** How likely is this to happen?
- **(c)** If it happens, what consequences are expected? To answer question **(a)**, a list of outcomes (or scenarios of events leading to the outcome) should be defined. The likelihood of these scenarios should be estimated (answer to question **(b)**), and the consequence of each scenario should be described (answer to question **(c)**).

Therefore, risk can be defined, quantitatively, as the following set of triplets:

$$R = < S_i, P_i, C_i >, \; i = 1, 2, \ldots, n \qquad \textbf{(2)}$$

where S_i is a scenario of events that lead to hazard exposure, P_i is the likelihood or frequency of scenario i, and C_i is the consequence (or evaluation measure) of scenario i, for example, a measure of the degree of damage or loss.

Since equation **(1)** involves an estimation of the likelihood of occurrence of events (e.g., failure of safeguard systems), most of the methods become relevant and useful. For more discussions on risk analysis, the reader is referred to (16).

Risk analysis: Risk analysis is an important tool for informed decision making and is typically defined in terms of the probabilities of occurrence and the associated consequences of hazardous scenarios.

Risk analysis is an emerging science, and it is a decision-making paradigm. Aven (3) makes a powerful argument for risk analysis as a new emerging science. Although it is rapidly developing it is not yet widely regarded as a science unto itself. As a paradigm, it is capable of producing knowledge about risks and risky activities in the real world. As a science, it also produces knowledge about concepts, theories, frameworks, methods, and the like to understand, assess, communicate, and manage risks. This latter knowledge set makes risk analysis as much a science as statistics is, for example. The risk analysis paradigm presented in this text is frequently referred to as risk management, especially by those who practice enterprise risk management (Figure 3).

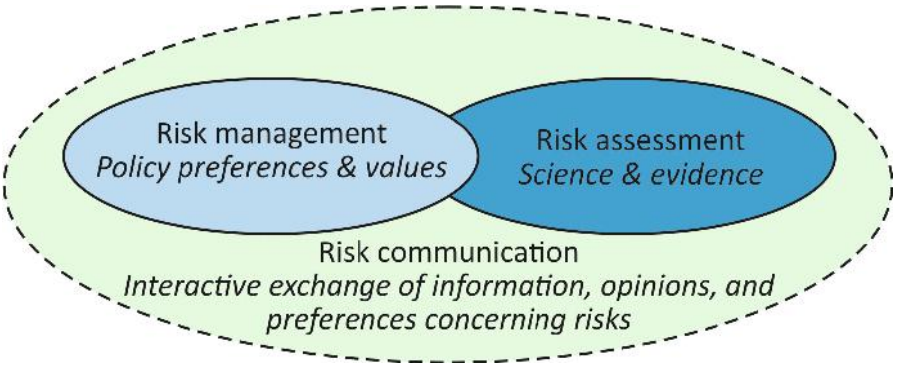

Figure 3 – *Three tasks of risk analysis*
(Source: Yoe, 2019)

The language of risk analysis is evolving. It would be comforting to think that it is evolving toward some consensus definitions and a common terminology. That is not yet the case, and this paper makes no attempt to resolve the language differences. What it does do is attempt to distill the principles common to the many different dialects of risk that are spoken in the fields of applied risk analysis. There is a growing tendency among some in both the public and private sectors to refer to the risk analysis paradigm as risk management.

A primary role of the *risk analyst* is to separate what we know from what we do not know and then to deal honestly, intentionally, and effectively with those things we do not know. The job of the risk analyst is to be an honest broker of information in decision making.

The first step into the analysis of the risk of a given system is that of identifying the hazards associated to its operation. The output of this task consists of a list of the sources of potential danger, i.e. those accident initiators (component failures, process deviations, external events, operator errors) which have a probability of occurrence not equal to zero and which can give rise to significant consequences. The identification of the accident initiators is obviously a key aspect of the overall safety analysis and great care must be put into its completeness since those accident events not included at this stage are very unlikely to enter in the analysis at a later stage.

Definition of Reliability: Reliability has two connotations. One is probabilistic in nature; the other is deterministic. We generally deal with the probabilistic characterization, and we consider the two aggregate agents of failure: time or cycle of use. Based on these assumptions, let us first define what we mean by reliability. The most widely accepted definition of *reliability* is the ability of an item (a product or a system) to operate under designated operating conditions for a designated period of time or number of cycles. The *ability* of an item can be designated through a probability (the probabilistic connotation) or can be designated deterministically. The deterministic approach deals with understanding how and why an item fails, and how it can be designed and tested to prevent such failures from occurrence or recurrence. This includes analyses such as deterministic analysis and review of field failure reports, understanding the physics of failure, the role and degree of testing and inspection, performing redesign, or performing reconfiguration. In practice, this is an important aspect of reliability analysis.

The *reliability of an item* can be defined as *(a)* the ability to render its intended function, or *(b)* the probability that it will not fail. The aim of reliability engineering under either of these definitions is to prevent failures but only definition *(b)* requires a statistical interpretation of this effort.

A more detailed look at the goals of improving reliability, in an integrated manner, would yield a better perspective on the role of reliability and availability analysis as shown by the hierarchy depicted in Figure 4.

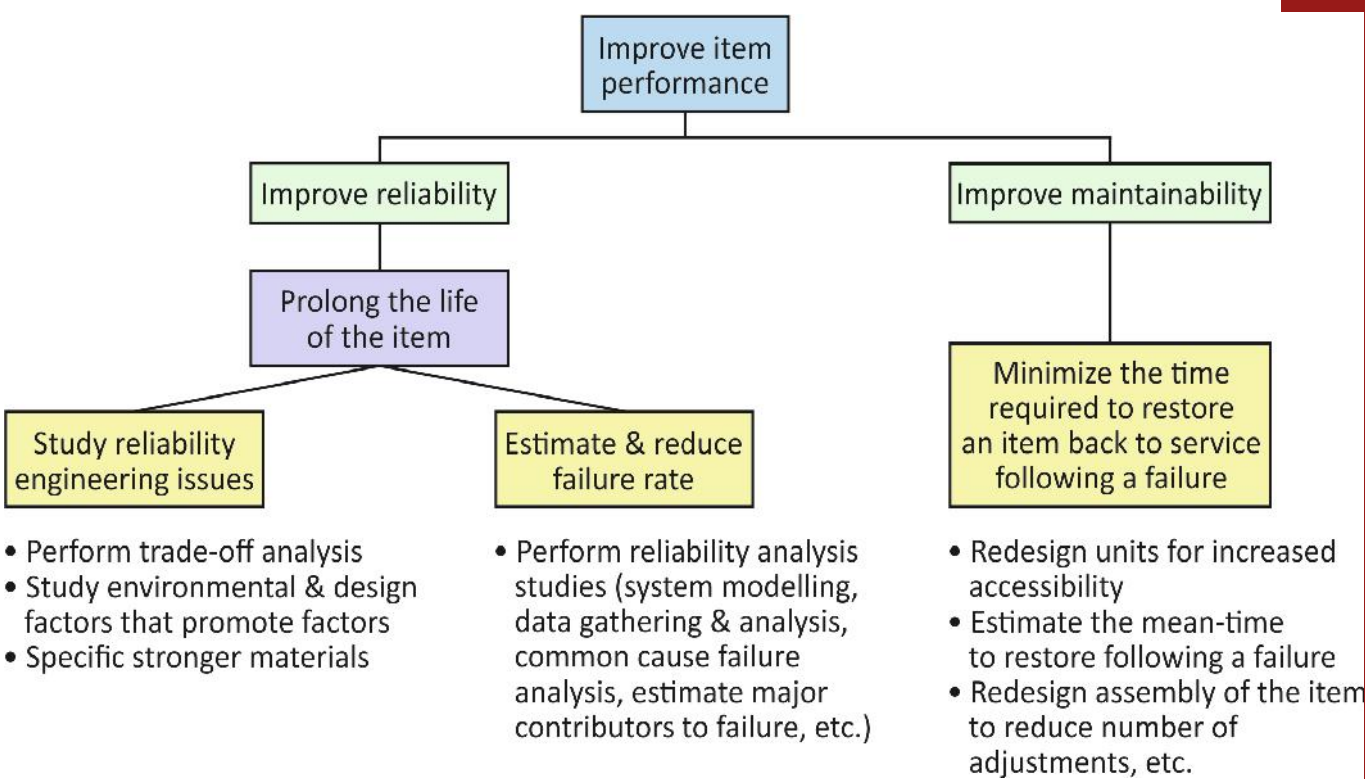

Figure 4 – *Conceptual hierarchy for improving performance*
(Source: Sutton, 2015)

In traditional reliability theory, both the system and its components are allowed to take only two possible states: either working or failed. In a multistate system, both the system and its components are allowed to experience more than two possible states, e.g. completely working, partially working or partially failed, and completely failed. A multistate system reliability model provides more flexibility for modelling of equipment conditions. The terms binary and multi-state will be used to indicate these two fundamental assumptions in system reliability models (20).

Reliability is used in the engineering context to describe the ability of a product to work without failure during its expected time in use. A product's reliability therefore depends upon how well it is designed to withstand the conditions under which it will be used, the quality of manufacture, and, if appropriate, how well it is used and maintained (21).

Reliability is the most widely used performance measure of a binary system. It is the probability that the system is in state 1. Once the reliability of a system is given, we also know the probability that the system is in state 0. Thus, the reliability uniquely defines the distribution of a binary system in different states. In a multistate system, it is often assumed that the state distribution, i.e. the distribution of each component in different states, is given. The performance of the system is represented by its state distribution. Thus, the most important performance measure in a multistate system is the state distributions. A state distribution may be given in terms of a probability distribution function, a cumulative distribution function, or a reliability function.

Redundancy can be used to enhance the reliability of a system without any change in the reliability of the individual components that form the system. However, in a two-failure mode problem, redundancy may either increase or decrease the system's reliability. For example, a network consisting of n relays in series has the property that an open-circuit failure of any one of the relays would cause an open-mode failure of the system and a closed-mode failure of the system. On the other hand, if the n relays were arranged in parallel, a closed-mode failure of any one relay would cause a system closed-mode failure, and an open-mode failure of all n relays would cause an open-mode failure of the system. Therefore, adding components in the system may decrease the system reliability. Diodes and transistors also exhibit open-mode and short-mode failure behaviour.

Common sense tells us that the reliability of our vehicles, appliances, and services (utilities, banking) depends on the reliability efforts made by the vendor. These efforts, in turn, are largely dependent on what customers demand. Our toleration of unreliable equipment and services has radically diminished in recent

years and, in response, most vendors have been able to improve reliability.

The analytical techniques are usually the most cost-effective means of failure prevention. They can be carried out early in the development and thus minimize rework and retesting. Analysis is cheaper than modelling and much cheaper than testing. Analytical approaches to failure prevention fall into two broad classes: *(1)* Analyses performed to demonstrate that the performance requirements will be met (and therefore, by implication that the item will not fail in normal use). Examples of these analyses are stress and fatigue analysis for mechanical items, worst-case analysis and thermal analysis for electronic circuits, and stability analysis for control systems. *(2)* Analyses performed to demonstrate that safety and reliability requirements are met. Examples of these are failure modes and effect analysis, fault tree analysis, and sneak circuit analysis.

Decision Analysis: Making technical decisions is a necessary part of engineering planning and design: in fact, the primary responsibility of an engineer is to make decisions. Often, such decisions have to be based on predictions and information that invariably contain uncertainty. Under such conditions, risk is virtually unavoidable. Through probabilistic modelling and analysis, uncertainties may be modelled and assessed properly, and their effects on a given decision accounted for systematically. In this manner, the risk associated with each decision alternative may be delineated and, if desired or necessary, measures taken to control or minimize the corresponding possible consequences. Decision problems in engineering planning and design often also require the consideration of nontechnical factors, such as social preference or acceptance, environmental impact, and sometimes even political implications. In these latter cases, the selection of the „best" decision alternative cannot be governed solely by technical considerations. A systematic framework that will permit the consideration of all facets of a decision problem is the *decision model.*

Accelerated Life Testing (ALT): The intensity of the global competition for the development of new products in a short time has motivated the development of new methods such as robust design, just-in-time manufacturing, and design for manufacturing and assembly. More importantly, both producers and customers expect that the product will perform the intended functions for extended periods of time. Hence, extended warranties and similar assurances of product reliability have become standard features of the product. These requirements have increased the need for providing more accurate estimates of re-

liability by performing testing of materials, components, and systems at different stages of product development. Testing under normal operating conditions requires a very long time (possibly years) and the use of an extensive number of units under test, so it is usually costly and impractical to perform reliability testing under normal conditions. This has led to the development of accelerated life testing (ALT), where units are subjected to a more severe environment (increased or decreased stress levels) than the normal operating environment so that failures can be induced in a short period of test time. Information obtained under accelerated conditions is then used in conjunction with a reliability prediction (inference) model to relate life to stress and to estimate the characteristics of life distributions at design conditions (normal operating conditions). Conducting an accelerated life test requires careful allocation of test units to different stress levels so that accurate estimation of reliability at normal conditions can be obtained using relatively small units and short test durations.

Probabilistic Risk Assessment (PRA): Probabilistic risk assessment (PRA) is an analytical methodology for computing the likelihood of health, environmental, and economic consequences of complex technologies caused by equipment failure or operator error. Likelihood is a catchall term that can be applied to either frequency or probability. Reducing the likelihood of occurrence of a hazard is often the first option selected in a risk reduction program, yet it is generally less effective than eliminating the hazard or minimizing the consequences.

It can also be used to compute the risks resulting from normal, intended operation of these technologies. PRAs are performed for various end uses. These include: understanding the safety characteristics of a particular engineering design, developing emergency plans for potential accidents, improving the regulatory process, and communicating the risks to interested parties. These are a few broadly stated examples of applications of the methodology.

Risk assessment is the process of establishing whether or not risks are adequately managed so that a safe system of work exists. It is defined by the UNISDR (2009) as „A methodology to determine the nature and extent of risk by analysing the potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihood and the environment on which they depend". Hence, risk assessment combines a characterization of the hazards with the level and extent of exposure with an assessment of differentials in vulnerability (and its converse – capacity) providing a calculated estimate of the risk of disaster in terms of impacts and their probability.

To improve disaster risk reduction, risk assessments should provide for advances in *risk management*, defined (UNISDR 2009) as „The systematic approach and

practice of managing uncertainty to minimize potential harm and loss". Disaster risk management then follows as implementation of policies, processes and actions to prevent new risk, reduce existing disaster risk, and manage residual risk, all of which contribute to the strengthening of resilience.

Integrated risk assessment is an iterative process where all the assumptions and uncertainty bounds at component and system levels are evaluated toward ensuring that the change is complying with the risk and performance goals, so that the subject change can be accepted.

Risk assessment and management was established as a scientific field some 30-45 years ago. Principles and methods were developed for how to conceptualise, assess and manage risk. These principles methods still represent to a large extent the foundation of this field today, but many advances have been made, linked to both theoretical platform and practical models and procedures.

There are signs of a revitalisation of the interest in foundational issues in risk assessment and management, which is welcomed and necessary for meeting the challenges the risk field now faces, related to societal problems and complex technological and emerging risks (Aven, 2015).

Risk Management

Risk management is much more than guessing how much an investment can lose. Discussions of risk management almost always centre more on risk than management.

Risk management is the application of a risk assessment, control and review process:

(a) A risk assessment based on hazard identification and evaluation.

(b) Implementation of control measures identified by the assessment as being necessary.

(c) Regular monitoring and periodic review.

The role of *risk management* has grown in many organisations over the last 20 to 30 years. Three reasons have contributed to this:

(a) Risk management has grown out of a broad range of very technical or specialist in nature disciplines and these different fields has yet to be optimised.

(b) Risk management has not been able to develop in a way which recognises that managers and organisations have always done it.

(c) We need to be clearer about the risk management capabilities needed by both managers and their specialist risk advisors.

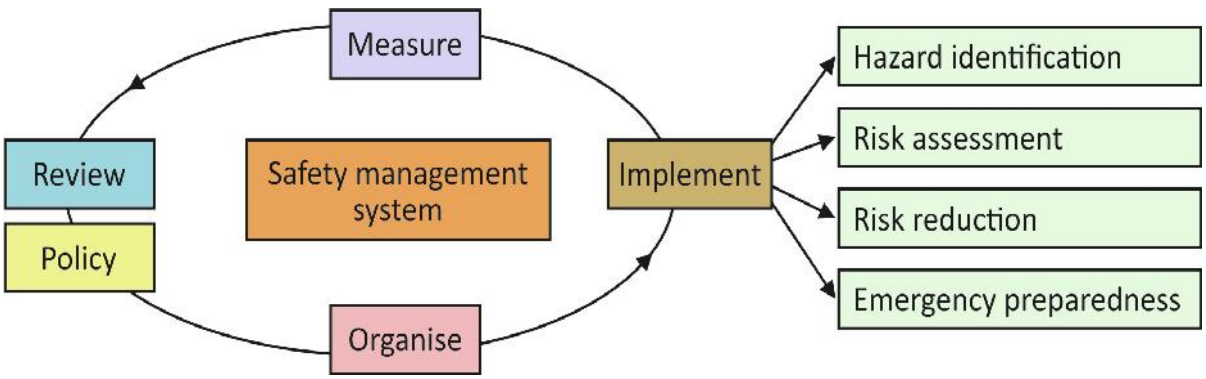

Figure 5 – *The management cycle*

Management systems are cyclical in nature – they represent a cycle of continual improvement (Figure 5). The system is dynamic, alive, ever changing and improving. Once the cycle has started there is then no starting or finishing point.

Risk management covers a broad range of issues, including technical analysis, the development and use of management systems, and human behaviour. Risk management is part of the larger topics of Operational Integrity and Operational Excellence. Many companies are also developing operational excellence programs. The manner in which these can relate to operational integrity is shown in Figure 6 (where: HSE = Health, Safety, and Environmental; RAM = Reliability, Availability and Maintainability).

Operational integrity is made up of technical initiatives; operational excellence incorporates nontechnical management systems that can affect safety and operability. These include distribution, inventory management, outsourcing, supply chain management, and procurement.

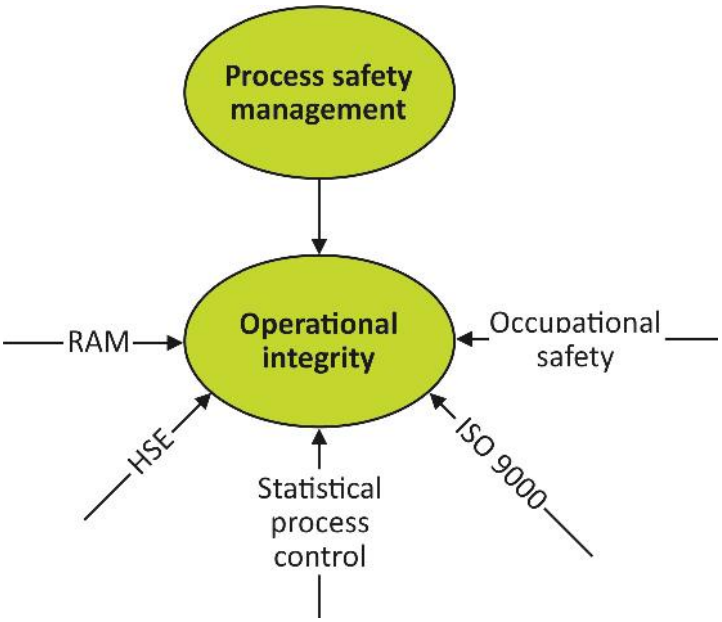

Figure 6 – *Operational integrity to operational excellence*
(Source: Sutton, 2015)

The intrinsic reliability depends on the reliability of the components, the project or design, and finally of the realisation of technical aspects of the device. Operational reliability is the product of intrinsic reliability, through the cost / income ratio (Băjenescu 2020).

Safety is involved with the management, engineering and operation of a system and is underpinned by human factors. An effective risk management program considers not just safety, but also environmental impacts, economic losses, etc.

Fault tree construction: Toward the end of the Second World War, systems techniques such as fault tree analysis were introduced in order to predict the reliability and performance of military airplanes and missiles. A fault tree is a graphical representation of causal relations obtained when a system failure

mode is traced backward to search for its possible causes. To complete the construction of a fault tree for a complex system, it is necessary to first understand how the system functions. A system flow diagram (e.g. a reliability block diagram) is used for this purpose, e.g. to depict the pathways by which materials are transmitted between components of the system. The first step in fault tree construction is the selection of the system failure event of interest. This is called the top event and every following event will be considered in relation to its effect upon it. The next step is to identify contributing events that may directly cause the top event to occur. At least four possibilities exist (Henley, Kumamoto, 1992):

(1) No input to the device;

(2) Primary failure of the device (under operation in the design envelope, random, due to aging or fatigue);

(3) Human error in actuating or installing the device;

(4) Secondary failure of the device (due to present or past stresses caused by neighbouring components or the environments: e.g. common cause failure, excessive flow, external causes such as earthquakes).

Failure Modes and Effects Analysis (FMEA): One hazards analysis technique used to analyze equipment items is FMEA. The method examines the ways in which an equipment item can fail (its failure modes) and examines the effects or consequences of such failures. If the criticality of each failure is to be considered, then the method becomes a Failure Modes, Effects and Criticality (FMECA) Analysis. The consequences can be to do with safety, reliability, or environmental performance. The following are components of a typical FMEA:

- Determine the failure modes of the selected equipment item;
- Determine the effects of each failure;
- Determine the criticality of that failure;
- Identify the indications that the failure has occurred;
- Estimate the rates (either over time or per mission) for that failure mode;
- Identify the failure compensation mechanisms.

The causes of equipment failures are not failure modes *per se*. The consequences of failures need to be developed in as much detail as possible.

Estimation of Equipment Reliability from Tests: To obtain information about the life distribution $F_T(t)$ of a component, it is necessary to carry out a 'life test' where n identical units of the component are activated and their lifetimes recorded. The fundamental assumptions that are made are that the lifetimes of the n components are statistically independent and identically distributed according to the continuous distribution function $F_T(t)$. The assumption of identically distributed lifetimes corresponds to the assumption that the components are nominally identical, that is of same type and exposed to approximately the same environmental and operational stresses. The assumption of independence means that the components are not affected by the operation or failure of any other component in the set. Any censoring mechanism must also be 'independent', i.e. censorings occur independent of any information gained from previously failed components in the set.

A highly reliable item is expected to fail less frequently, resulting in smaller risk. On the other hand, the risk of an item may be used to identify items that should attain a high performance. Accordingly, risk and performance of an item synergistically influence each other. This concept is depicted in Figure 7.

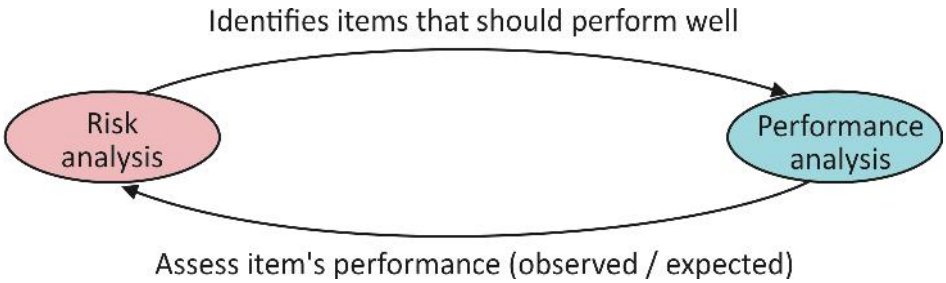

Figure 7 – *Synergistic effects between risk and performance of an item*

Performability: The word „performability" was not commonly used or found in the reliability dictionary until its first use was made in 1978 by John Meyer (Meyer 1980), in the context of performance (meaning reliability and maintainability) evaluation of highly reliable aircraft control computers for use by NASA (Figure 8). Performability engineering has as its scope the evaluation of all aspects of system performance.

However, professor Misra (2008), has extended the use of word performability to reflect an amalgamation of reliability and other reliability related performance attributes, such as quality, availability, maintainability, dependability, and sustainability (Figure 8). Therefore, performability can be considered as the best and most appropriate means to extend the meaning of effectiveness and overall performance of a modern complex and complicated system in which mechanical, electrical, and biological elements become increasingly harder to differentiate.

The definition of the term *performability* has been widened to include sustainability in the context of the changed sce-

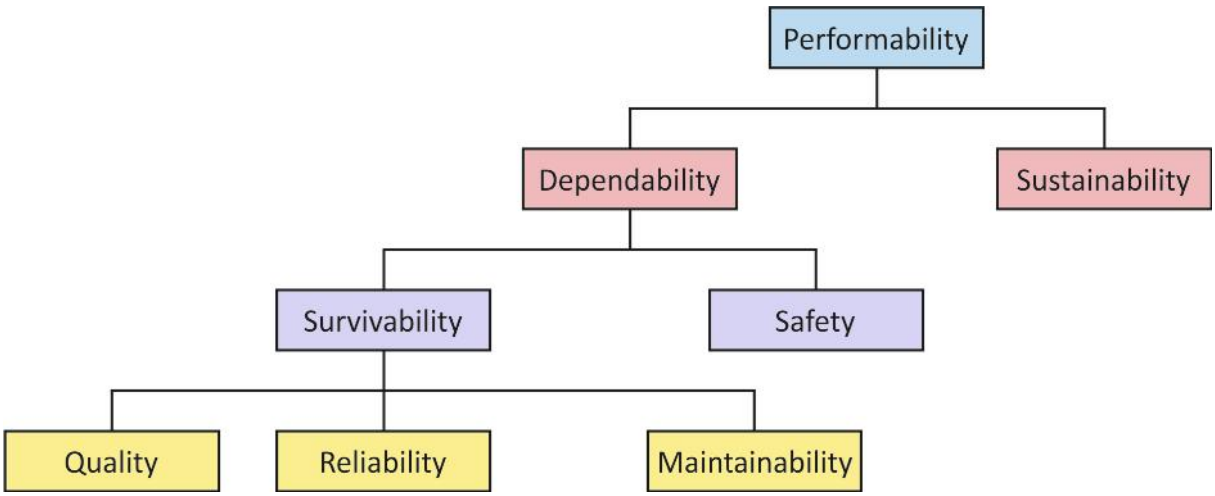

Figure 8 – *Implication of performability*
(Source: Misra, 2008)

nario of the 21st century (Misra, 2008), in order to reflect a holistic view of designing, producing and using products, systems or services, which will satisfy the performance requirements of a customer to the best possible extent and are not only dependable (implying survivability and safety) but are also sustainable.

Conclusions

The scientific foundation of risk assessment and risk management in reliability engineering presents some issues relying on perspectives that could guide correctly decision-makers. It is hoped that this discussion can inspire more researchers to build a strong platform for risk, risk analysis, risk assessment, risk management, and reliability risk meeting current and future challenges.

Truly optimal design should necessarily consider sustainability along with dependability as the design criteria for all future products, systems and services.

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„There can be no value in the whole unless there is value in the parts."
Bertrand Russell

Factors Influencing Marketing Decisions

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Abstract

Companies want to know how consumers act and make their buying decisions in order to improve the marketing strategies and be more competitive on the market. This paper investigates what are the consumer decisions based on since it is known that the more choices someone has, the more difficult it is to decide, especially when there are not many differences in terms of quality and price between the products. The authors show that decisions nowadays are based mostly on self-branding, gaining social currency and on the identity play, and also mention the moments that matter in the decision process.

Keywords: consumer psychology, decision-making process, consumer behavior, buying behavior

Introduction

Understanding customer behavior has been a topic of interest both for the companies as well as for researchers. Getting more details on how customers feel, act and select between the available options would help marketers improve their campaigns (Stankevich, 2017).

The first section presents the five-stage model of customer buying process, demonstrating that the process of purchasing begins way before the conversion and ends after the actual purchase. Each stage will be explained considering psychological and social factors involved.

In the second section, the author focuses on the evaluation of alternatives and purchase decision stages from the previous

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model, which have the highest impact when talking about the effectiveness of ad campaigns. The results presented in the last section are part of an undergoing study that will be further developed.

Traditional Model of Decision Making

Marketing strategies aim at reaching consumers in the moments that matter, presented below in the five-stage model of customer buying process (Comegys *et al.*, 2006).

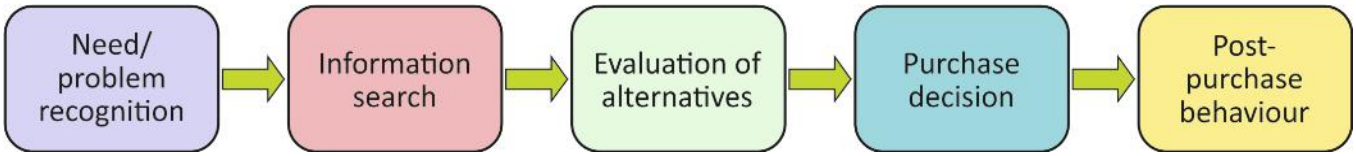

Figure 1 – *The five-stage model of consumer buying process*

1. Need recognition. The buying process begins with the need recognition or problem recognition when the customer notices the difference between the actual and the desired state. Sometimes, marketers aim at creating an intentionally imbalance between the actual and the desired state. This imbalance will make the customer aware of the need, so he will proceed to buying the product (Stankevich, 2017).

The need can be triggered with internal stimuli (hunger, thirst, need for shelter) or external ones (passing by a restaurant or simply a need generated by one's social environment) (Comegys *et al.*, 2006; Armstrong *et al.*, 2014).

Need recognition stage is influenced by other factors, among which more important are the motivation and the availability of new products/improved versions of known products, but also the gender, income, education, age, social connections and role in the society/community.

2. Information search. The second stage in the buying process refers to the *information search*, where the customer either relies on internal information gathered from utilizing the product, searches externally by asking family or friends for advice, or begins looking at reviews online. The sources mentioned above are more credible for the customer, but there are also other sources like: magazine ads, social media ads, product placement, influencers' recommendations, retailers' website, etc. (Stankevich, 2017).

The amount of time spent on this stage varies with the levels of expertise and with the perceived risk. Alba *et al.* state that as the level of expertise grows, the search is more efficient, but also the experts rely more on internal sources then on external ones (Alba *et al.*, 1987). It is known that consumers seek for convenience and consequently they will search external credible sources to shorten the time. The perceived risk however tends to increase the time spent on searching. Kotler *et al.* mentions the attention of the customer, reminding how hard it is nowadays to grab *customer attention*. In this direction, he suggest to group the alternatives into four sets: *the total set* includes all possibilities, *the awareness set* contains the alternatives the customer is aware of, the products that meet customer criteria are grouped into *the consideration set*, and finally the decision will be taken from *the choice set* (Comegys *et al.*, 2006; Kotler *et al.*, 2009).

3. Evaluation of alternatives. According to Kotler *et al.*, customers tend to set some minimum requirements criteria in order for any product to be considered for the final purchase. More on how people make decisions will be developed in the next section, but it is important to mention that customers either focus on a recommendation they trust, or they focus on a combination of attributes, for example good quality at a fair price, or low price for a product they already know, and so they remain after the analysis with less alternatives, making the decision an easier process (Kotler *et al.*, 2009).
4. Purchase decision. In this stage, it matters again how complex is purchase for the customer, because especially with goods used for a long time and with a higher price, it tends to appear a delay between the purchase decision and the actual purchase. For consumable, affordable products the decision process is much faster.
5. However, it worth mentioning here the impulse shopping, based on customers' emotions. Customers might avoid shopping on impulse if they have self-control, meaning they know very well what they want/need, keep track of their behavior, and are able to change (Baumeister, 2002, Comegys *et al.*, 2006).
6. Post purchase behavior. The brands and retailers must understand this stage of the model especially if they want the customers to come back and become loyal. First of all, if the customers are satisfied, there are higher chances they come back, but simply being satisfied

does not create loyalty (Oliver, 1999). Loyalty is related to the brand preference and it has a direct impact on the purchase decision. The post purchase actions of a company/brand might create a loyal customer or even a brand ambassador. The overall experience with the product/brand is the major factor that makes a customer recommend the product to others by writing a positive review.

The Choise of Decision Strategy

Some decisions are *nearly automatic* (stopping at red light when driving, preparing breakfast, etc.), others *semi-automatic* (choosing grocery, deciding if to take dinner out or at home, what clothes to wear, etc.), and others are *deliberated* (what car to buy, where to go in vacation, etc.) (Willman-Iivarinen, 2017).

As stated in the previous section, after recognizing the problem, so having a motive for the purchase, there is an alternative set from which to choose, that people only limit to a consideration set (Willman-Iivarinen, 2017; Kotler *et al.*, 2009).

There is a highly appreciated book on intuitive decision, Gladwell's *Blink*, that suggest decisions are less stressful if we rely on intuition (Gladwell, 2012; Taleb, 2007), however researches from academia „are more skeptical about intuitive decision making" (Willman-Iivarinen, 2017).

Simon argues that due to the lack of resources like information or time, customers chose the good enough instead of the optimal solution (Simon, 1955; Willman-Iivarinen, 2017), also when the choice is not of critical importance for the customers, they use heuristics in order to avoid the effort (Payne *et al.*, 1988; Willman-Iivarinen, 2017).

Even if researchers have a different view on heuristics, they all agree „they are adaptative and depend on personal preference as the decision context" (Willman-Iivarinen, 2017, Kahneman *et al.*, 1982; Gigerenzer *et al.*, 1999).

Table 1 – *Heuristics examples used in decision making*

Heuristic	Description
Satisficing heuristic	Decision makers select the first alternative that meets the criteria, the 'good enough' option, not necessarily the optimal one
Lexicographic heuristic	Decision makers will focus on one main attribute and all options will be ranked accordingly, making this heuristic rather fast and frugal. Also named *one reason heuristic*.
Eliminating by aspects heuristic	This method is a combination of the two heuristics mentioned above, meaning that the decision maker chooses the predetermined characteristics to be taken into account and after determining the most important one, removes the alternatives that do not respect the desired characteristics. Then, they analyze the alternative in respect with the second characteristic, and so on until only one alternative is left.
Frequency of good and bad features heuristic	The decision maker lists the good and bad characteristics for each alternative, subtracts the sum of bad attributes from the sum of good ones, and in the end choses the highest score.

Research Methodology and Findings

The data used in this study was collected by the authors as part of a bigger research study in June 2020. The respondents were asked to fill-in a questionnaire about their buying behavior. Later, 43 of them, both men and women, aged 19-45, were asked to participate in an interview, because only 43 questionnaires out of 80 collected shared information about the decision-making process during a recent purchase. The interview was necessary to make sure the data set was correct and to add a few control questions, but most importantly to ask more details about the motives of the purchase, the set of alternatives and about how the final decision was made.

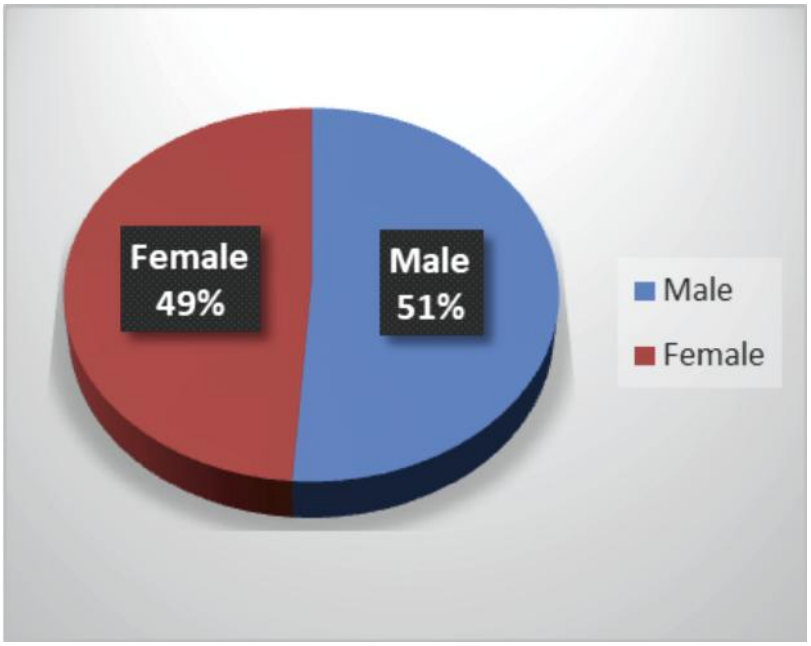

Figure 2 – *Respondents' gender*

A few details on the respondents' demographics: 21 females and 22 males (Figure 2), 14% of the respondents are aged 19-25, 19% are between 26-32 years old, the best represented group in the study, 44% are aged 32-38 and 23% are between 39 and 45 years old (Figure 3). All respondents are university graduates or students, 40% having a master's degree, and 3% a PhD (Figure 4).

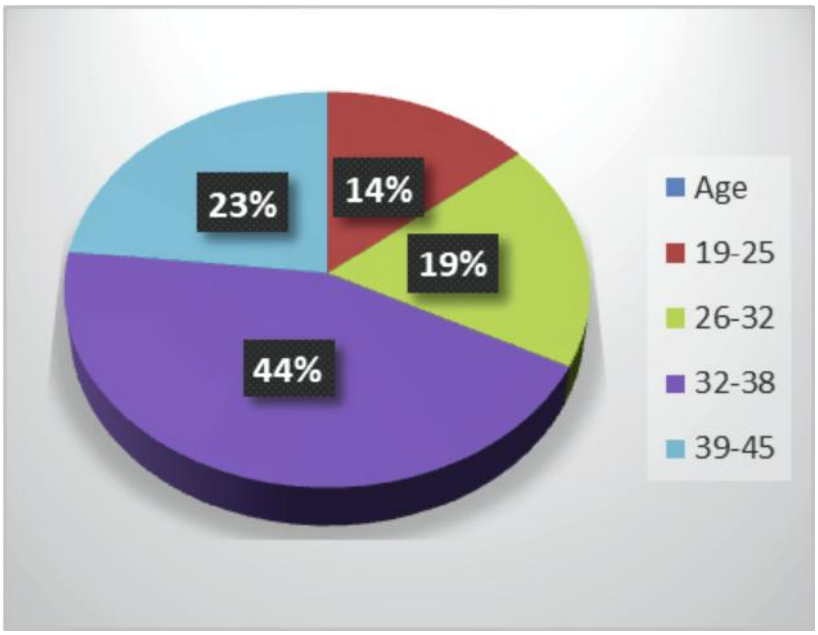

Figure 3 – *Respondents' age*

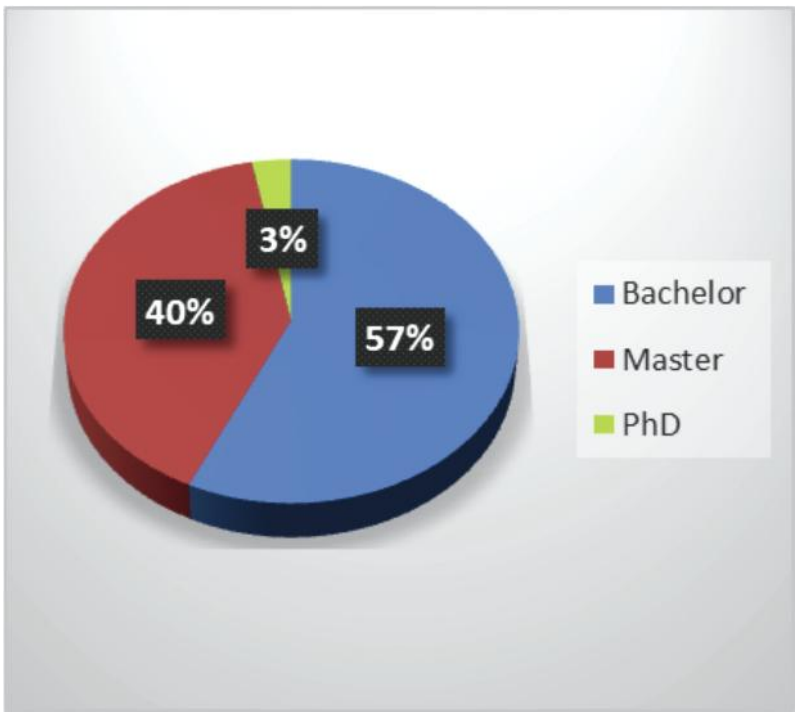

Figure 4 – *Latest degree obtained*

The author considers that the collection of data was rather difficult because first of all respondents were reticent to why they are asked so many details they never give attention otherwise, and secondly, there were also some contradictions in the situations they presented (observed in the control questions) so those questionnaires where eliminated.

The main objective is to determine how customers make the purchasing decision depending on the product needed. Further work will present how the customer is influenced by the social context.

The author noticed that younger respondents have the tendency to make intuitive decisions regarding on average half of their purchasing decisions, comparing to older adults. For example, in the age group 18-25, more than 50% on the respondents declared they follow their intuition, and chose the first good enough alternative, not necessarily the optimal one. This is valid for clothing, as for young adults it is more important the color and the design, than the overall quality, material and functionality as it is for more than 80% of respondents older than 32 (Figure 5). Also, if asked about their meal ordering or grocery shopping, younger adults again refer to the satisficing heuristic in percent of 40%, because they do not give so much importance to the quality but rather to the convenience of obtaining the goods, while the majority of older groups try to focus on the frequency of good and bad heuristics, for examples choosing the best quality food they afford, looking for eco alternatives or locally produced goods in the grocery shops.

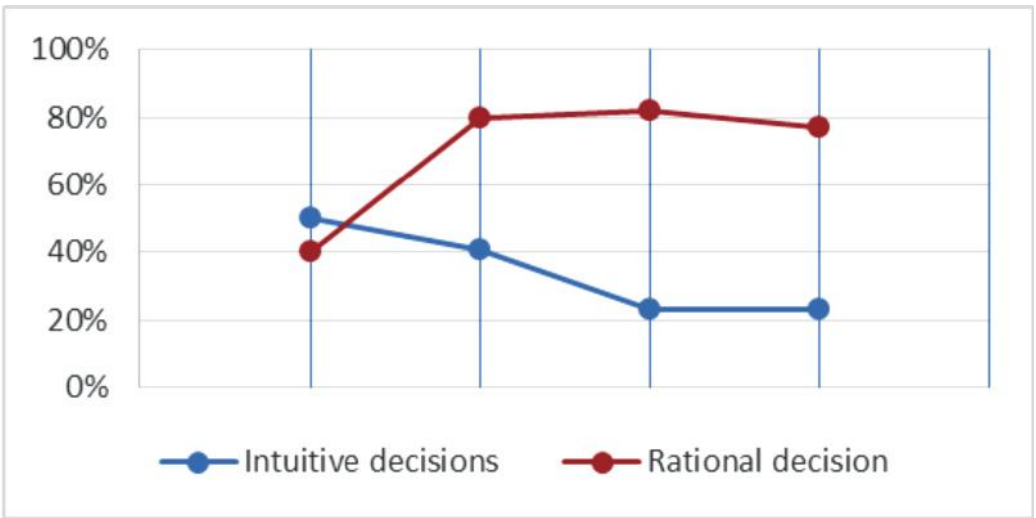

Figure 5 – *Decision type*

Another finding refers to purpose for which the product is purchased. If the product is to be used at home and is not going to be seen by others leads to a different purchasing behavior, then if seen by friends or community. These goods are used as social currency or as a signal for values. These are the products customers form emotional connection with and continue to buy it mostly because of the image they want to have. Some popular brand examples the authors identified in the interviews are Moët & Chandon, Apple, Tommy Hilfiger, Dior, Nike, etc.

The items from the brands mentioned above are to be bought in almost 98% of the cases in social context, because they help the customer define an identity, they consider would include him into certain groups or reflect their future goals.

While shopping, 74% of the respondents think that branded products will help them improve and signal this to their friends. In brands purchasing, the decision-making process is rationale, and it describes as a mix of the heuristics mentioned in the table.

All groups, when in time pressure, have the tendency to choose emotionally. This means that when they do not have enough information on the characteristics of the product, and there is nobody they can ask for advice, they just follow some superficial criteria. The more choices one has, the more difficult it is to choose one option, especially when customers do not have yet a brand preference. So, if the purchase is not that expensive or complex, customer prefer to choose intuitively and only in case of major purchases (house, car, etc.) they use a mix of heuristics. The younger the customer, it is more probable to experience time pressure, have difficulty with deciding upon one alternative and most important easier to influence. This is why influencer marketing targets mostly young customers on social platforms like Instagram or Facebook.

Conclusion

This study is part of a bigger research study on customer behavior and effective marketing techniques and described how customers make decisions and what factors influence those decisions.

The literature review and the results might be a start point for many companies that want to target better their customers and obtain higher ad efficiency. The most important findings suggest that young buyers (18-25 years old) need help to decide what to purchase comparing to older ones. This can be provided with recommendations, reviews given by other users available or by clearly mentioning each characteristic, and also by keeping a limited number of options. Another important finding refers to good bought as a social currency, where the brand matters the most in terms of the values the customer wants to transmit to others, case in which the decision is made after careful deliberation.

Acknowledgements

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„The current value is not the price that you paid, but rather the price that you would realize upon sale."
Jonathan Heller

Chatbots as Marketing Communication Tool

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Abstract

The paper presents the use of chatbots as a channel of marketing communication increasingly used by various organizations. The benefits and disadvantages of chatbots from the standpoints of both organizations and customers are revealed. Several platforms for building chatbots and the industries that will benefit the most from using them are mentioned. An overview of the chatbots developed in Romania from 2016 to present is exposed. At a very high pace of use, the chatbots market will growth, they will become more intelligent and they will be an integral part of our lives.

Keywords: chatbots, marketing communications

Introduction

The efficiency and effectiveness of marketing communication with customers and potential customers is a key success factor for companies. The ways companies communicate with their target markets has been evolving at a rapid pace especially with the rise of internet when a multitude of options became available, from e-mail, to social media, to mobile apps, to real-time messaging as online chats.

As a result of continuous development within the field of Artificial Intelligence (AI) and of the behavioral shift in how people use technology to communicate, in recent years the use of chatbots for marketing purposes has increased. Today, a multitude of companies develop their own chatbots to be closer to its customers. Integrating chatbots into marketing communication strategy

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is no longer an isolated action, but a daily reality. Chatbots offer the desired content seek by customers connecting them with companies, brands, and information in real time and at affordable costs.

According to Kilens, 2019, some of the reasons why customers turn their attention to the use of chatbots are: companies' sites are hard to navigate; there are no service outside normal operating hours; poorly designed smartphone apps; the service is not accessible on mobile devices; it takes too long to find services; services feel impersonal.

The Use of Chatbots for Marketing Communication

Chatbots aim to revolutionize the interaction between the companies and the customers. Among the benefits an organization might record from using chatbots are the following: reducing costs (per year there are a reported 265 billion customer requests; organizations spend nearly $1.3 trillion to service these requests; chatbots can help saving up to 30% of this); cost savings (the estimates show that by 2022 there will be $8 billion in cost savings from the use of chatbot conversations); enhancing customers' interaction (by 2020, 85% of customers interactions will be handled without a human agent) (Abbas, 2019); boosting brand outlook; increasing peoples' satisfaction; improving performance; reaching new customers; gaining a deeper understanding of customers; support team collaboration (26% of organizations use AI chatbots and assistants for this purpose; across all company sizes, Microsoft Cortana is the most commonly used intelligent assistant in the workplace 49%; it is followed by Apple Siri (47%), 23% of organizations

are using Google Assistant, and 13% Amazon Alexa, while only 2 percent of organizations have custom-built AI chatbots) („Spiceworks", 2018)

For customers on the other side, the benefits might be:

- 24 hours, seven days per week availability;
- instant and consistent answers without pressure: customers and prospects can face more stress and pressure while trying to find information, so unlike traditional online experiences, chatbots can solve customer problems more efficiently and effectively;
- programmability: chatbots can be used to automate common tasks such as arranging meetings, providing advanced search functionality;
- manage greater complexity and volume than humans: a study suggests that humans can only concentrate on 3-4 things at the same time; if humans try to manage more than this, errors are bound to happen; chatbots, on the other hand, can simultaneously have conversations with thousands of people; no matter what time of the day it is or how many people are contacting you, every single one of them will be answered instantly (Bergant, 2018);

- easy, friendly, and accessible communication;
- automate recurrent tasks: chatbots now help automate tasks which are done frequently and at the right time; employees can increase their value in an organization when they replace their repetitive tasks for analytics tasks; chatbots can easily do a lot of recurrent tasks such as respond to frequently asked questions, accept payments, bring a query result, create quotes, accept payments, help implement procedures, etc.; for example, there are numerous Slack bots which automate repetitive tasks; this helps customers save time and increase productivity.

Based on a survey conducted in the USA, Great Britain, Germany, France, Italy and Spain people aged 18 to 34 are twice as open to communicating with a chatbot as an assistant when shopping, compared to other age groups. The same source states that a quarter of respondents under the age of 34 are directly interested in a personal shopping chatbot („2019 Trends", 2019).

However, not everyone is happy interacting to chatbots. As said by Garcia, 2018, the main criticisms from customers to chatbots are: prevent the connection with a human; offer too many unhelpful responses; redirecting to self-serve FAQs; recommend bad suggestions; waste of time with unnecessary pleasantries; take too long to respond.

Other criticisms about chatbots (Ghitulescu, 2019) are: not able to understand customers' requests; not have the ability to differentiate the specific nuances/variations of human dialogue; perform wrongly the given instructions; not understand various language accents.

As stated by „2019 Trends", 2019, 58% of respondents from a survey believe that

chatbots are not as effective as expected. However, it is predicted that by 2020, 80% of enterprises will use chatbots.

As said by Knight, 2018, the industries that will benefit the most from chatbots are e-commerce in proportion of about 90%, insurance in approximately 80% expected, followed by healthcare with 75%, 65% in retail and 60% in hospitality industry.

It is expected that chatbots will redefine the customer service industry in which, the banks will profit the most. By 2022 banks can automate up to 90% of their customer interaction using chatbots. In the same time, traditional call centers are under huge threat („Chatbots", 2017).

According to Kumar, 2018, the chatbot platforms for building a chatbot are classified in non-coding and coding. Among the platforms for building chatbots without

requiring writing codes are: that are equipped with basic and advanced resources to build a chatbot are:

- Chatfuel: it provides resources with a drag-and-drop features and targets Facebook Messenger and Telegram; there are estimated over 46 000 of chatbots using this platform, and the most famous being the ones for Adidas, MTV, Volkswagen, and British Airways.
- Botsify: with more than 40 000 chatbots, has drag-and-drop feature as well, and templates for travel, restaurant booking, etc.; it allows creating chatbots for Facebook Messenger, WhatsApp, and Instagram; Among the top clients using this platform are Shazam and Unicef NZ.
- KITT.AI: targeting Alexa, Facebook Messenger, Kik, Skype, Slack, Telegram, Twilio, the chatbots built on this platform can be easily integrated with web and mobile apps; the platform provides a complete set of tools that can be utilized to build standalone chatbot for businesses; UPS is one example of company using this platform.

Chatbots Developed in Romania

This overview starts back in 2016 when was launched a chatbot for Facebook Messenger named MOOCBuddy (Figure 1), as a Massive Open Online Courses – MOOC recommender system (Holotescu, 2016). MOOCBuddy can assist anyone to discover news about MOOCs, individual learners to find MOOCs for their personal and professional development or can even help teachers who intend to integrate MOOCs in their courses. One of the main aims of the chatbot was to promote the Romanian MOOCs initiatives, which were stored in an updated database. Thus, the chatbot recommendations consist of items from this database and of links to specific searches in MOOCs directories such as MOOC List (mooc-list.com), Class Central (classcentral.com) or Open Education Europa (openeducationeuropa.eu).

Mondly, a company from Brașov city, has launched in 2016 the first chatbot that teaches 33 languages (Figure 2). Apple named Mondly the best new app in Europe (Andriescu, 2016).

Developed in 2016 by ChatBot Romania, ChatBot.RO (See Figure 3), is a bilingual (Romanian and English) personal digital assistant for your everyday online interests: tell the weather in real-time; the currency rate (BNR official daily exchange); latest news from Hotnews.ro; top movies in Romania Box Office; top music on radio; latest books, and much more.

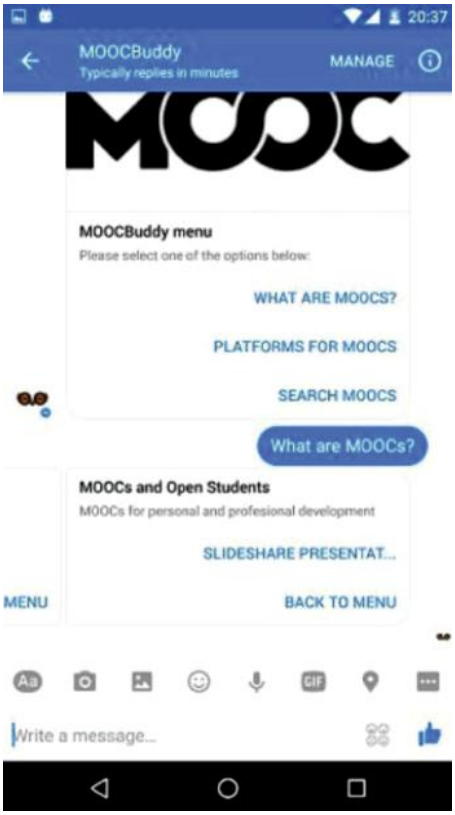

Figure 1 – *Moocbuddy chatbot*

Figure 2 – *Mondly chatbot*

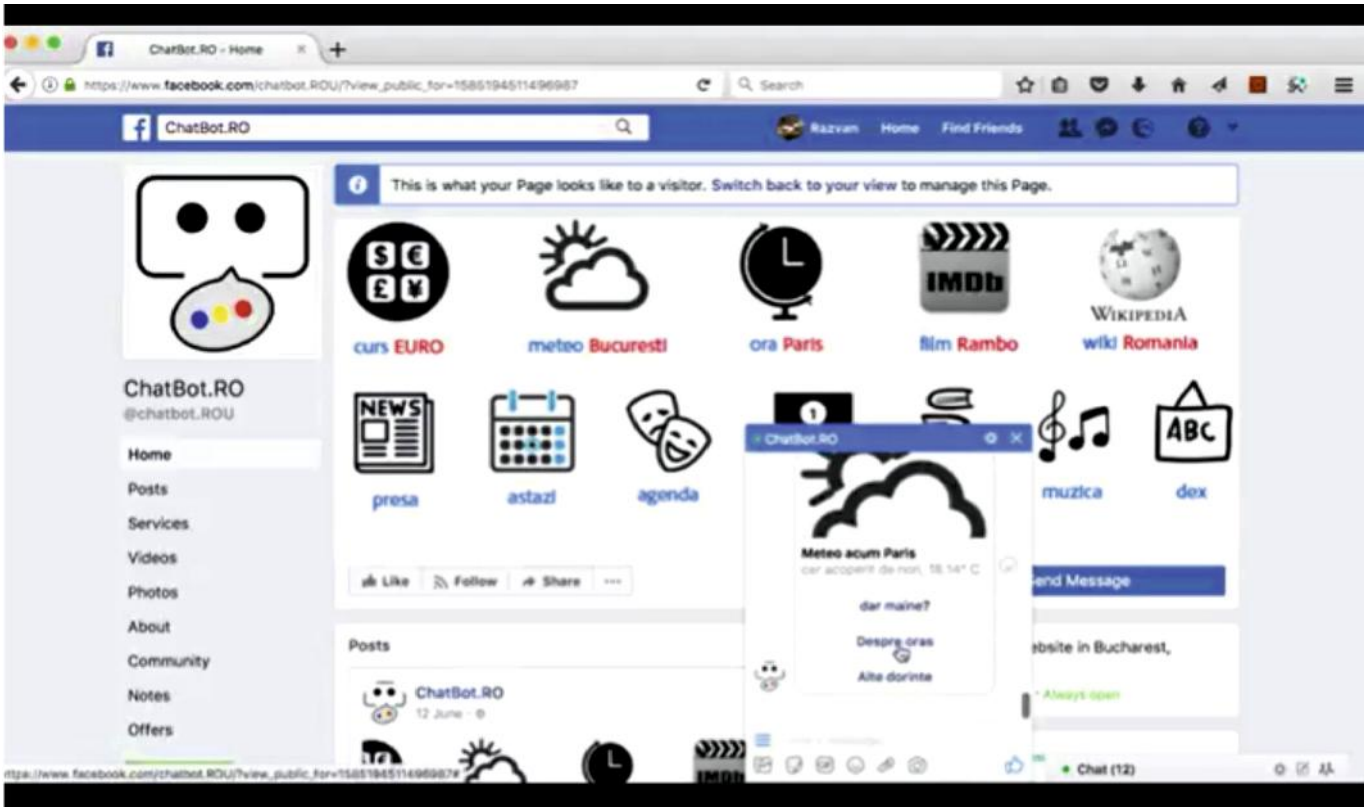

Figure 3 – *Chatbot.ro*

Transylvania high tech company developed in 2017 the Chatbot restart energy (Figure 4), that allows the user to get a personalized offer for gas and electricity, based on his monthly consumption and location.

Figure 4 – *Restart energy Chatbot*

The same company developed in 2017 for Timișoara city, the RATT ChatBot for the local public transport company (Figure 5). The chatbot offers the timetable of public transport but also information about the VeloTM station map, for checking the availability of the bicycles provided by Timisoara City Hall and the stations where the vehicles are at that time („Orarul RATT", 2018).

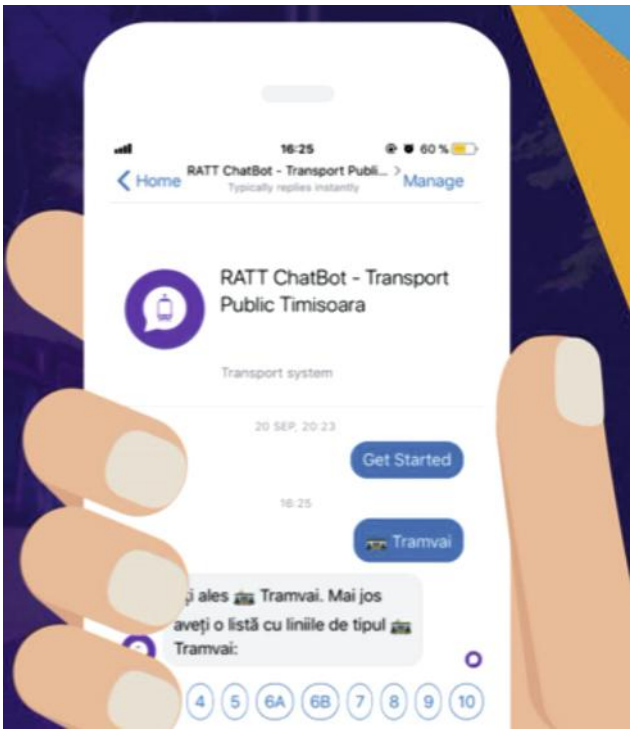

Figure 5 – *RATT ChatBot*

Also, in 2017, Vodafone Romania introduced its chatbot Future Chatbot (Figure 6) to respond to inquiries from various areas of interest.

As said by Săndulescu, 2018, in retail industry, the first chatbot was created by Centrade | Cheil for Carrefour Romania. The chatbot was developed to have three functions: careers (open jobs opportunities), store (users' access to stores network), and complaints (sending customers messages directly to the stores managers). The application has been integrated into the Facebook Messenger platform.

Figure 6 – *Future chatbot*

Orange Romania, the other GSM network giant operator, has installed in 2019 its chatbot called Djingo (Figure 7), as a personal assistant offering info about subscriptions, contractual period, PUK code, etc., as well as doing reconnections, blockings and unlocks.

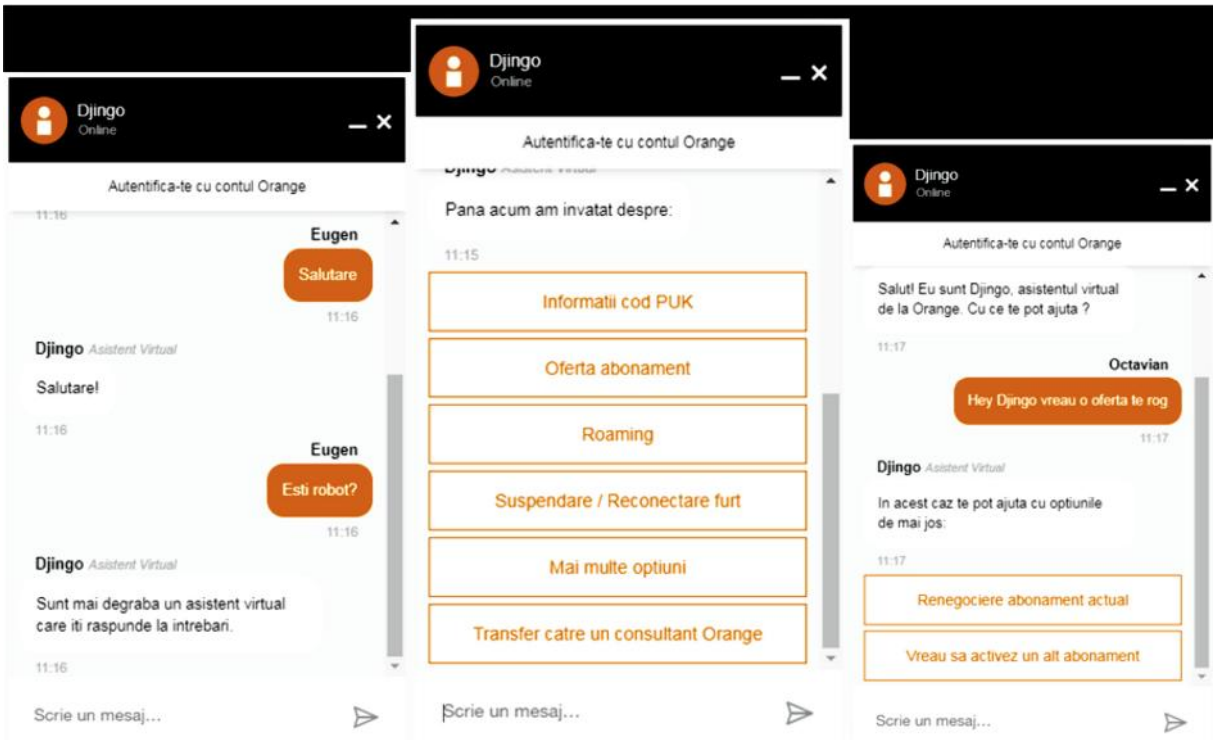

Figure 7 – *Djingo Orange chatbot*

Since 2018, in betting and gambling industry, Superbet company has iRina chatbot to communicate with their customers. The first legal travel chatbot in the world was created in Romania and it is called LAWra. It provides verified legal responses to any problems encountered during a trip abroad (Iurcu, 2019). The first chatbot used in a restaurant is Alice which works for Hard Rock Cafe Bucharest offering info but also delivering music suggestions from the restaurant's playlist (Ghitulescu, 2018).

In Cluj city, the Central University Library implemented a chatbot called temporarily Librario (Figure 8), intended for customers to query library-specific information (Marc, 2018).

At Transilvania Bank there are three chatbots in place. The chatbot Livia (Figure 9) is assigned for communications with individual clients and is able to offer consumer loans. Raul chatbot on the other hand, is used for online communication with business customers. And the third chatbot is Aida, which was created by the Druid start-up for the HR department of the bank („BT", 2018). Aida is used by the 10 000 employees of the bank for obtaining various information about HR policy, diverse internal rules and regulations, promotions, certificates solicitations, submitting holidays requests, asking about days off and holidays, bonuses or deductions from salaries and many others (Niță, 2019).

Figure 8 – *Librario chatbot*

Figure 9 – *Bank chatbot*

Remaining in the bank industry, Libra Bank introduced the first chatbot with video capabilities, called Leya to sell banks' products to customers (Figure 10) („Primul Chatbot", 2018).

Figure 10 – *Chatbot for consulting*

In insurance industry, in 2019, the ASIROM company in cooperation with Druid company introduced the Cara chatbot, capable of issuing insurance policies (Ghitulescu, 2018).

Danfoss Romania, a company for engineering solution in cooling, heating, drives, emission monitoring, industrial automation, fire safety, high pressure pumps, and many more, has developed its own chatbot that speaks in English called Danfoss Drive (Figure 11) to provide immediate customer support services for troubleshooting of drives products of the company („Faceți..Danfoss", 2019).

Figure 11 – *Danfoss drive chatbot*

In University POLITEHNICA of Bucharest there is in the final stage of testing and making the appropriated improvements of a conversational chatbot ETIA to provide an effective solution for managing emotional states by addressing the idea of partial, sometimes total recovery of patients, by resorting to medical psychology (Butuc, 2019). Precisely, ETIA provides the user with a conversational framework and a number of functionalities aimed at:

- identification and diagnostics using Hospital Anxiety and Depression Scale (HADS) and Emotional Thermometer;
- treatment using Cognitive behavioral therapy (CBT) and Solution-focused brief therapy (SFBT);
- monitoring evolution through weekly generated reports illustrating the evolution or involution of emotional states, data taken over and analyzed on the basis of the conversational system.

Conclusion

Even though traditional communication prevails for now (consumers communications with businesses are 60% over telephone, 60% over email, 54% over website, and 38% online chat with a person) compared to 15% with chatbots, chatbot technology continues to improve, and the usage data highlights chatbots' growth potential (Markgraf, 2019). By 2021, 50% of companies will spend more on chatbots than on mobile apps (Panetta, 2017).

Chatbots will replace many repetitive activities that people are currently doing, benefiting from the advantages that unlike people, they do not tire, they do not forget, and they can increase their knowledge base very much and very quickly.

The chatbots have the potential to improve the online experiences of all people, regardless of age. Customers will become used to communicate with organizations via messaging apps, virtual assistants, and smart home devices. Being able to analyze information and take decisions on their own, chatbots will be an integral part of our lives. It is expected that chatbot technology will evolve drastically to provide an ease and convenience in human lives. By 2024 the global market size for chatbots is expected to reach 1.34 billion USD (Bhutani and Wadhwani, 2019).

Even if they are not very visible and vocal, the number of Romanian companies exploring the potential for the development of chatbots is much higher. And this is because not just the players from the domestic IT industry engage in this market, but also digital marketing and web development agencies, which offer basic solutions, easy to set up and use.

Acknowledgments

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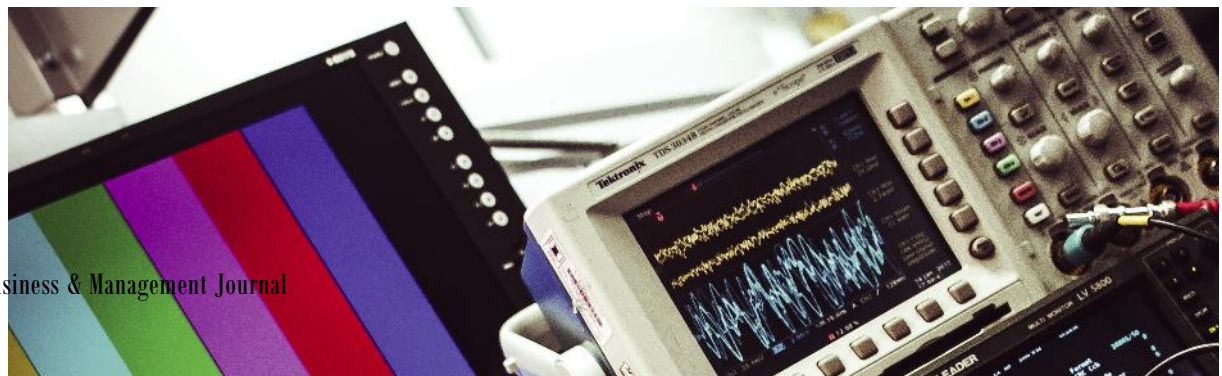

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Human Capital in Crisis

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Abstract

The main attributes of an organizations are characterized as open and dynamic social systems, able to develop individually. In essence, an organization is a social system with human capacity, beyond the means of production, essential to the formation, operation and development of an organization. Interactions between people and the connections between them are important in achieving the goal of the organization. The objectives of the organization must coincide with the goals of the organization's leadership and meet the needs of those involved in the production system, so the level of connection between human capital and resources is essential. Human capital is the most important factor for the organization, it represents the accumulation of professional skills, combined with the creativity and initiative of each person, together generating essential resources to the organization and producing services and materials meant to generate profit. Each organization invests in forming and developing the human capital in order to create specialists in the industrial branches that the organization develops. Satisfaction with the basic needs of employees is an essential factor in the organization's development. If this is not the case, the human capital can be destabilized slightly and can cause the state of crisis. Defeating human primordial needs can lead to an increase in the state of crisis of the organization, thus being able to evolve until the collapse of the organization. Human capital, in the event of a crisis, regardless of its nature, is the most important factor. The human factor decides how the crisis will be perceived and the means used to end the crisis. Knowing the human capital, the needs and especially the abilities of each employee can help the organization overcome a crisis moment easily and can solve an emergency without involving all the factors at its disposal.

Keywords: human capital, human factor, state of crisis, organization needs, level of connection

„Labor is the true standard of value."
Abraham Lincoln

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Introduction

Industrial organizations contribute to the development of modern society and the speed with which industries and technologies are developing on organizations, sometimes major changes. In order for these things to produce the intervention of the management concept as efficiently as a set of methods and means of solving problems at the organizational level and not only.

The organizational structure decisively influences the nature of human interaction and the perception of the organization. The size of the organization, the number of hierarchical levels the number of departments, the functional substructures, the complexity of the activity place their mark on the whole organizational activity, determining the content and significance of the messages resulting from the behaviour organizations. The structure of the organization gives us an insight into the basic features of the organization: human resources, the number of members of the organization, financial resources and material resources.

The structure reflects the organizational hierarchy, which targets the power relations within the organization and allows the knowledge of the internal communication processes, the communication structures and the distance between these structures and the decision centres.

The staff of the organization is defining its identity and image. Essential to the organization is, at the same time, the relationships of people and the relationships of each man with the overall structure of the organization. The quality of the people determines the quality of the organization and, therefore, a major concern is required to achieve the socialization and professionalisation of each individual.

The way management is done at the organization level is directly proportional to its ability to absorb information and implement it in order to increase the production rate or maintain the organization at an optimum level of production. At the same time, efficient management foresees and avoids the organization's entry into poor situations, crisis situations. If management is at the organization level, it goes through

different crisis situations caused by internal/external factors or by a combination of factors even independent of its production capacity. Thus, we focus on the situation of crisis management at the level of the industrial organizations, how they impose an imprint on an organization such a situation and at the same time the methods and means by which an organization can avoid and overcome a period of crisis.

Depending on the nature of the causes of the crisis, the way of prevention and reaction of the organization, it may be more affected or less affected by the effects of the crisis. Starting from the definitions and classifications of the types of crisis, their impact and their consequences must materialize the benchmarks for the implementation of a crisis-management strategy at the level of the industrial organizations.

Organization Management

Organization management is a structured part of management, the most common one is based on the need for a market economy. It must provide and structure a well-defined plan for achieving the organization's goals and mitigating the risks the organization may face. Depending on the country where the organization is active, the number of employees, the scope of activity, climate and resources, the organization's management varies. First of all, the organization has to operate in close proximity to the resources it needs in the production process. Also, the management capacity of the organization also means how to use the resources they have, having a multidisciplinary character, by analysing sociologically the factors they have, the factors they need, the productivity degree the organization can raise, and especially vision made to design and anticipate crises.

Managing processes have to take into account the cumulative workmanship between the execution processes that comprise the workforce, the products and services used, and the role of the recruitment and human resources team, the qualities of the management team and its outlook. The management has to take into account the social-economic, technical-material components, but above all human, able to cope with the management process of the organization. The forecast is both anticipating production capacity and possible impediments in the production process. The management team has to take into account the predictive forecasting prognosis, choosing a temporary variable for which they will make a realistic forecast in which the organization's plans are shaped and developed. The plans should be mandatory for industrial organizations, representing a realistic objective assumed for a period ranging from one month to five years, include a number of programs through which these plans will materialize. The programs are detailed, including a high degree of certainty of production, designed to lead to the implementation of the plans. The programs include details of supplies, quantities, finished products, warehousing and sales.

All the steps detailed above can be accomplished by communicating, delivering the message in a clear, precise manner, a quality of management that can support the organization or make it harder for development.

Crisis Management Plan

The crisis management plan involves prioritizing action. The priority being staff and how they perceive and understand the crisis. The most important component of an organization is the human component. Thus, with the help of the communication, the staff must be properly informed and work with the management team when necessary to overcome the crisis. In order of priorities, the materials and equipment come in order to ensure normal production.

In the event of an IT crisis in an industrial organization, the whole process is blocked, thus checking the sources that caused the crisis, the documents and information that can be saved, the degree of network damage and the percentage of recoverable information. Generally, computer systems have a back-up process able to save most data, but there may be human mistakes and this process can not be done on time. The most dangerous computer losses can occur in oil industries. Faulting a system can cause significant fuel leakage, environmental damage, and consistent financial damage. To prevent such incidents, oil companies have a permanent way of checking these systems, but in the case of disasters they have acted promptly and neutralized as far as possible the negative effects.

In the case of a timber-producing industry, landslides in the area concerned, floods, forest fires or termites invasions disrupt the organization's good functioning. In this way, it announces its customers and suppliers on the problem they are facing, trying with the existing resources to honour the orders already taken over. And looking for new raw material collection areas. Sometimes natural disasters bring different industries to the stage of impossibility of continuing production.

A team is formed to carry out a plan, which operates under the strict supervision of the management or the public relations director. The team of specialists on various issues structured a communication plan capable of dealing with all possible questions that will arise. It is essential that during the crisis the organization knows how to communicate and who assumes

the role of communicator or spokesperson. The activity of the crisis cell is a group activity where the entire team assumes responsibility. Team members need to know how to work in a team under stress, they have to take responsibility and discuss decisions before submitting a final form.

The members of the crisis cells must simulate a crisis, in order to act in good conditions in the event of a crisis. At the same time, members of the crisis cell, together with the management of the organization, must designate a person in charge of communication, a spokesman, to convey the message clearly and precisely to the public involved. The communication channel is not a fixed one, it must include both audio, video and text messages. Transmitting is done through both media and fax, telephone, email, meetings, display, internal notes, service orders.

Managemnt Before Crisis

We need to take into account several things that we need to discuss before a crisis occurs. To begin with, we need to develop a system to detect signals or to alert the emergence of a crisis quickly in order to identify the problems that may arise in a future crisis. Coombs (2012) recommends that we focus on threats or vulnerabilities that are most likely to occur and which have the most detrimental impact. According to Weiner (2006), research shows that the vast majority of crises occur when companies fail to identify a potential problem earlier and develop an action plan to manage the problem before it.

Pauchant and Mitroff (1992) say that a key step ahead of the crisis is to get the support of the senior management department to integrate crisis management into the organization's emergency planning.

The prioritization of crisis planning and the integration of the crisis management process into organizational policies should be supported by senior management. Dodd (2006) states that the person responsible for preparing for crisis situations must be one with direct responsibility and maximum accountability. Thus time and money resources must be managed in such a way as to maintain preparedness for crisis situations.

Lee, Woeste and Heath (2007) say that it is necessary to create and maintain a written crisis management plan to serve as the organization's response to a crisis and to train and train a team prepared to describe and detail this response as many times as needed. Even when organizations have a crisis management plan and a team to identify the crisis, they tend to fail in crisis planning. Training a team to lead the crisis has involved a review of the crisis management plan. People training and the formation of crisis management teams should go beyond other planning activities, the problem is that less than half of the existing companies are using this method.

Seeger (2006) supports the involvement of traditional media as a strategic resource to help manage the crisis. A team of spokespersons should be identified and trained to deal with the details of crisis management in the environment of the organization. According to Duhe (2005), the organization has to use different spokespersons to increase credibility and reflect different kinds of expertise on a current crisis.

Developing the organization's online part by empowering content for and interacting with those interested. Kolek (2009) describes in his paper how Telsa Motors used the CEO's blog to explain the situation of employees and thus minimize the chances for inaccurate media articles. Develop a network of strategic partnerships before the crisis that provides expertise and support in crisis situations and assists in the dissemination of true messages.

The key moment for an organization to take proactive steps to develop a systematic stakeholder communication process before the crisis is emerging to enhance the relationship with stakeholders. Key messages should strengthen:

- accessibility, competence, openness, transparency and honesty;
- the desire to involve and listen to those concerned with the goal of achieving results on both sides;
- empathy, concern and compassion.

Finally, when necessary, self-evaluation messages should be considered. According to Heath (2006) the message can instruct people on what they can do to protect themselves, to help others, or to take action that might be significant in more abstract or social contexts.

Management During Crisis

A crisis plan should be implemented by a crisis-management team that has been hired, as mentioned before. We have to admit that a crisis has certain characteristics: time pressure, control problems, level of threat that is different in magnitude, and constraints on response options. A well-built crisis management plan, including both training and simulations, will help the organization to manage these features of a crisis.

A mix of media communication with internal auditors and outside audiences should be developed. In some situations face-to-face encounters may be appropriate, while in others, it may be more beneficial to rely on updates to the organization's web page, RSS feeds, e-mail, Twitter, etc. Increased attention needs to be paid to disseminating stakeholder information as current generations spend more time using email, SMS and social media than watching television news or reading magazines. According to Fearn-Banks (2011), it is preferable to identify key messages that should be communicated to stakeholders. Boin claims that key messages should include statements of concern for

the injured or killed and what the organization does to manage the crisis (Boin, 2009).

Between February and April 2016, the crisis of the Romanian baby sickness appeared. During this period three babies died, several children from Argeș county were admitted, which led to the emergence of many hypotheses regarding the causes of things that happened. The crisis was accentuated by the media, the state institutions being pressured to find out what were the causes that led to these diseases. In February, in Pitești, samples were taken from a fresh cow's cheese from a store. At the end of the month, the Minister of Agriculture, said that the e-coli bacteria was found in the cheese sample, the cheese being produced by some company.

The only strategy the company adopted during the crisis was the one it adopts in its daily life, transparency and honesty. Regarding the establishment of the communication strategy, the owner of the company said that at that time, he had to take the initiative and be open to the public, trying to be as transparent and sincere as possible to his public to give them confidence and to lessen the crisis situation already created.

At the beginning of March, after the scandal began in the media, the human capital dealing with crisis management posted the first message, with a defensive and modest tone. The second message posted on the company's Facebook page is a call to action of all Romanians. The crisis management team wanted to involve in the business all those who wanted that thing, so that every Romanian could buy shares. On March 9, the first official version of the analyzes is communicated, from which it appears that the cheese produced by the company had nothing to do with the sickness of the babies.

The strategy adopted by the crisis management team, that of being honest and transparent in everything, was the basis of the communication on the company's Facebook page. The messages were sincere and did not bypass the topics exposed by the media and authorities, informing the clients of the company constantly and always coming back with messages according to their curiosity. The communication with the partners of the company was made constantly, the stores where the factory had sales being kept permanently updated with everything that happened. The community has shown solidarity with the company, the City Hall supporting the factory throughout the crisis.

Management After Crisis

The actions we need to take after the crisis has been resolved are to continue communicating with internal and external stakeholders (including the media), assessing the effectiveness and efficiency of the response to the crisis, updating the crisis

management plan and perhaps the team crisis on the basis of evaluation and also to draw up a report that includes what the organization has learned in organizational processes and policies. According to Dodd (2006), the organization will want to return as soon as possible to the current situation, as it does before the occurrence.

Due to the strategy adopted by the crisis management team, the partner stores supported the company, following the crisis, their products being found in several stores and having a greater range of commercialized products. The platform created by the company, allowed the Romanians to become shareholders of the company, thus it registered a significant number of shareholders and for two months after its development it managed to raise the amount why it deposited 100,000 lei.

Company strategy implemented by the strategic management team managed not only to avoid its collapse, but also to regain the trust of its consumers and to attract other consumers of the products. Through the strategy adopted by the team of people who dealt with the crisis management, the company had a positive attitude towards the customers and the employees of the company, being always honest and transparent through the statements it gave. Another beneficial thing was that all the partners of the company were always kept abreast of everything that happened, as proof that they and the City Hall supported supported the company when the statements given by the Minister of Agriculture appeared in the press, which meant a plus to combat the crisis period more easily.

Most importantly, after the end of the crisis, it is the leaders of the organization to discuss strengths and weaknesses, set up a way of working and improve parts that

did not work in parameters at the time of the crisis. Making a detailed report an essential and extremely useful tool in preventing and managing possible crises. Crisis management involves problem management, a report of risk factors, and the formation and maintenance of relationships with the public and private media, the media and mass media. A positive, solid image, an open and sincere communication through exchange of information and opinions can help avoid a crisis or collapse of the organization.

The outcome of a crisis always depends on the degree of preparation of the members of the organization and the loyalty of the organization to the purpose and mission of the organization.

Conclusions

Crisis management creates, depending on its capacity, opportunities for the organization or succeeds in maintaining the organization's intact image. A good crisis management strategy is essential in the organization's operation and development. Crisis management specialists must have

communication skills, human psychology skills, but above all, the ability to empathize with people in the organization and the environment. For the efficiency of crisis management, the team has to work together well and communicate effectively.

The dynamics with which the team manages the crisis situation characterizes the management process. We must keep in mind that any organization operates in a changing social environment, so any organization must act and react to profit, to adapt to market requirements. Managers, being able to clearly determine what the organization's goals are, plan the actions to solve the organization's problems, empower employees and prepare them for possible changes. It is all managers who evaluate employee performance and productivity.

The role of managers is essential in any situation, but at a time of crisis, they are most prepared to cope with the situation faced by the organization. The objectives of the organization as an entity must coincide with the goals of the organization's leadership and meet the needs of those involved in the production system. Thus, the level of connection between human capital and resources is essential.

Human capital is the most important factor for the organization, it represents the accumulation of skills, skills and professional skills, combined with the creativity and initiative of each person, together generating essential resources to the organization and producing services and materials meant to generate profits. Human capital, in the event of a crisis, regardless of its nature, is the most important factor. The human factor decides how the crisis will be perceived and the means used to mitigate or end the crisis.

Knowing the human capital, the needs and especially the abilities of each employee can help the organization overcome a crisis moment easily and can solve an emergency without involving all the factors at its disposal. In conclusion, the structure of each organizations is the identity element with direct consequences on all its components that gives distinction and specific image to the organization.

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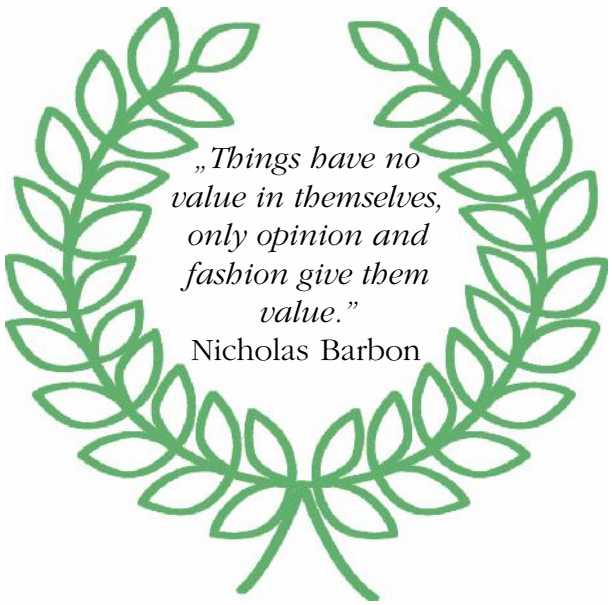

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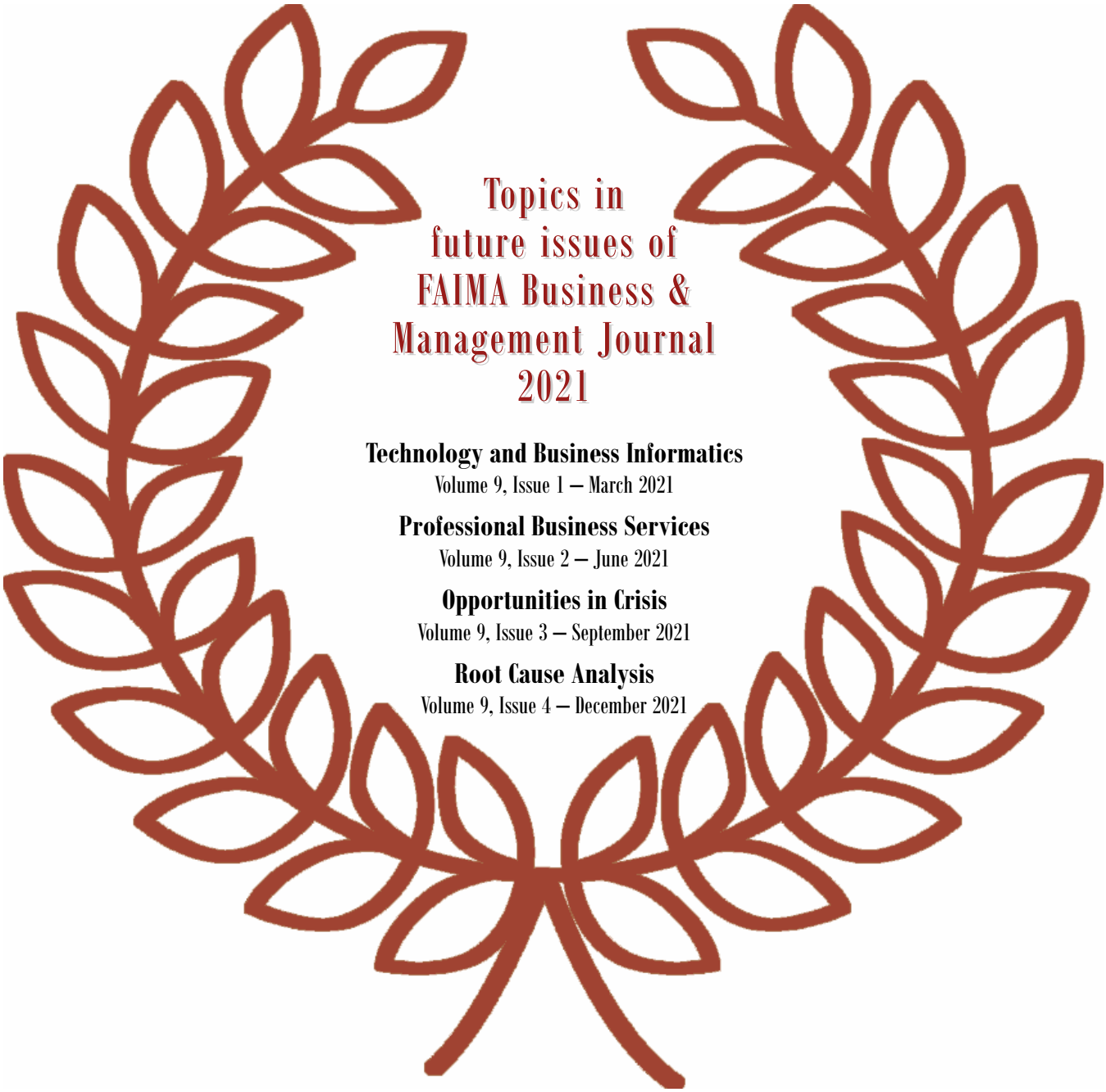

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