

Analysis of the Science, Technology and Innovative Production Discourses of the Government in Turkey within the Frame of Information Society Thesis

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Abstract—Social structure has been studied under varying names from the traditional and industrial societies to the information society within the focus of communication technologies. Information society is defined as a social structure that has an effect on all social areas, the basic production factor of which is information and where computers and communication technologies are taken as basis in the processing and storage of information. In information society related arguments, also the effect of science and technology on economic growth and social development is marked as a significant element.

In this context, within the scope of the present study science and technology discourses were addressed within the frame of information society arguments, and it was tried to determine how the future society will appear within this transition that is assumed to take place from the industrial society towards the information society. For this purpose, the “Science, Technology and Innovative Production” approach, with which Turkey’s ruling party Justice and Development Party set forth its objective of closely monitoring post-industrial information society processes and getting involved within these processes in the 64th Government Program was analyzed within the scope of “Information Society” theses, and the society designed by the government was tried to be defined. In the study, data obtained through descriptive analysis were interpreted in line with predetermined themes.

Keywords— Government program, information society, science and technology.

I. INTRODUCTION

SCIENCE and technology policies over the entire globe have direct effect on the welfare levels of countries. As a natural consequence of such positive effects of technology all countries are in a competitive pursuit to access, harness and develop technology. The belief that technology and information directly impacted financial performance hence requires to be employed as a political tool has gained further impetus. Therefore the role of technology started to cover a further detailed place in financial analyses. It can thus be argued that due to the increase in the financial asset of information and transformation of information and production technology into one political tool, a shift of

paradigm has been experimented. Such shift of paradigm corresponds to the transition from industrial society to information society (Seyrek and Sarıkaya, 2008: 54).

The onset of this society type is dated to the 1960s. In the 1960s and beginning of the 1970s a range of ideas on modern society were developed (Kumar, 2004: 14). Sociologists underlined the propensity towards deep-rooted changes in the foundational characteristics of highly advanced countries. They claim that a new society format is about to be born and this society shall differ from the previous industrial societies in terms of a list of features (Bozkurt and Baştürk, 2012: 469).

In regard to this new society a number of definitions such as “Post-Industrial Society/D. Bell”, “Information Society/P. F. Druker”, “Post-Capitalism Society/R. Dahrendorf”, “Information Society/Y. Masuda”, “Network Society/M. Castells” have been shared (Bozkurt and Baştürk, 2012: 469; Yamaç, 2009: 11; Bozkurt, 1996: 13; Headrick, 2002: 12). Yet amongst them Information Society has been the most popular definition (van Dijk, 2006: 19; Geray, 2003:118). Post-industrial societies have widely been recognized as “information” societies (Williams, 1989: 87).

The promise to produce information, which in essence provides some social benefits, is one antique theme dating back to the roots of civilization. As experienced beforehand the governments, rulers, and political entities greatly valued useful information in all stages and ages of life. The government is required to tackle with the strategy and practical issues of the administration applying technical information (Habermas, 1992: 62; McClellan III and Dorn, 2014: 425). A replicate path is evident in Turkey of which Government Program (Hükümet Programı) specifies its preliminary objective as; “closely tracking entire processes that post-industrial information society follows and to partake in such processes during this 21st century” (64th Government Program, 2015: 116). In this program the underlying goal is, in all the stages of manufacture (production), employment creation, exportation increase, to increase the sector onto a further competitive and powerful position in the investment and management stages. Through the steps in this direction it is accentuated that in the manufacturing structure it could be feasible to multiply the share of high value-added products created via advanced technology. In this Program it has been

elaborated that the quality of laborforce would be enhanced, a better setting for business and investment would be established, and an information-society based strategic transformation able to achieve transformation in strategic sectors would be provided (64th Government Program, 2015: 15).

This study particularly focuses on the specific objective of Turkish Government. Within this framework “Science, Technology and Innovative Production” approach specified in the 64th Government Program of Justice and Development Party leading Turkish State has been analyzed with respect to “Information society” theses and the aim has been to shed light to the form of society designed by the governing party. In this study descriptive analysis has been employed. In descriptive analysis the aim is to present obtained findings to the readers in an ordered and commented format. To achieve that objective, obtained data are first openly described. Next provided descriptions are explained, commented and list of results are obtained. Associating, explaining and providing future-relevant predictions based on the obtained themes could also be included into the dimensions of the comments to be provided by the concerned researcher (Yıldırım and Şimşek, 2005: 224).

II. INFORMATION SOCIETY

Change is an inevitable rule. As argued by Newman change left a direct impact on social institutions and the entire range of technologically-advanced societies, the foremost of which is the United States, have transformed into novel societies. In former eras agriculture and farming used to lay the foundation of economy whereas in subsequent ages the economy started to be under the control of factories. In modern age on the other hand production of goods has been replaced by the media, research and development, tourism, banking and finance, technology and relevant sectors operating in information and service domains (2013: 231).

A range of factors played active role in the structuring of modern world but in particular the technological shifts having kicked off in the eighteenth century and being a totally brand format for the existence of mankind, the Industrial Revolution in short, has enabled the rise of ground-breaking technological changes over the globe (McClellan III and Dorn, 2014: 323). The narration on Industrial Revolution has mainly been analyzed from a technical aspect. Accordingly the first Industrial Revolution took place with the implementation of steam power. The Second Industrial Revolution emerged as a consequence of new energy forms such as petrol and electricity, and the Third Industrial Revolution having risen on the foundation of nuclear energy was an effect of the application of electronic systems –computer, automation, microchips- to wider domains of production and control (Williams, 1989: 82-83).

It is widely agreed that application of industrial technology has, under no circumstances, been restricted with pacifist financial development processes. Technological innovations altered the existing conditions in the industrial communities

of the twenty first century as well. On one hand technological advancements have been utilized to create the tools boosting social welfare, but on the other hand industrial civilization proclaimed developed countries as global leaders and subjected less-developed countries to the wills of industrialized nations, while concurrently industrial technology was predominantly and intensely left to the control of arms-industry (Giddens, 2001: 35; McClellan III and Dorn, 2014: 398; Yamaç, 2009: 4).¹ Having claimed that we would witness the closure of Industrial Age, Havemann finds the advancement in science and techniques breathtaking and exhilarating. However Havemann also heralds a bad omen with these words; “it is creepy and abhorring that the carnage of millions of people who have been victimized by the kind of crimes and criminals never ever existed before are not due to natural disasters but existing social chaos of modern age” (1990:7).

New energy resources, novel structuring in the workmanship within factory production system, nascent tools in the financing of industrial development and industrialization that structured the key characteristics of ideological changes accompanying industrialization triggered a list of deep-rooted social transformation processes next to technological innovation and financial growth. Not only did the process realign the order in traditional society but it also created a new society in which the preliminary financial activity pivoted in the axis of Industrial Production. Industrialization also introduced a considerable number of ideological effects and it has been witnessed that open market and free enterprise have also surfaced (McClellan III and Dorn, 2014: 333-334).

The entire range of technical developments that fueled during the eighteenth century and first half of the nineteenth century laying the foundation of Industrial Revolution are far distant from the scientific theory, as claimed by McClellan III and Dorn. It is nonetheless not feasible to attest that science indeed failed to play any social or ideological role in supporting this industrialization process. On the contrary science integrated to the social and cultural tissue of European society in conjunction with the development of Industrial Revolution in Britain. Science was promoted as a cultural and intellectual task. Regardless of the fact that technology climbed in tandem with traditional line without any assistance of scientific theory, a list of top-notch artists of the eighteenth century-Europe established social ties with the world of science. Industrial Revolution Age in essence witnessed the alignment of connection between technology and handicrafts in favor of the novel ties between technology and the world of science (2014: 335-338).

Nineteenth century in particular witnessed the outbreak of historic merger between science and industry as well as the

¹ Dating back to the earliest stages of industrialization, industrial production processes have been applied to military use, and this practice in turn made arm-production and military organization forms developed the industry unprecedently compared to under industrialized cultures and radically changed warfare practices. By the same token, spread of industrialization is closely associated with the colonization history of Europe (Giddens, 2001: 35; McClellan III and Dorn, 2014: 390- 391).

components of science and technology. The kind of shifts witnessed with the advent of the seventeenth century are not merely bound to industrial production or the invention and implementation of steam engine also renowned as the key symbol of particular era. Printing and telegram machines left equally powerful marks just as the steam engine (McClellan III and Dorn, 2014: 359; Yamaç, 2009: 15). Radio communication was one of the earliest samples of the application of science and the implementation of the latest theories into technology and industry. Adding a technological character to information and increasing the tools for monitoring, measuring, recording, saving and distributing the information correspondingly assisted in disseminating the production (Burke, 2013: 281; McClellan III and Dorn, 2014: 361).

Toffler explains this new society as “the Third Wave” and renders this statement as regards its commencement: “Within the first ten or fifteen years after the Second World War when the wave of industrialization climbed to its peak, there was also the outbreak of the Third Wave that changed anything it touched on the spot; but its true nature was not yet clear to the beholders” (1996: 32).

Although the idea of a society regulated by information can be dated way earlier than the introduction of information concept into the language and culture of modernity (Mattelart, 2004: 11), in the last quarter of the twentieth century, the technology revolution that positioned information into its center has dislocated the format of various actions including but not limited to thinking, production, consumption, trading, controlling and communicating (Castells, 2007: 3). In the words of Castells, information age promises to “set free a productive capacity that is beyond the power of mind” (2007: 515). In the 1960s it was argued that all ideologies came to a deadlock and based on this argument Daniel Bell referred to “post-industrial society” to explain the new setting (Mattelart, 2004: 60). Bell claims that post-industrial society is characteristically an information based society (1976: 46).²

Information societies are signaled as the kind of societies which are, corresponding to a humanitarian and sustainable socio-economic development, able to utilize interactive communication networks (the new media) and possessing a share in the international sectors operating in the production stages of technology and applications demanded for the utilization (Geray, 2003:118). Castells reports that the roots of new world order can be traced to the historical merger of the three independent processes at the end of 1960s and mids of the 1970s. These processes are technology revolution; economic restriction and flourishing of cultural and social movements (2007: 486). Webster on the other hand argues that information society can be depicted under five categories

namely; technology, economy, profession, location and culture (2006: 8). On the basis of post-industrial society hypothesis lies the transfer toward service and information relevant sectors in particular as a response to the rapid fall of the laborforce in agriculture and production sectors and the consequential shift witnessed in the distribution of professions (Williams, 1989: 90). Explaining the new world process through the lens of reporters’ approach towards science and technology, Nelkin remarks that 1960s was the age of scientific technological breakthroughs and revolutions. According to Nelkin who explains that the framework changed at the end of 1960s and during the 1970s the admiration towards science and technology was replaced by the anxiety for risks involved in social life. Her argument is that during the 1980s, technological exhilaration of the 1960s was rejuvenated. The idea of modernization was resuscitated; celebration of technology emerged as the promotion of higher technology. The cliché saying of “old breakthroughs” was once more on the stage (1994: 21).

Industrial society relied on the coordination between machines and individuals for the production of goods whilst in the new society coordination is organized around information (Bozkurt, 1996: 37). Bell attests that among pre-industrial age societies the materials were strategic resources and among industrial societies the capital was the strategic resource but among post-industrial societies theoretical information was valued as one strategic resource (1976: 46). In information society the institutions that produced information started to form the pillar “axis” of the society (Bozkurt, 1996: 13). In any given information society, social structure is affected not only by the shifts in the domains of science and technology but by the changes in the spheres of intellect and philosophy (Yamaç, 2009: 12).

Within information society that is based on new technologies and centered around information production, new communication technologies grab attention as major factors (Yamaç, 2009: 42). New technologies involve new forms for communication. Irrespective of the experienced transformation this new age is, as claimed by Wood, an “information age” and this new technology is the inevitable component of this change (2003: 39). It is true that each communication tool is the bearer of a new civilization (Mattelart, 2004: 53).

The development witnessed in communication technologies expanded the amount of information extractable in the society and made it accessible for all members of a community. Furthermore these technologies achieved to gradually transform the entire society. Many people have argued that emergence of such tools fueled a social revolution which embraced the concepts of democratization, freedom of communication, participation and advancement (Timisi, 2003: 10).

² A number of researchers claim that “information society” is an “interval stage” in reality rather than a totally novel model of social structuring. It should be viewed as the sum of innovations that communication technologies preserve within their own body and it paved the way for new inventions born out of its practices. A rapid transformation in social structures is evident; however this transformation has not yet reached the quality to lay the foundation for the definition of a brand new society (Yamaç, 2009: 6; Nair, 2008: 86).

III. SCIENCE-TECHNOLOGY AND INNOVATIVE PRODUCTION DISCOURSES AND CONCEPTUALIZATION OF INFORMATION SOCIETY IN THE 64TH GOVERNMENT PROGRAM OF TURKISH ADMINISTRATION

A. Science - Technology and Information Based Economy

As specified under 64th Government Program of the ruling party in Turkey, Justice and Development Party, presently the driving dynamics of economic development is constituted of information production and transferring information to added value. It has also been argued in the same program that financial bodies founded upon traditional production methods fail to be sustainable. In this Program it is stated that future world would be constructed via science & technology and information-based economy (64th Government Program, 2015: 107).³

The ruling party considers science and technology as the formula of the key to be ranked amongst the list of high-income countries (64th Government Program, 2015: 107). Indeed it is recognized that science and technology are the two strongly collaborative forces designing modern world (McClellan III and Dorn, 2014: 431). New technology is one of the most critical indicators of the new age and it is an undeniable truth that currently it has become one integral part of social world and key element in all the stages of daily activities (Dickson, 1992: 28; Webster, 2006: 9).

Despite being dated back to the eighteenth century the concept of "development" that emerged as quite an effective determinant of the intellectual world of the second half of eighteenth century and nineteenth century (William, 1985: 245) and twentieth century is presently translated as "technological development". In modern age a new form of society was born out of advanced industrial societies and the term corresponding to this new form of society is information society. Because currently new technology is the key element nourishing information society it is feasible to correlate information society with technology society as well (Gülenç, 2015: 166).⁴ Dickson attests that grasping the role of technology within society is not merely significant in itself but is an essential part of understanding the very nature of society (1992: 28).

As can be inferred from the narratives above the most striking feature is the power ascribed to science and technology. Twentieth century witnessed an inevitable transformation between science and society. Research and development via science and technology are viewed as inseparable twins (McClellan III and Dorn, 2014: 1). Indeed the development level of a country used to be measured via

the volume of produced steel and energy but currently information-technology forming micro - electronic, telecommunication and computer technologies provided several means which could measure the volume of obtained, processed, transferred and stored information. In this new age development criteria heavily rely upon information-based volumes rather than physical quantities (Yücel, 1997: 22).

Throughout the course of history each period conserved an individualized technology applicable to its production process. Every single new technological development heralded the ways for a new technological invention. This process lays the ground for continuous development (Yücel, 1997: 8). Science and technology has now turned into a directly- productive force. Yıldız, Ilgaz and Seferoğlu argue that without producing science and technology it would be infeasible to catch and build the future. The same researchers also allege that science and technology unite hence complement one another and drive new gates in the area of international competition (2010: 461).

The process of developing national information and technology is viewed as a systematic phenomenon and this complete process constitutes the scope of any design. By the same token national technology policies demand to be designed in a systematic format while in response they call for an effective management and strategic perspective. Thus national technology and innovation systems have been, by a set of countries, designed and operated within autonomous, public or semi-public institutional frameworks geared toward specific strategic targets (Seyrek and Sarıkaya, 2008: 54).

Giddens claims that economic factors are heavily influential in the way science and technology is experienced in real life (2001: 44).⁵ From a general outlook, societies, even presently, continue to experience a phase of transformation from agricultural society to industrial society (McClellan III and Dorn, 2014: 389). Developments in science-technology open up wider and newer horizons for economic development (Yücel, 1997: 19).

B. Innovative Production in Economic and Social Development

It has been accentuated in the 64th Government Program that economic and social development of Turkey is closely intertwined with innovative production and the Government officials explain that during their reign, the party's aim has been to provide a source substructure to enable the passage toward an information-based and competitive national economy (64th Government Program, 2015: 108). Kinçsei states that innovation is the key activity of information society (2007: 7). Knowledge-information operations in economy are dated to the 1960s (Geray, 2003: 118).

⁵ Giddens advocates that science and technology affect and get affected by political and cultural factors. He argues that competition for power among countries, expansion of wealth and the attempts of military forces to outlive other states constituted an energetic source for change. With the development of science which is among the cultural factors affecting social change processes secularization of intellect positively contributed to the emergence of critical and innovative quality of modern perspective (2001: 44).

³ Yamaç claims that in order not to fall behind "Information Society" formations, Turkey has long been engaged in continuous activities some of which can be listed as Science-Technology-Industry Policies Work Group (1992-95), Turkey Informatics Council (2002), e-Turkey Operations (2002), Vision 2023 Technology Vision Works (2009: 25).

⁴ "Development" term, though dated to the eighteenth century, bears a longer past in essence. "Development" is conceptually equated with the originality of historical process. The words standing for developing or development have been in abundance during Antique age. Belief in development gained an accelerated climb during the second half of the nineteenth century (Koselleck, 2007: 20, 117).

This condition necessitates the production of industry and services by manipulating the inherent ability of technology production and innovativeness in the spheres of advanced technology (Geray, 2003: 133). Within information society in which information has become the preliminary resource providing real capital and affluence, information base is essentially the ground for economy (Drucker, 1992: 237-239). As stated in Government Program it can be feasible to forge an information society via “an information-based economy depending on humans and science and technology existing with humans and also concocting the favorable setting for the commercialization of science and technology” (2015: 107).

As stipulated in this Government Program the preliminary target aimed with ‘Commercialization Prioritized Transformation Program in Top-Priority Technology Domains’ is multiplying the quantity of technological products and brand names, empowering research and innovation centers, incrementing the quantity of qualified laborforce and improving innovative entrepreneurship. Within this scope it is underlined that in priority sectors technological product investments and prototype development processes would be supported. In the remaining priority sectors viz. energy, health, aviation, space, automotive, rail systems, informatics and defense investments geared toward technological products would be backed up (2015: 109).

Bozkurt and Baştürk suggest that Turkey is one country that is greatly affected by the outcomes of information age but still suffer from major handicaps (2012: 481). This condition is, as stated by Kocacık, bound to the fact that Turkey entered the industrialization phase later than the rest of countries which in effect concluded that substructure of information society failed to sufficiently benefit from the developments constituting its preliminary conditions (2003: 7). In Government Program within the framework of industrial policies, it is envisaged that in an outward-oriented structure in industry the vision for Turkey is to rise as a production center enjoying R&D facilities, and companies manufacturing innovative and qualified laborforce-based goods with high added value and goods produced with medium and high technology. Led by industry at most, key targets have been specified as investment to productive domains, concentrating on high-technology sectors, boosting health industry production, speeding automotive sector operations, rising as the producer of electronic sector in the spread of innovative solutions with information and communication technologies-support (64th Government Program, 2015: 111-114).

Bozkurt and Baştürk propose that to catch up with information age, Turkey is mandated to establish its information substructure. On the other hand in the transmission toward information society, transformation in people's minds is equally important as technological transformation. To achieve that it is imperative to reformulate information as an urgent necessity among the members of society (2012: 481).

To solve the emergent problems Bozkurt and Baştürk suggest that the rising demand for qualified laborforce that would produce and utilize new technologies and

consequentially in order for Turkey to catch up with information age, rapidly increasing Turkish population should be educated in line with novel developments (2012: 481). Yücel argues that information storage and present level of Turkey enable the country to dominate generic technologies and by employing such technologies it can become one member of global information society without further delay (1997: 21).⁶

As claimed by the government science, technology and innovation cooperatively play critical role in Turkish economy for the solution of this problem. To reach the objective of being one giant global economy it is mandated to become a country exporting high-value added goods by producing technology and to achieve that the target is to set an effectively functioning R&D operation that can produce information and by utilizing information in a quality-way, transforming information into a commercial asset and an innovation ecosystem as well. It has also been foreseen to improve in quality and quantity the researcher laborforce and employ further numbers of researchers in private sector (64th Government Program, 2015: 108).

Government also plans to implement a range of innovations to become an information society in parallel with the theories on information society. These innovations can be listed as; enhancing research activities in quantity and quality; setting a technology transfer platform; protection and supervision of intellectual property rights; safeguarding patent rights; founding a patent stock market; technology development (64th Government Program, 2015: 109-110).

IV. CONCLUSION

Throughout historical process societies have been defined in a list of ways; hunter-gatherer, agricultural society, industrial and information society. The foundation of economy was first based on agriculture and in the subsequent ages it focused on factories. With the advent of information society, production of goods has been superseded by the media, research & development, tourism, banking & finance technology and relevant information and service sectors. New society model dated to the 1960s has been explained through different concepts, but still “information society” concept has risen as the most popular concept.

With the arrival of the nineteenth century a historic merger between science and industry as well as science and technology cultures was witnessed and new technology was then recognized as one of the most critical indicators of

⁶ Yücel examines science and technology relevant policies in Turkey during specific periods such as Pre-Republican period; 1920-1950 period; 1950-1960; 1960-1980 and post 1980. The author claims that though it was late, the state administration launched steps for a range of innovative acts starting with the eighteenth century. In the very first years of the Republic one commonly-agreed idea was that economic development could only be realized through quick industrialization and in the 1950s particular emphasis was rendered to substructure investments such as roads, dams or ports. Incentive policies were utilized to commission private sector with the application of technology-transfer dominated investments. Between 1960-80 import substitution development policies gained impetus and at the onset of 1980s in Turkey intensive investments were directed to industrial sector but in the 1990s such investments shifted toward service sector at most (1997: 42-52).

modern ages. In the last quarter of the twentieth century a technology revolution centered around information has radically transformed the format of a number of domains including but not limited to thinking, production, consumption, trading, controlling and communicating. It has been accepted that science and technology are the two most powerful effects that collaboratively shape the modern world.

In the 64th Government Program of the ruling party in Turkey, Justice and Development Party, it has been stated that currently the fueling dynamics of economic development is, in parallel with the theories on information society, information production and transformation of information to added value. The governing party argues that economic structures operating through traditional production methods fail to be sustainable thus the main objective is to catch up with information society since the world of tomorrow could only be constructed via science and technology in addition to an information-based economy. Within this framework the Government Program suggests that information society can be forged by harnessing humans and science & technology that can co-exist with humans and through an information-based economy.

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