# THE CHARACTERISTICS OF THE INFORMATION ECONOMY

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***ÖZET***

ABD, Japonya ve bazı Avrupa Birliği ülkeleri 1950'lerin başında bilgi ekonomisine dönüştüler. Bu dönüşüm sonucunda, hizmet ve bilgi sektörleri ülkelerin üretim ve istihdamı içinde hakim sektör durumuna geçti; sanayi sektörünün boyutları küçüldü. Bügi üretimi, bu yeni ekonomide buluşlar ve politikaların formüle edilmesi için daha önemli hale geldi. "Bilgisayar teknolojisi" veya "bilgi teknolojisi" (TT) olarak adlandırılan yeni bir teknoloji ortaya çıktı. Bu değişikliklere ilave olarak, katılımcı demokrasi farklı bir politik sistem olarak parlamenter demokrasinin yermi aldı.

Bu çalışma, bilgi ekonomisinin yukarda sayılan özelliklerini derinlemesine ele almaktadır. Çalışmanın amacı, yeni toplumun özelliklerini sanayi toplumu ile karşılaştırmalı olarak açıklamaktır.

***ABSTRACT***

The US, Japan and some European Union countries transformed to the information economy in the early 1950s. As a result of this transformation, the size of the industrial sector declined as the service and information sectors became dominant m the employment and production of the countries. In this new economy, knowledge production activities have been more important for umovation and policy formulation. A new technology called "computer technology" or "information technology" (IT) has come out. In addition to these changes, participatory democracy replaced parliamentary democracy as a different political system.

This study examines the above characteristics of the information economy deeply. The purpose of the study is to explaine the characteristics of the new society m comparison with that of the industrial society.

## 1. INTRODUCTION

The term "information economy" has been widely used in the development literature to reflect the new development stage of the advanced countries. Sometimes, the

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term "information society" is also used instead of the term information, economy[1]. It does not matter which term is used, a different economic and social development stage has come out. The US, Japan and some European Union countries have transformed from the industrial society to the information society/information economy since the early 1950s. Hence, the characterisitcs of the new economy shaped after 1950s.

Although some sociologists and economists such as Weber, Marx and Schumpeter foresaw main characteristics of the new society before 1950s- their explanations were Utopian because the characteristics of the new society did not come out clearly at that time. After the industrialisation spread all over the world, some countries such as the UK, Germany and the US reached the advance level of industrialisation. The characteristics of the new economy were defined by looking at economic and social structures of these countries. The widely known characteristics in the literature can be found in Bell's post-industrial society paradigm. These are (Bell, 1973, p. 14):

(i) Economic sector; the change from a good producing to a service economy,

(ii) Occupational distribution; the pre-eminence of the professional and technical class,

(iii) Axial principle; the centrality of theoretical knowledge as the source of innovation and policy formulation for the society.

(iv) Future orientation; the. control of technology and technological assessment,

(v) Decision-making; the creation of a new 'intellectual technology'.

The purpose of this article is to explain the characteristics of the information economy that distinguish it from the industrial society. The characteristics of the information society will mainly be drawn upon from Bell's theory of post-industrial society and will be explained by giving examples from the

[1] Different names have been used for the new society. Some of these names are:, "post-industrial society" (Bell, 1973; Touraine, 1971), "knowledge society"(Drucker, 1970, 1973,

advanced countries. However, some new characteristics of this society such as the diffusion of IT, social values of the new society, etc. will be added from the latest literature.

The article is divided into nine sections. After the introductory section, section two explains the importance of the service sector in information societies. Section three stresses the role of professional and technichal workers in the new development stage. Section four discusses why information and knowledge are important in the advanced countries. Section five argues that new technologies should be controlled in the information society in order to pi'event side-effects before they are introduced. Section six gives the characteristics of the new technology as well as its names. Section seven and section eight explains political system and the social values of the new society respectively. Section nine is devoted to the conclusion.

## 2. SERVICE ECONOMY

The term "service economy" was first coined in the literature by Fuchs (1968) to reflect the emergence of the service sector as the dominant economic structure, both m terms of employment and production. In this sense, the US became the first service economy in the world in which the service sector accounts for more than half of the total employment and more than half of the GNP in 1950s.

### 2.1 EMPLOYMENT IN THE SERVICE SECTOR

The expansion of the employment in the services in industrialised societies was explained in economic and social development theories such as three-sector model (Fisher, 1935; Clark, 1940, Fourastie, 1949), the post-industrial society (Touraine, 1971; Bell, 1973) and the information economy (Porat, 1977)[2]. The traditional three-sector model argues that primary (agricultural) activities dominate the economy in terms of

Stehr, 1994).

[2] The theories on the changing employment structure of the advanced countries are widely discussed in my Turkish PhD Thesis entitled "Sanayi-sonrası Toplum Sürecinde Avrupa Birliği"., Kayseri: Erciyes University, 1996.

their share of employment and output in the early stages of economic development. At a later stage, however, secondary (industrial) sector becomes more dominant m the economy, and finally, tertiary (service) activities become the largest sector in the economy.

There are three explanations of the increasing employment in services: „„.

1. The increasing demand for 'producer services' such as office cleaning, factory canteens and technical design has increased the employment in the services.

2. The income elasticity of demand for services is more than one. Hence, as societies become richer, final consumers demand more services than before

3. The productivity in the services does not increase as much as the productivity in manufacturing. As a result of this fact, the increasing demand for services is provided by the additional labour force transferred from the other sectors (Gershuny and Miles, 1983, p.29).

**Table 1. Employment in Agriculture, Industry and Service Sectors for Selected Industrialised Countries (1960 and 1991)**

-As % of the total work force-

| Countries | Agriculture | | Industry | | Services | |
|---|---|---|---|---|---|---|
| | 1960 | 1991 | 1960 | 1991 | 1960 | 1991 |
| France | 13.2 | 5.8 | 32.7 | 29.5 | 54.1 | 64.7 |
| Germany[1] | 14.0 | 3.4 | 47.0 | 39.3 | 39.1 | 57.4 |
| United Kingdom | 4.7 | 2.2 | 47.7 | 27.3 | 47.6 | 70.0 |
| Canada | 13.2 | 4.5 | 32.7 | 23.2 | 54.1 | 72.3 |
| United States | 8.5 | 2.9 | 35.3 | 25.3 | 56.2 | 71.6 |
| Japan | 30.2 | 6.7 | 28.5 | 34.4 | 41.3 | 58.9 |

Note:[8] Data refers to Federal Republic of Germany

Source: Data for 1960: OECD (1985). *Labour Force Statistics 1963-1983.* Pans: OECD; Data for 1991:OECD. (1992). *Quarterly Labour Force Statistics.* Pans: OECD.

These explanations present that the most important characteristics of the information economy is that the largest part of the workforce is employed in the service sector. The US was the first service economy in the world after the Second World War with more than 50% employed population in the tertiary sector. By 1980, the share of the US employment in tertiary sector was more than two-thirds of the total employment, -*in*.

contrast to the US, Western European countries transformed into service economies in late 1970s. By 1977, the share of the employment in the service sector in EEC countries reached 52 %, while the rate of tertiary employment in the Council of Europe countries was 48.6 % (Gershuny and Miles, 1983, p. 15). Table 1 shows the employment share of the service sector, as well as the share of the agriculture and the industry in some advanced countries in 1960 and 1991.

### 2.1.1 EMPLOYMENT IN THE GOVERNMENT SERVICES

Government activities are included in the service sector. Information society literature (Bell, 1973; Gershuny and Miles, 1983; Daniels, 1985; Stehr, 1994) stressed the increasing employment share of government in the service sector. There are several reasons of the growing employment in non-market or public services (Daniels, 1985, p.37):

*(i) Demographic Changes:* Life expectancy has increased in developed countries due to medical advances. For example, the average life expectancy in the US has grown twenty-six years since 1900. Similar changes can be observed in the other developed countries. Dropping birth rates and the increasing life expectancy led to the increase in the number of-the elderly population. In 1983, the number of the people sixty-five and older outnumbered teenagers for the first time in the US (Crawford, 1991, p.68).; As a result of these demographic changes, more and more people hve after they retired, which means they require a wide range of health services that can not be provided by private sector as cheap as the government (Daniels, 1985, p.37).

•; *(ii) The Increase., in the. Education, Level:* As explained above, postTİndustrial services rise in the information society. One of these services is the education that generally provided by the government so that the iriiriimum standards for the educational level should be achieved to improve knowledge arid skills. According to Bell's observations,' the fastest growth irt government employment in the US was in the educational services that comprised *ÎÖ"/o* of the state and local government employment in 1968 (Bell, 1973, p. 132). Similar change in the employment stmcture was observed m

the European Union countnes, In the post war period, government employment in education and health has nsen more than the government employment in welfare services and public administration (Gershuny and Miles, 1983, p. 183). These developments increased the employment m government activities.

*(Hi) Social and Community Services:* In developed countries, social and community services which mainly consist of the looking after the disadvantaged children and the assistance of families with social and related problems have increased. As these services are generally supplied by the government, the employment m government services increased.

*(iv)Relations with International Organisations:* Every country is a member of various international organisations and trade blocks such as EU, OPEC and NATO. Some agencies founded to improve the relationship with these organisations increase the government employment.

**Table 2. Government Employment[11] in Selected Industrialised Countries (1960-1990)**

-As % of total employment-

| Countries | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 |
|---|---|---|---|---|---|---|---|
| Canada | | | 19.5 | 20.3 | 18.8 | 200 | 19.7 |
| United States | 14.7 | 15.7 | 18.1 | 17.8 | 16.5 | 15.8 | |
| Japan | | | 5.8 | 6.5 | 6.7 | *6.4* | *6.0* |
| Australia | 23.0 | 23.0 | 22.9 | 26.2 | 26.0 | 26.4 | 22.8 . |
| France | | 13.1 | 13.4 | 14.3 | 15.6 | 17.8 | 22.6 |
| Germany[13] | 8.0 | 8.0 | 11.2 | 13.9 | 14.9 | 16.0 ;. | 15.1- |
| Belgium | 12.2 | 12.2 | 13.9 | 15.7 | 18.6 | 19.9 | 19.5 |
| Sweden | 12.8 | 12.8 | 20.6 | 25.5 | 30.7 | 33.1 ' | ' 31.7 |
| United Kingdom | 14.8 | 14.8 | 18,0 | 2Q8 | .21.1 | 21,8, | .19.2 .,,- • |

Notes: (a) Government employment comprises employees of all departments, offices, organisations and other bodies which are agencies of the central, state or local public authorities, (OECD, 1992,p.556).

(b) Data refers to Federal Republic of Germany

Source: OECD(1987). *Historical Statistics 1960-1985.* Pans; OECD, p.38;OECD. *(\992b)£conomic Outlook-Historical Statistics 1960-1990.* Paris: OECD, p.42.

Table 2 presents the trends in the share of the government employment in. some industrialised countries between 1960-1990. In 1990, the share of the government in the employment ranged between 6% (Japan) and 31.7% (Sweden) in the countries mcluded

in Table 2. The difference in the rate of government employment within the countries can be explained by economic and political systems -for example, the privatisation level and social democratic economic model- of the countries. Therefore, the reason of the high employment rate in government in Sweden is a result of the lack of privatisation in this country until the early 1990s (Sj0holt, 1995, p.42).

Another important point that can be observed from Table 2 is that the employment rate in government activities increased in most countries, except France and Belgium, until the middle of 1980s and then started to decrease. The data for government employment in Table 2 includes employees working for government administration, defence, education and social services, but it excludes employees working for public enterprises (OECD, 1987, p.541). The reason of the declining government employment after the middle of 1980s m the sample countries can be the decrease in some of the above government activities because most of these services reached a saturation point in advanced societies. However, as it is impossible to observe the share of different government activities such as education, health etc., in the employment from the Table 2 we can not say which government activity led to the decrease in the share of the employment.

### 2.1.2 THE EMPLOYMENT OF WOMEN IN THE SERVICE SECTOR

An important characteristics of the information society is the increasing participation of women in the paid workforce. In the US, only one third of all women between the ages of twenty and sixty-four were in the paid workforce; however, this rate exceeded two-thirds by 1990 (Crawford, 1991, p.62). The similar change in the employment structure has occurred in other advanced countries as well. The reasons of the increasing participation of women in the paid workforce are the increasing educational level of women and the protective legislations on behalf of the working women in developed countries. Most of the women entering the labour market have been employed in, the service sector because of the part-time employment opportunities m this sector. Therefore, Bell said that "the service economy is very largely is a female centered

economy if one considers clerical, sales, teaching, health technicians, and similar occupations" (Bell, 1973, p. 146).

Table 3 shows the employment structure of women in 1983 and 1993. The following observations can be obtained from Table 3 about the changing employment structure of women in some European countries:

(i) Employment rate of women m agriculture declined, while the rate of employment in mdustry and services increased over the time period covered in Table 3

(ii) There are significant differences in the employment rates of sectors among the countries. The employment share of agriculture ranged between 1.1 % (UK) and 8 2 % (Italy) in 1993. The same disparity can be observed for the employment share of the mdustry, which had an employment share between 10:6 % (Netherlands) and 22.0 % (Italy) in the same year, and the employment share of services that comprised 86.7 % of employment in Netherlands and 69.8 % of the employment in Italy.

(in) Table 3 shows that the largest part of the women is employed in the service sector in all countries, although the employment rate differs considerably in the countries. The industry is the second big sector in terms of the employment share of women in the countries, while agriculture has the smallest share.

**Table 3. Sectoral Distribution of Women in Some European Countries (1983-1993)**

-As % of employed female population-

| Countries | Year | Agriculture | Industry | Services |
|---|---|---|---|---|
| Netherlands | 1983' | 3.3 | 12.2 , | 84.4 •, |
| | 1993 | 2.7 | 10.0 | 86.7 |
| Belgium | 1983 | 2.8 | 18.3 | 78.9 |
| | 1993 | 2.0 | 14.1 | 83.9 |
| UK | 1983 | 1.3 | 19.7 | 79.8 |
| | 1993 | 1.1 | 15.8 | 83.2 |
| France | 1983 | 7.5 | 20.0 | 72.5 |
| | 1993 | 4.5 | 15.3 | 80.2 |
| Italy | 1983 | 13.3 | 26.4 | 60.3 |
| | 1993 | 8.2 | 22.0 | 69.8 |

Source: 1983: CEC. (1993). *Labour Force Surveyl983-1991.* Luxembourg: CEC, 1993.1993: CEC. (1995). *Labour Force Survey Results 1993.* Luxembourg: CEC, 1995, various pages.

As a result of these observations it can be argued that the semce economy has transformed into a 'female centred economy' in Bell's terms in the sample countries. Although agriculture:still has an important share in Italy and France, the largest part of me women are employedin the service sector. ,....,.

## 2. 2 THE PRODUG1ION OF THE SERVICES

As mentioned earlier, the traditional three-sector model is not only related with the changing employment structure of the countries but also the changing contribution of the sectors into the output. Table 4 presents the contribution of the sectors into GNP in some European countries in 1960 and 1993.

The contribution of the sectors to GDP changed considerably between 1960 and 1993 in the countries (Table 4), The contribution of agriculture to GDP declined, whereas that of the services increased in all countries. The contribution of industry to GDP, however, did not show a general tendency during the same time period because of the different development level of the countries. It is suggested in three-sector model that the share of industry in the output increases in the first place as industrialisation spreads, and then the share of servissin-production starts to increase. Therefore, the contribution of industry and services to GDP increased together in some countries, such as Greece and Turkey, that started industrialisation later than the others. Industry is still an important component of GDP in Japan (40.2 %), although this country reached a high level of industrialisation.

**Table 4. Sectoral Distribution of Gross Domestic Product in Some European Countries, the US and Japan (1960-1993)**

-Value added as % öf GDP[4]-

| Countries | Year • | ^Agriculture | .Industry | Services |
|---|---|---|---|---|
| Austria | 1960 | 11.1 | 47.0 | 42.0 |
| | 1993 | 2.3 | 34.1 | 63.6 |
| Finland | 1960 | 184 | 38.6 | 43.0 |
| | 1993 | 5.2 | 31.6 | 63.2 |
| Greece | 1960 | 26.2. | 29,5 | 44.0 |
| | 1993 | 16.4 | 30.7 | 52.9 |
| Turkey | 1960 | 40.8 | 20.5 | 38.7 |
| | 1993 | 16.2 | 29.8 | 54.0 |
| UK | 1960 | 3.8 | 47.1 | 49.1 |
| | 1993 | 1.9 | 31.8 | 66.3 |
| Japan | 1960 | 13.1 | 44.2 | 42.7 |
| | 1993 | 2.2 | 40.2 | ' 57.6 |
| US | 1960 | . 7.2 | 24.9 | 68.0 |
| | 1991 | 2.0 | 27.0 | 71.1 |

Note: [a]Value added and GDP values are based on current year national currency of the countries.

**Source: World Bank.** *World Star Data 1995.*

Having considered the above observations, it can be argued that the contribution of sectors to GDP generally changed as it is suggested m three-sector model m the countries mcluded in Table 4. The service sector had the largest share in GDP m all countries in 1993, even though industry was still dominant in some of them.

## 3. THE PRE-EMINENCE OF THE PROFESSIONAL AND TECHNICAL CLASS....

Information society has a different occupational slxucture from mdustrial society. In industrial societies, serm-skilled (blue collar) workeT has the largest employment sliare in the economy. In the mformation society, however, the share of the blue collar workers m the employment has dechned and the largest part of the labour force has been employed m 'white collar occupations'[3]. Although the terms 'information

, [3] Bell accepted four groups of,occupations as white collar: (ı)Professıonal, technical and kindred workers; (ii)Managers, officials and propnetors except Farm, (in) Clerical and kindred workers and, (iv) Sales workers (Bell, 1973, s.18)

work force'(Dordick, 1993) or 'information workers' (Katz, 1988) are used instead of the white collar workers in the literatüre, white collar workforce comprises sales workers which are not included into the information work force (Voge, 1983, p.98).

The figures m Table 5 show the general trends of the occupational distribution of employment in the US between 1970 and 1994 by using the data from ILO, *Labour Force Statistics.*

The rate of employment in white-collar occupations in the US grew from 45% in 1970 to 56.4 % in 1994 (Table 5). During the same period, the share of blue-collar workers decreased from 33.5 % to 25.9 %, while the share of service workers increased from 10.5 % to 14.0 %. The rate of increase (33 %) in the employment share of service workers was greater than that of (25. %) the white-collar workers . But, the employment rate of the agricultural workers did not change very much in the same period

**Table 5 Distribution of Active Population by Occupations in the US (1970-1994)**

-Percentage-

| Occupations | 1970 | 1975 . | 1980 | 1985 | 1990 | 1994 |
|---|---|---|---|---|---|---|
| White-collar | **45.0** | **47.2** | **48.8** | **51.8** | **55.0** | **56.4** |
| -Professional, technical and related workers | 13.8 | 14.2 | 14.1 | 14.7 | 15.8 | 16.7 |
| -Administrative and Managerial workers | 7.8 | 9.9 | 9.6 | 10.3 | 12.0 | 12.7 |
| -Clerical'and related workers | 16.8 | 17.1 | 15.9 | 15.3 | 15.3 | 14.9 |
| -Sales workers | 6.6 | 6.0 | 9.2 | 11.5 | 11.7 | 11.9 |
| **Blue collar** -Production and related workers, transport equiprrient operators and labourers | **33.5** | **33.1** | **28.7** | **28.8** | **26.8** | **25.9** |
| **Service workers** | **10.5** | **13.6** | **11.9** | **13.5** | **13.3** | **14.0** |
| **Agricultural workers** | **2.9** | **3.0** | **2.7** | **3.4** | **2.8** | **3.0** |
| **Not adequately defined**[3] | **8.1** | **3.1** | **7.9** | **2.5** | **2.3** | **0.7** |

Note:[a] This group comprises unemployed people, armed forces and employees not adequately defined.

Source: Distribution of active population according to occupational groups is calculated from ILO, *Yearbook of Labour Statistics,* various years.

Bell estimated that the rate of employment in professional and technical occupations would be 14.9 % in 1975. Our calculations for the same year (See Table 5)

indicated that the employment share of professional and technical personnel in the US reached (14.2 %) almost the same rate with Bell's estimation. In 1994, the employment ratein professional' and technical occupations reached 16.7 %, and as a result, this group became the second largest employment category after the blue-collar occupations (25.9 %).

It is clear from the above explanations that occupational structure of the countries is changing as they move from industrial society to information society as a result of the increasing role of the information and.knowledge in the society.

**4. INFORMATION AND KNOWLEDGE**

The advanced world lias increasingly been reliant on information and knowledge. The information and knowledge content of goods and services-has-been —increasing because these two factors have upstaged land, labour and capital as the most important inputs of the production. While some sociologists and economists emphasised only the role of information (Stonier, 1983; Webster, 1995) or only the role of knowledge in the society (Machlup, 1962; Drucker, 1970, 1993; Stehr,? 1994), some others distinguished between the role of knowledge and information. (Bell, 1973; Haywood, 1995). Although these two terms are sometimes used instead of each other, they have different meanings which can be clarified by giving their definitions.

It is generally accepted that there is an information-knowledge chain and that the data is the first stage in this chain (Haywood, 1995, p.1). "Information is data[4] processed into some useful form" (Martin, 1988, p.8; Bell, 1982, p 504).

Knowledge means "an organised set of statements of facts or ideas, presenting a reasoned judgement or an experimental result" (Bell, 1982, p.505). For Bell, "knowledge' or 'theoretical knowledge' is an 'axial principle' of the new society. In the past, some clever people made great innovations when they are trying to solve a problem in an trial and error way. In an information economy, however, innovations are based

[4] Data is sometimes used as the raw matenal of mformation. However, data and information are frequently accepted in the same sense (Martin, 1988, p.8).

on theoretical knowledge. Therefore, one of the most important features of the inforrnation society is "the primacy of theory over empiricism and the codification of knowledge into abstract systems of symbols" (Bell, 1973, p.20). Codified knowledge, in the form of symbols, can be used in varies areas by different people to make innovations. For example, the developments in computer science is based on binary mathematics of which the principles were set out by Alan Turing in his work, *Computable Numbers, 1937.* Theory is important not only for technological innovations, but also for social and economic relations For example, governments apply economic policies regarding theoretical models, such as Keynesian and monetarists (Webster, 1995, p.47).

As theoretical knowledge is the central variable of a post-industrial society, universities and other research institutions become the 'axial stractures' of the society (Bell, 1973, p.26; Crawford, 1991, p.34). Research activities and knowledge production of universities increased in recent years. Machlup (1962) divided knowledge production activities into five categories. These are: (i)Education, (ii)research and development, (iii)media, (iv)information machines, and (v)Mormation services.

## 5. **THE CONTROL OF TECHNOLOGY**

Industrial society and information society came out as a result of technological revolutions. The first technological revolution was the application of steam power to different areas such as transportation, mining and factory machine production. These developments took place more than two centuries ago. The second technological revolution, which took place one century ago, was the spread of electricity (coded messages on wires, telegraph and telephones, lifting etc.) and of chemistry The developments in chemistry lead to the production of synthetics, petrochemical products and plastics. Bell says that the third technological revolution has four technological innovations:

(i) *The change of all mechanical, electric and electromechanical systems to electronics.*

In industrial society, machines were mechanical because they were powered by steam and by electncity. Today, electronic systems replaced mechanical parts,

(li) *Miniaturisation*

The units that conduct electricity has become smaller in the last two decades because of the developments in chip. The components of every chip lias increased exponentially. In the past, there were four thousands bits on a chip. Today, the number of the bits on a chip are more than five million.

(iii) *Digitalisation*

The third technological revolution increased digitalisationj the representation of information by digits. For example, telephone was based on analogue system. After the developments in digital switching, binary systems were used in telephones

(i) *Software*

An important technological innovation in computers is software. The developments in software allowed the users to do different .tasks, without learning a programming language such as COBOL and FORTRAN (Bell, 1989, 166).

Technological developments have increased the production of goods, so the productivity and living standards increased all oyer the world, but new technologies had harmful side^ffects in the past. For example, "In,automobiles, the gasoline engine was more effective than steam,, but it has smudged the air" ,(1923,p,27).,.Bçll.argues,that new technologies should be controlled in order to,prevent side^ffects before .they, arc introduced , ,,, ;.•,

## 6. THE NEW TECHNOLOGY

Throughout the history, every society emerged with a different technology from the earlier societies. The technology of the information society is completely distinct than that of the industrial society. In industrial society, the steam engine was the main technology which substituted physical labour of men and led economic development by increasing the production of goods. In an irrformatiori society, however,.,,the computer technology which replaces the mental labour of men and increases "the mass production

of cognitive, systematised information, technology and knowledge" is the mam technology (Masuda, 1981, p.30).

The new technology has been given different names stressing various characteristics of it. Bell, Masuda and some other writers stressed the role of the computers in the processing, storage and transmission of the information. But, they did not used the term IT, because this term only coined in the literature after the middle of 1980s[5]. Bell called the new technology 'intellectual technology' whereas Masuda called it computer technology. In my view, it should be emphasised that Bell's intellectual technology and FT have different meanings, although both of these terms emphasise the role of computers in the processing of the information. This point can be made clear by explaining the definitions of IT and 'intellectual technology'.

There are different approaches to define IT. However, the wider definition belongs to Freeman and Soete (1985). They defined IT as:

"A new techno-economic paradigm affecting the management and control of production and service systems throughout the economy, based on an inter-connected set of radical innovations in electronic computers, software engineering, control systems, integrated circuits and telecommunications, which have drastically reduced the cost of storing, processing, communicating and disseininating information. It comprises a set of firms and industries supplying new equipment and software, but its developments and applications are not limited to this specialised IT sector" (OECD, 1989, p. 136).

In the eighteenth and nineteenth centuries, scientists worked on only two-variable problems, but in twentieth century, they began to work on problems with more variables. The advances in decision theory, game theory and so forth made possible to solve the complicated problems. The development of problem solving rules by a computer program or sets of instructions based on statistics or mathematical formulas are labelled as intellectual technology by Bell. In my view, statistical and econometric softwares such as SPSS, LIMDEP and MICROFIT can be accepted as intellectual

^More recently, the term "Information and Communication Technologies" (ICTs) have been-started to use instead of TT.

technology although Bell did not give any example. Cronin and Davenport (1988) gave different reasons for the expansion of the intellectual technology including the developments m computer technology. These are:

(i) The exponential increase in the volume of recorded information- >• •

(ü) Accelerating developments in computing and communications technologies.

(iii) The growing information consciousness and information dependence of society at large (p.286).

If we compare the definitions of IT and intellectual technology,fherefiş not any clear distinction between these two terms. But, it is clear that both IT and intellectual technology came out as a result of the advances in computer technology. In my view, information technology has a broader sense than the intellectual technology since it also comprises a set of firms and industries supplying the software and equipment.

The most important point to emerge from the above explanations is that a new kind of technology based on computer and communication systems has come out .-The new technology has reduced the cost of processing, storing and disseminating of information. It seems that the developments in software and equipment will decrease the cost of IT and, as a result will increase the number of IT in daily life,

## 7. POLITICAL SYSTEM

The pohtical system of the information society is the participatory democracy, a pohtical system that allows the ordinary citizens to participate in policy making (Naisbitt, 1984, p. 159). In this sense, the pohtical system in the information society will be different from the parliamentary democracy which is the common political system of the industrial society.

In an industrial society, citizens are organised around labour unions and small political parties so that they can achieve ideological programs. In an information society, however, unorganised citizens will involve in decisions through media, which is a form of participatory democracy, and therefore citizen movements will take the role of the

labour unions as a force for social change because of the participatory democracy (Masuda, 1981, p.33).

Initiatives and referenda are the main tools of the participatory democracy. Initiatives appear on the ballot through direct citizen action, while referenda are the means for citizens to approve of legislative action (Naissbitt, 1984, p. 164). The referendum has become a very popular tool especially in Western European Countries This shows that participatory democracy replaced the representative democracy in advanced societies.

## 8. SOCIAL VALUES

Social values of the information society defined in different ways by the writers reflecting their original culture. For example, Masuda (1981) reflected Japanese view and stressed the role of the 'voluntary community' in which a group of people work together to achieve their common goals. According to him, the materialistic values of satisfying physiological and physical needs are the basic values of an industrial society, while the *satisfaction of achieved goals* will be the basic social value in an information society (Masuda, 1981, p. 3 3).

In contrast to Masuda, Crawford defined the social values of the information society by observing the changes emerging in American society (Table 6).

**Table 6. Basic Social Values of Industrial and Information Societies**

| **Industrial society** | **Information society** |
|---|---|
| Hierarchy | Equality |
| Conformity | Individuality and creativity |
| Standardisation | Diversity |
| Centralisation | Decentralisation |
| Efficiency | Effectiveness |
| Specialisation | Generalist, interdisciplinary, holistic |
| Maximisation of material wealth | Quality of life, conservation of material resources |
| Emphasis on quantitative content | Emphasis on quality of output |
| Security | Self-expression and self-actualisation |

Source: R. Crawford. (1991). *In the era of human capital.* United States. Harper Collins, p.82.

According to Crawford, the information society İs organised around individuality and creativity. The term 'individuality' reflects the main difference between Masuda, who stressed the role of voluntary community, and Crawford. However, other values such as the effectiveness, equality and creativity are the basic values that every information society should have.

## 9. CONCLUSION

Different kinds of societies (primitive, agricultural, industrial and information) reflected different development stages throughout the history, hi this sense, information society is the most advance development stage in human 'life. Transformation between societies is a result of technological developments which depend on information and knowledge. So, no matter which name is given to the new society, information and knowledge are the crucial variables for the development of this society.

The significance of the information and knowledge led to a new economic and social system which is completely different from the industrial society. The share of the agriculture and industry has decreased in developed countries, while that of the-services has increased. Materialistic values started to disappear in information societies.

## REFERENCES

Atik, H. (1996). "Sanayi-sonrasi Toplum Sürecinde Avrupa Birliği," Unpublished PhD Thesis. Kayseri: Erciyes University, 1996.

Bell, D. (1973). *The Corning of the Post-industrial Society: A Venture in Social Forecasting.* New York: Penguin Books.

Bell, D. (1982). "The Social Framework of the Information Society". In T. Forester (Ed.), *The Microelectronics Revolution: The Complete Guide to the New Technology and Its Impact on Society* (4th ed.) (pp.50-549). Oxford: Basil Blackwell.

Bell, D. (1989). "The Third Technological Revolutions and Its Possible Soao-economic Consequences", *Dissent,* pp. 164-176.

CEC. (1993). *Labour Force Survey 1983-199J.* Luxembourg: CEC.

CEC(1995). *Labour Force Survey Results.* Luxembourg: CEC

Clark, C. A. (1940). *The conditions of economic progress,* London: Macmillan.

Crawford, R. (1991). *In the Era of Human Capital.* United States: Harper Collins.

Cronin, B. (1988). "Post-industrial Society: Some Manpower Issues for the Library/ Information Profession". In B. Cronin and E. Davenport (Eds), *Post-professionalism; Transforming, the Information Heartland* (pp.286-299). London: Taylor Graham.

Daniels, P. W. (1985). *Service Industries: A Geographical Appraisal.* Cambridge: University Press.

Dordick, H. S., and Wang, G. (1993). *The Information Society: A Retrospective View.* California; Sage,

Drucker, P. F. (1970). *The Age of Discontinuity: Guidelines to Our Changing Society.* London; Heinemann.

Drucker, P.F. (1993). "The Rise of the Knowledge Society", *The Wilson Quarterly,* 17, Spring, pp.52-66.

Fisher. A.G. (1935). *The Clash of Progress and Security,* London: Macmillan

Fourastie, J. (1949). *he grand espoir du XXsiecle,* Paris.

Freeman, C. and Soete, L.(1985). *Information Technology and Employment: An Assessment.* Sussex: Science Policy Research Unit of Sussex University.

Fuchs, V.R. (1968). *The Service Economy.* New York: National Bureau of Economic Research.

Gershuny, J.I., and Miles, I. D. (1983). *The New Service Economy: The Transformation of Employment in Industrial Societies.* London: Frances Pinter.

ITaywood, T. (1995). *Infor-Rich-Info-Poor: Access and Exchange in the Global Information Society.* Sussex: Bowker-Saur.

fLO. *Labour Eorce Statistics.* Various years.

Katz, R. L. (1988). *The Information Society: An International Perspective.* New York: Praeger Publishers.

Machlup, F. (1962). *The Production and Distribution of Knowledge in the United States.* Princeton, NLPrinceton University Press.

Martin, W. J. (1988). *The Information Society.* London: Aslib.

Masuda, Y. (1981). *The Information Society: As Post-Industrial Society.* Bethesda: World Future Society.

Naisbitt J. (1984). *Megatrends: Ten New Directions Transforming Our Lives.* London: Macdonald and Co.

OECD. (1985). *Labour Force Statistics 1963-1983.* Pans: OECD.

OECD. (1987). *Historical Statistics 1960-1985.* Paris: OECD.

OECD. (1989). *Information Technology and New Growth Opportunities.* Paris:OECD.

OECD. (1992a). *Quarterly Labour Force Statistics.* Pans: OECD.

OECD. (1992b). *Economic Outlook: Historical Statistics 1960-1990.* Paris: OECD.

Porat, M.U. (1977). The Information Economy: Definition and Measurement. US Department of Commerce.

Sj0holt, P. (1995). "The Dynamics of Services as an Agent of Regional Change and Development: The Case of Scandinavia", *The Service Industries Journal,* Vol. 15, No.3, pp.36-50.

Stehr, N. (1994). *Knowledge Societies.* London: Sage.

Stonier, T. (1983). *The Wealth of Information.* London: Methuen.

Touraine, A. (1971). *The Post-industrial Society.* London: Wilwood.

Turing, A. (1937). *Computable Numbers.*

Voge, J. (1983). "The Political Economics of Complexity", *Information Economics and Policy,* 1,97-114.

Webster, F. (1995). *Theories of the Information Society.* London: Routledge.

World Bank. *World Star Data 1995.*