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1. INTRODUCTION

In the last decade, at the dawn of a new millennium, a new key word has appeared in the field of R&D: “innovation”. Buzz word? Momentary fashion? New word for the old terminology “development”? In fact, number of journals, reviews, papers, books and conferences about innovation are so great that they show that innovation is undoubtedly there for at least the next decade.

To better understand this wave, it is interesting to learn about its origin, its way of propagation, its impacts on the receiver. We will define innovation, innovation system, innovation process and describe briefly the mechanisms that encourage innovation. We will demonstrate that innovation is on going, as well as in industries, education and in the society in general. After describing this new type of wave, we will analyse the challenges that are proposed / prescribed to acousticians.

2. INNOVATION WAVE: SOURCE, PROPAGATION, AND TRANSMISSION

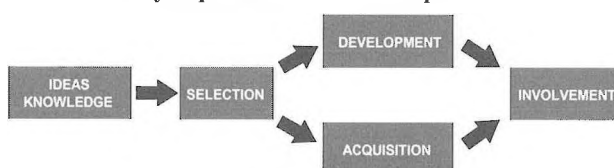
2.1 Definition

Various authors and working groups have tried to bring their own definition of innovation. The clearest and most concise is probably the one found in the Oslo Manual (OCDE): *“Innovation consists in managing knowledge in a creative way in order to respond to requests coming from the market and to other social needs.”* (Free translation) [1]

Innovation relies on three key words : knowledge + creative + market; that is to say : learning + originality + needs.

Still referring to Oslo Manual, authors say: *“An innovation is accomplished when introduce on the market (product innovation) or used in a production process (process) or services”* and they add: *“Innovations interfere with all kinds of activities: scientific, technologic, organisational, financial and commercial”*. So, innovation calls on a group of multisectorial resources and conditions. If creativity is the heart of innovation, innovation can take place only with team working, only with the interaction of many actors. Then, we talk about innovation system based principally upon four pillars: scientific research, human resources (education), legal and administrative environment, scientific and technical culture. Innovation depends strongly in research, but innovation by itself is not research. You have to go from the new knowledge / idea to the results (commercialisation) to realise an innovation. Patents are not innovation until they are not on the market. Development is optimization around a product, a process. If there is no originality in it: it is not innovation.

Key sequences of innovation process



2.2 Innovation: from the source to the receiver

Speaking of innovation, it is important to go from the transmitter to the receiver and still, the receiver (client) has to get the power and spectrum he did want (market needs). So, the source has to be created in that regard and its propagation/transmission has to give the receiver the signal, rapidly and at low cost. It results from these conditions that to reach an innovation, you have to have interaction: innovation is a body contact sport. *“Technology transfer is a person-to-person activity or a body-contact-sport. Inventions and new technologies spring from and reside in the human kind”*. [2]

Research about innovation revealed an important point: *“Most of the essential knowledge, in particular technological knowledge, does not exist under a written form. Therefore, transferring certain type of information can be done efficiently only between two experienced persons – by transmission to a receptive person expert enough to fully understand the information or by physical transfer from the persons having the knowledge”*. [1]

Innovation depends on the flow of knowledge and this flow should be systematically encouraged and facilitated. *“The main way to increase academia’s contribution to innovation is to increase the number of communication channels (knowledge flows) between Academia and industry”*. [3]

“The motors of every efficient innovation system are communication and interaction, namely direct and open links between individuals in industries and universities, in languages that will speed the flow of human creativity”. [4]

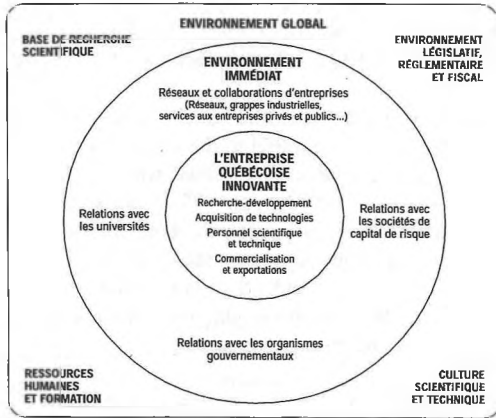
“Innovation is a continuous chain – innovation systems are as solid as their weakling mail”. [4]

“But as good as basic knowledge or research quality could be, it does contribute to innovation only when its conversion to the industry and society is open and dynamic”. [4]

The innovation wave: the author is strongly convinced that it relies on knowledge creation and diffusion through open interaction. This is also the opinion of other scientists: *“By far the greatest contribution of Academia to innovation takes the form of indirect and intangible flows of knowledge, and the bulk of these knowledge flows occurs through the literature and informal interaction. The main way to increase academia’s contribution to innovation is to increase the number to communication channels (and thus knowledge flows) between Academia and industry”*. [5]

“While the transfer of intellectual property is often thought as the essence of technology transfer, such a view is misleading. Signing of licence agreements, payment of royalties, and transfer of intellectual property are among the few elements of technology transfer. But unpatented know-how, ideas and suggestions often constitute information of considerable value, however difficult to measure and evaluate”. [6]

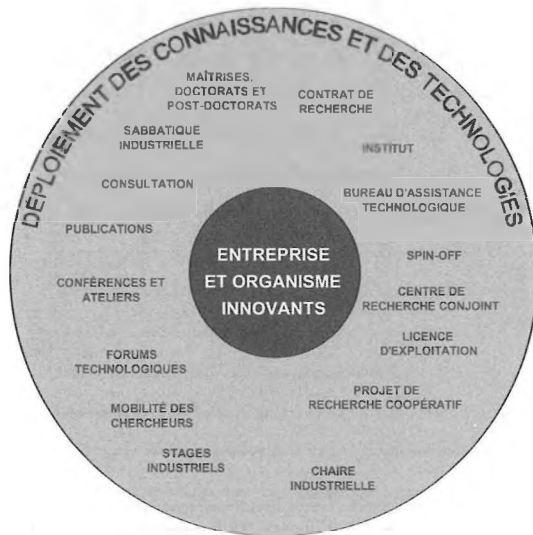
Basic innovation system, as proposed by the C.S.T. [7]



ments in both countries have long performed a considerable amount of applied as well as basic engineering research. The principal contribution of universities to the technical needs of industry is human capital, that is, well-educated, learning-skilled science and engineering graduates. Thus, movement of a nation's innovation system must be considered the most important technology transfer channel of universities. The primary research output of academic research remains nonproprietary new knowledge that is disseminated widely through publications and conferences. Because of the nonproprietary, or "public goods" nature, of much of its output, academic research is funded primarily by the public sector in both countries".[9]

What are the new approaches in education for young researchers in graduate studies? Do professors should train clones of themselves?

**Wheel of Innovation proposed by the author [8]
(in French in the paper)**



3. ACOUSTIC AND INNOVATION

What will or will not be the contribution of the acoustic field to innovation? Based on the main characteristics of the innovation wave, the author will approach the following subjects during the oral presentation:

What are the new promising fields in order to bring innovation in acoustic? The author will give some examples, especially regarding the medical field, which is very promising.

What are the mechanisms of interaction that should be put in place in order to increase the interactions between universities and industries, also in order to increase noteworthy the number of innovations driven by manufacture industries. The weakness of this link is the weak mail of innovation in acoustic.

"Technology Transfer from Higher Education Institutions. The primary missions of universities are education and research directed at the advancement of knowledge. However, engineering schools and engineering depart-

4. CONCLUSION

The innovation is there is stay. It takes its source in the original knowledge, which is put in human interaction and is diffused efficiently in regards of the signal emitted by the receiver (buyer). This brings challenges for the acousticians from all horizons, in enterprises, universities and public surroundings. The future of acoustic depends mostly on how acousticians will succeed in taking up this challenge.

5. REFERENCES

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