

# 1 Characteristics and types of innovation

## 1.1 Innovation - Introduction

### Keywords

Innovation, Innovation process, Types of innovation, Innovation measures, Innovative firm, Innovation metrics

### Learning Objective



This component is an introduction to the basics of innovation theory. After reading it you will understand what innovation is and what it is not, what the main types of innovation are and how firms can measure innovation. You will also learn that innovation is not a privilege of big firms - perhaps innovation processes are already running in your SME or organization?

It will take approx 45 minutes to read this module and 40-60 minutes to discuss it with a group of people.

### Introduction

All the man-made changes that the world has witnessed are a result of this tendency to look for something new and different. The desire to try something else is a prominent human characteristic. There is no end to the new ideas in the world, but when these ideas create value, it becomes innovation.<sup>1</sup> Good ideas are of no use unless they are implemented.

*Chester Carlson invented the xerographic process in 1938. A copy machine was revealed in 1948, but it took another decade while innovators from Haloid-Xerox delivered a practical rotary-drum office copier.*

From time to time, innovation is done by taking an existing idea, concept or product and improving it. However what is more remarkable is to be able to think beyond what already exists, and coming up with a brand new concept.

Why is innovation demanding so much attention in our days? Because the pace of change is increasing rapidly. The world is shifting from an industrial age to a knowledge age. In the continuously changing global environment, strategic advantage can only come from being leaders rather than followers of change, and the only way that firms can be leaders of change is through innovation.

All firms need to be innovative, as innovation is the lifeblood of future revenue streams.<sup>2</sup> The reality however is that most companies, particularly small and medium-sized enterprises (SMEs), find it difficult to understand what innovation is, how innovation can be effectively managed and, that innovation is not an issue only for high-tech industries. Any individual, any company, in any industry, can be innovative. Innovation is a process, not a destination.

<sup>1</sup> <http://ezinearticles.com/?An-Introduction-To-Innovation&id=276936>

<sup>2</sup> <http://www.innosupport.net/>, Module 1.3

There are many theories on innovation subject - what is innovation; what are the main innovation characteristics and types; how innovation can be managed, etc. The world has not yet (and possibly never will) come up with one unique innovation theory,.

### 1.1.1 What is innovation?



Before introducing the definition of the innovation, it is important to make the distinction between innovation and invention.

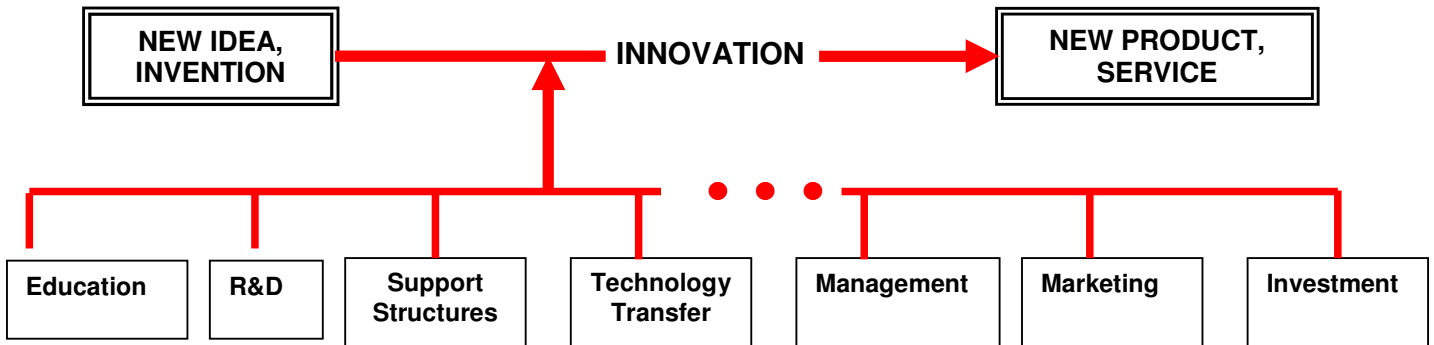
It is important to be clear that **innovation is NOT invention**. An innovation is the extension of an invention. If an inventor discovers “the next big thing” but is unable to find anyone to produce it, then “the next big thing” remains undiscovered to the world.

While inventions can be carried out anywhere, for example in universities & research institutes, innovation occurs mostly within firms, although they may also occur in other types of organizations. To be able to turn invention into innovation a firm normally needs to combine several different types of knowledge, capabilities, skills and resources. For instance, the firm may require production knowledge, skills and facilities, market knowledge, a well functioning distribution system, sufficient financial resources, etc.



**One of the strongest characteristics of the innovation shows that the innovation is a continuous process.**

Figure 1: Innovation process



The innovation definition proposed by the Organization for Economic Co-operation and Development (OECD) and European Commission (EC) in the guidelines for collecting and interpreting innovation data (Oslo Manual<sup>3</sup>) read as follows:



**An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.<sup>4</sup>**

<sup>3</sup> Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data.

This broad definition of an innovation covers a wide range of possible innovations.

The *minimum* requirement for an innovation is that the product, process, marketing method or organisational method must be **new (or significantly improved) to the firm.**<sup>5</sup>



**A common feature of an innovation is that it must have been implemented.**

A new or improved product is implemented when it is introduced on the market.

New processes, marketing methods or organisational methods are implemented when they are brought into actual use in the firm's operations.<sup>6</sup>

Innovation activities vary greatly in their nature from firm to firm. Some firms engage in well-defined innovation projects, such as the development and introduction of a new product, whereas others primarily make continuous improvements to their products, processes and operations. Both types of firms can be innovative: an innovation can consist of the implementation of a single significant change, or of a series of smaller incremental changes that together constitute a significant change.<sup>7</sup>



**An innovative firm is one that has implemented an innovation during the period under review.**<sup>8</sup>

For a better understanding of what is innovation and what is not innovation, Oslo Manual defines changes in firms, which are NOT considered as innovation:

- Trading of new or improved products is generally not a product innovation for the wholesaler, retail or transport and storage firm.<sup>9</sup>
- The purchase of identical models of installed equipment, or minor extensions and updates to existing equipment or software, are not process innovations. New equipment or extensions must both be new to the firm and involve a significant improvement in specifications.<sup>10</sup>
- Firms engaged in custom production make single and often complex items according to customers' orders. Unless the one-off item displays significantly different attributes from products that the firm has previously made, it is not a product innovation.<sup>11</sup>
- A change in the price of a product or in the productivity of a process resulting exclusively from changes in the price of factors of production is not an innovation. *For example, an innovation does not occur when the same model of PC is constructed and sold at a lower price simply because the price of computer chips falls.*<sup>12</sup>
- It is not an innovation to stop doing something, even if it improves a firm's performance. *For example, it is not an innovation when a television manufacturer*

<sup>4</sup> Ibid., 146, p.46

<sup>5</sup> Ibid., 148, p.46

<sup>6</sup> Ibid., 150, p.47

<sup>7</sup> Ibid., 151, p.47

<sup>8</sup> Ibid., 152, p.47

<sup>9</sup> Ibid., 204, p.57

<sup>10</sup> Ibid., 199, p.56

<sup>11</sup> Ibid., 201, p.56

<sup>12</sup> Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data, 200, p.56

*ceases to produce and sell a combined television and DVD player, or a property development agency or construction company stops building retirement villages. Similarly, ceasing to use a certain marketing or organisational method is not an innovation.*<sup>13</sup>

- In certain industries such as clothing and footwear there are seasonal changes in the type of goods or services provided which may be accompanied by changes in the appearance of the products concerned. These types of routine changes in design are generally neither product nor marketing innovations. *For example, the introduction of the new season's anoraks by a clothing manufacturer is not a product innovation unless the anoraks have significantly improved characteristics.* However, if the occasion of seasonal changes is used for a fundamental change in product design that is part of a new marketing approach used for the first time by the firm, this should be considered a marketing innovation.<sup>14</sup>

### 1.1. 2 Why is innovation important?

Successful innovation is strongly linked to financial performance. Innovation is a key driver of economic growth. It also brings wider benefits for society. Ideas and discoveries improve our standard of living. Innovation can also lead to better standards of safety, better health care, better quality products, and products and services that are better for the environment. Innovation has increased our productivity far beyond that of previous generations and has fundamentally changed the way we live and all aspects of our lives. Innovation and education are key ingredients to our global success in a knowledge economy.

Our fast-changing world brings challenges and opportunities for businesses. Innovation can help businesses make the most of these changes. Changing customer needs and expectations, changing competitors, changing technology, changing external regulatory environment, and an increasingly global and dynamic marketplace - all bring opportunities for innovation. Innovation can lower the cost of production, build new markets and increase competitiveness. Innovation can drive performance by building profitability, generating employment and increasing market share and growth.

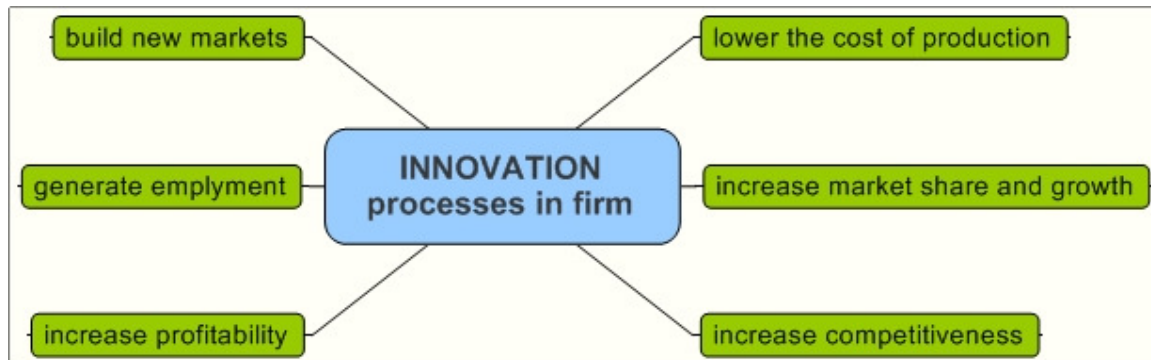
The figure below displays advantages of performing innovation at companies.

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<sup>13</sup> Ibid., 198, p.56

<sup>14</sup> Ibid., 203, p.57

Figure 2: Benefits for firm from innovation



Please stop and think: Have you thought about innovation in your company? Are your products or services still competitive in the market? Do actual and production costs estimate significant figure in the turnover in your company? Maybe it's worth thinking about?

*Sony releases 5,000 new products per year. A laptop's expected life is now only two years. Drug development is down from ten years to four years. There has never been a time when more products and services were being launched or when new technologies were being introduced to the market ever more rapidly.<sup>15</sup>*

The winning firms of the next ten years will be those that embrace innovation and build it as a core capability.



**If you aren't innovating your competitors are!  
If you do not innovate, you compete on price only!**

### 1.1.3 Where can I use innovation ?

Innovation is key to help your firm grow and expand in a fast changing world. Innovation is tightly linked to the financial performance, as successful innovation can reduce the cost of production of goods or services, open new market niches, introduce new products or services, which will in turn make your firm more profitable in the future.

Any firm, company, organization, and even individual person can be innovative.

Innovation is not confined to large businesses with the resources to employ an innovation manager or other highly skilled and specialized staff. Small businesses offer fertile ground for innovation. Many of the key products of the past century have been introduced by small business and this sector continues to produce radical innovations.

<sup>15</sup> A CSC White Paper, European Office of Technology and Innovation. What Innovation Is. How companies develop operating systems for innovation, p.6

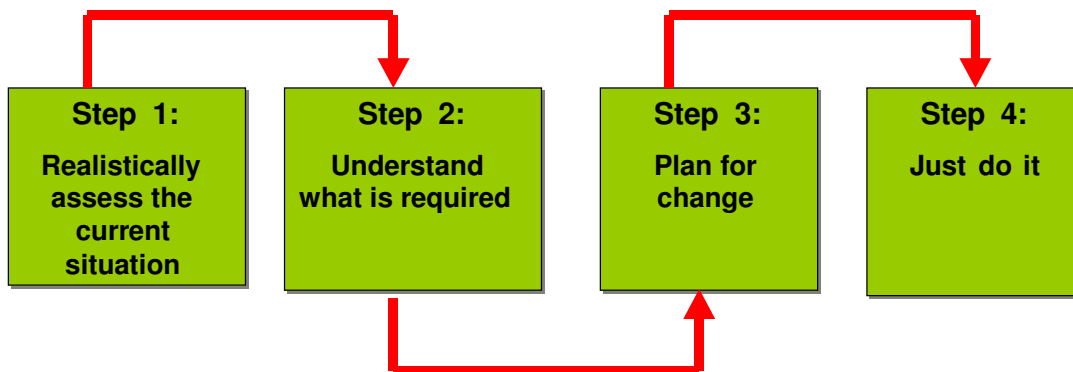


**Innovation is vitally important to small business. It's the lifeblood of every successful small company, helping it to thrive and be successful!**

#### 1.1.4 How to start innovating?

There is a practical, simple and effective approach to becoming innovative. It depends on taking four steps in order to create a purposeful and strategically framed program for building innovating performance. These steps are summarized below. The actions and tools required to implement these steps are discussed further in the Flash presentation and components of this Guide.

**Figure 3: Four steps for building innovating performance**



The animation is available in the online guide only ([www.innosutra.net](http://www.innosutra.net)).

## 1.2 Types of innovation

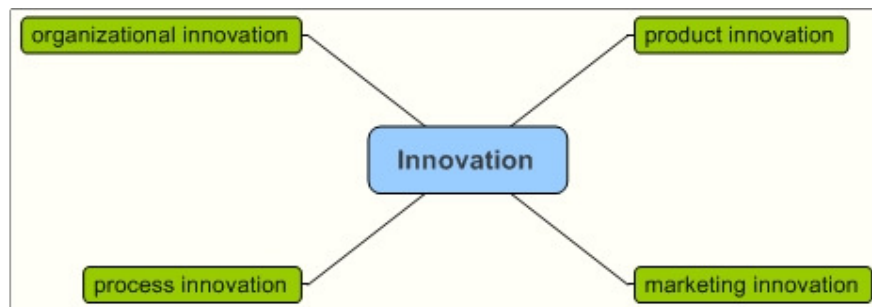
Innovation varies in scope, time for completion and organisational and societal impact. Categorisation of any kind usually involves areas of duplication, where the lines between one category and another overlap. We will overview the main types of innovation and simplified classification.

We also need to note that **categorising an innovation is not a science** and any one innovation can be positioned into different categories by firms.

### 1.2.1 Four main types of innovation (by innovation object)

As an object of the innovation, the Oslo Manual<sup>16</sup> concentrates on four innovation types: **product innovation**, **process innovation**, **marketing innovation** and **organizational innovation**.

Figure 4: Four main types of innovation



**A product innovation** is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.<sup>17</sup>

**Examples of product innovation:** first portable MP3 player; introduction of ABS braking, GPS (Global Positioning System) navigational systems or other subsystem improvements in cars.



**A process innovation** is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, technology, equipment and/or software.<sup>18</sup>

<sup>16</sup> Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data

<sup>17</sup> Ibid, 156, p.48

<sup>18</sup> Ibid, 163, p.49

**Examples of new production methods** are the implementation of new automation equipment on a production line or the implementation of computer-assisted design for product development.

An example of a new delivery method is the introduction of a bar-coded or active RFID (Radio Frequency Identification) goods-tracking system.



**A marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.<sup>19</sup>

Marketing innovation is aimed at better addressing customer needs, opening up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales.<sup>20</sup> The distinguishing feature of a marketing innovation compared to other changes in a firm's marketing instruments is the implementation of a marketing method not previously used by the firm. It must be part of a new marketing concept or strategy that represents a significant departure from the firm's existing marketing methods. New marketing methods can be implemented for both new and existing products.<sup>21</sup>

For example, the first use of a significantly different media or technique – such as product placement in movies or television programmes – is a marketing innovation.



**An organisational innovation** is the implementation of a new organisational method in the firm's business practice, workplace, organisation or external relations.<sup>22</sup>

Organisational innovation can be intended to increase a firm's performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labour productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies.<sup>23</sup>

The distinguishing features of an organisational innovation compared to other organisational changes in a firm is the implementation of an organisational method that has not been used before in the firm.<sup>24</sup>

**Examples:** the first implementation of practices for employee development and improving worker retention, such as education and training systems; the first introduction of management systems for general production or supply operations, such as supply chain management systems, business reengineering, lean production and quality-management systems.

<sup>19</sup> Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data, 169, p.49

<sup>20</sup> Ibid, 170, p.49

<sup>21</sup> Ibid, 171, p.49

<sup>22</sup> Ibid, 177, p. 51

<sup>23</sup> Ibid 178, p.51

<sup>24</sup> Ibid 179, p.52



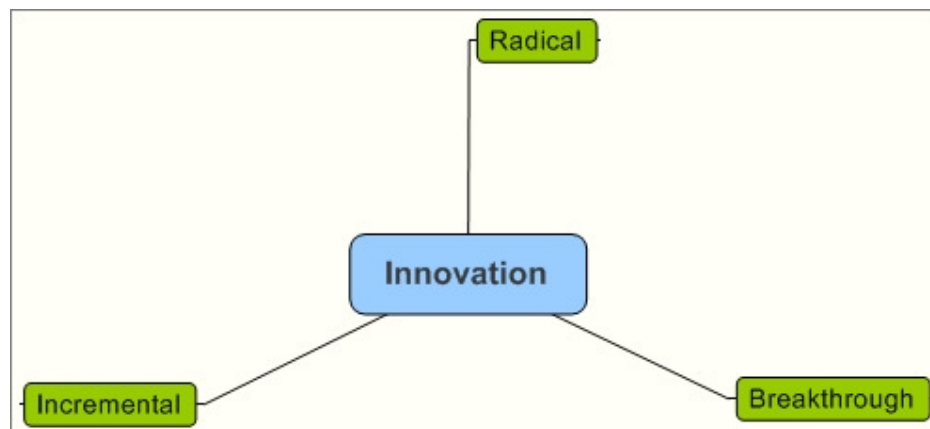
## 1.2.2 Incremental, radical and breakthrough innovation



*Please stop and think:* Now you know that innovation can affect a firm's products, processes, marketing activities and organizational issues. However, to manage your business successfully is not sufficient in today's frequently changing market. If you would like to be a real innovator, you need to learn every minute of every day! Why? – because the innovator has to be aware of the knowledge linked with purposeful and effective innovation.

It's time to learn about classification of innovation by novelty of results.

Figure 5: Innovation types by novelty of results



**Incremental innovation** includes the modification, refinement, simplification, consolidation, and enhancement of **existing** products, processes, services, and production and distribution activities.

The majority of innovations fall in this category.

*Some examples of incremental innovation:*

- *Many versions of Sony's Walkman are not the original but all the models that followed and were built on a common platform.*
- *Most automobiles, with annual minor improvements that over years provided significant benefits in safety, efficiency and user comforts.<sup>25</sup>*

<sup>25</sup> Gerard H.(Gus) Gaynor (2002). Innovation by Design: What It Takes to Keep Your Company on the Cutting Edge,p.24, 25



**Radical innovation** involves introducing new products or services that develop into major new businesses or spawn new industries, or that cause significant change in a whole industry and tend to create new values.<sup>26</sup>

*Example of radical innovation: banking business has gone through at least a mild metamorphosis – ATM machines, funds available just about anywhere in the world with the appropriate plastic card.*



**Breakthroughs** take people by surprise. They are rare events, arising from scientific or engineering insights. They are called "breakthroughs" because they do something that most people did not realize was possible.

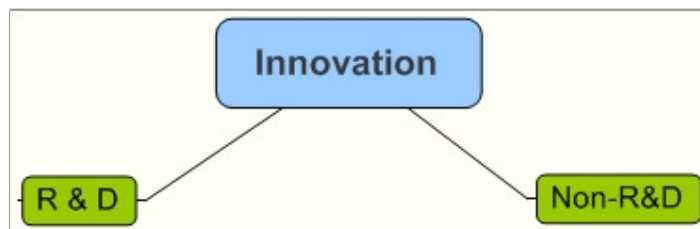
Breakthroughs create something new or satisfy a previously undiscovered need. Big breakthroughs often have uses and effects far beyond what their inventors had in mind. Breakthroughs can launch new industries or transform existing ones. Breakthroughs are also called "Disruptive innovation".

*Example of breakthrough innovation: the first EARS laser printer was made by Xerox. This laser printer could print 60 copies a minute at 600 dots per inch. No one had ever built anything like this before!*

### 1.2.3 Innovation types by innovation source

The OECD in Oslo Manual<sup>27</sup> systematised innovation types by dividing the source of innovation into two groups: **R&D and non-R&D**:

Figure 6: Innovation types by source



The main idea of this systematization is to show that not all innovation processes in firms have to be developed or/and implemented in co-operation with R&D institutions (universities, research institutes, etc.).

Moreover, the majority of innovative SMEs are not linked to any R&D institution. Few of them have their own R&D departments (in-house R&D), while others are innovating due to their skilled personnel.

<sup>26</sup> Ibid, p.27


<sup>27</sup> Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data.


## 1.2.4 Innovation types by strategy


Innovation by firms' innovation strategy can be divided into two groups: **open innovation** and **closed innovation**.

Figure 7: Innovation types by strategy



 **Open innovation** consists of strategies by which firms can acquire technologies they need and exploit technologies they have developed. In open innovation firms get their technology from multiple sources. Open strategies for innovation seek efficiency through effective partnering.<sup>28</sup> **Nobody ever created a breakthrough with open innovation.**<sup>29</sup>

 **Closed innovation** employs strategy of hiring the smartest technical people in an industry. It assumes that a firm must itself develop its own new products and services and be the first company to get them to market. It assumes that the firm that leads the industry in R&D spending will eventually lead the market. Finally, it assumes that a company should hold on to its intellectual property tightly to keep the competition from benefiting from the ideas.<sup>30</sup>

 **Please stop and think:** Now it's your turn! Which strategy does your organization use? Just take time and think! There is no benefit in arguing which strategy is better or more efficient. Let us look at the example below.

### **Examples:**<sup>31</sup>

*In 1981 the Xerox personal computer (PC) was a leading-edge high-performance computer with the ability to send, receive and print high-quality documents. Xerox built the entire Star system, from chips through software including manufacturing, distribution, service and financing. You could not really buy a single Xerox Star. You could buy a three-user system with a network facility and a shared laser printer for about \$17,000. This is the example of the closed innovation.*

*In contrast, the IBM PC cost about \$3,000 and was marketed broadly to individuals and small businesses. Among the factors in the success of the IBM computer were the brand name, the much lower price, and the use of third-party dealers for hardware and software. The product itself was an example of open innovation. The processor came from Intel, the operating system from Microsoft, and the application software from third parties.*

<sup>28</sup> Mark Stefik and Barbara Stefik (2004). Breakthrough. Stories and Strategies of Radical Innovation, p.235

<sup>29</sup> Ibid, p.10

<sup>30</sup> Ibid, p.237

<sup>31</sup> Ibid, p.238

*What worked for IBM in the open-innovation approach was that it powerfully exploited the strengths of its partners. IBM did not try to create or control all of the technology itself and market forces quickly created competition among suppliers. IBM recognized that the product was a personal computer rather than a corporate computer.*

*Although Xerox had been marketing the Alto and the Star for several years, it was disastrously slow to recognize and adopt strategies that are more effective. Furthermore, it did not powerfully exploit the strongest methods of the closed-innovation paradigm. For example, it did not aggressively protect its technology position with patents. It did not develop an effective licensing strategy, nor did it use patents to slow down the competition.*

*Without question, IBM's open-innovation approach to the personal computer dominated in the market.*

*However, it is interesting to remember that IBM's execution of open innovation did not keep IBM in the driver's seat. Today personal computers are more often referred to as "Wintel" computers than as "IBM computers." That is an acknowledgment that architectural control and market dominance now are driven by the Windows operating system from Microsoft and the processor chips from Intel. Lacking any proprietary advantage, IBM lost its hold on the PC market. Leadership passed to the companies with the key technologies.*

### 1.2.5 Top-down and bottom-up innovation

In majority part of organizations, innovation usually comes from the **top-down** or from the **bottom-up**.

Figure 8: Top-down and bottom-up innovation



**Top-down innovation (TDI)** has the advantage that the people in power set the pace - they set the targets and the objectives and provide the funding. The implementation is left to the appropriate personnel.

Those working on the project do not have to beg for funding. This approach takes the form of a directive, such as:

- We will explore that new market.
- We will eliminate some segment of our current product line.
- We will compete in some new market segment with a new product.

- We will invest in this new technology for the future.
- We will make an investment in automated manufacturing.<sup>32</sup>

Such directives leave no doubt as to where the firm will find its future.

The only limits of top-down innovation are the people resources.

**Example of top-down innovation:**<sup>33</sup>

*In 1982 Canon began reconceptualising the plain-paper copier business and investigated the opportunities for lightweight compact copiers. Management knew that the new copier would not come into being by minor improvements in component and assembly designs. It would need a thorough analysis of the market to establish the required features, advantages and benefits. Canon approached the opportunity with a high-level project team. The team included:*

- *Project manager - the director of the Reprographic Products Development Center (RPDC);*
- *Advisor to the project-managing director of the RPDC;*
- *Director of the corporate technical planning and operations center;*
- *Representatives from quality control, finance, and marketing;*
- *Task force to examine the colour copying issues.*



**Bottom-up innovation (BUI)** is innovation originating someplace in the bowels of the firm. Everyone is welcome to participate in bottom-up innovation. BUI provides the greatest challenges to innovators - those people who think differently, who ask many questions, who have many interests, who are dissatisfied without change, who are considered arrogant, who bring a different perspective, who ask "why not" more often than "why," who create problems for first level managers, but who are the lifeblood and future of the firm. These are the people who come up with ideas and are willing to go through the laborious process of first convincing themselves<sup>34</sup> and then convincing several levels of management of the value of those ideas.<sup>35</sup>

**Example of bottom-up innovation:**<sup>36</sup>

*3M is a good example of bottom-up innovation. 3M now operates in 63 countries and promotes entrepreneurial spirit worldwide. 3M is a leader in coated and non-woven abrasives, tapes of unimaginable compositions, transportation and personal safety, medical, pharmaceutical, and health care information systems, a leading supplier of*

<sup>32</sup> Gerard H.(Gus) Gaynor (2002). Innovation by Design: What It Takes to Keep Your Company on the Cutting Edge,p.48

<sup>33</sup> Ibid, p.48, 49

<sup>34</sup> Please see components 4.6 and 10.2 of this guide for details

<sup>35</sup> Gerard H.(Gus) Gaynor (2002). Innovation by Design: What It Takes to Keep Your Company on the Cutting Edge,p.51

<sup>36</sup> Ibid, p.52, 53

*connecting, insulating, and protective products for the electronic related industries, Post-it Notes and many other related products.*

*Innovation is part of the company's culture that has been fostered for more than seventy-five years. That culture, while providing freedom of action and opportunities for exploring new ideas, was guided by operational and financial discipline. The history of some of the products that now represent its major divisions includes mild threats of termination from management if the person championing the product did not cease spending time on it. That history also reveals that those threatened individuals continued to pursue their efforts in some form in spite of management's objections*

## 1.3 Innovation measures



How to measure your firm innovativeness? Would you like to find out if your firm is innovative? You haven't done it before? Let's start to learn about innovation measures, because this topic is fundamental for sustained performance and growth within firms!



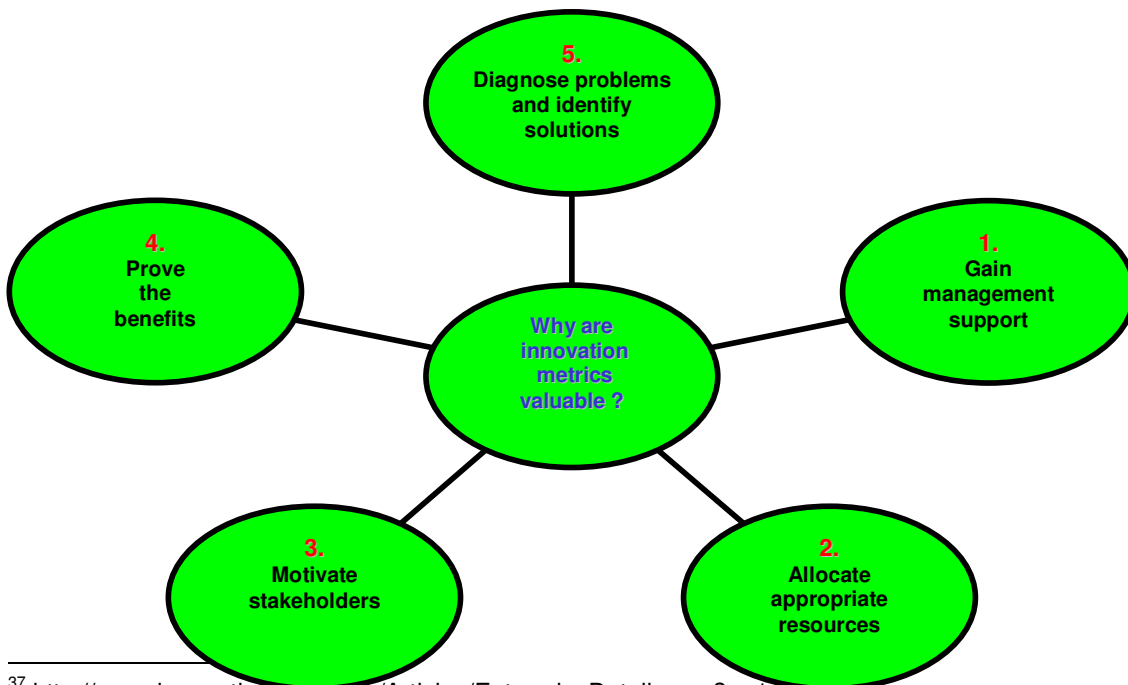
**Innovation metrics** are organizational measurements that help classify the organization's ability to innovate and its record of success -- are valuable for several reasons.<sup>37</sup>

Innovation metrics are important for either a small start-up company or a stable international company, because metrics affect a company's operation in line with its goals and best interests and assist managers to make decisions based on objective data.

Measuring success in innovation depends on the type of innovation and the firm's approach to measuring success. Since each innovation is different and all firms have different priorities, the methods will vary. Some will focus totally on the quantifiable financial expectations, while others will use a blend of the quantifiable and the qualitative.

Specific, measurable and actionable measures of innovation facilitate the innovation process and produce significantly more innovative outcomes. The following figure and Flash presentation will show you why innovation metrics are valuable:

Figure 9: Why innovation metrics are valuable<sup>38</sup>



<sup>37</sup> <http://www.innovationtools.com/Articles/EnterpriseDetails.asp?a=146>

<sup>38</sup> <http://www.innovationtools.com/Articles/EnterpriseDetails.asp?a=146>



Now let us have a look at the following Flash presentation, which demonstrates in details “*Why innovation metrics are valuable*”.



The animation is available in the online guide only ([www.innosutra.net](http://www.innosutra.net)).

Innovation can be viewed as having three distinct but related components: **inputs**, or resources, such as people and money; these get fed into **processes**, which act on and transform the inputs; and **outputs**, or the end results, which include both cash returns and indirect benefits, such as a stronger brand and acquired knowledge that can be applied to other offerings and purposes. All three components can, and should, be measured.<sup>39</sup>



*Please stop and think:* What types of innovation does your organization need to reach your objectives? Use your judgment, based on your innovation objectives and strategy, and decide what deserves your full attention and what does not! As a general starting point, however, consider tracking at least some of the metrics listed below. In addition, remember - the balance between the different metrics, both within and across the three categories, remains the most important factor.

**For example, you can measure following inputs:**<sup>40</sup>

- **Financial resources being committed.** Firm’s finances, funds, loans, grants, risk capital, etc.
- **Human resources.** You need to track the total number of people committed to an innovation, certainly. However, you also, more importantly, need to monitor how your key people are being used. Make sure you know how, and where, these people are spending their time.
- **The number of ideas generated and the expected payback for each.** Ideas are an important input — the fuel for innovation. While many firms think they have a shortage of ideas, most don’t. Nevertheless, if you do not measure, you will never know. Moreover, if it turns out that you really don’t have enough big ideas, you’ll need to know what you need to do in order to put in place the necessary steps to resolve the shortfall.<sup>41</sup>
- **R&D spending.** How much the firm is spending per year for acquisition of external R&D competence?

<sup>39</sup> The Boston Consulting Group (2006). Measuring innovation 2006, p. 6

<sup>40</sup> Ibid., p.13

<sup>41</sup> Please see component 4.6 of this guide for details



### For processes, you can measure:<sup>42</sup>

- **Resources expended per individual project and on average.** A process needs to be both effective and efficient. Most firms can readily measure efficiency, so you can start there — but don't stop there.
- 
- **The number of ideas that are moving from one stage of the process to the next.** If a process is supposed to be working, is it working? What is happening inside the process at any point in time?

### For outputs you can measure:<sup>43</sup>

- **The number of new products or services launched.** While the absolute number of new offerings is not a financial output, you need to know what is coming out at the end of the process.
- **Incremental gains in revenues and profits.** Whether the innovation is a process change, a new product, or an improved customer experience, an innovation needs to impact profits.
- **The ROI (Return on Investment) of your innovation activities.** This is what it's all about. Are you earning a sufficient return on your innovation spending? Innovation ROI is a key metric to use to determine how much to invest in innovation.
- **Indirect, non-cash-generating outputs** that are important to track. The number of patents filed or the number of trademarks, scientific articles written by staff, can track knowledge gained, for example.



**Remember, not all innovation measures are quantifiable!**

The most commonly used innovation metrics are:

- **Percent of current year sales due to new products released in the past N-years.** One study indicates that about 50% of firms are using this metric.<sup>44</sup>
- **R&D spending.** This metric assumes that the amount of money spent on research and development directly correlates to the amount of innovative products, processes and services that get to the public.<sup>45</sup>
- **Patent creation (trademarks, copyrights, articles).** Some firms create patent after patent and boast of their innovative capabilities. While this may be well and true for a few firms. Many firms do not patent their products and processes but instead treat them as confidential. Once a patent is issued, knowledge of the innovation becomes available to all who choose to search the patent literature.

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<sup>42</sup> The Boston Consulting Group (2006). Measuring innovation 200, p.13

<sup>43</sup> Ibid.,13,14

<sup>44</sup> [www.triz-journal.com/archives/2003/03/d/04.pdf](http://www.triz-journal.com/archives/2003/03/d/04.pdf)

<sup>45</sup> [http://www.realinnovation.com/content/what\\_is\\_innovation.asp](http://www.realinnovation.com/content/what_is_innovation.asp)

Counting the number of patents does not provide much security for beating off the competition. The optimal solution is to have patents that add significant value.



Regarding the number of metrics to use, obviously you don't want to use too few. You also don't want to use too many, since time, effort, and resources go into the tracking of each. Innovation experts suggest that the ideal number, across all three elements of innovation, is between 8 and 12. More important than finding exactly the "right measures," though, is beginning to use measures that are merely not too "wrong."<sup>46</sup>



*Please stop and think* : Pick a few metrics from the examples above and get start to experiment! Look at them over a period of time and you will soon see whom and what is being successful.

## 1.4 Summary of Key Points

Innovation is a continuous process, where a new idea is created, transformed into a concept for implementation of a new or significantly improved product/service through to commercialise. Innovation is not invention. As you may remember, the main types of innovation are **product innovation**, **process innovation**, **marketing innovation** and **organizational innovation**. Innovation types by novelty are **incremental**, **radical** and **breakthrough**. Innovation by firms' innovation strategy is divided into two groups: **open** and **closed innovation**. Depending of the approach, innovation is classified by **top-down** and **bottom-up**. And finally now that you are familiar with the theory, it is important to measure innovation using **innovation metrics** in order to analyze the organisations competence to innovate.



*Please stop and think*: For a better understanding of innovation variety, we recommend you to spend some ten minutes thinking on answers to the following questions:

- Is your firm innovative?
- What type or types of innovation is your firm dealing with?



Now you know what innovation is and what it is not; what the main types of innovation are and that innovation is not confined only to big firms in high-tech industries - **any firm in any industry can be innovative**. You got hints on how to become innovative. Of course, it is not so easy. Our Guide will help you on your way to innovation with tools, methods, examples and information. In this Guide's component, we presented only basic information. For more detailed information on innovation subjects, please look at *Bibliography* and *Web sites* at the end of this component.

<sup>46</sup> The Boston Consulting Group (2006). Measuring innovation 2006, p.14

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The secretariat collects data, monitors trends, and analyses and forecasts economic developments. It also researches social changes or evolving patterns in trade, environment, agriculture, innovation, technology, taxation and other areas. The OECD is also known as a premium statistical agency, as it publishes highly-comparable statistics on a very wide number of subjects.

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Innovation Portal is supported by DG ENTR of the European Commission, and is designed for those with an interest in innovation, both policy and practice. Innovation Portal is designed for users with an interest in innovation, both policy and practice. The latest policy documents on innovation and the latest news and events.

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## GLOSSARY

**Innovation** - implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations (Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data)

**R&D** – Research and Development.

**Innovative firm** - one that has implemented an innovation during the period under review (Oslo Manual, 3<sup>rd</sup> Edition. (2005). Guidelines for collecting and interpreting innovation data)

**Innovation metrics** - organizational measurements that help classify the organization's ability to innovate and its record of success -- are valuable for several reasons. (<http://www.innovationtools.com/Articles/EnterpriseDetails.asp?a=146>)