

Digital Revolution and Economic Society

Digitale Revolution und Wirtschaftsgesellschaft

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Abstract — The digital revolution will significantly change the organization and social order of our Society. New forms of IT-based production (for example industry 4.0) will require new forms of cooperation in the economy and in the society. "Entrepreneurs" and "Intrapreneurs" will be of primary importance in the future. What this economic society can look like, what kind of working life can be expected, and how the societies can ensure a high level of employment integrating cyberspace and physical space (society 5.0) is also subject of this article.

Zusammenfassung — Die digitale Revolution wird die Organisation und die soziale Ordnung unserer Gesellschaft erheblich verändern. Neue Formen der IT-basierten Produktion (zum Beispiel Industrie 4.0) werden neue Formen der Zusammenarbeit in Wirtschaft und Gesellschaft erforderlich machen. "Unternehmer" und "Intrapreneure" werden in Zukunft von vorrangiger Bedeutung sein. Wie diese Wirtschaftsgesellschaft aussehen kann, welche Art von Arbeitsleben zu erwarten ist und wie sie ein hohes Beschäftigungsniveau durch die Integration von „Cyberspace“ „Lebenswelt“ (society 5.0) gewährleisten kann, ist ebenfalls Gegenstand dieses Artikels.

I. DIGITAL REVOLUTION IS IN PROGRESS

The term "Digital Revolution" refers to the global changes in the economy and in the society brought up by the invention of microchips, which have brought up a change in technologies as well as in all spheres of life [4].

From 1947 to 1979 the transistor paved the way for the development of advanced digital computers. During the 1950s and 1960s government, military and other organizations made use of computer systems. The computer and the first cellphones became familiar machines in the 1980s and became a necessity for many jobs. By 1992 the World Wide Web has been introduced, and by 1996 the internet became a normal part of many business operations and a part of everyday life.

By 2000 a really "Digital Revolution" has begun to spread all over the world; mobile phones were commonly seen, the number of internet users continued to grow, and the television started to transition from using analog to digital signals. By 2010 Mobile communication has become very important, as nearly 70 percent of the world's population owns a mobile phone. The tablet computers (2015) surpass personal computers with the use of the internet and the promise of cloud computing services.

Our current situation and the near future is characterized by a steadily accelerating development of digitalization and tremendous changes in communication, interaction, spatial mobility and industrial production [9]. Transaction and information costs worldwide are falling due to the development of the new technologies and will continue to decline in the coming decades. Under such conditions, a society's ability to innovate becomes the decisive determinant of corporate success and economic prosperity. Only those who can produce new products, services, forms of organization etc. will be able to take a prominent position in global competition [12]. Artificial intelligence will push this development more and more in the future.

Policies often ignore effects of traditional economic and bureaucratic processes. Therefore imitation, stagnation and retrogression remain. Access to innovative ideas is usually obstructed by institutional barriers, bureaucratic structures,

party-political nepotism or political-career-oriented opportunism.

Policy alternatives lie far beyond traditional dogmas and are neither comprehensible nor feasible for the majority of the political bureaucrats beyond the dominant mainstream. Old politicians have no ideas (see A. Merkel in FRG [16]) and the young politicians often are just copying old concepts (see S. Kurz in Austria [8]). It is therefore significant that approaches to solve future problems originate from private consulting [18].

The rapid evolution and adoption of big data by industry has leapfrogged the discourse to popular outlets, forcing academic pressure to catch up. Academic journals in numerous disciplines, which will benefit from a relevant discussion of big data, have yet to cover the topic. Many business cases exploiting big data have been realized in recent years. Twitter, LinkedIn, Facebook Netflix etc. are examples of companies in the social networking domain [15]. But this is only the "technical side" of the rapid development. Also important is the socio-economic side of the upcoming changes in the society.

II. SOCIO ECONOMIC BASIC MODELS

By the end of the 1980s, three fundamental socio-economic models could be distinguished from each other. The "Work centered Society", the "Leisure oriented Society", and the "Differentiation Society" [11].

A. The Work centered Society

The term refers to the model of a society that is "work centered". Its outstanding mark is high working hours per capita. In particular, Japan and Korea in the past are associated with this model. Secondary virtues such as work discipline, diligence and correct execution of technically standardized activities are positively associated with this concept. Bureaucracy, lack of mobility and lack of interest in culture and education, however, are negative aspects.

Toward the end of the 1960s, the working-class model started to move in East Asia. This was especially true in Japan, but increasingly also in Korea. But now these times when per capita working hours in these countries were almost twice as high as in Europe are a thing of the past. Today only for 28

percent of the Japanese success in the job is still a priority life goal [1].

B. *The Leisure oriented Society*

The European leisure society fits in well with the parole of the German Trade Unions "Pappi belongs to me on Saturday". Its expression today ranges from the indispensable winter, summer or intermediate vacation, the private garden and dacha cultivating to the almost obligatory golf game. Symptomatic of this type are also demands for more leisure time as an instrument of employment policy, the regulation of shop opening hours, etc. However, the realization of these leisure entitlements requires steadily increasing productivity due to their cost effects under increasing international competitive pressure. This, in turn, contributes to increasing long time unemployment despite positive growth rates of the real social product. The European leisure oriented society has thereby received a cynical aftertaste, since too many people have as unemployed (especially in the south of Europe) an almost unlimited amount of "free" time [2].

C. *The Differentiation society*

The differentiation society is a model that is oriented towards the internal social developments of the USA. A strong differentiation of incomes favored a relatively high employment of the lower skilled income groups through low-wage employment. This Anglo-American model has led to greater flexibility, deregulation and cost reductions through repression of the state. This position (Thatcherism) has given the United States, the United Kingdom and New Zealand an employment aura of wonder [11].

However, an unequal distribution of incomes has occurred as well as an uneven distribution of labor and work content. For this reason, critics speak of a divided society in which a vertical differentiation of qualifications, incomes and assets is increasingly emerging.

D. *Vertical Society and Balanced Society*

The essential feature of a vertical society is the strong inequality of income, wealth and labor. They create work elites who perform interesting and high-paying jobs, which are significantly different from the majority of employees. They have to settle for moderately paid "average work" with a low degree of satisfaction.

A small group of privileged people enjoy attractive work content. The higher the income, the longer one works. The categories working time and free time flow into each other. Apparently this part of society is privileged by the development. At the same time, this development is an expression of increasing social imbalance, the social and economic consequences can lead to considerable tensions.

A well-balanced society is characterized by less differentiation in all the fields outlined. The main feature of this type is, above all, the inclusion of a broader workforce in demanding work content. This can promote satisfaction and income effects may eliminate existing disparities beyond the world of work. At the same time, the potentials of society can be optimally mobilized and implemented through independence, flexibility and diversity into economic progress and growth. Their spillover effects can thus have an economic stimulus in those parts of society that do not already participate in the process of self-determination and independence.

A well-balanced society is therefore also visionary referred as a "society 5.0" [10]. This means a human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space. It may be seen as an utopia for the new

economic society of the "Digital Age" following the present "Society 4.0".

III. THE "NEW ECONOMIC SOCIETY"

However, this will only be achieved if companies and the state succeed in setting the political course, the organizational structures an adapted law system for such a future [6].

A. *Intrapreneurs, Entrepreneurs and Flat Hierarchies*

On the basis of a good education, satisfaction and motivation are essential prerequisites for motivation and creativity. Equally important are self-determination and the possibility of self-realization through a satisfying activity. Extensive self-employment of employees in the design of work processes and contents or the integration into work teams with flat clear tasks and accepted task sharing largely fulfill these requirements. Even in larger companies, self-employment, self-determination and direct connection to the success of dependently employed employees can develop self-reliant entrepreneurs within the company - "intrapreneurs". To achieve this, vertical corporate structures must increasingly be replaced by horizontal ones. Hierarchical corporate structures are currently still necessary, because they serve to minimize information and transport costs. With further growth and wider use of new information technologies, they are becoming increasingly unnecessary [12], as we can see in the actual "Covid-Crisis".

This already reveals the basic concept for a future economic order. An end-to-end horizontalization of the economy would mean that "vertical" employment contracts do not exist anymore. Each employee would become a largely autonomous and self-reliant employee - the "entrepreneur". In the economy of the future, there will no longer be any hierarchical structure like in today's companies. They will consist of a network of horizontal value-added relationships organized in network structures. Numerous papers are published on the technical side of this subject. Most of which, however, are in the area of computer science and are less concerned with socioeconomic aspects.

The outlined corporate structures are no utopias today. The number of temporary employment contracts in Germany has increased by approx. 10 percent p. a. Temporary employment agencies and their intermediary services are gradually being replaced by computer exchanges of equal partners in a project. This development is already evident in much of the craft industry and commerce. On these exchanges, two independent entrepreneurs (in contrast to the "dependent" intrapreneurs) establish direct relationships and conclude a project-related contract in which the nature of the services to be provided are determined. This cooperation does not take place on a permanent basis. It is time-limited and project-related. A highly flexible form of cooperation outside the usual competition rites will be established.

"New forms of work" will exist with more one-man companies, a change of employment 2-3 times a career and more long distance working or working from home. Many people will no longer be firmly bound to jobs and businesses. They will work in links on an order and project basis [3]. It is easy to see that this requires significant changes in people's skills and mentalities.

B. *Virtual Companies and Outsourcing*

Virtual companies and outsourcing refer to different strategies for dissolving obsolete hierarchical resource relationships and rigid value chains. Virtual companies have more resources in their activities than they own. They acquire

project-related and time-limited necessary resources and capacities, thus gaining high flexibility at a low fixed cost burden. Outsourcing aims also on a reduced corporate risk. Former departments become independent entities outside the company (spin-offs). These act independently and offer their services also to other companies. They collaborate with other spin-offs on a project-related basis, which they can compete with in other areas.

External services (e.g. consultancy and special assistance) are used for precisely specified projects. Efficiency advantages are mobilized by high responsiveness, customer- or market-specific solutions, free partner choice, low follow-up costs, limited overheads and above all high motivation of the equal partners. As a result of these changes traditional corporate or market boundaries are becoming less important. Business units and entire industries are moving beyond their traditional fields (business migration). The ability to respond dynamically to changing customer requirements is more important to the company's success than the production of traditional products.

For the success of a company the separation of traditional vertical structures is inevitable. Current developments show that in the future there will no longer be rigid corporate pyramids. Open networks in which people think and act not vertically, but horizontally will be the normal platform. In addition to the gain in flexibility, horizontal structures mean greater motivation of the participants and by this greater ability to innovate. Many companies of the future will therefore have virtual structures that represent networks of temporary cooperation of independent partners and thus are capable of highest market performance. Modern information technologies and big data enable this development and promote it considerably. This is the digital revolution we are faced with [5].

C. New Communication Channels

The world wide web and its big users and developers like Apple, Google and others are currently the epitome of a global and innovative network. Through its current and future range of services, it represents the necessary technical prerequisite for the functioning of the future society. However, in its history it is also a parable for the possible success and growth opportunities of horizontal networks in other spheres.

Successful innovators form the starting nodes of a network. Joint projects are the first virtual companies. The development of efficient exchange mechanisms between the network nodes on the one hand and between the markets on the other results in a highly dynamic competition of know-how, offering high profit opportunities. The high profits of start-up companies attract investors. Funding for future projects will be set up (self-financing). Through the development of its own "network culture", a set of rules is gradually being developed that codifies exchange and entry modalities. Once the network has established itself, larger companies are integrated as sub-networks or ousted as outsiders. The result is a world-spanning network that is self-optimizing as its nodes undergo self-learning in the emerging international and interdisciplinary communication. Gradually, the integration of economy, ecology, culture, education, technology and information takes place in common structures. The density of the global network is increasing at a rapid pace and is also affecting media and political development by the possibility to use "Big Data" [5].

D. Changed Ownership and Investor Behavior

Property, influence and management structures are also changing worldwide. While the identity of owners and entrepreneurs was typical even in large business units until the 1960s, this changed considerably until the end of the

millennium. Employees in managerial positions who have no (significant) ownership of the company are increasingly coming to the fore. This is especially true in Germany for medium-sized companies, if the heirs of the generation decide to dispense with the participation in the management of the inherited companies, or even sold them. Personal ties to companies, industries or corporate traditions are behind the interest in high returns or sales revenues.

The executives face large, often institutional investors (funds) that are gaining global influence. These managers are not interested in preserving traditionally grown structures, but favor rates of appreciation and returns on the funds entrusted to them. Management structures and concepts that do the best in this regard are therefore increasingly supported by them. Here it becomes clear that owners and investors are also increasingly interested in horizontal networking.

It is easy to see that all this requires internationally and nationally considerable changes in the organizational and legal framework of our economy and society.

E. Changed Role of the State

In this future society the present role of the state and its shaping of economic relations will become less important. Most of the government's tasks will be taken over by social and local institutions, because they can fulfill them more efficiently. Large companies are already planning and operating globally, regionally and locally and are therefore active in areas that used to be largely reserved for state actors. The problem-solving techniques of functional units - state, region, enterprise - will therefore have to converge more and more over the next few years.

The new society 5.0 will be based largely on self-organization and individual self-realization. It will be characterized by non-hierarchical, network-like structures in which one communicates and decides horizontally. To this end, the current legal and organizational structure of state-building must be considerably changed. Specifically, the following changes are necessary: Tax advantages for the further education of employees, redistribution of supportive measures in favor of innovative industries, tax reductions for employee stock ownership, the conversion of the capital-based pension insurance with the legal obligation to invest a minimum share in micro-enterprises (venture capital).

In this context, education content needs to be changed and developed, education, research and infrastructure spending in all sectors must be significantly increased.

However, institutional, organizational conditions within societies also play a role. These include the introduction of a compulsory school and study year abroad as well as special courses (through colleges, courses, etc.) for intrapreneurs. The components of internationality and self-employment must be anchored more than ever in education and training. Added to this must be a communication offensive that recognizes employee participation in changing corporate success as an appropriate and essential source of income for the future and arouses understanding of the need to promote venture capital for micro-enterprises.

For the transition phase to the new society and in phases of crisis, a basic social security is mandatory, which applies to all members of society and guarantees their material existence. On the one hand, it serves as social security in the traditional sense. On the other hand, it serves as a material basis for education and training measures, as they are necessary in certain phases of life [17].

F. Self-realization and willingness to learn

The working life of the present is still divided into three sections: the training and education section at the beginning of life, the work and leisure section in the middle of life, the retirement or retirement section at the end of life. This temporal life profile is regarded by many as immutable. Therefore, there is a strong lobby for its preservation, in which structural conservatives of all political camps work together. The state education system is therefore still almost completely focused on this rigid pattern of life and misleads the majority of people in their professional development. It often prevents a change in the life plans and thus contributes to misguided orientation and inflexibility to life-long frustration. The future will need lifelong education and training concepts that provide the content adapted to the different life phases. At the same time, it is necessary to integrate the knowledge and experiences of the active participants in the economic process into their teaching offers.

Latent knowledge is thus activated and codified for others. The development of the knowledge base must be continuously integrated into the content of the training. This is already evident in the education system, with small and flexible universities surpassing highly subsidized public universities in terms of high attractiveness and efficiency. Intrapreneurs and entrepreneurs can emerge only from such a system and act only under its conditions. Through the meaningful cooperation of both types, they could provide for the satisfaction of the highest need that people (according to Maslow), the self-realization.

On the one hand, this will create a society that will give its citizens a better, more "meaningful" life. On the other hand, motivation and efficiency are increased. In conjunction with the effects of the reorganization of the economy outlined above to form networks with flat hierarchies, economic effects are released which are not possible in today's hierarchically and bureaucratically organized economic order. However, self-realization, intra- and entrepreneurship are closely related. In order to reach the highest level of need satisfaction, conditions are necessary that do not actually exist. From "lifetime employment" to "lifetime employability" is the concept that aims for a "lifelong learning individual"[13].

IV. VALUE CREATION AND EMPLOYMENT

Creative work will increasingly displace routine and unskilled work. The work will serve, to a far greater extent than today, the individual self-realization and be detached from the prevailing view today that it is merely a necessary evil for the material assurance of actually desirable leisure time. This increase in motivation will increase production readiness and productivity, so that a significant increase in the value of the services will be achieved. For the foreseeable future, this will still be the privilege of a growing, but still relatively small, class of service providers.

However, their value orientation plays a key role in the achievement of high employment. If high incomes are created in the dynamic core of the society, their use already creates superior consumption (ranging from high-quality recreational activities to domestic service benefits). This is the base of employment in those sectors which are not yet included in the core of the society. However, modern services, domestic services etc., need to be freed from their current stigmas and bureaucratic obstacles. In addition, the innovative activities in the international competition open up lucrative markets, which are conditioned by technological availability monopolies and can be used with absolute advantage. The new economic society thus triggers a sustained, growth-securing process,

which also may transfer itself to the remaining parts of society through internal links and multiplier effects.

The problem of unemployment will, in the long run, also decline due to structural effects on the labor market. So in this new society the limits of working time, education time and free time will be fluent. As more and more people must become independent entrepreneurs, unemployment recedes. A self-employed person can work less or more, depending on the order situation. He may occasionally need basic care, but he cannot become unemployed in the traditional sense. Therefore, a material basic security provided by the state will be an absolutely necessary base for the independent search process for lucrative and satisfying activities and it also allows for further or re-qualification if it is necessary in the working life cycle [6].

This innovation-dependent view increasingly informs the content and boundaries of the policy debate at the governmental level, at the firm level, and the way in which individuals interpret the economic and political contexts that structure their lives to create a new society which we really can call "society 5.0" [10].

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