Information Technologies: its learning and impact on Marketing Global Services

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Reactions against technology have arisen throughout all ages and cultures, as if through some pact with the devil. Since the beginning of the Industrial Revolution its proponents have had to bear numerous criticisms from those who fear the growing importance of new machines and the social problems that they apparently bring with them. Even Saint Agustine warned against "all types of poison, arms and destructive machines that have been invented to the detriment of mankind".

As in all orders and walks of life there are extreme attitudes that reflect in part truth or reality. Technology could not be the only exception, void of staunch supporters or detractors. We could be more sensitive to the arguments of some than others, but we could never lay a deaf ear to the attacks on technology, much too serious and deep to be cast aside.

We continue to call attention to the growing mistrust with respect to the technology which characterises contemporary society. The undeniable and tangible social advantages which technology has contribute to conquering are being replaced more and more with social problems caused by its use.

Mankind's technological knowledge has failed, although not totally, as far as providing efficient solutions to many of the most important world problems (equal distribution, conflicts).

Why has humanity not assimilated and learned from its own history? Why is it taking so long to perceive that a different, global focus ant treatment are necessary? Rarely has a concept been required to have such a strict application as to its meaning as on this occasion. "Global: a whole, not divisible in parts". And the principal parts implied are science, technique, economics and politics, in a global framework.

A heartfelt battle with ourselves must be fought so that an innovative spirit might win over the conservative, creature of habit that dwells in every living being, rational or irrational. For the purpose of achieving the desired change, and in order to deflate or prevent the undesirable ones, the first thing that we need to do is not only to learn to confront change, but to participate actively in it. If we do not assume responsability for controlling change, taking full advantage of it and guiding it, as well as influencing it, the day could come when the resulting problems overwhelm us.

Up to now we have identified some of the main causes for which technology (and in particular information technology) has not contributed as much as expected to raising mankind above inequality, poverty, hardship and disease, and is at the same time, becoming a threat to us. We have done so using the ideas of many authors with different criteria, even copying entire paragraphs literally. And so we continue, although at some point taking their conclusions out of the context in which they were drawn may weaken the original concept. (To further delve into the though of each one of them, a bibliography is included).

Let us analyse other causes that could seem obvious and, perhaps for that reason, may not be taken into account. Many of the protagonists in Shakespeare's tragedies have a deep and enigmatic character, to the contrary, the three witches in Macbeth, moved by the goddess Hecate (dark goddess of fortune) play a clear part: to provoke the downfall of Macbeth. If he had stopped to reflect in order to amend the atrocities committed, the outcome would not have been, perhaps, so tragic. When Macbeth says "I am in blood stepp'd in so far that, should I wade no more, returning were as tedious as go o're; Act 3, Scene 4". Hecate reacts by encharging the witches to win him over by predicting a splendid future for him and by offering him the certainty of its fulfillment. ("He shall spurn fate, scorn death, and bear his hopes 'bove wisdom, grace and fear; and you all know, security is mortals' chiefest enemy. Act 3, Scene 5)". In summary, in the end they convert Macbeth into one of the victims of the most trivial and sordid suggestions of Hecate: the conviction that more of the same had to be better.

Any person with a minimum of intuition, or through experience, should understand that the doubling of something good does not lead to doubling the satisfaction or the positive result: moreover, it may detract from the beneficial results or make a problem even larger.

The application of information technology has been, and continues to be, what has made the error of this assertion manifest. In the majority of cases it has been used to speed up certain processes and has turned our to be the simple amplification of the problems that lay beneath the methods applied, which were hidden due to the personal intervening of the professionals involved. So that information

technology does not provoke irreversible technical and human situations, or simply in efficiency or inefficiency, in many cases a change in the way of doing or thinking is implied. For that reason, a period of mentalization/adaptation should accompany this process. As can be assertained, an essential part is education (elementary, secondary, university and entrepreneurial).

—El progreso material va por delante del espiritual. Nos han puesto el teléfono antes de que Gertrudis tenga algo que decir.

(Figure 1)

As opposed to the habitual inertia of identifying solutions in a restricted and isolated framework of other factors that affect a problem, let us try to contemplate the whole spectrum in a global framework. A change that represents a global focus as has been indicated above. Let us see why.

Information technology plays a political role in society related to the distribution of power and the exercise of social control, in both a material as well as an ideological manner. Technology maintains and promotes the interests of the dominant group in the society in which it is developed. Material and ideological factors play an important part in the determination of the nature of technology itself. The social relations of production, among the diverse groups or social classes involved in the process of production, are reflected in the means and factors of production, or, stated in another way, technology and social models support each other mutually.

At the present time, economic growth can only be reached through a greater rationalisation of the work force, which requires a growing number of professionals with scientific and technical training to control and regiment the production process, increasing the efficiency and productivity of the workers that are lucky enough to have work, excluding those with no specialised skills.

(Figure 2)

The dominant modes of hierarchical organisation and authoritarian control have been incorporated into technology which is developed by capitalist societies and, as a consequence, coincide with it. This means that a predominantly functional attitude with respect to the natural environment, an attitude which fully confirms Descartes' prediction according to which science should provide knowledge "through which we are capable of becoming owners and possessors of nature" and, however, divorce ourselves from it.
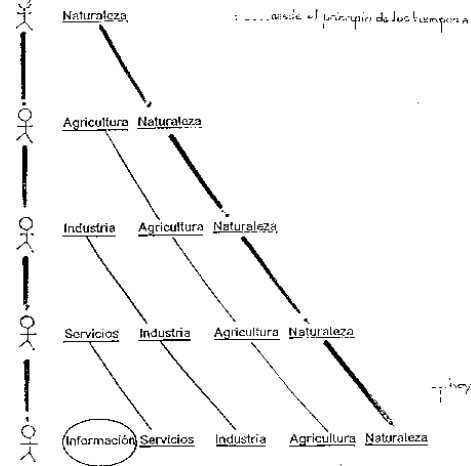
(Figure 3)

The same thing occurs in so-called socialist countries that have assumed and developed a mode of production formulated initially in a capitalist framework. They have been obliged to introduce forms of organisation and social control, to make an efficient use of technology, which are essentially of a capitalist nature.

According to the economist Frederic Benham "a powerful force exist which works constantly in favour of greater per capita production and a higher standard of living". It is the progress of science and invention; the economic hope of the human race is based on technological progress.

This theory has been accepted to such an extent that the development of technology is what is used as an indicator of the general progress of social development, and tends to characterise societies as being advanced or third-world according to their level of technological sophistication.

The individual feels more and more trapped by the powerful forces which are beyond his/her control, and is reduced to little more than an economic figure, being constantly and incomprehensibly manipulated within a vast inhumane complex.

There are authors who think that general scientific and technological development are sufficient in themselves to stimulate economic growth. Based on this criteria, one of the most efficient ways of stimulating said growth is to support wholeheartedly activities in research and development. However, this process also functions

in the opposite sense. An economy based on rapid growth requires a specific type of technology; one that is capable of producing a maximum innovation of new products, and not those which frequently hardly take into account real social needs.

One of the main conclusions reached by the historian Jacob Schookler is that "the majority of new industrial technologies have been discovered because they have been pursued", and not in the majority of cases because social needs led to their development.

Some additional, ant not secondary, problems are those which arise through excessively rapid industrialisation or mechanisation: unemployment and non-understanding/assimilation. This is frequently associated with the substitution of traditional techniques based on jobs related to small-scale production, limited by the physical capacity and capital-based techniques.

This is what caused at one time the migration of the rural population to the cities in search of work, and is what is happening now when from technologically advanced countries inappropriate technologies are applied to social and economic conditions in less developed countries. Situations are produced such as the one that Joaquín Costa presented years ago: "If the soul of the black man were coercible and if Christianity could be introduced into it through external forces in a moment or a generation, this poor black man's brain would explode, as any blossoming fruit would explode if we tried to make it grow and ripen in one instants...".

Information technology, as could be expected, tends to accentuate and reinforce class divisions and inequality rather than eliminate them. Those who do not possess sufficient resources to utilise available technology find themselves in a position of permanent disadvantage. In the opinion of different analysts, some world-wide networks (of computers), and at a reasonable price, could eliminate many of the competitive advantages enjoyed until now by the large companies which possess huge financial resources (Joseph Maglitta, editor of Computer World, USA).

At this point perhaps it is necessary to use a meta-language that allows better understanding. We suppose that every society wishes to progress, philosophically speaking. It aims to reach a more complete and ample life through the development of greater faculties and by satisfaction of more complicated goals. First it would be necessary to reach and agreement on the meaning of this goal, since attaining "happiness", according to Sidney and Beatrice Webb in 1879, is also a cultural question. The western individual associates it with "multiplication of possessions", whereas the oriental individual with "reduction in needs". A clear contradiction. As in the story of the king who was diagnosed with the need to acquire the shirt of the happiest man in the world as a remedy to his evils. And when the faithful subjects, wishing that

their king recover his health and his smile, located the long sought after person, they discovered that he did not even own a shirt.

What are the limits of information technology? For some scientists who defend so-called "hard artificial intelligence" there are practically no limits. The only one that could be established with technology developed to the present time lies in the need to know the most elementary actions of which a chain sequence of a process or activity is composed, since current computers are not capable of working without a detailed description of said elementary actions. In summary, on the one hand machines/technology, on the other the mysteries of the functioning of the brain.

For scientists who are aligned with "soft artificial intelligence", the limitation is clearer. Technology immediately before the Second World War began to speed up tasks which involved repetitive processes, elementary or not, such as "calculating, averaging, extrapolating, adjusting, composing...". The following step in recent years has led to the design and development of technology that permits an easing of the burden in repetitive "intellectual" work, such as "translating, inferring, understanding, learning, deducing, associating...". On the other hand, they have the certainty that it will not be possible to reach such a degree of development such as to free mankind from the activities of the type "imagining, thinking, creating, reflecting, meditating, inventing, investigating...". What the technology of the future must foment is any of the activities that characterise or identify the human race (mental activities).

Whether we are on the side of the scientists or on the other, what is certain is the incidence and effect that the evolution of information technologies will have on occupation and orientation of the job market.
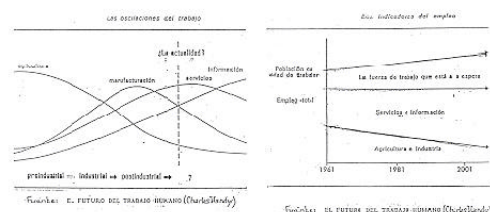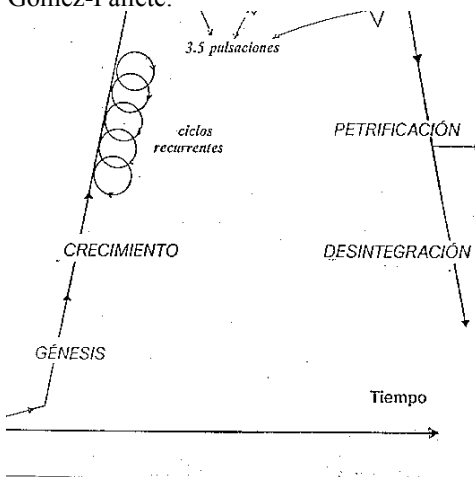

(Figure 4)

According to the conclusions of Charles Handy total employment is being maintained at the same time as the working age population is growing. If we add to this the fact that technology contributes to increasing productivity in the areas of "service and information", fewer and fewer professionals will be needed. Therefore it will be necessary to confront a true transformation or change in the productive function, at the same time sharpening skills to create new schemes of production an for the distribution of time and goods.

So that we may be able to put wings to our imagination we should set forth a few more

considerations. In the first place the studies carried out by Nikolai Kondratiev, according to whom "economic activity is developed following long fluctuations of some 50 years of duration" and "in the periods of decline important discoveries or inventions are produced".

•   First fluctuation 1789-1849 (height 1814): steam engine
•   Second fluctuation 1849-1896 (height in 1873): Chemical products, steel,
          petroleum (in 1884 the term Industrial Revolution is used).
•   Third fluctuation 1896-1945 (height in 1930). Automobile and telephone.
•   Fourth fluctuation 1945-1995 (height in 1967): Computer and communication
                 networks. Since 1970 there has been a decline which has led us to a ...
•   Fifth fluctuation?

It remains to be seen what our reaction will be vis-à-vis these new challenges and if, once and for all, our actions will have a lining of solidarity which will effect real change.

With this in mind, we move toward our second consideration, using as a starting point the studies carried out on social cycles and evolution of culture by Arnold Toynbee and Manuel Alfonseca, and in turn presented with graphic accuracy by Felipe Gómez-Pallete.

(Figure 5)

Any process of evolution, as varied as the environment in which it takes place and as wide as the framework may be, can be represented by a graph similar to the one presented. It is the so-called "*cycle of life*" that are highlighted and labelled in the figure: "*genesis, growth, collapse, universal state, fossilisation, disintegration*".

However, the graph does not express what the factors are that cause the curve "*cycle of life*" to take on such a catastrophic, natural and pessimistic form.

Nor does it speak of whom is responsible for these factors and, as a consequence, if they are random. There is no doubt that (except to a certain extent in our own cycle of life) we can influence said defining

factors in the slope of the curve in such a way that a "*change of cycle*" can be facilitated.

Following from Watzlawick and Gómez-Pallete, we can identify three types of "*change*" that determine the evolution of the cycle of life, and, therefore, condition the future:

•   Change 0 (natural):When the absence of solutions is the problem. When the changes "happen" but are not provoked. When events are allowed to follow their natural course
•   Change 1 (apparent): When the "solution" is an added difficulty. When the "solution" does not solve the problem. When the "solution" is more of the same
•   Change 2(real): When old problems are solved... at the same time as new ones appear. When instead of changing "within" the "system", the system is changed
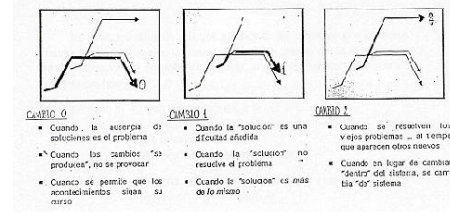
(Figure 6)

Some examples that reflect these three types of changes can be extracted from the analysis of the people, entity, enterprise or organisation, vis-à-vis information technology, since this is the information closest at hand and the most comprehensible. We will summarise concisely, according to mentality and reality:

Attitude   Type of change

-Computer science is something for computer experts 0 (natural)
-"Empty" Computer plans (apart from business strategy)
-"new" computer plans are discussed
-computer plans which take strategy into account 1 (apparent)
-Information is a production factor. Our future depends to a great extent on its proper implementation
-Business strategy takes into account (among
          2 other parameters) the technological knowledge" ("know-how") of the company (real/surprising)

We do not know the reason behind the fact that many of the examples that come to mind and tend to be used in courses and talks from an introductory stage to a high level at Business Schools represent attitudes of the "type 1 change".Example a)What are you looking for in the light of the street lamp?
The car keys, which I've lost
Did they fall out here?
No, but there is no light over there.

Example b) General Pyrrhus to his legions: "One more such victory and we are lost" (pyrrhic victory) One more reason for thought. What are the alternatives available?

Change 0: Persisting with the means and ways, activities, education,... that worked so well at the end of the last century and the beginning of this one. (Industrial society).

Change 1: To continue maintaining the production model, capital work, pointing out the importance of information, but not considering it a production factor by giving it that type of treatment. (Hyper-industrial society).

Change 2: Synthesising culture and technique (Society of knowledge).

Tres sociedades alternativas
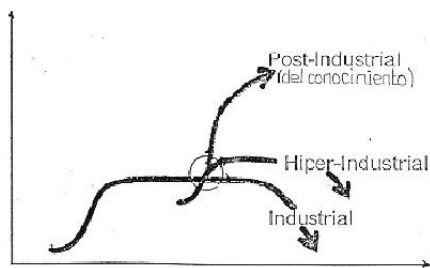
(Figure 7)

An additional reflection that I hope will continue to clear the way for others. You do not need the special abilities of a fortune-teller to predict the material invasion of information technology in all active areas of our lives. Let us begin with a tripartite model Education-Work-Leisure and contemplate its evolution:
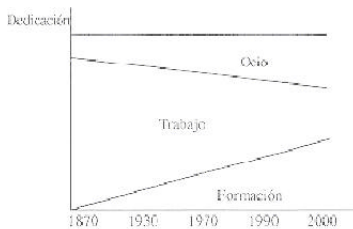
Basado en datos de W. H. Martin y S. Mason, de Leisure Constultants

(Figure 8)

The proposal of solutions in an industrial or hyper-industrial society could be relatively easy and "Taylorian", since technology is limited to a field of action and activity which is becoming more and more reduced. Fallacious arguments abound from the moment that a proposal is made outside of the realm of immediate surroundings. On the other hand, the schema is useful to contemplate a vision of unquestionable reality not subject to interpretation. Information technology influences and becomes a protagonist of all areas of our lives. And since in the end everything boils down to economists (defect of a capitalist society) we

remember the concepts that best fit into the tripartite model.

Conclusions

As it often happens, there is no answer that could be considered best beforehand. Such statement is true when defining curricula of any speciality in engineering so avoiding the pitfalls of "Change 1". Extreme decissions may lead to awful results. We refer to those who set aside good things of the past because the have "aged", and yet may fit within a new frame of work. However we should not be afraid of designing a new paradigm even though we may keep the current one for sometime since it may be risky to lose it as a reference.

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