

Ecommunication and Innovation

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Abstract:

Communication management, toward the external world, in large organizations, is confined to procedures based on reporting, surveys, etc. which increase the cost of communication thus reducing creativity and innovation. To understand the process, we discuss the nature of communication and its links with social organization and then see how it influences innovation by spreading a common need to solve a general problem. Finally, we will try to see how it may be implemented in organization, in order to foster innovation.

Abstract :

La gestion de la communication avec le monde extérieur dans les grandes organisations est confinée à des procédures basées sur les rapports, les sondages, etc. Ce qui augmente le coût de la communication et par conséquent, réduit la créativité et l'innovation. Afin de comprendre le processus, nous discutons de la nature de la communication et de ses liens avec l'organisation sociale, et de quelle manière cela influe l'innovation, en transmettant un besoin commun de résoudre un problème général. Finalement, nous essaierons de voir comment cela peut être implémenté dans une organisation, afin d'améliorer l'innovation.

Keywords :

Innovation, communication, information, system, society

1) Introduction

Information and Innovation are two large concepts which have been thoroughly studied from different angles. So, we will first provide a few definitions in order to work within a clear framework, and then we will show how innovation and communication interact together.

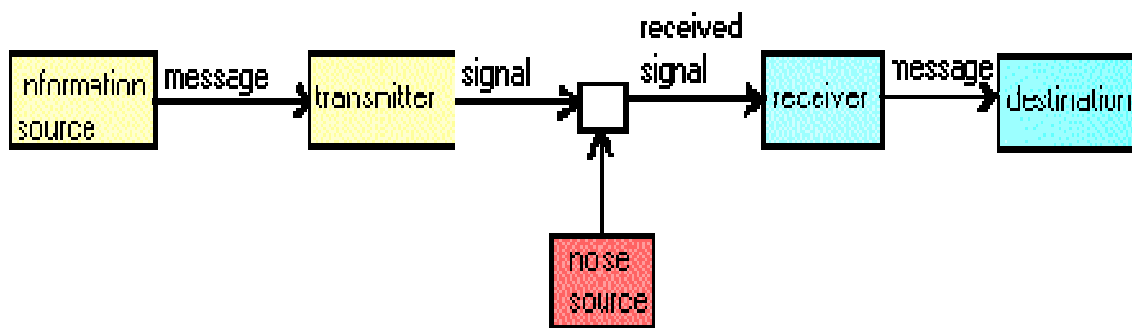
Information and communication will be presented based on Shannon's model of communication (Shannon, Weaver, 1949) since his work set the foundation of modern Information theory. Then, we will see how information and communication cannot be separated from social organization, and then, based on Von Hippel's recent work on innovation, we will explain how by its own nature, innovation is closely linked to information and thus communication. Finally, we will provide external references to illustrate our reasoning with a few examples from recent projects which benefit from ecommunication in their innovation process.

2) Information system, communication and social organization

While internet and information technologies are getting more and more advanced we are witnessing a change in our society due to these new media of communication. So we will focus, in this part, on the fundamental approach of communication.

2.1) Information System.

Information being a wide concept, we will only do a brief introduction. W. Weaver and C. E. Shannon's work, considered the fathers of information theory, defined a linear model of communication, best described by this scheme:



Information system diagram (Shannon, Weaver, 1949)

This diagram does not restrict its field of application to one realm, information system can be found in engineering, biology, and society etc.

Two computers with network cards, two humans talking, a cell and its nervous system, communities interacting, are information systems.

In such systems, information is the amount of uncertainty, a message eliminates. As opposed to noise which is anything that interferes with the message and thus reduces information. Information

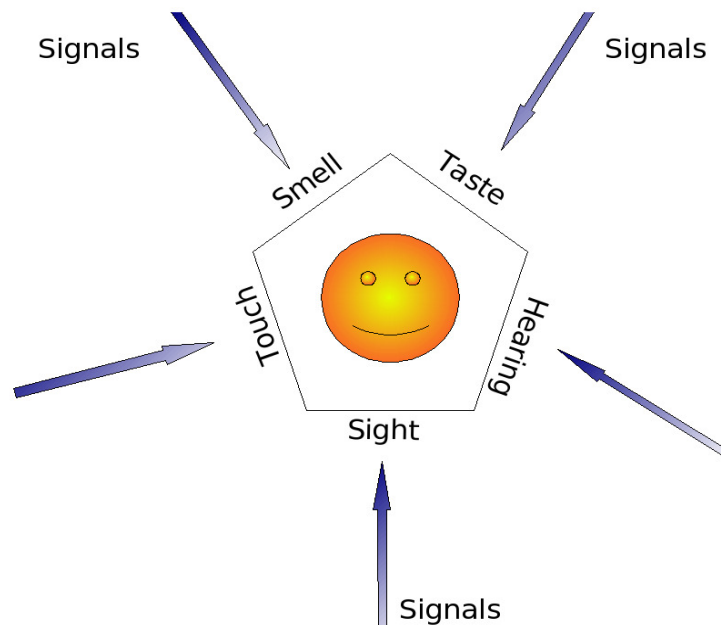
theory also introduces the concept of channel capacity, as the maximal amount of information that can be transmitted through a channel of communication.

Communication itself is defined as the process of exchanging information usually via a common system of symbols. (Communication, 2005)

2.2) Interest of formalisation

These concepts help us to understand more clearly the nature of communication and its role in our society. Indeed, providing that, we can consider individuals as playing the role of receptors in the above diagram, information will be all input we receive from outside.

Thus, what we know of the world depends only on how much information we receive from the world. Increasing this amount of information reduces uncertainty (from the definition itself) and makes the world a less surprising place.



2. Individual as an information system

The capacity of our senses is limited thus the only way to increase our knowledge (stored information)

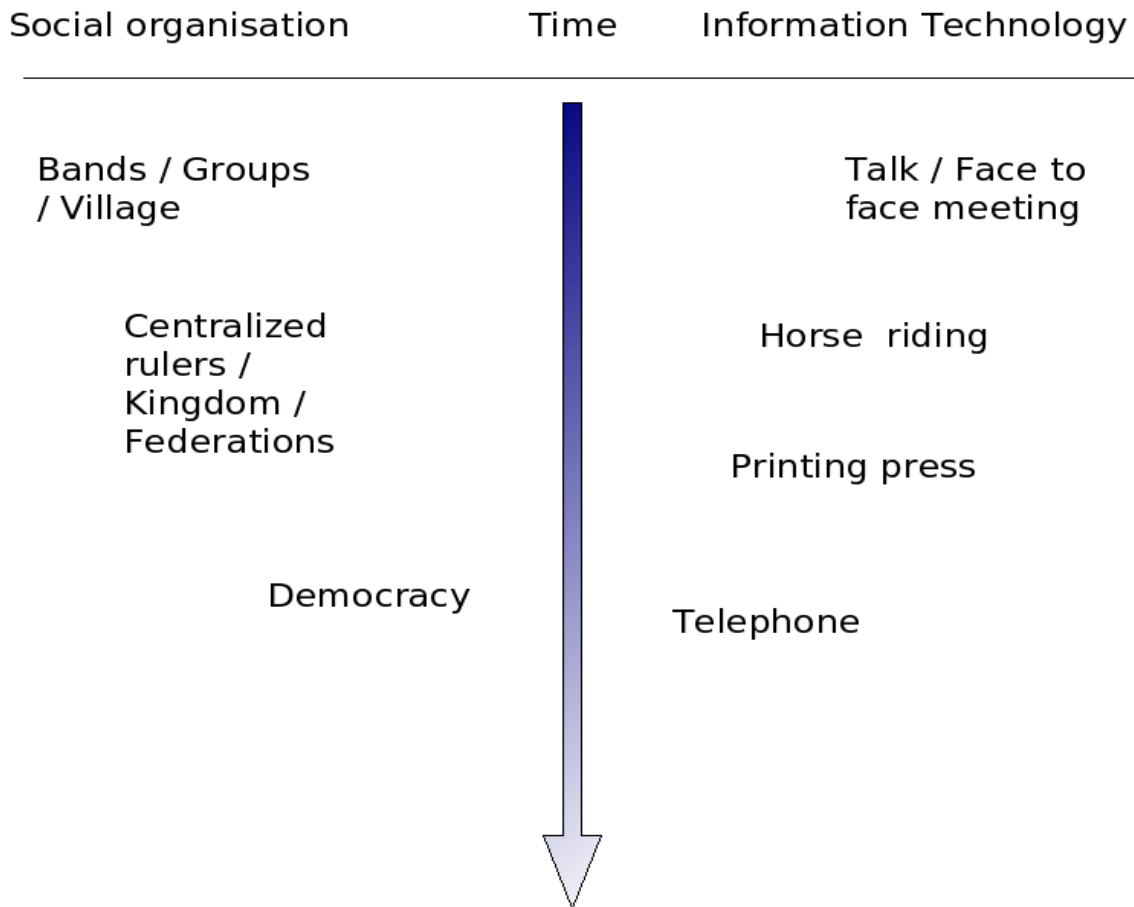
So, considering the information per time ratio is limited (channel capacity of our five senses), the best way to maximise our information about the world (thus, increasing our knowledge) is to communicate with other individuals, which leads to build a community. Community becoming a place to share information resources.

2.3) Communication and Social Organization

We have seen that individuals tend to get together organized in communities to share resources, including informational resource which is a way to broaden their perception of reality by increasing the amount of information they have about the world. Thus it seems logical to have a relationship between the shape of these communities and how they communicate.

De facto, throughout history, we see a strong correlation between communication systems and social organization. Apparently, the critical factor is the cost of communication. Indeed, when the only mean available to communicate was face to face communication, which the most expensive way for a group to communicate, the only organizational structure observed was small groups, villages and bands, with little or no cooperation, between them, not to speak about coordination. They were organised this way because they just had no other choice. However, when mankind discovered horse riding, this was a much faster way to travel and thus a lower cost mean to communicate. Then, emerged a new structure in society, with centralized control, by a man or a group of people, who could get enough information to control and protect an area. This kind of organisation lasted very long, evolved from connected villages to kingdom, empires etc. Until, eventually man would discover the printing press, a revolution in itself, which would lead to a revolution in actual fact, transforming kingdom into democracy. All these changes were made possible only because new means of communication appeared

A good question would be to examine whether new media of communication were responsible for these changes or if they just came in at the right moment or whether they were consequent technical evolutions of a more global social evolution. ?



2. Parallel evolution of information technologies and society

Information technologies are innovations themselves. So before further analysis, we must what is innovation and how does it appear.

3.)Innovation

Innovation is defined in many different ways, depending on whether we analyse the process itself or the conditions necessary for it, or even the impact of innovation. Since we are interested in interaction between communication and innovation, we will focus on relatively important innovation, something that would be big enough to be marketed, even if it does not change the fate of humanity.

3.1) Who, what, when, how.

When we examine daily life, we see that everyone is a potential innovator. Hence, the first question is why someone would have to innovate. Actually, innovation is needed because it brings a solution to a problem, or adds a more convenient mean to live. Basically, innovation is what makes life easier. But, without a problem, or a need, they cannot be any innovation. It seems rather logical: there would be no reason to try to innovate, if there were no necessity. Sometime, innovation in itself is the necessity, as we witness with great inventors, such as Edison, who were people having fun solving problem. But, that is innovator's necessity; it is his problem, so even in this case, innovation turns to be the overhead of a problem solving process. How does innovation appear? We do not know: it is often a random try which, then, turn up to be useful, enjoyable, or practical. However, what it is the key that bring us to do this try in particular? We do not know.

For an innovation to be considered as a technical progress it need to solve a major community problem: and we will see this is a critical issue that is not addressed properly in innovation management nowadays.

3.2) Innovation and information

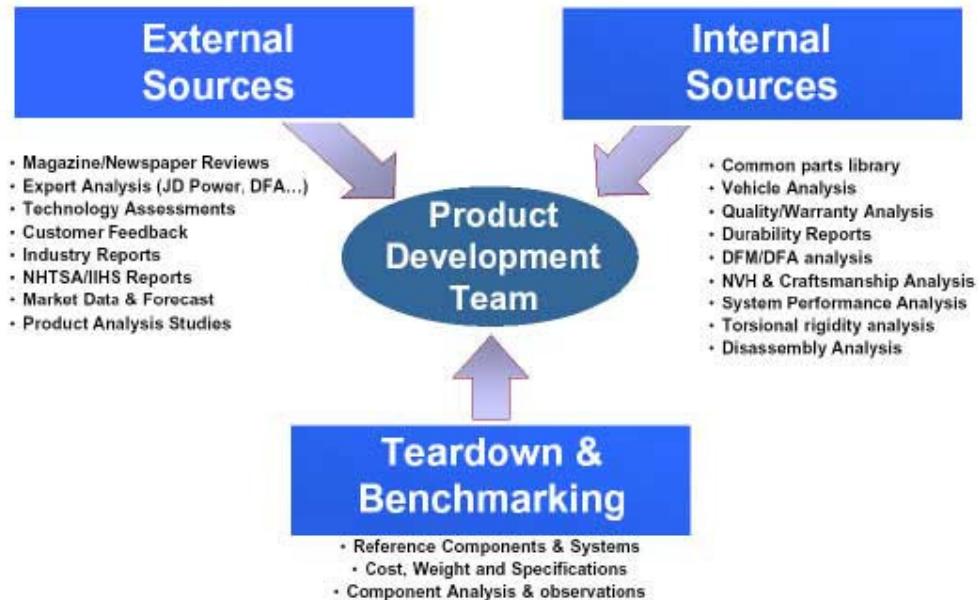
To innovate, it is not enough to have a problem; one also needs resources in order to solve it. Resources include technology, material resources, competences and information. The reason why we focus on information, rather than on any other means, is because information is the most valuable among all, as it is the primary resource that we need to innovate, the rest come second. For instance, if we consider the case of plane invention : Before man was able to understand properly the laws of nature that allow birds to fly, he was unable to actually *think* the plane, technology and material resources would have been of no help until the reality of this world was properly understood, and then technology followed.

The real problem with innovation is thus to understand reality in order to really build concepts or tools that suit our needs. It is therefore an information problem before being a technological problem, hence communication is a key for innovation and consequently success (or at least there is a strong correlation between success and innovation).

3.3) Innovation management in big and small organisations.

In big organisations, innovation management takes the form of a heavy normalised process following more or less this diagram:

3. Innovation management process (AutoKnowledge©, 2005)



As we see the development team is located right in the middle of the information system, receiving as much information as possible about the product they develop. This scheme of development has been proven efficient on commoditized products, when the manufacturer has a good understanding of the product. However, Von Hippel (2005) reports that three out of four manufacturer innovations is a market failure, which tends to indicate something is wrong with the above approach when it comes to innovation.

In order to understand why it does not work, Von Hippel (2005) introduces a distinction between manufacturer innovation, and user innovation:

Manufacturer innovation is when its author benefits by *selling* it, as opposed to *user* innovation, when its author benefits from *using* it. And he also found out that 80% of innovation on the market is initially a user innovation.

Even though it might seem surprising, it is consistent with what we said above, about innovation and its relation to problem solving, meaning that *the need is the key for innovation*.

Small organisations have no marketing department; they consist of small, flexible teams, where each person is equally responsible for the company. These structures are often more innovative than big organization which tends to react to the market instead of anticipate the market. However, big organizations benefit from a strong investment capacity, larger resources and economy of scale, which small companies do not have. The perfect equilibrium would then be to have on the one hand large resources and task force, available in big organisation, and on the other hand, to also have freedom, flexibility, creativity that are the benefit of small organisation.

And indeed, it is very well illustrated by Microsoft most successful software: it was originally products developed by small companies which had a need for it, inside there teams. And because in small companies, the degree of communication is higher than in big organisation, the need spreads

much more easily within the rest of the company. So, the need was not artificially guessed by the marketing department from surveys analysis, and customers reporting, but it was perceived from within, by people concerned with this need.

4.) Ecommunications and Innovation

To summarise: to innovate we need a problem to solve, we need informational resources, thus we need a community, and we need tools to communicate, and the more we can communicate the more efficient is the community. And we have seen that the lower the communication cost, the higher the degree of communication in a community.

Considering that commoditisation of ecommunication will allow community to appear more and more easily, and at very low cost we can thus understand that ecommunication will be an important factor for innovation.

This is already happening in different places as Malone (2004) reported. Such cases as the Wikipedia project (<http://wikipedia.org>), the Apache project (<http://apache.org>) are getting more and more common. Management styles based on loose hierarchy like in AES corporation spread among the corporate world, and this global move is made possible only by availability of low cost of communications. Thus it seems possible now, even in large scale organization, to have a high degree of communication and thus flexibility and creativity.

Nevertheless, technological progress does not imply open minded attitude and we can still witness counter-communicative attitude like in Barkham (2005) describing the case of an employee fired for blogging about his work place. Thus, we will have to learn anew the meaning of *communication* in his human sense.

But these events are minor disturbances of a global large scale process happening in our society. That is, individuals are now given the tools they need to “globalize themselves” to quote Friedman (2005). This process is impacting many fields at once: business models and the way people work together (Malone, 2004), social organisation (Friedman, 2005), learning process and thus innovation process (Von Hippel, 2005).

And we have seen one of the reasons for it, is the wide access to information due to low cost communications and easy community building process.

5) Conclusion.

We have analysed the links between communications, information, and innovation. We can now understand how ecommunication may impact our society. But we still have to work out how to make a good use of it, which is not a technological problem nor an information problem, but rather a human problem, rooted in our education. So, next step could be to introduce these new means of communication in our education system, to make a radical change about how we look at learning.

References:

- 1) AutoKnowledge, (2005) *Information Flow Chart*, URL: http://www.autoknowledge.com/info_flow_chart.htm, last access date: 27/05/2005
- 2) Barkham P. (2005, January 12) Blogger sacked for sounding off, *The Guardian Unlimited*
- 3) Communication (2005) In *The Wikipedia Encyclopedia*, URL: <http://en.wikipedia.org>
- 4) Friedman T.L. (2005) *The World is Flat: A Brief History of the Twenty-first Century*, New York: Farrar, Straus and Giroux
- 5) Malone T. W. (2004), *The Future of Work*, Boston: Harvard University Press
- 6) Shannon E.C, Weaver W. (1963), *A Mathematical Theory of Communication*, Urbana, Illinois: University of Illinois Press
- 7) Von Hippel E. (2005), *Democratizing Innovation*, Cambridge: The MIT Press