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The smart city technology in the super-intellectual Society 5.0

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Abstract. The actual base for the social sector reforms is life preserving innovations propagating cyber-possibilities into population day to day life. The global trend to create an advanced social model postulated by Japanese researchers and associated today only yet with the Industry 4.0 requires to create a super-intellectual Society 5.0. The point for close attention for the Society 5.0 could be simultaneously the problems of social and economic ways, which require solutions to make the humanity humane. The Society 5.0 reaching is provided by digital services penetration in all spheres of human activity based on the Internet of Everything. The most important problems to justify the current State ways digitalizing are chosen to be economy segments where the social inequality symbols are still yet in domination. The Smart City net scheme using the Internet of Everything to realize the main statements of the Society 5.0 megaproject is proposed.

1. Introduction

The informative society economic transformation universal tool responding to the population actual requirements is the Industry 4.0 concept propagating the technological initiatives probed into the production environment into the social sphere [1, 2]. The super-intellectual production results application beyond the branch technological problems creates a synergy zone for the new social composition model expanding the cyberspace advantage for the national development base projects into non-production segments [3].

The Society 5.0 megaproject, which was initiated by the Japanese specialists is a part of the industrial economy global basic statements transformation to establish the knowledge economy and to transmit humanity to the civilization development next step. The population cyber-interaction new format based on the Industry 4.0 successful technologies requires to create some highly developed systems giving all the society participants the optimal solutions where the artificial intelligence is engaged [4, 5].

Japan announced a strategy where the entire city infrastructure is renewed with the smart net components to support the maximum intellectual IT (Information Technology)-communications engaging the Internet of Everything. The wireless nets advanced technologies (5G, Wi-Fi and other) adapt the Society 5.0 concept for the human capital needs for the conditions of safe and ecological urbanism [6]. The cyberspace integration with the physical environment contributes the artificial intelligence superstructure creation for the different level of services, which may solve social and economic population problems with the digital environment resources [7].



The active digital transformation of morally and physically old city infrastructure is pointed to a technological leap to increase the long-term authority cooperation efficiency with business and population in the human activity different spheres [8]. The solutions generated into a cyber-production is the stable evolutionary development base of the Society 5.0 which is being adapted to the priorities of the actual cultural, economical, industrial and other modern defiance. To reach the «long» goals including the creation of new general human values, smart things, intellectual services and other are promoted to the State policy rank to motivate the huge companies to reinforce the IT-equipment manufacturers and cyber-physical systems interaction in all branches of the economy [9, 10].

The advantages of the social consciousness model modification and city infrastructure physical and cyberspace renewing, which are being prognosticated for the near future seem to be far and unreachable for the observers, which makes it actual to apply the full scale scientific advanced ideas and knowledge in the Society 5.0 [11, 12]. The human necessities diversity involves the economically potent countries into searching for new points of additional profit, which is gathered from the Industry 4.0 technological preferences, which are not limited to the production component only. In the perspective that could be seen the combined informative and production technologies implementation could be expected in the segments of pilotless transportations, the enlightenment sphere, in the construction, in the pharmaceuticals, in the atomic electrical energy and other spheres which are being viewed today as the base for the digital innovative economy [13].

2. The Society 5.0 cyber-interaction

The Society 5.0 cyber-interaction requires the electronic data to be processed in the cyberspace collected through digital communication means after the population residence physical environment conditions monitoring and smart systems functioning. The technological innovation into the entire society production activity scale is related to the appearance of things (Which in wide sense means: gadgets, city administrative infrastructure objects, autonomous transport and other) with Internet detectors which give the information as digital and linguistics data.

The technologies of peripheral calculations quickly and safely identify objects into the smart net, which supports all types of devices connection and aggregates the informative data tides for the level of useful knowledge, which are necessary for the population in emergency and day to day situations. The internet communication infrastructure all covering application in the Society 5.0 urbanism may accumulate the cyber-production actual data with the high level of their centralized analytical processing after which the systemized knowledge necessary for the consumers are returned to the physical environment.

The formed with those tools social and economic IT-infrastructure is the technological platform of the super smart Society 5.0 where the central place is for the Internet of Everything. The Society 5.0 things and technologies are out of the narrow traditional boundaries, which are typical for the Industry 4.0 concept studying, which was initiated first only for the metal processing production. The reconsideration of some technologies importance for the Society 5.0 megaproject may develop them and apply independently form private solutions, which are proposed today by some smart things suppliers.

To support the initiative proposed with the industrial internet tools create in the mental aspect a high level controlling tool providing fast data exchange among the active participant agents of the city smart net. The collected intellectual data helps more accurately to solve each particular social and economic population trouble and that why the Society 5.0 is being constantly optimized. Speaking of the population social factors importance expanding the Society 5.0 must be viewed as the deep information application into all key economic spheres.

3. The Society 5.0 smart State net infrastructure

The smart State net components using the Internet of Everything technology to realize the Society 5.0 megaproject main principles is given in figure 1.

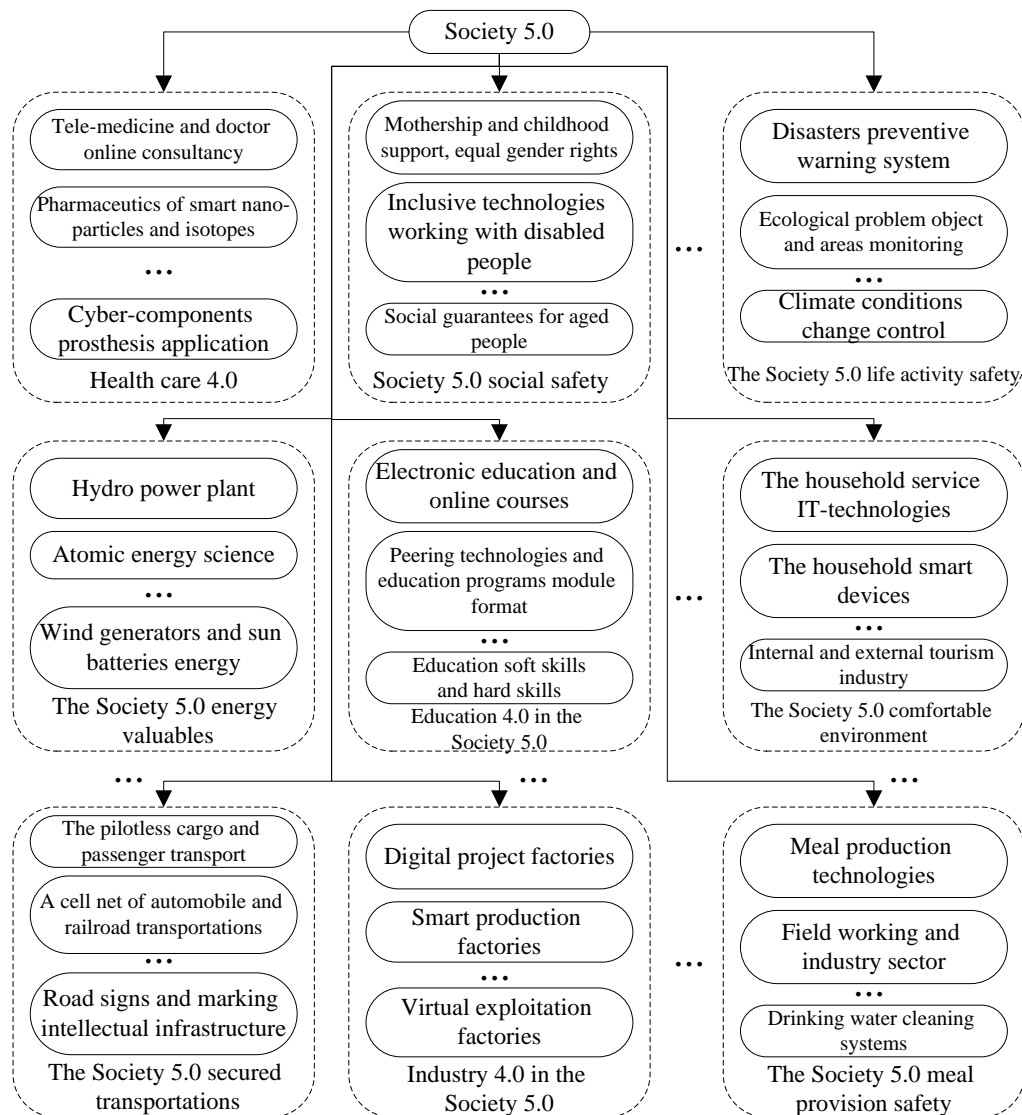


Figure 1. The smart State net components using the Internet of Everything technology to realize the Society 5.0 megaproject main principles.

Without being limited with the Industry 4.0 technological spheres the Society 5.0 provides a smooth cyber-interaction for the new generation infrastructure agents which are the mixed Education 4.0, the digital Economy 4.0, the telemetry Healthcare 4.0 and other. A complicated combination of non-structured data into the cyberspace is processed with the artificial intelligence, which illustrate the advanced and improved net technologies into socially important cloud services.

The Society 5.0 megaproject specifics is the cyber-structures deep penetration into the world after which there is a balance among solutions, methods and means which correspond the social and economic and technical defiance. The population mass demand for cyber-services, which provide the high level of convergence of innovations in cyber-physical spaces, which improve the quality of life. The megaproject ambition goal to create a good environment with a long-term social success shall be realized in practice with analytical data centers resources, which calculation capabilities decentralized-ly distributed among the cloud and smart things.

Among socially important cyber-solutions, which are applied today to create some controlling strategies of the city urbanism the following ones could be revealed:

- the electronic commerce technology to support online banking, block chain and goods and services contactless ways of payment using QR (Quick Response)-codes;
- the electronic health keeping technologies which process in real time the computer tomography photos and which also provides a remote online service of doctor consultancy;
- the cyber-security technologies to realize multi-factor automatic identification of net devices and person authentication which apply the images recognition mechanisms which in combination reduces the crime;
- the energy resources electronic control technologies from simple street lights to the atomic electrical stations;
- the weather and environment condition cyber-monitoring technology (climate) to monitor the indications current status and to prognosticate the ecology situation development (which is very important in particular for agricultural business, the emergency population warning systems and other);
- the cyber-sells technologies for population services and consumer segment which makes a commercial offer individual with the goods and services electronic customizing principles which combine the interests of each society member;
- the electronic government technology to realize online vote, the authority organs meetings online translations for the legislative, executive, judicial branch and other;
- the electronic education technology which permits the education content and digital library resources studying remotely which is important for disabled persons and persons who reside the remote areas;
- the household items remote control technologies (refrigerators, washing machines and other) through the Internet of Everything;
- the technologies of safe road traffic which provide the driverless transportations with automobile, railroad and air means;
- the population social security technologies which provide voluntary services and material State payments for citizen with limited movement through their electronic applications and other.

Each separate technology is a narrowly applied developed service and good which characterizes the innovative economy stage and the production Industry 4.0. The total digitalizing requires the cyber-physical space system complex dialectic unity to optimize the Society 5.0 resources synergy to provide the citizen welfare. The conceptual designs with dominating technology factor to satisfy the social population necessities defines the State infrastructure assets as a digital platform where the socially responsible business deploys highly accurate informative ecosystems of life preserving innovations with high quality standards.

The Society 5.0 megaproject ideologists evaluation says that the cyber-physical spaces resources total optimization is the less capital consuming compared to stage by stage digitalizing of some economy branches or social segments where the city infrastructure must be renewed. If they refuse to improve the State socially by sectors the economic efficiency will be an increase in data significance which are viewed in another humanity evolution stage as a resource to expand the State social solidarity.

4. Conclusion

The Society 5.0 constructing includes the informative knowledge base and a data bank creation, which contains the applicable and fundamental social and economic technologies, which form a synergy in solving the actual humanity troubles. The technology availability and their wide humanitarian application let the economically potent countries create comfortable living environment and gain the leading positions of the super intellectual Society 5.0 practical propagation.

The Industry 4.0 digital leap success in the social mind creates the new behavior models of the population cyber-interaction where the highly advanced cyber-systems eliminate the barrier, which is typical for the smart cities world. The cooperation with business circles huge internet companies

representatives to design the technological innovations let the Society 5.0 discover all optimal solutions advantages to facilitate the human communication with authority organs work processes in all branches and levels, service commercial companies, education companies and other.

The combined data application by cyber-agents mobilizes the technologies to form useful (new) knowledge necessary for the State economic progress in the future establishment the Society 5.0 intellectual humanitarian model. The directed efforts of authorities and business together with the artificial intelligence create the new population social welfare, which is not included in the industrial economy model:

- a combined way of employment to realize different types and timetables of remote jobs;
- human substitution in hazardous automatic productions which use the technologies of ecological danger;
- a remote way to propagate the State services into the population in a wide range of socially important questions (the acts of civilian states, estate deals, subsidiaries) and other.

The tangible obstacles to establish and harmonically develop the Society 5.0 are the low level of civilian activity, which prevents the progressive ideas new economic model implementation in all places and business absence of desire to support financially the technologies of clear social application. Meanwhile the Japanese government megaproject the Society 5.0 is a real technological leap to develop the city State infrastructure and innovative ecosystems.

To create a humane society with intellectual digital platform for the interests of a particular person in a separate (isolated) country is a highly improbable scenario of the civilization development. The actual aspect to reach the stable general welfare is a full scale international cooperation where the industrial economy balance of interests is preserved and also social equality and environment safety for future generations. The Society 5.0 tools are democratic State policy systems combined with authority tolerance, business and population to the appearing social defiance.

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