About Technological Sustainability and Perishability of Work Models

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Abstract—**The article aims to discuss the relation between sustainability and its impact on the labor market, especially on the work processes. Sustainable development is a holistic concept in which the economic, the social and the environment are in an inextricable connection. Due to these reasons on sustainability, a variety of views were issued. However all the debates have a common divisor: sustainability - technology connexion. From the technology point of view, our century should be the luckiest from humans' history: it gains from a technology that conserves natural resources and energy, with high productivity and high efficiency that is environmentally friendly and more equitable in its impact globally. Unfortunately, it still has a major vulnerability: the new technology doesn't by itself solve the sustainability issues of the Earthlings and Earth. And the way of managing the benefits associated with computer technology, leaves gaps too wide to disseminate risk and hazard, on the macro-social and individual levels. We are at the beginning of 'The Hybrid Age' in which the new socio-technical era is unfolding as technologies merge with each other and humans merge with technology. Current technology's true impact isn't just physical or economic, but social and psychological as well. The article (i) analyzes some of the technological consequence on the formal work dynamics and, (ii) proposes some subjects of reflection on the most neglected aspects of the 'sustainability".**

Index Terms—**Sustainability, technology, organization, flexi work.**

I. THE SUSTAINABILITY-TECHNOLOGY COEXISTENCE

"Sustainable development" has become the mantra of the last decades and a new subject of international political ideology. A.O. Lovejoy, (1965) [1] considers that each period has its own "unit-ideas", some sort of central concepts which mark, reinterpret and reorganize phenomenon, knowledge and methods. The "unit-ideas" ar actually perennial of the human conscience which return under various disguises every time. "Sustainability" is one of the "unit-ideas" that refers to life's durability and quality, and to the humaniti's progress in ecological limits and international juridical regulations. They are principals formulated by religions and Asian philosophies, reformulated by the antic greeks, Abrahamic religions, philosophers and scientists, thought and felt by everyone of us. In 1987 though, "sustainability" has been launched in the political and academic discourse by the *World Commission on Environment and Development* (WCED 1987; Sathaye et al. 2007) [2], as a prevention regarding *"Our common future"* (Gro Harlem Brundtland) [3]. In a short period of

time it becomes a key concept for the *Earth Summit in Rio de Janeiro* (1992) and a major objective for the *ONU* agencies for economic and social development, referred to as *Agenda 21.*

As the majority of aspects related to society, and even more to the current globalized one, the subject is a "wicked problem" (wicked- Eng. "bad", "sinful", "vicious"). "Wicked problems" [4] are very hard to define, they are ambiguous, associated with powerful economic, moral, professional, political aspects, they are dynamic, often synergic and difficult to shape. Confirming its status, "sustainable development" is perceived as a holistic concept in which the economic, social and environment are inextricable bound (Halsnaes et al. 2007, 122) [5]. The debates on sustainability have a common divisor: the sustainability-technology conexion. The technological philosophy and sociology claims that a better construction of our world depends on the manner of understanding this relationship (Johnson and Wetmore 2009, p. 441) [6]. Deepening the manner of understanding and theoretical explanation of the technological impact over society and of the social over artifacts, can be framed (Feenberg 1999, p. 9) [7] between the opposite limits of "instrumentalism" ("technology" means only neutral instruments used by man in reaching his goals) versus "subjectivity" ("technology" means human intentionality and as a result moral responsibility) - this subject is extensively developed in another article [8].

In fact, under all the controversy, two problems stand debated:

1) The criteria regarding the assignment of human resources towards the development of technology types that would resolve the ecologic problems;

2) The axiological criteria – the "chosen" technologies should be extensive creators of welfare, growth of living standards at global level, they should produce real added value for humanity.

And it seems as though the new digital technology is able to sustain all the criteria, including the ones that are outlined by the *Brundtland Report*: it preserves the natural and energetic resources, it has a high productivity, it's intensive, non-polluting, it has an increased efficiency, it's much more equitable through its impact at global level- it eases the capital flow, access to markets for the developing countries' products – and a lot more other benefits. Yet the *Report* also draws attention on the fact that the new technology is a generator for unique risks and that it "is not inherently benign" (ibid., p. 217, 219).

In what way are the threats derived from the informational technology perceived? Ignorable in relation to the advantages, and considered almost without costs of

opportunity. This conviction derives from a conscious or not violation of the reporting records, meaning that the advantages generated by the new technology are in reference with the economic dimension and the disadvantages are profoundly experienced as disruptive forces, on a social and psychological plan. The mobile phone has facilitated for example the entrance of the small agricultural manufacturers from Bangladesh (including women), of the fisherman from India and so on, with their products in marketplaces – others then the ones in their community – but it also introduced new pathologies in DSM IV (e.g. nomophobia – the fear of being away from the phone, new addictions), as the internet facilitated the communication but also created multiple identities and the virtual world. Step by step, the information system – IS – (simple human activities combined and/or completed by the computer) has been replaced by the information and communication technology – ICT – (the technology's interaction with humans, processes, data, decisions, etc.), and now we talk about biotechnology, nanotechnology, robotics, neuro-sciences, astrophysics…What will awayt us in the near future? It seems as though the most plausible scenario is that of the cross-breed human being, its merger with technology. "*The Hybrid Age*", described by Parag Khana & Ayesha Khanna, is the socio-technical era in which technologies interact between one and other and are inserted in the majority of human actions [9].

One of the radical aspects of information and communication technologie's applications – ICT – is represented its impact on the work processes.

II. The Organized Formal Work

The hyper-competition between the global markets has generated the acceleration and passing from the sequential activity to the almost simultaneous one, which has produced profound changes in all the human life domains, especially in the organized environment of work. Thus *"the more and more temporary aptitude reunions"*- as Toefler calls the organization (p. 27) [10] – are organized for more and more temporary purposes in the entire economy. To be competitive in the current world of corporations, the organizations must be very agile and flexible to identify and value opportunities and at the same time very moderate whenexpending the resources. The environment's constraints force the department of human resources management (DHRM) to permanently reinvent the organizational structures, as well as to systematically redesign the critical programs. Generally the DHRM envisages the establishment of a sustainable environment to make the organizational functions and processes mor efficient. On this background, the general objectives of the HRM proffesionals target, besides managing the workforce flows (inputs-outputs):

1) The continuous development and improvement of a collaborative corporative environment (Briscaru, A., 2012) [11];
2) Designing a strategic plan to substantiate and facilitate the decisions regarding the organization's future evolution (Kaplan, D. (2003) [12];
3) Ensuring the maintenance of the organizational values

and priciples, including of the common fund of knowledge;
4) The continuous development of the workforce abilities – starting with the strictly technical ones and ending with the relationship ones.

In an economy where less than 20% of the activity consists in the creation of physical goods (Block, W. (2001)[13] and the inputs and outputs are measured in bytes, the HRM experts have the duty to identify, anticipate the critical problems and project feasible solutions for resolving them. The "critical problems" of the economy, globalized or not, or in other words the "crisis" that our time's organizations have tu surpass are often related to the availability of the workforce and to the consequences that this phenomenon implies, among the acute being: the loss of collective memory, mentoring, the management of talents and leadership, others and also the aged workforce, the continuous formation, the *off-shoring* and *outsourcing,* i/emigration etc. All of these phenomena, that represent a priority and often emergencies, take place on the background of three major constraints: the growth of work productivity, the reduction of costs and the loyalty of employees, especially the ones ranked "A".

One of the solutions that seems to meet the optimum standards regarding the environment's pressures and the critical problems rised by the shareholders and the stakeholders (groups or co-interested individuals, environment), is considered to be the flexible work.

III. What Is the Flexible Work?

"… a significant part of the workforce consists of collaborators with contracts, free agents and other persons that work at company A, but they are actually hiered by company B." Robert Reich (ex-minister of Work),"Working but not"Employed", New York Times, 2001.

"Flexible work", also known in the dictionary as "flexiwork","flexitime", is a model of work program with a variable duration, which can be rendered in any locations chosen by the employee. Practically the flexible work reformulates the variables of the "work" concept: what's important is what you do, not where you do it. Ofcourse, this type of work is not suitable for any kind of professions but especially to those of the computerized technology and some types of services (e.g. travel agencies, e/commerce, employees of audit offices, others), as the flexible work does not mean full outsourcing of an activity. The employee keeps in touch with the hiring firm virtually and physically.

Although experimented with at the beginning of the 90th, (the accredited initiators are considered to be two businessman: William Henning şi Wilhelm Haller), the old work routines (schedule, office, files and binders with written papers in them, the order, control and all the other intensely exercised accessories), the lack of an adequate infrastructure, the employers' but also the employees' reservs, don't yet permit the development of the new model of work's whole potential.

The flexible work is agreed upon and expressly stimulated by many countries' legislation. In the USA Fair Labor Standards Act" N.p..[14] or in Autralia, the legislation

expressly requires a balance between work and free time [15], and the flexible work practices exceed 50% of the time for work. In 2005, the Office for National Statistic of Grate Britain announces that approx. 50% of the hired workforce in the private or public sector, works a flexitime program. So currently 3.7 millions of people – over 12,8% of the active british workforce – works the majority of time at home; 27% of the active workforce works part-time; 41% of business have their headquarters at the shareholder's home; 60% of the new business start at home; over 90% of the employers state that they offer different types of flexible work and ultimately, 3 of 5 new created jobs are atypical (no set schedule and no permanent jobs). [16]

IV. THE ADVANTAGES OF FLEXIBLE WORK

Employers and also illustrative names in the social research domain, (Abrams, R. (2000) [17], appreciate that flexi work has direct and extensive results on the following indicators:

1) The growth of work efficiency by focusing on results and not processes;
2) The reduction of financial costs for the firm (e.g. the exploitation of space and utilities) as well as for the employee (e.g. travel expences);
3) The empowerment and accountability of the employees;
4) The decrease of discriminations (related to gender, role, physical state, age, etc.) and stimulation of diversity;
5) The growth of objectivity and equity in performance evaluations;
6) The reduction of pollution;
7) The redimensioning of the work-free time ratio;
8) The growth of employee satisfaction and implicitly their loyalty;

V. THE HUMAN RESOURCES MANAGEMENT ENGAGED IN FLEXI WORK PROCESSES

Adopting flexible work practices requires strategic organizational changes on a large-scale. They don't just resume to ensuring the technical and technological support, they expand on *values and organizational climate*. In the case of flexible work, a mutual contract where trust is the *sine qva non* condition is practically activated: companies assume the fact that employees have the option of choosing their work schedule, selfcontroll and responsibility of their results, and the employee responsibly honors his objectives and all the results of his activities. Moreover, the company is forced to create an organizational environment that facilitates collaboration and innovation, and the employees have to give up the "personalized teritories"-offices.

Flexible works gives new meaning to the *concepts and practices of management*. The company has to generate special rules for the efficient and effective functionality of the virtual teems (e.g. changes in schedule, processes and *just in time* operating algorithms) ane one hand, and on the other hand it has to consider maximizing the efficiency regarding the inter-relationship with stakeholders. In this context and on the background of a reduced and focused on results exogenous control, the employee manages his task in

a semi-autonomous schedule. In terms of the team, what's important is that it develops communication and reference protpcols, so that it maintains its cohesion.

The percentage of managerial actions is largely transferred on the connections and inter-relationships between departments and teams. Roughly, the management is focused on the following types of coordinates (Lederer *et al.*, 2000) [18]:

1) Data gathering;
2) Consulting;
3) Work analysis;
4) Establishing key units of measurment;
5) Planning technological changes of the networks and channels of communication, HRM polocies, others;
6) Calculating and diminishing costs;
7) Evaluating;
8) Training.

On the same note, it is thought that flexible work offers an increased degree of openness and transparency in the operationalization of employer-employee partnership roles. Both counterparties are aware of the necessity of being prompt when identifying and implementing solutions with the largest possible added value and of accepting unusual methods of doing and delivering things.

Paning and developing the employee's career represents a special chapter in the employer-employee relationship. Generating a continuous learning culture is the warranty of any organization's competitiveness. Flexible work determines the employer to explore new types of continuous forming projects and to invest in specific service programs, in good practice acquisitions (benchmarking), sale operations, good relationships, etc., in order to align the needs of the employee to the firm's objectives.

David Ulrich [19] considers that the organization's innovative forming process has two components that he calls *business unit services* and *centers of excellence.* The *business unit services* cover the following types of activities: basic technical training for local needs, training for the development of skills and knowledge transfer as well as consulting services related to performance. The *centers of excellence* ar responsible for the expertise of the direction and coordination of otganizational resources, in order to create the firm's employability brand, programs of leadership development, managerial sequence plans and talent development.

The tendencies of the past years are visibly more and more focused towards e-learning. This type of forming increases the availability and personalization degree of the knowledge transfer, but it especially lowers the costs and time of formation (Brynjolfsson, 1993; Johannessen et al., 2001). The information technology has the merit of expanding the entire knowledge base, from the tacit ones to the explicit ones, from knowledge regarding the work process and internal inter-relationships to their external aspects, from individual to organization as a whole (Alvesson, M, 2000, Dewett & Jones, 2001; Johannessen et al., 2001; Powell & Dent-Micallef, 1997)[20].

From our point of view, e/learning has its disadvantages, as any kind of human action does, the main one being that of loss of the group's and formator's motivation-energetical contagion. Moreover, the problem with training in

otganizations, including the on-line one, has an intese need for a new vision. "Learning" can't be projected as a delivery service with cognitive or acting patterns content for the members of an economic, private or public, entity anymore. In a strategic perspective, learning must be managed and integrated with other aspects and elements from the organizational environment, and firstly, with the stakeholder's qualification. We consider (i) the organization's responsibility of qualifying its clients and potential consummers, through informing and forming sessions regarding consumer and benchmark behaviors, as well as (ii) its support for trainings that involve mentoring and coaching actions.

What must be underlined is the fact that whatever the pattern of work the organizations adopt – classic or flexible – the continuous forming represents the optimal method to enable the emloyees and the organization as a whole, with critical self-reflection, shared values and visionary temporal horizons.

VI. CONCLUSION

The current acceptation of "sustainability" will probably suffer many avatars – in form and content. The individual and collective benefits delivered by sciences and new technologies will probably annihilate our mental shields of defending our perceptions about the "natural man". Yet these aspects shouldn't diminish the alert in choosing our own evolution and the responsibility regarding our degree of technological cross-breeding.

As a specific aspect of technology, *flexitime*, the flexible work or *teleworking*, offers the individual the advantage of choosing his optimal work – free time plan, as well as the possibility to save movement time and afferent costs. The reason for choosing flexible work for the organization is related to the competitive strategies of diminishing costs: spaces, utilities, storage, others and ultimately the afferent costs for managing human resources. Yet the risks assigned to teleworking are much more expensive and have personal and organizational consequences which are unpredictable on a medium and long term. Anyway, we considere that flexible work, as it is experienced now, dismantles intensely exercised and refined organizational-institutional structures, roles and social values. It's not an ideal *modus vivendi*; it is just our way of being and living.

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