

Integrated System of Enterprises' Innovative Development Management Under the Conditions of Post-Fordism

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Abstract: Basic tendencies of enterprises' innovative development management have been considered from the perspective of postfordist transformations. It has been determined that mobility is a specificity of postfordist industrial management. Mobility provides dispersion of structural subdivisions all over the world, it doesn't need any governmental support and strict control. Total diversification of the kind allows to implement «high» technologies through global data revolution practically into all spheres of social life. The evolution of social relations types from feudalism up to Post-Fordism has been provided and their specifics defined. Analytical studies carried out have enabled to discover formed world innovative centres and – from global economic perspective – those of half-peripheral countries with low level of innovative development. The directions of China management of innovative development, whose combined innovation level steadily increases, have been described. It has been determined that a great many of world countries is not currently being on the postfordist stage, since an industrial labour is characteristic for them which defines their type as traditional or early industrial pre-modern. We've also found that innovation development governance at the global level through the prism of postfordist transformations manifests itself in looking for niche, strict subordination to global market mechanisms, decentralization under control of transnational corporations; at the national level: in decentration of social space and thinking, marginalization of urban population, migration; at the meso level: in orientation on consumer needs, considerable mobility of production, individualization under global standardization; at the micro level: in project approach, faster time to market, cost minimization.

Keywords: *postfordist transformations, innovation level, social development, information technologies, innovation management, innovative activities.*

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1. Introduction

Management of innovative development of enterprises is especially topical in modern research. It produces scientific discussions. Sometimes scholars' conclusions, concerning the phenomenon of Post-Fordism differ radically. That is the main reason of a philosophical discourse's emergence whether Post-Fordism is our future. Countries that are semi-peripheral from the perspective of global economics constitute a considerable problem for a study of innovative development of enterprises. In particular, this also applies to the Ukraine.

Dramatic globalization and integration, causing competition increase, form prerequisites for innovative development of world countries. Effective state economical policy has been accompanied by innovations, providing dissemination and implementation of high technological products at the level of an economic entity of the country. Powerful innovative possibilities (both financial and intellectual) for effective transfer of technologies and innovative management are preconditions for innovative development.

The objective of our research is to indicate tendencies and perspectives of the management of innovative development of enterprises in the conditions of Post-Fordism.

The problem of innovative development of enterprises and its tendencies is the subject of many works of contemporary scholars. In particular, da Silva et al. (2016) study processes of innovations development in small and medium-sized firms. On the base of research provided, they concluded that the development of innovations of the enterprises explored depends on the type of economic activity and also on interaction of internal and external environment.

The research of Chukurna et al. (2020) made it possible to form methodical foundations for assessment of the potential of innovative development of industrial undertaking on the base of integrated approach. The approach includes identification of financial state of the enterprise and evaluation of internal and external factors of innovative activity.

Kristoffer Chelsom Vogt (2015) examines the development of postindustrial society from utopia to ideology. He states that theories of postindustrial society formerly were formulated as utopia, and postindustrial society ideology is a specific worldview, regarding labour, knowledge and education. Practical work is defined by the author as obsolete.

Scientific findings of Loris Caruso (2018) relate to the digital innovations and the fourth industrial revolution. The author points out that nowadays ITC began to comprehensively constitute images and expectations

of the future. At the same time, this causes social fears of total control, alienation, job and security loss.

Alsulaimani et al. (2020) propose a review of different methods and decisions that could have been used in parallel and distributed management of innovative information system. Considerable attention is paid to motivation and challenges, linked to the usage of parallel processors in an enterprise.

Shen et al. (2020) explore Chinese-pattern innovations and analyse their influence on international market in current economic activity. The authors note the increasing impact of Chinese enterprises, forming of their overseas properties and corresponding increase of their social responsibility. Accordingly, the study provides conceptual model of new economical era, of Chinese-style innovations and international consequences for Chinese.

David S. Byrne (2020) makes conclusions, concerning the conception of a class in post-industrial era. The study is built within the borders of synthesis of critical realism as philosophic ontology and of complexity theory as scientific ontology. In particular, the feasibility of classes' exploration in societies who abandoned industrial systems under the conditions of their postindustrial development and for which post-welfare is a holistic class policy has been considered in the paper.

Donna Hirsch (2011) concentrates her research on the review of post-industrial German society. She focuses attention on the afterwar crisis and early Cold War, and on the existence of a discussion, concerning the future of German class society of these periods.

In correspondence with historical circumstances, there was a competition between capitalism and communism in Germany. Only in 1990th the softening of the social systems' contrast took place in the society. The author assesses such changings in her study.

Powell & Khan (2014) in their papers explore tendencies and trajectories of aging in postindustrial society and, based on statistics, analyze challenges, caused by aging. Using integrated approach, they determine understanding and deciding of the complexity of future aging of the society and make corresponding propositions.

Rumyantsev (2015) studies a postindustrial technological method of production and proposes a criterion that differentiates between a postindustrial technological method of production and an industrial one. He also draws attention to the success of postindustrial technologies in ecology and on their influence on the environment and the humans, determines the necessity of their careful study. He states that social problems should have

been regarded from the perspective of both postindustrial and super-industrial society.

Studies of Hout et al. (1993), Nerubasska & Maksymchuk (2020), Nerubasska et al. (2020), focused on permanence of employment in postindustrial society, claim that in developed capitalist countries, despite of the changings, class inequalities remains, and the conception of a social class became unnecessary because of the changings in hierarchical nature of society.

2. The assessment of the level of innovative development

A definition of the conception of innovative development is essential for our research.

Scientific base in general and Polinkevych (2015) in particular define innovative development as creation, implementation and commercialization of innovations that will provide qualitative changes, social, economic, ecological consequences and sustainable increase of profit, and also investment attractiveness in the long term.

On the other hand, innovative development could have also been regarded by three components: a resource one, a technological one, and a market one (the latter reflects the impact of an enterprise on saturation of market with innovative products) (Pjyatnytska, 2013; Palamarchuk et al., 2020).

The innovative system at the national level covers: tertiary institutions, research organizations, venture funds, public bodies, which elaborate and implement innovative policy and Institutional Relations (customs, traditions, regulations, legal acts which in the interaction create, accumulate, disseminate and commercialize scientific and technological knowledge in the country) (Fedirko, 2017).

Certainly, at the level regarded Institutional connections emerge, which are linked to: governmental regulation of the national innovative environment (scientific and technological, educational, regulatory, industrial and other policies); the connections at the local, regional, national and international levels that provide integrity of the national innovative system; instrumental links (levers of influence): financial and logistic support to the innovative process, innovation diffusion promotion, the R&D infrastructure gerulation and instruments for the development of the human investment; sectoral linkages that determine institutional structure influence on production technology and country specialization; the connections within the framework of "knowledge triangles" between enterprises, universities and Government research institutions (clusters, technology parks, business incubators, patent

sharing, informal links, etc.); knowledge and technology diffusion into the production practice of enterprises of wide circle (licences, know-how and equipment); staff mobility between civil and privat sectors. Economical success of innovative activity of the country could also have been linked to its ability for usage of the «window of opportunities» that opens on early stages of Kondratjev's new technological cycles (Fedirko, 2017).

In order to make an analytical assessment of the level of certain countries' innovativeness and define Ukraine's position in the general rating the data from Table 1 may be used.

Table 1. *The integrative indicator of innovativeness (rating) of the countries*

An average over the European Union	99	101	99	100	103	104	109	112
Ukraine	32	31	32	31	29	29	27	27
Germany	129	129	124	124	123	126	127	130
Russia	42	46	42	48	48	46	48	48
USA	105	92	94	92	92	90	91	99
Japan	106	106	107	107	111	106	109	105
China	78	81	85	84	86	91	92	95

Source: Prepared by the author on the basis of: European innovation scoreboard (2020)

Calculation of the innovativeness general indicator involves following aspects: the number of doctoral program graduates; tertiary education; common international publications; citations; governmental support for research costs; business support research costs; innovative products/ processes; marketing innovations; innovative cooperation; public-privet joint publishing; private co-financing of public research and development; patent applications; trademark applications; design applications; export of medium- and high-tech products; export of science-intensive services (European innovation scoreboard, 2020).

The data provided witness high rating grades of South Korea's and EU countries' innovative activity. It should have been highlighted here that China and South Korea demonstrate dramatic growth dynamics.

World economic thought pays considerable attention to Chinese innovative development management experience. Its innovation aggregate level rapidly increases. Furthermore, today China is in the centre of world economical, political and cultural arena. It is a powerful conductor of world economical growth in the spheres of trade, investment and patent applications.

The review of the characteristics of Chinese innovations, provided in Table 2, constitutes a considerable interest for our study.

Table 2. *Characteristics of Chinese innovations*

Characteristic features	Essential signs
The acceleration of innovation "only fast and not broken"	Seeking for new methods that accelerate modernization of products, shorter time to market, minimization of costs, reduction of innovation products and scales of productive investment, rapid opening of a new market cycle.
low cost orientation	Transnational companies choose China as a base for cheap and rapid innovations. It will have devastating impact, cause big-scale and flexible innovations. They will satisfy unmet developing market needs, and world consumers will enjoy products that are more accessible.
Powerful political component	Chinese government positions itself as an innovative mechanism and institute. Joint innovative centres, technological parks, business incubators, research institutes and selected innovations through initiatives, politics, regulations and research financial support.
Credo «to learn from mistakes»	Constant desire to learn from mistakes; constant optimization and improvement. On the base of client feedback, an enhanced iterative product emerges soon and then continues improving. West companies are too much concerned of the quality and reputation of the brand, so they cannot reduce production quality flexibly.
Concentration on general cooperation	China attaches importance to collectivism, and Chinese government participation in enterprises', research institutes' and other persons' innovations. In doing so, a model of connected innovation is formed with many objects such as basic elements of universities, enterprises, research facilities with public and financial institutions; intermediary organizations, innovation platforms, non-commercial organizations as supporting factors. Through deep cooperation and integration of resources, innovations that are more original are generated between creating of an actor's knowledge and that of a technological innovation actor.
Concentration on the middle and low-end segments of the market	The middle and lower market levels are a big pyramid, so developed decisions may be replicated and migrate into different countries, cultures and languages. When developed economies occupy high-end markets, they gradually refuse low-end ones. Chinese-style innovations

	do not follow that rule. Innovative decisions' design is easy for correction.
Combining of two innovative ways	There are two of innovative ways existing for China. One is from 0 to 1, a beginning, an original innovation and a creativeness; the other is from 1 to N, a transition from property to knowledge, constant improvement, desire for the ultimate. In the situation when developed countries have built the potential “from 0 to 1” they don't pay much attention to the one “from 1 to N”. China combines both potentials successfully.

Source: Prepared by the author on the basis of: Shen et al. (2020)

These innovative elements became successful for this country and brought corresponding results. But the following drawbacks of Chinese-style innovations are pointed out (Shen et al., 2020): insufficient level of innovative conscience, low investment into the R&D, innovative talents shortage, deficiency of joint research platforms and designing.

EU countries' innovative rate achievements are obvious, too. Their average within the period investigated grew 13 points higher. It shows a considerably high and stable level of innovative activities management in these countries and is caused by common rules of competition within the borders of common economical space. These rules effectively and in equal measure stimulate innovative entrepreneurship of both technological leaders and EU newcomers.

The statistics provided demonstrates a negative tendency of the general indicator reduction for Ukraine, who is last-ranked in European charts. In general, corresponding mediocre ratings among post-socialistic countries should have been highlighted.

Let us examine a composite index of innovations in Ukraine in terms of its individual components to detail their state (Table 3)

Table 3. *Innovation rates of selected European countries, 2018*

Country	General indicator of innovations	Human assets	Research network	Innovative environment	Finance and support	Investment by firms
European average	108,8	122,3	112,6	158,1	109,4	119,2
Ukraine	26,8	100,8	15,0	6,0	7,6	52,9

Source: Prepared by the author on the basis of: European innovation scoreboard.

The information given testifies to low level of the general indicator of innovations in Ukraine. In particular, the research network, financial support and investment by firms are last-rated among European countries. Ukrainian human capital index don't correspond to the European either, however, it is pretty close. Meanwhile, Ukrainian legislation policy, directed to the creation of positive investment climate due to cheap labor, intensively exploited, do not form proper conditions for innovative development of enterprises in the country. It only expands directions of Ukrainian workers' outsourcing.

It should also be recognized that there is no any refurbishment of worn-out funds in peripheral countries. It hinders implementation of the latest technologies and robotizing. However, there is an opinion that poorer societies are prone to productive process automation. The reason of that is considerable logistics that needs such update.

3. Managing of innovative development; its Post-Fordist transformations

Philosophical and conceptual aspects of Post-Fordism are tightly correlated with new economy, whose main characteristics are: wide exchange zone, e-commerce usage, intensive production methods application; high technologies and information as a driving force of economical growth; changing of the schemes of production, consuming and resource distribution; global integration tendency.

Pechenjuk (2020) gives synthesis traits of the new economy, based on “knowledge and intelligence as factors of economical development; dominating of the services that build human assets in the economical system; economical growth due to informative component; virtual economy and global market of goods and services; creativeness priority; economical relations, based on equality and collaboration; global networking and its inner competition”.

The characteristics of social relations types' evolution (Table 4) should be considered here to make our research more complete.

Table 4. *Social relations types and their characteristics*

Feudalism	Fordism	Post-Fordism
Manufacturing of individual goods for a certain employer, total exclusiveness	Transition to mass replication of commonly required items	Transition to the production of Individual (exclusive) goods on the base of modern technique and mass production

Complete freedom, liberalism in the manufacture managing system (despite severe system, existing in the era of feudal workshops).	Disappearing of the freedom, enhanced control over production process, conveyor equipment, and governmental control over trusts.	Return of the freedom in the shape of mobility and flexibility of production; freedom to find global market niches; subordination of the freedom to strict global market mechanisms
Decentralization of manufacturing and absence of standards	High concentration of production, detailed standardization emergence	Decentralization of production but it's over the transnational corporations' control; individualization comes back again but within global standardization
Miserable existence of the people but their life is holistic	Alienation increases; consumer society forms itself, and turns people into the slaves of imposed needs.	Making the home a workplace; remote work; total alienation
The majority of the population constitutes a society bottom, which is hardly possible to escape.	It becomes possible to escape the society bottom; forming of a welfare society	Mass urban marginal layer emergence; precariousness; social and economical polarization; total dependence on outer conditions of existence

Source: *Prepared by the author on the basis of:* Kondrashov (n.d.).

The information provided demonstrates the resemblance between feudalism and Post-Fordism.

Postfordist era production management is characterized by considerable mobility through which companies distribute their structural sections all over the world and do not need any governmental support and strict supervision. Such a total diversification allows implementation of high technologies through global information revolution actually into all spheres of social life.

Powell & Khan (2014), Drobotya et al. (2021) point out that postindustrial societies' nature depends in a great measure the relationship with the Third World. The authors accentuate that the process of de-

industrialization that has lead them to post-industrialism was a consequence of relocation of multinational corporations' production from leading industrial centres to the Third World countries where safety measures and wages costs are much lower, than in the developed industrial societies. Besides, changing of values and norms of postindustrial society has been stressed. Rationalism and effectiveness become a priority; it creates a big gap between social structures and culture.

Defining of contemporary borders and scales of Post-Fordism's existence and its perspective tendencies in the realm of innovation management is an essential question of our research.

Determination of hierarchy at different levels of management and their characteristics is important in the process of innovative systems' studying. We consider it reasonable to review innovation processes' managing at micro-, meso-, macro-, and global levels (Figure 1).

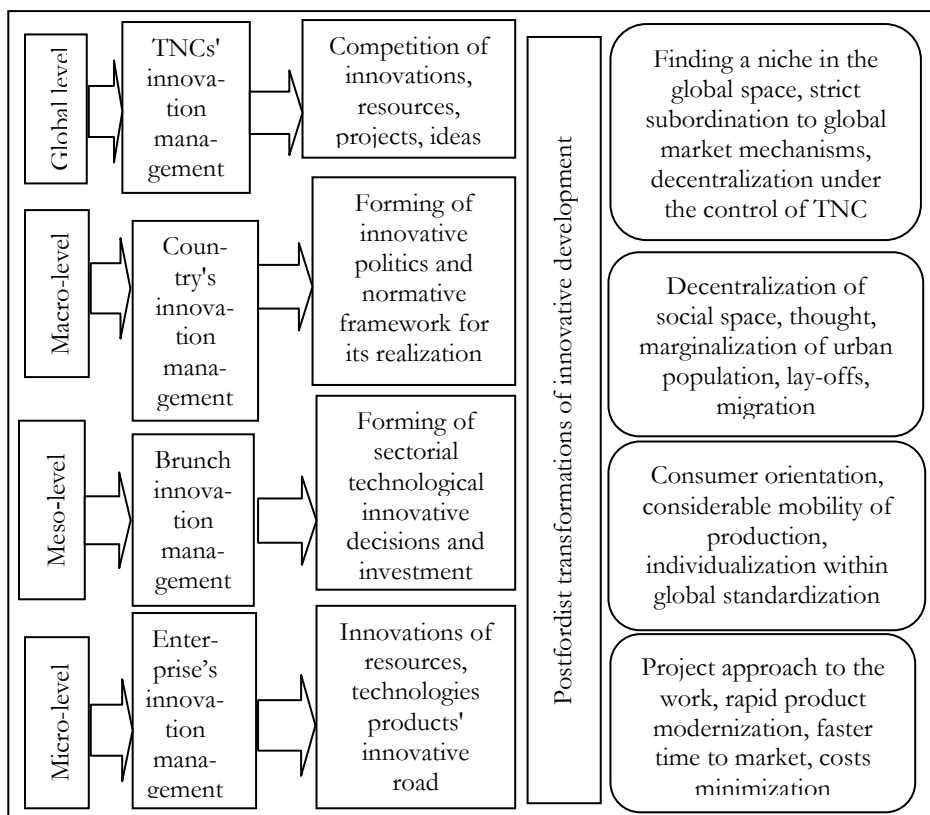


Figure 1. *The hierarchy of management of enterprise innovative development.*
 Source: authoring

According to the conclusions of their study, da Silva et al. (2016) point out: small and medium-sized firms at the micro-level make innovations not systematically but intuitively, and concentrate on their founders' ideas. They innovatively focus on customer satisfaction and market needs, and managers and owners are wary of partner relationship forming.

As Shen et al. (2020) point out, scales and effectiveness worry a medium-sized firm. Since New Economy is platformed on information and on information technologies, enterprises take “Internet-economy” for a basis. The criteria of success are achievements of the market part and of the integration degree with information technologies. Thus, a medium-sized enterprise is worried by the technical progress.

Byrne (2020) makes a conclusion that industrial employment and mechanisms with the help of which classes lived in the industrial society are not priorities in the old centres of industrial working class any more. Yet, he stresses existence of a huge world industrial working class, concentrated mostly in East and South Asia and in other part of the Southern hemisphere. It has been claimed in the study that industrial countries, developed earlier, continue to possess an economy, organized on the base of market capitalism. This also applies to post-soviet systems of European countries. Therefore, in the author's opinion, post-industrial capitalism is characteristic of these countries. Besides, the principles of “capitalism of public welfare” have undergone considerable deviations due to industrial capitalism. Economy and privatization, especially in the post-soviet nations, invaded social security, changed a nature of employment in the sphere of health-care, education, social protection. It has worsened working conditions and wages greatly.

Loris Caruso (2018) states that the fourth industrial revolution is defined by government agencies, private institutions (World Economical Forum, hedge-funds, commercial banks), and literary sources as a deep transformation of goods and services production due to functioning of the new wave of technological innovations: machine learning; artificial intelligence; 3D-printers, connected to software for digital processing; interconnected machine simulation; integration of the information flow along the value chain; multidirectional linkages between production process and products (Internet of things). The author claims that, according to basic provisions of Industry 4.0, public and private institutions are awaiting for mostly positive consequences of productivity enhance, economical possibilities and the future of the labor. Potential positive elements, characteristic of the new cycle of innovations, call out and broaden those

that are typical for the former innovative periods and linked to both ITC Technologies and transition from Fordism to Post-Fordism. In spite of that, these transformations haven't lived up to any of the expectations. The author proves that technological innovations always have to be socially valid and cannot concentrate only on technical or technological aspects.

Market ideology supporters say that new technologies' implementation stimulates new working places' emergence and enhances competitiveness and productivity. Reduction of production costs causes increasing demand for products and, as a result, demand for labor. New technologies provide labour productivity, which causes reduction of a working day. However, in our opinion, the situation of such sort is more typical for economically developed countries. The problem of countries' technological development side effects is an important aspect that must have been studied. We agree with Muljavka (2016) that automatizing is lucrative from the perspective of profit maximization on the condition that costs of innovation acquisition and maintenance are lower, than wages of employees of a certain industry. In accordance with the data, given by the author, in the USA robotized systems' service costs nearly \$10-20 per hour. It is lower, than average wages in industrial production. The tendency to robotizing will increase. Economically developed societies and economic centres, which are the producers of those goods, will benefit from this. Rapidness, with which innovative products are updated, does not leave any chance for poorer countries. It will contribute to the augmentation of a technological gap between them.

Maiboroda et al. (2021), on exploring international logistic sector, came to the conclusion that integration of technological decisions of Industry 4.0 in the developing countries characterizes by political and legislative barriers. As for the developed countries, ecological barriers are characteristic of them. In their turn, all those factors are slowing down the development of international logistics, which, in comparison to other spheres, integrates the technologies of Industry 4.0 more slowly.

Intensive development of information and communicative technologies, and also of their infrastructure enabled implementation of digital technologies at all stages of production, from local level operations to transnational production, which uses hired labor from all over the world. At the same time, it is worth noting that about 60% of the world population have no access to the Internet and therefore cannot benefit from digital economy. It means, in our opinion that a great part of the world countries isn't at the Post-Fordism stage, since an industrial labor is characteristic of

them. Many countries are under the pre-modern conditions, that is, in traditional or early industrial type of society.

It is known that Post-Fordism means deindustrialization. However, deindustrialization may have different reasons and consequences, according to the country's development level. In the developed countries, it may have turned into post-industrialization that would promote knowledge and technologies industry development. The low-level countries, due to the absence of the capital and of the effective governmental managing, may end up in the pre-industrial situation.

It is worth to admit that under the conditions of Post-Fordism, enterprises are targeting production of specialty goods for niche, segmented markets, synchronized to global ones. It influences shifting priorities of consumers, who are moving from mass consumption to individual and prefer originality. Search for uniqueness and exclusivity causes the emergence of a postmodern mass personality.

In general we have to acknowledge that postfordist vector of social development is not interested in individual innovative development of the majority of the planet's population: it needs workers of "the gap" who will smooth technical unevenness; service staff and consumers. It will lead to strengthening of the disproportion of innovative gap between countries and forming of a high-qualified creative class, who is engaged in imaginative work and uses a creative intelligence. In particular, Sevrjukov (2021) classifies as such "an engineerized minority", occupied by direct development and implementation of technological innovations. A precariat represents the other considerable part of the society. It does not have any access to the qualified education and, accordingly, cannot pursue innovative work and live up to the contemporary challenges.

4. Conclusions

Development and spread of innovations are the result of effective governmental policy. The data, given in the study, testify to formed world innovative center's existence and to semi-peripheral (from the perspective of global economics) countries with low innovative development.

Under the conditions of the digital postmodern world, innovative technologies comprehensively represent images and expectations of the future. In the same time, technological breakout causes considerable fears of social nature: those of total control, alienation, job loss and loss of social protection. In our opinion, it will not promote mass intensification of the innovative activity.

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