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INNOVATION MANAGEMENT PRINCIPLES FROM ISO 50500 SERIES

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ABSTRACT

Since 2013, more than 70 experts from 50 countries gather international Standardization Office (ISO) Technical Committee (TC) 279 to create a new set of international standards on Innovation management: the ISO 50500 series, with publication expected in 2018.

These standards will facilitate the transition of organization's innovation strategy into effective actions. In particular, ISO 50501 standard proposes recommendations for innovation management system and to develop external collaborations boosting innovation projects. To reach this goal, ISO TC 279 experts have decided to share a common vision of innovation builds upon 7 innovation management principles that are covering the new stakes regarding the field of innovation. In this paper, we present the rationale for the ISO 50501 and its 7 innovation management principles. Then we show how this new standard is aligned with the concept of open innovation as originally defined by (Chesbrough 2003) and suggests that firms can enhance their innovative performance by both acquiring knowledge from external sources and benefit financially from internally generated technologies that do not fit the current business model (Enkel, Gassmann and Chesbrough 2009). We consider the open innovation in the specific context of large group and start-ups relationships. Then, we present the core principles of the innovation management proposed by ISO TC 279 experts:

- i. Realisation of value
- ii. Future-focused Leaders
- iii. Purposeful direction
- iv. Innovation Culture
- v. Exploitable insights
- vi. Mastering uncertainty
- vii. Agile management

Finally, we provide the rationale of each principle through business examples. Business examples cover interactions between large corporations and start-ups. Through these examples, we show the relevance of these 7 principles, and how

they can efficiently support openness process and innovation management in different types of organizations. Indeed, we argue that this standard is not limiting the innovation management momentum but will support in particular any innovation management activities between large groups and start-ups. Consequently, this paper provides several results by showing how these 7 principles proposed by ISO TC 279 experts are representative of the innovation management and can be considered as a baseline or framework in future research works.

Our paper is also opening some practical implications: proposing a standard on innovation management is often perceived as a non-sense by many people. Indeed, standards may be perceived as restricting creativity. Still, organizations share a common need around innovation at large. In this paper, we present the relevance of the ISO 50500 series and why it is expected that these standards will shape the whole innovation management community.

To conclude, we will present some limitations of this paper and share some perspectives: even if we decided to address only start-ups and large corporations' interactions, we assume that this work could be extended, in particular to public policies for innovation management or institutional supports for innovations.

Key words: Management of innovation; ISO standards; Large Corporations; start-ups

INTRODUCTION

Standards and innovations are rarely in the same statement. Indeed, standardization of innovation management is perceived as an oxymoron the having a standard on innovation is an impossible wager. This common statement comes from a concept confusion between creativity and innovation and also by a terminology confusion, innovation is as well considered as an outcome, a set of activity or a process (Couger, 1990).

To clarify the terminology, the processes and more generally the whole system for innovation management, an international committee has been settled to provide guidance on innovation management. Generally, the word "innovation" sometimes refers to the activities or the processes resulting in, or aiming for, innovation. In ISO standards on innovation management, Innovation is defined as an outcome.(Hakvag, 2017)

Future standards on innovation management is settled on seven principles:

- i. Realisation of value: it is the goal for organizations to engage in innovation activities
- ii. Future-focused Leaders: Leaders propose a vision, present a future to reach.

- iii. Purposeful direction: Leaders propose a purposeful direction to engage all the resources in innovation
- iv. Innovation Culture: people are more flexible, with an insatiable curiosity, with a tolerance for failure and with a balance of passion and objectivity need support and protection.
- v. Exploitable insights: strategic intelligence helps to identify market trends and innovation opportunities
- vi. Mastering uncertainty: innovation project development consists mainly in implementing a learning plan to reduce project uncertainty
- vii. Agile management With Agile approach, organizations can more effectively resolve unexpected risks and opportunities

BRIEF PRESENTATION OF ISO 50501 INNOVATION MANAGEMENT SYSTEM

Management Standards on Innovation management intends to break down the existing cultural, and structural obstacles among/organizations. Indeed, Innovation Management System consists in a set of interrelated and interacting activities and other support necessary to achieve innovation strategy.

Innovation ISO 50500 series will be organized as follow:

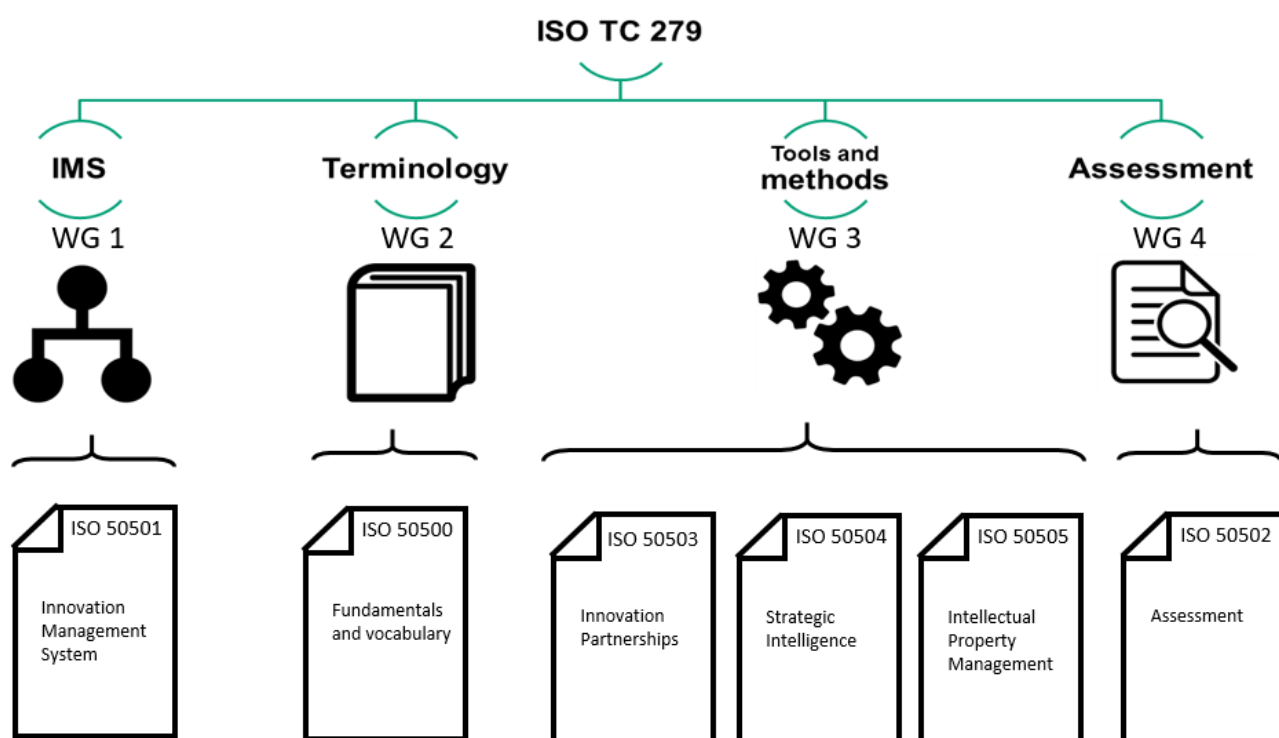


Figure 1: ISO 50500 series

The following standards would be published in the coming months:

- I. ISO 50500 Innovation management -- Fundamentals and vocabulary
- II. ISO 50501 Innovation management -- Innovation management system -- Guidance
- III. ISO 50502 Innovation management -- Assessment -- Guidance
- IV. ISO 50503 Innovation management - Tools and methods for innovation partnership -- Guidance
- V. ISO 50504 Innovation management -- Strategic intelligence management -- Guidance
- VI. ISO 50504 Innovation management -- Intellectual property management

These International Standards is intended to be applicable to:

- i. all types of private, public and not-for-profit organizations, regardless of type, sector or size. The focus is however on established organizations rather than on temporary or start-up organizations;
- ii. all types of innovations, e.g. product, service, process, method, model innovations, from incremental to radical innovations etc.;
- iii. all types of ways to innovate, e.g. internal, collaborative, user, market- and technology-driven innovation etc.

ISO 50501 is a hat document embracing high level considerations for innovation management system. Innovation management is more effective when viewed as a system, indeed it guides the whole organization to determine and focus on the efficient and relevant innovation activities and support.

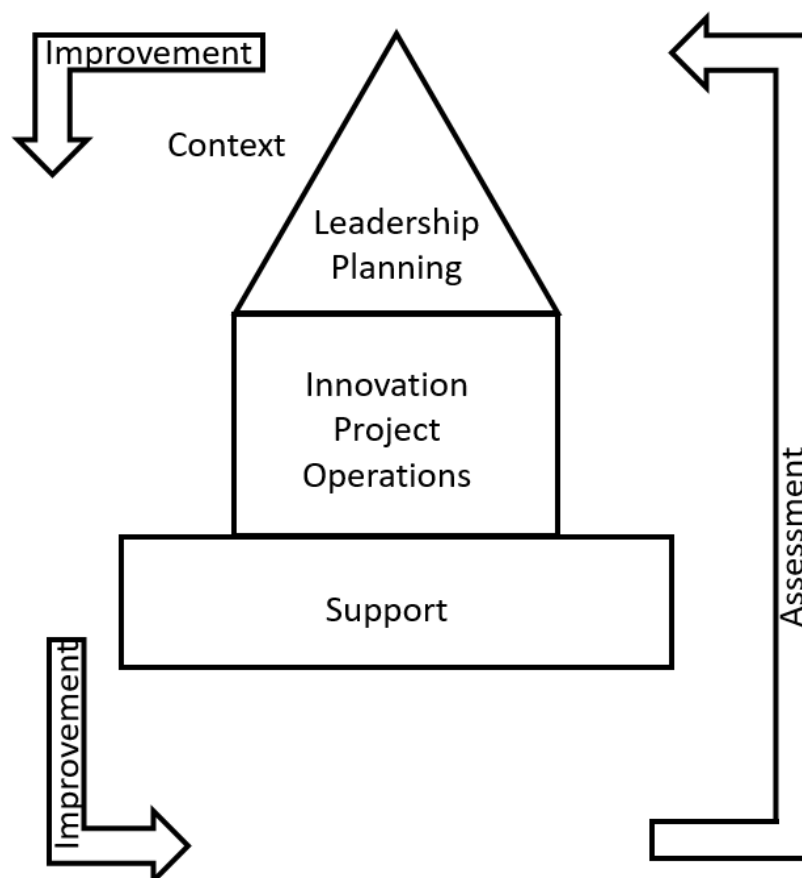


Figure 2: Structure of ISO 50501 Innovation Management System

An innovation management system encourages top management as well as leaders to establish appropriated and meaningful innovation ambition. This system also helps to optimize the use of resources. It indicates how to create awareness in sharing common vision and common set of tools and methods. With a facilitated assessment, (in including weak system elements, bottlenecks and unintended consequences) a benchmarking with external best practices may drive to more effective and mature management practices. In adopting ISO structure for system management, this standard on innovation management becomes compatible, and possible to integrate, with other existing management systems of the organization such as business management system.

Development of ISO 50501 has started with the elaboration of seven pillars, called principles, which helped 25+ experts of ISO 50501 working group to develop their activities.

INNOVATION MANAGEMENT PRINCIPLES

A management system is usually defined as the framework of activities and processes used by an organization to ensure that innovation strategy can be achieved. During elaboration of standards for management system ISO Committee experts worked on attributes of the systems such as: resources for the system, leadership, operation, evaluation. But, prior to this work, they have

established a set of principles to share a common understanding and a common background on innovation management.

The following sections of this article detail these seven principles. And we propose to illustrate each principle with an example from large groups/ start-ups relationships.

Realization of Value

Presentation of the Principle

ISO TC 279 have defined innovation standard as an outcome, which is realizing or redistributing value.

In fostering innovation management organization intend to increase business profitability and competitiveness, reduce costs, increase customers' satisfaction and renew activities' portfolio of offerings, comply with regulations, attract talents, partners, funding, enhance branding, create social benefits etc.

Rationale of the Principle

The realization of value is the ultimate objective, desired impact, and the rationale for organizations to engage in innovation activities. Innovations may be significant and transformative in their impact for all stakeholders involved. This value created by innovation is generally assed with financial metrics by large groups. But this notion of value creation or redistribution makes the difference between an invention and an innovation. Value can be realized, redistributed, or destroyed for innovators, intermediaries and users, in a value chain or network, or across sectors, areas or disciplines. Some stakeholders may be negatively impacted by e.g. disruptive innovation, and innovations may have both positive and negative impacts on the broader context, beyond the interests of the stakeholders involved, which may need to be considered.

Typically, innovation understanding as business model innovations leads to better organizational economic, environmental and social performance as described by (Evan and al., 2017)

The value created can be also a non-financial value is generated or redistributed. Innovation is not necessary a question of money, it can question the social changes.

Illustration of the Principle

For example, a start-up supporting budgets management of overindebted families in need will generate value for the global community. Indeed, an overindebted family will be in better position to prioritize their current invoices. A social start-up developing an application to support budget management of overindebted families is a today supported by the incubator of a large group specialized in commodities management. This is win-win situation generating value for the Society, overindebted families and the

commodities provider: the social start up benefits from finance and business support from the large group and in counterpart, the customers of the commodities providers can honour their invoice with a mastered budget.

Innovation Culture

Presentation of the Principle

A common background to share the culture is supported in organization by training, coaching of new methods for innovation. The rapid spread of tools such as Blue Ocean strategy (Kim,2015) ,Business model Canvas (Osterwalder, 2010)or Lean Startup (Ries,2011) as well as design thinking (Brown, 2009) or C-K method (Hatchule, 2013) show the necessity to codify and share some common practices. Today, Adobe has codified start-ups methods to create “kick box”,a tool kit available on open source mode (<https://kickbox.adobe.com/>). The goal of this box is to create and empower innovators able to learn from their failure, able to build minimum viable product and able to use their networks than creating innovations.

Rationale of the Principle

As these methods are widely used by entities looking for scalable and exponential markets, they have naturally been adopted by start-ups. Indeed, the entrepreneur is characterized by a set of behaviours, such as courage, risk taking and effectuation capacities. So, Innovation culture foster entrepreneurship mindset and influences regular employees who may have adopted an administrative mindset especially in large organization. They have to be challenged and pushed out of their comfort zone. The leaders also have a pivot role in developing such a culture, indeed they have to be role models in inspiring people, and in challenging the status quo.

Illustration of the Principle

To develop this innovation culture, some organizations challenge their members in opening corporate incubators. These structures generally shake established businesses with new ways of working and new dynamics and make digital disruption more tangible for managers of large group. In banking industry the threat of fintech, insurtech, or even regtech made this approach unavoidable. The goal of such a relationship is not necessarily to generate new ideas but to empower corporate innovators and to develop innovation branding for the employment marketing in other to attract talents.

Future-Focused Leader

Presentation of the Principle

Then the leaders of a profitable organization are torn between two tendencies: today operations and future opportunities. A profitable organization has by created a recurrent revenue and maintain it on being customer and delivery focus. To keep their ability to deliver on time on cost and on quality, an organization optimizes resources uses; as described in standards such as ISO 9001 on quality management. To maintain sustainability of the organization, leaders have to look ahead and prepare the future.

Rationale of the Principle

In this principle, leaders are not only represented by the top management but also by all middle managers who want to challenge the status quo. A typical leader will then build an inspiring purpose more than control processes. He or she will also engage teams in continuously pushing back their own boundaries thanks to leader's trust. With this principles Resilient organizations are led by resilient, energetic, honest, and active leaders that see back only for constructing a better future. It is also beneficial from a human resources point of view; indeed, talented individuals are kept in the organization for developing ideas that bring profitableness.

The inability of an organization to capture new opportunities and to respond to challenges may lead to stagnation, becoming irrelevant and eventually to the demise of the organization. So, engaging in innovation activities makes organizations future focused. Moreover, the ability to innovate and to make it a core organizational capability is increasingly becoming the most important differentiator and dominant success factor of organizations.

Illustration of the Principle

Typically, this kind of behaviours needs curiosity and courage to act. This kind of soft skills is today developed in large group training leaders on innovation management methods. Start-ups coaches have transformed into their theories their practices with start-ups leaders and give the opportunity to organization's leaders to experiment them. To share the start-up mindset and in particular the ability to disrupt existing business, trainers form couple with a leader from a large group and a founder of a start-up. (Byrne,2017) presents the co-development methods coming from Quebec that brings leaders to adopt effectuation mindset as defined by (Sarasvathy, 2001). Effectuation principle could. Effectuation includes a set of decision-making principles start-ups entrepreneurs are observed to employ in situations of uncertainty.

So, what innovation leaderships means today? Bill Fisher in (Trifilova, 2017) proposes the following attributes for innovation leadership: communication, trust, visionary, and ability to learn and change. Then Innovation has to be considered as a lifestyle where it is necessary to be ambitious daring, to take chances and fail often.

Purposeful Direction

Presentation of the Principle

Organization's vision and innovation strategy have to be aligned. Market positioning organization values and innovation strategy have to be widely spread in the organization to guarantee a shared and common understanding of innovation's direction.

Rationale of the Principle

In providing a purposeful direction, leaders are empowering their teams in creating a clear view of the future destination with achievable mile stones that everyone in the business can understand and share. Indeed, having everyone on the same page is critical to achieving organization's strategy.

There is a tendency to consider innovation as a chaotic and unframed process because it may involve free thinking during the early phase. Indeed, Innovation starts with an opportunity, a pain coming from the market's expectations. Few companies have an explicit innovation strategy, as opposed to their corporate strategy. Indeed, the corporate strategy is assumed to encompass a strategy for how the company innovates and the question of how and why a company innovates is never considered properly. A purposeful direction is beneficial for an organization as it ensures alignment with the organization's strategy and fosters adoption of the innovation by the business, indeed objectives transparent and meaningful for innovation on strategic and operational level. A purposeful direction is also helpful to create clear evaluation/performance criteria for the innovation activities, the innovation project portfolio, the innovation management system and the contribution of innovation to increased competitiveness.

Illustration of the Principle

Market intelligence department of a large oil and gas company has identified low cost airlines and low-cost models of railways companies has a threat for private car transportation. company's strategy has been refocused on two main axes: competitiveness of energy provision and sustainability of energy. To increase competitiveness of car transportation for private trip, this oil and gas company has decided to support a start-up proposing a monetized service of car-pooling. this start-up was a mean to disrupt transportation market. The start-up was supported in offering coupon for oils to first members of the car-pooling offer. This partnership met the target of green development in exchanging the car-pooling system support with carbon credit. the oil and gas company was in a position to disrupt transportation market with thermic engine and a digital service but also to develop its green strategy.

In communicate innovation roadmaps to all departments, Marketing of this oil and gas companies has been able to translate the strategic direction into innovation actions. The close monitoring of the contribution of operational innovation activities to the strategic direction supports to innovate in the return of investment of the partnerships.

Exploitable Insights

Presentation of the Principle

This principle illustrates mainly the trends started from 90's where business development moved from a techno push approach to a market pull ones.

Organizations are facing constant conditions of change and disruption. Then they must constantly adapt themselves to their changing ecosystem (Drucker,76). In particular businesses must adapt to these changes in proposing a new future, a new vision they have to respond to disruptions that make the business uncertain (Ansoff,75) .

Rationale of the Principle

In the innovation management field, the S-Curve (Foster, 1986) illustrates the introduction, growth and maturation of innovations. In the early stages large amounts of resources are expended on the concept but small performance improvements are observed. Then, as the knowledge and learning accumulate, progress becomes more rapid and the innovation reaches a certain adoption level with an exponential dissemination. A disruptive innovation created a new S-curve, shifted to the right of the original one, with a higher performance limit. Today S-curves are more and more frequent and are also colliding.

So Innovators are more and more struggling. The success of their ideas appears uncertain, or with a hard-competitive landscape. With a combination of research techniques organization may access data and knowledge to make decisions more confidently and accumulate knowledge and rapidly.

Market and intelligence unit provides improved understanding of the context of the organization, and an Improved decision making with regards to selecting insights, ideas, and ultimately which innovations to invest in.

Illustration of the Principle

Start-ups scouting helps organizations to maintain their technology watch, market watch. But it is not enough today as the systems are so complex today that an organization cannot be disrupted by only one actor. For example, with digitation, it is not only a company, an organization which is disrupted but a whole industry, transforming value chain in a complex ecosystem.

How can relationships between start-ups and large groups generate insights? Outputs of collaboration between start-ups and large groups can generate a lot of technical, market, feasibility insights. In order to optimize their costs and suppliers' management large groups have often efficient procurement process. This process is based on a limited list of suppliers. Most of the time this collaboration is stopped by procurement department as the start-up is not list in the suppliers' lists. A large group in automotive developed a new concept 'Minimum Viable Purchase'. They have created a separate entity whose processes are open to start-ups. They work with the start-ups not on a minimum

viable product but for a minimum viable purchase satisfying procurement requirements. Of course, purchasers are involved in this process as well as engineering department, contract managers are also involved in the process to keep the first move advantage.

Agile Management

Presentation of the Principle

Established companies often struggle to become more dynamic. Agility is the ability of an organization to renew itself, adapt, change quickly, and succeed in a rapidly changing, ambiguous, turbulent environment.

Rationale of the Principle

New ideas and new solutions very often require changes in organizations, systems, processes and competences to respond accordingly. Effective innovation management requires continually and proactively adapt the organization in a timely manner to new foreseen needs resulting from insights, changes in environment, interested parties' expectations or in the objectives

Illustration of the Principle

For example, a French transport company created their incubator to challenge the whole company and introduce digitalisation as a new way of working. In 2012, Chief Innovation Officer wanted to optimize the placement of trains in stations. In just three hours, an owner of the start-up hosted in the incubator helped him to identify bottlenecks by adopting agile principles. In particular he proposed him to review the pricing of the offer and to incorporate a financial director in the managerial team. This was a real mentoring work from the start upper, who does not need to master the subject. The idea is not to replicate a previous success but it is the distance and the openness which bring the solution.

Managing Uncertainty

Presentation of the Principle

(Daniel, 2007) shows how usual project management tools are not powerful for innovation project management. Indeed, uncertainties is constantly present on the route of innovation. In regular innovation project management uncertainty is rapidly assessed as a risk. Uncertainty is different than risk: Risk is about futures to which probabilities can be reasonably assigned; whereas uncertainty is about futures for which a probability distribution cannot be determined. Organizations deal with risk every day and are have learned how to manage it. Nevertheless, organizations may stay paralyzed, when facing uncertainty. Indeed, they often mistake uncertainty for risk. Uncertainty comes from the constant evolution of customer desires from new technologies, from competitive shifts and even from

political, economic and social systems. Managing this uncertainty, and turning it into risk which the company can readily deal with, is critical to a company's future.

Rationale of the Principle

The future of an idea is fully uncertain as it is by definition totally new. With unknown, prediction is futile, then it is better to think metaphorically. than crossing into unknown rivers requires to have milestones with small steps forward and backward which are small trials and errors. Leading in the unknown is a completely different ballgame from what has traditionally been the practice in an industry before a period of disruption. Collaborators have also to be comfortable with change management. For google also mindset of employees is important, during hiring process, sourcing managers assess candidates on their ability to be comfortable with ambiguity.

Innovation culture, as described previously would also encourage experimentation. Prototyping is poorly considered in some large organizations: the ones making prototypes is the ones who does not know.

Illustration of the Principle

Many large groups open fablab to transform prototyping perception. Fablabs are born in California with the makers movement and has been institutionalised by MIT. The maker and hacker movement is a contemporary subculture, representing a technology-based extension of DIY culture. In 1968, the first issue of the American magazine The Whole Earth Catalogue was released. Subtitled "Access to Tools", this catalogue listed a vast range of available products for makers. It has become the bible for the DIY movement in providing amateurs information on equipment and supplies, allowing them to make their own things and then became the birth date of the movement. Today fablabs are also a chance to create a showcase for large groups and to attract hackers' start-ups. A French retail store for DIY and home improvement has created a fabled and became a natural partner to spread « maker fairs ». The French DIY store can test new business models but also new products with this early adopters' community. With this image of hackers' supporter, some start-ups have been attracted to create a partnership instead of competing in front the French retail store.

CONCLUSION

The context of which a large group works today is characterized by e.g. accelerated change, globalization of markets, emergence of new technologies and competitors, new regulatory requirements and ever more demanding users and citizens.

In this environment, the ability to innovate is a key success factor for most organizations. They seek to continuously realize value by introducing new or changed products, services, processes, models, methods etc.

So Top managers or leaders in large companies often ask themselves, “Why aren’t we better at innovation?” It seems reasonable to make better ideas emerge, look outside the company for concepts and partners, establish different funding mechanisms, and protect the new and radically different businesses from the old. Because the dead fishes follow the current and only the alive one swim upstream, innovation takes courage.

Disruptions goes so fast that large groups are not well prepared to answer disruption. start-ups with their agility and ability to listen to the market. Start-ups needs large groups to understand regulations and to benefit from expertise, branding, Intangible assets ...

Just as start-ups multiply, business is transitioning from the predictable like the Newtonian mechanics to the unpredictable such as quantum mechanics; from the business operation where bankruptcy is the exception to the uncertainty management where the bankruptcy is the norm. To survive, corporates have to attract start-ups and then to be able to identify disruption moment in their own industry.

To have successful partnerships, both sides have to be well prepared and understand the stakes of such a collaboration. A large group is very efficient to implement a process and run it. With a systemic and systematic approach large groups can become efficient in their relationships with start-ups. That is the reason why a standard on innovation management can be fruitful for effective relationships. With the future ISO 50501 a start-up can share a common vocabulary and set of practices on innovation management and open innovation to collaborate effectively with large groups.

We have shown how the seven principles of innovation management ISO 50501 can be illustrated by real cases coming from start-up large groups relationships. The next step would be to analyse the content of the ISO 50501 standard which will be publish late 2018. It could be also of interest to analyse how the recommendations of ISO TC 50501 can improve governmental plan to improve innovation ecosystem of a region.

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