

## **New Trends in Development of Services in the Modern Economy**



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# **New Trends in Development of Services in the Modern Economy**

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# CONTENT

INTRODUCTION .....	7
<b>CHAPTER 1. EVOLUTION OF SERVICE INDUSTRIES .....</b>	<b>9</b>
1.1. Service Industries Historical Genesis .....	9
1.2. Theoretical Analysis of the Services Sector Development .....	29
1.3. Services Sector in Modern Economic Paradigm Transformation .....	47
<b>CHAPTER 2. ANALYSIS OF THE SERVICES MODERN DEVELOPMENT TRENDS .....</b>	<b>63</b>
2.1. The Services Sector Role and Importance in the Global and Ukraine Economy .....	63
2.2. Structure and Dynamics of the Services Sector Development .....	72
2.3. Services Sector Development Major Determinants .....	106
<b>CHAPTER 3. TENDENCIES AND PROSPECTS OF SERVICE SECTOR MODERNIZATION .....</b>	<b>117</b>
3.1. Qualitatively New Provision of the Service Sector in the Global Economy Generation Process .....	117
3.2. Domestic Economy and Services Sector Fundamental Problems .....	168
3.3. State Incentives for the Services Sector Development .....	174
<b>CONCLUSIONS .....</b>	<b>193</b>
<b>REFERENCES .....</b>	<b>197</b>



## INTRODUCTION

The services sector strategic development unites a multitude of economic and managerial aspects and is one of the most important problems of economic management. Many researches devoted to this industry study are available. Most of them are performed in the traditional aspect of the voluminous calendar approach to strategic management, characteristic of the national scientific school. Such an approach seems archaic, forming false strategic benchmarks.

The services sector is of special scientific interest in this context due to the fact that the social production structure to the services development model attraction in many countries suggests transition to postindustrial economy type where the services sector is a system-supporting sector of the economy.

Actively influencing the economy, the services sector in the developed countries dominates in the GDP formation, primary capital accumulation, labor, households final consumption and, finally, citizens comfort of living.

However, a clear understanding of the services sector as a hyper-sector permeating all spheres of human activity has not yet been fully developed, although interest in this issue continues to grow among many authors.

Target of strategic management of the industry development setting requires substantive content and the services sector target value assessment.

Huge work in this prospect has been undertaken by a number of scientists D. Bell, O. N. Balayeva, T. D. Burmenko, S. Gubanov, L. Demidova, I. Dumoulin, V. L. Inozemtsev, Ph. Kotler, K. Lovelock, J. F. Lyotard, D. V. Markova, V. Yu. Piskulov, M. D. Predvoditeleva, P. V. Savchenko, V. N. Soloviev, E. Toffler, R. I. Tsvylev, E. S. Shlenskova etc. are among them. The services sector as a modern industry based on technological process modernization and innovations research is reflected in the writings of N. G. Adamchuk, S. S. Alabyan A. Gureev, L. A. Zhuravleva, S. M., Iovchuk, J. Mudaryanto, A. Novikov, Yu.V. Piskulov, N. V. Rozanova, V. S. Slobodkin, V. A. Fedosov, V. N. Filina L. V. Shemyakina, S. Yu. Yagudin, N. V. Yalina, etc.

In the works of the listed authors the services sector is viewed either from the macroeconomics standpoint as a separate sector capable of independently forming general economic effect, or from the sectoral approach of certain types of services that form segments of the industrial market position, which does not reflect completeness of the industry contribution to the socio-economic outcome of the region and country as a whole. Entrepreneurship role in the services sector development has been poorly studied, economic boundaries for the services sector expansion are not clear, the services sector contribution to a modern person quality and comfort of the life formation has not been fully explored hitherto.

The Monograph basic concept is the message that a certain level of the services sector development is attributable to the prevailing conditions of economic equilibrium in the population purchasing power area and prices and business risks level.

The goal of research is strategic criteria terms of the services sector modern development description.

The writing team expresses sincere gratitude to all participants in the Monograph discussion for valuable guidelines and constructive criticism.

# CHAPTER 1

## EVOLUTION OF SERVICE INDUSTRIES

### 1.1. Service Industries Historical Genesis

Research of service industries genesis enables its case history and development tendencies revealing. E. D. Dneprov wrote: “Debating the determining problems of the present every educated person can recognize that their origins pertain to the past. And modern problems can hardly be successfully resolved without identifying and understanding these origins” [58].

In this regard genesis of the whole variety of services in specific historical periods seems socially significant to be studied since it creates prerequisites for scientific prediction of its development in the future.

The choice of the present research techniques is determined by the development of global service industry in different countries of the world peculiarities, historical data generalization necessity, as well as their holistic estimation and perception. In this regard a constructive-genetic method to examine services genesis for formulating positive conclusions that are relevant in modern conditions, as well as a relative-comparative method for determining specificity and dialectical character of service sector formation and development process at different stages of human development have been used.

Before proceeding to service industry formation and development genesis analysis the following semantic concepts should be addressed.

In the Explanatory Dictionary by Vladimir Dahl the following interpretation of service is given: “to render a service is to serve, please, be useful, do the right pleasing thing” [51].

S.I. Ozhegov’s Dictionary suggests the following interpretation of this notion: “a service is an action that benefits or helps another person” [108].

The Big Economic Dictionary describes the concept of service as “a specific product of labor that does not acquire external forms, and the user value of which, unlike real product, lies in the direct labor useful effect” [30].

In its turn, the Great Soviet Encyclopedia states that: “a service is a certain expedient activity, existing in the useful effective labor form” [29].

It is noteworthy that the above multitude of rather general interpretations of the “service” concept reflects its versatility and depth. Analysis of historical genesis of service industry development conducted below is the confirmation.

Mosaic structure of information about different types of services development history is conditionally grouped according to the Ancient World, Middle Ages, New World, Industrial and Post-Industrial Epoch periods.

From the Ancient World period many prerequisites determining activities related to services provision emergence have been available. It was in that period that the most important types of services, existing up to this day, took off in various spheres of human activity:

- 1) In the state and legal relations area;
- 2) In the economic relations (handicraft production, trade, money circulation, etc.) area;
- 3) In the life, as well as personal needs satisfaction area;
- 4) In the spiritual and artistic-aesthetic inquiries area.

As for the services in the state and legal relations area development prerequisites, countries of the Ancient World were evolved in various ways.

Thus, in ancient Egypt Pharaoh ruled the country by means of created sophisticated bureaucratic apparatus, which was headed by the Tjaty. Institutions and temples were under his control, he was in charge of militia army levy, as well as overruled in the court.

During the Archaic period (about 800-500 BC) Ancient Greece consisted of a totality of independent states-policies. One of the largest policies was Athens covering an area of 2,500 km. The real power in Athens belonged to Areopagus, or to the Council, which included three top officials called Archons. Thus, Archon Basilevs presided in Areopagus, organized cult sacrifices and disposed lease of the temple land property. He also managed theatrical holidays and other celebrations. Responsibilities of Archon Eponym included the city authorities' management and those who funded choral and theatrical competitions appointment. He also administered inheritance as well as orphans and widows cases. Archon Polemarh was responsible for donations, as well as special athletic competitions in honor of war victims organization. In addition, he also dealt with court cases. With the advent of Democracy (508 BC), all power was mainly concentrated in the hands of Strategists, and the Archons were only controlling cultural ceremonies and celebrations. The Council, or Areopagus, originated drafts of new laws, peace treaties and other public initiatives, which were then discussed and approved by the People's Assembly.

Sufficiently detailed information about the ancient Romans life, from which the prerequisites for services in the field of state and legal relations sphere development can be judged, has been preserved.

Thus, the Roman Empire territory was divided into areas, formerly provinces. The provincial government was administered by Senators who commanded their army, monitored border protection, controlled tax collection and acted as judges.

A group of officials who ruled Rome was called the Senate. The Senate was in charge of state property, finance, participated in foreign policy issues, and appointed military commanders, defined state security measures, maintained public order, etc.

A vivid historical example of services in the field of economic relations development prerequisites can be considered in the earliest Sumer-Ubaid period when rivers banks and swamp lands were reclaimed by landowners. The land of Sumer was flat and fertile, but suffered from the lack of rainfall. The Euphrates River presence did not improve the situation until, in due course, the landowners learned to build irrigation canals to create water reserves and supply it to the fields. Consequently it allowed to cultivate more land and as a result surpluses of food products, and hence goods for sale, emerged. Population significantly increased; some people became artisans, merchants, priests, etc.

Another example is Ancient Egypt. It should be noted that craftspeople were considered to be well-paid and respected members of that society. The most honorable craft was embalmer's craft. The most skillful of them worked at temples or in palace workshops of Pharaohs, as well as in noble and wealthy Egyptians estates. As for the rural area, craftspeople supplied their products to local market and also had their own hide-land to generate additional income. Women also had an opportunity to engage in some types of crafts: weaving, gardening, perfumes and fragrances preparation. The most common types of crafts in Ancient Egypt were: pottery, carpentry, metal working, papyrus production, boat construction, weaving, glass making, tanning, etc.

The economy of Rome advanced much further in this direction. Money did not exist in the Early Republic period and people simply exchanged some goods for others. Later financial transactions were made through bronze ingots calculation. In the Empire epoch a single economic system that coordinated trade and monetary circulation emerged. That is, the Ancient Rome economy can be assumed the first origin of financial services.

At the same time, the link between road traffic development, which was built on the military needs basis but in parallel had a positive impact on trade

and distant settlements state control development, is also of a particular interest. Thus, for example, traders who followed the troops sold their goods to the conquered countries inhabitants. Trade flourished due to the ability to quickly reach the remote outskirts of the Roman Empire. In 312 BC the first strategic route — the Appian road — construction was started. It should be noted that road communication, in addition to the mentioned above, also contributed to the Provinces association and the authorities of Rome operational management.

It is noteworthy that priority occupations of the Ancient Roman society upper classes representatives were military service, as well as political and financial activities. And, for example, middle-class people, foreigners, and freedmen were architects or doctors. Ordinary citizens were mainly engaged in various crafts or trade, and villagers were engaged in farming. Craftspeople made various products with the help of apprentices and sold them in their workshops-stands themselves. Merchants purchased goods at large wholesale fairs, and then resold them in their shops in retail.

It should be noted that ancient forms of trade and economic services in their level could meet a number of modern requirements.

In addition to trade and personal services a huge number of activities related to crafts, as well as work requiring highly skilled training, emerged in the Ancient World cultures. In the cities of the Mediterranean and in the East stonecutters and sculptors, architects and builders who taught crafts to children in schools worked. Taverns and inns owners can be called the first service industry managers.

Unknown in other cultures professions appear in ancient China: ivory carvers, specialists in lacquer miniature and enamel; manufacturers of silk fabrics and porcelain were among them. In China there were centers, including monasteries, where martial arts, as well as psychological and physical improvement techniques were taught.

The ancient Greeks and Romans also had tutors teaching Eloquence Training, Philosophy and Acting Basics. All these types of training were charged.

As for medical care sphere, during the period it progressed and its development was closely connected with religion, cult and temples. At temples schools were organized to train doctors. Healing functions were gradually concentrated in the narrower circle of persons (Elders and Priests) hands. The disease essence (its cause) was considered in the context of religious worldview, that is, the disease cause was considered to be either diabolizing or the Gods' will. At the same time, disease natural causes were also recognized.

Later professional doctors appeared. They gained a place of honor in the society and were recognized by the state. Professional doctors were traditionally

taught medical skills in the family: the head of the family passed medical experience to his children, taught them medical skills, as well as secrets of medicines preparation.

After the writing systems invention prescriptions, diseases descriptions, medical practice and methods of medicines preparation started to be recorded. At that time, medicinal substances of mainly plant origin, less often of animal origin and even some mineral substances, such as mercury and arsenic, were used.

In that historical period, doctors continued to improve pregnant women assistance and developed such methods of mogitocia interference as cesarean section and embryotomy. The surgery was known and applied both in quiet life and on the battlefield: doctors removed arrows, bandaged wounds, stopped bleedings and used painkillers (opium, henbane, hemp, etc.).

It is noteworthy that the following historical fact served as the first prerequisite for services in the sphere of everyday life and personal needs satisfaction emergence.

The epoch of Rome of that time is known for self observation growing popularity. Hairdressers were widespread and became not only a place to get appropriate services, but also a meeting place for friends and lovers to chat. At that time bearding became fashionable and most of the Romans shingled. Later fashion changed and wearing long hair, which they curled and oiled, became popular. In parallel, bath-houses popularity increased. Initially they were simple washing rooms and were intended exclusively for men. Later, in the Empire epoch, enormous sizes bath-houses with luxurious interior decoration and a complex system of heating and supplying water were built. From simple premises for washing they turned into peculiar cultural centers, in which thousands of Romans enjoyed their free time with pleasure. It is noteworthy that in large bath-houses even libraries and reading rooms were available and visitors were also offered different drinks and dishes.

It is arguable that they were the first integrated public service establishment prototype. After washing visitors could invite hairdressers, barbers and massage therapists, who immediately offered their services. In addition, bath-houses had a special patio for wrestling and various sports activities, and in some bath-houses even outdoor pools were arranged.

Curious is the fact that in the Roman civilization period most ordinary Romans houses lacked kitchen. If they wanted hot food they had to visit a tavern. On the contrary, wealthy Romans could afford large size and high comfort kitchens in their houses construction. As a rule, slaves worked there, each of which specialized in cooking a single dish or performing a certain work.

The idea of the first “business lunch” belonged to the Roman innkeeper Sekvia Lokatu in 40 BC. He tumbled to an idea to offer the service to too busy Romans who for some reason could not go home for lunch. For the record, cooks were considered elite then; they were highly appreciated and awarded with loud titles.

Let us emphasize the fact that it was the sphere of spiritual and artistic and aesthetic foundations of the Ancient World society that laid the present civilization culture foundations.

Thus, information as to how ancient Egyptians spent their free time can be gleaned from the wall paintings, which are still preserved in tombs. Theaters did not exist in that period and first dramatic performances were staged at temples; the stories, as a rule, were based on the Gods’ life stories. In addition, court processions and various religious celebrations were regularly staged, which also represented colorful spectacles for the public. Sport games and entertainments on the Great River — the Nile — were especially popular.

Ancient Greece is known to us as the Olympic Games birthplace, which is where sport was one of the most popular activities. Various kinds of wrestling, running, discus throwing, and chariots racings received the greatest development. It is noteworthy that the policy of encouraging sports was adopted at the state level, which allowed the Greeks to be in good physical condition and in good alert in hostilities events. At that time many competitions, where athletes could take part, were organized. Most of them were local sports events, but four of them — Olympic, Pythian, Isthmian and Nemean games — attracted participants from all over Greece. They were called the Panhellenic Games. Each of them was held as a part of a cult festival dedicated to a God. Sports popularization not only contributed to its mass character, which made it possible to improve physical qualities and motor abilities, strengthen health and prolong creative longevity for the population, but to increase the state’s defense capability as well. In addition to the above mentioned, sport became the population entertainment sphere.

As for the modern European theaters genesis, they originated in Ancient Greece with theatrical performances in honor of Dionysus in the countryside. Later, in Athens it became a more official festive event, known as the Great, or Urban Dionysiads. Every year poets composed songs for this event, they were performed by a choir accompanied by dancing. It should be noted that all roles in Greek theater were performed exclusively by men, who created different images with masks and costumes.

Based on archaeological excavations, mosaics, paintings and works of Roman writers studied, an idea of how the Romans spent their free time can be worked out.

Public entertainments and spectacles in Rome were called “Ludi” (Games). It is noteworthy that many of these spectacles were funded by the Government, as they were part of the Religious Calendar. Three kinds of such spectacles are known to us: theatrical performances, chariot races and fence-plays, as well as wild animals penning.

From the third century BC the Theater Golden Age begins, which is explained by close ties between Rome and Greece establishment. At the beginning, but as late as in 55 BC, performances were held in primitive wooden theaters with a small spectators’ capacity. The first stone theater in Rome, which could accommodate up to 27 thousand people, was built by Pompey. Later such theaters were built throughout the Empire.

Animals penning and fence-plays were favorite entertainments in ancient Rome. Circuses were used for their conduct, as well as for chariots races. Later stone buildings — the so-called amphitheaters — were built for this purpose. Fence-plays systematic conduct turned them into mass spectacles demanding organizational activities.

Thus, it can be summarized that the Ancient World communities demonstrated a lot of economic practice and social relations peculiarities, which could develop in combination of various services availability only. Along with that, activities that could potentially serve as social development catalyst were originated in Ancient Greece and Ancient Rome, and continued to deepen during the Middle Ages period. Thus, a powerful for that time “growth point”, that is scientific and philosophical thought and art development oriented to person comprehensive development, dominated in these cultures.

The foregoing confirms that the Ancient World service sector was primarily of an applied (utilitarian) nature, that is, provided pressing daily needs satisfaction, including the services, without which it would be impossible to exist harmoniously and develop the society. Moreover, it was not institutionalized, and services were regulated by that society rituals and traditions.

The next historical stage of service industry formation is connected with Western Europe and Middle East medieval societies. This period covers the V to XV centuries. In the specified period of time, production-financial and public mechanisms that deepened economy and market relations differentiation were formed.

These mechanisms include:

- specialization and differentiation of labor;
- manufacturing system;
- coerced labor by wage labor replacement;

- capitalist relations formation;
- credit and financial institutions emergence and formation (the first banks were established throughout Western Europe in the XII century by the Order of Knights Templars).

It is expedient to explore service industry in the Middle Ages period development on the example of Western Europe, the Mediterranean and the Middle East countries, since it was there that the new types of services were worked out and developed.

Thus, the Chinese of the Ancient World and Middle Ages period became famous as pragmatic executives: goods manufacturers, travelers, traders, as well as inventors. Inventions of that time (gunpowder, compass, paper, etc.) potentially consisted of a huge application effect. But the Chinese culture was characterized by orientation on its strengthening rather than on its own traditions renewal.

In contrast, Eastern cultures in general personified a stable social development with slow dynamics, which prevented innovative breakthroughs in various spheres of life including economy up to the XX century.

On the other hand in the Mediterranean and Western Europe countries in the late Middle Ages, as well as in the Modern Period (since the XVII century) evolutionary monotony of economic and social development was violated. It was there that the most significant changes in spiritual sphere, in the field of economic and labor relations, as well as in people's worldview took place. Printing was the most important innovation of that time. Fairly simple technology invention and introduction had a revolutionary impact on information replication and dissemination speed, as well as on its availability. It is commonly known that handwritten books were much more expensive than duplicated printed copies.

It is noteworthy that during the Middle Ages period new leisure time club forms (knightly orders, singing corporations, university societies), which contributed to the humanistic culture spread and a new type of thinking formation, emerged. The need to unite in the face of hostile forces pushed people to unite and strive to legally consolidate their alliance. Thus rural and urban communities, merchant guilds, solemn communities, which had clear organizational structure and existed at the expense of their own funds, were created. All these social associations contain club features [71].

In a number of cities in Western Europe, universities, which from school-centers for theologians training were gradually transformed into secular educational institutions, appeared. Typically, the Middle Ages schools were arranged

in churches, and priests taught in them. Tuition fees were charged, so only children of wealthy parents could afford studying.

It should be noted that during the Middle Ages period differentiation between the highest and the lowest classes representatives was particularly deepened. Among other things this was reflected on leisure time activities. If an ordinary person leisure activity was mainly limited to folk art, the upper class representatives had a rather wide range of entertainment; tournaments, hunting, military training, feasts, games, dances, etc. were among them.

As for the sports development, with the advent of Christianity in Europe sports fell into decay. The Church doctrine considered exercises for body development to be corrupting the soul and alienating the person from the God. Despite the Christian Church official negative attitude towards physical culture, the authorities not only had to encourage knighthood training, which was former main military force in Western Europe, but also turn a blind eye to folk games and competitions — in particular in Germanic lands and Ireland, where the games tradition survived until the second half of the XII century.

First racing sulkies and organized skates production appeared as late as in the XIII century, and various ball games such as tennis, faivza, bendiball, football, bowling, whirligig were described in the XIV century [140].

The Medieval theater history is an entire epoch cultural section (from the V to the XVII centuries) through which a medieval man consciousness can be studied. In this consciousness common sense and the most bizarre superstitions, faith zeal and mockery over church dogmas, spontaneous cheerfulness, craving for the earthly and severe asceticism imposed by the Church were combined contradictory. Wandering amateurs — gistrions were also especially popular during this period. In France they were called jugglers, in England — minstrels, and in Russia — skomorokhs. Skillful gistrion was one actor theater. He was a magician and an acrobat, a dancer and a musician, he could show an act with a monkey or a bear, play a comic sketch, walk a wheel or tell an amazing story. Cheerful spirit of a fair and a free joke were presented in these stories and sketches. The vagrants' art, based on satire and criticism, was also popular. The Church pursued gistrions and vagrants, but was powerless to destroy people's love for theatrical spectacles.

This theatrical art development period is also known for the mysteries genre genesis, which is mass, square, amateur art. Mysteries were part of city festivities arranged in fair days; abstract church plots acquired national color in them. Square theater reflected a medieval man cheerfulness, his merry audacity and thirst for a miracle, that is faith in goodness and justice triumph [141].

In societies that began movement along capitalization path of their economy the most important element of modern service, that is “service producers — consumers” link, emerged. This chain operated especially intensively in the travel services scope.

People in the Middle Ages traveled mainly to holy places: Muslims made hajj to Mecca, and Christian pilgrims traveled to Jerusalem and Rome.

In the XI century the Catholic Church replaced church confession with pilgrimage. This form of confession only contributed to tourism development. It should be noted that pilgrimage was encouraged by almost all religions and was one of the internal motivators of such tourism development.

The number of travelers increase led to roadside inns enlargement. By modern standards, these were primitive prototypes of private hotels. Guests were offered to sleep side by side on mattresses laid out on the floor in one of the rooms. Each of them either ate their food, or bought something from the innkeeper.

It should be noted that transport system evolution contributed to this in a certain way as well. Thus, in the XII-XIII centuries a real “road revolution” took place; transport network which routes primarily met trade interests, was built up. They were mostly tracking unsurfaced roads. Most time of the year through impassable mud they could not be overcome; so traveling on horseback was necessary. The best roads were considered to be hard-surfaced old Roman ones which were used for many centuries and some of them have even been preserved to these days. The most extensive network existed in Italy and Gaul, fewer number of such roads were available in Spain and Britain. Such network was created from military-strategic considerations, and trade motives were taken into account considerably less.

The goods were transported mainly on packed mules and donkeys, and later harnessed in carts horses were also used. Certain progress in transport development can be associated with harness improvement, and especially with spoked wheel and iron rim invention, which made alleviating the cart weight possible. Trips were made on horseback, or on horse litters. A carriage as a new kind of transport emerged only in the XV century. However, they were expensive and belonged to nobility and titled individuals only.

Vast majority of all goods was delivered by the sea that is why particularly noticeable changes in maritime transport development took place rather than anywhere else. Thus, in the IX century Scandinavian vessels with high boards were considered to be progressive: they sailed with oars and seated up to 200-300 people. But they were later surpassed by German and Mediterranean

shipbuilders. They built caravels with 500-600 tons capacity that took more than 1,000 people aboard.

Steering wheel was improved in the beginning of the XII century, and compass came into use as long as in the XIII century. Ship's compass introduction had a tremendous impact on shipping in general and on naval matters in particular, since compass made trekking the open sea from one place to another for long distances possible, with possibility to significantly reduce these distances, and pass them with much more confidence in poor visibility and unfavorable weather conditions.

By the aid of compass more accurate navigation charts plotting became possible. Quite satisfactory maps of the Mediterranean were used as late as in the XIV century, but without use of geographical network, that is, without latitude and longitude indication, which, however, did not matter for those sailors as they did not know the way to determine their location.

River transport of that time was quite convenient, cheap and relatively safe. It should be noted that rivers often had to be forded, since stone and wooden bridges were not common. For large cargoes transportation barges were predominantly used. They were dragged along coast lines by horses put in harness by ropes. To transport small loads ordinary boats were used. Navigable river routes network covered the whole of Europe. Canals were used to connect rivers. Gradually, canalling technique reached high level: they started to be equipped with chamber locks.

Gunpowder invention and powder mixture utilization were used in mining operations as burnout means for stones loosening. First mountain tunnels were caved in the XIV century.

The Modern Period was first and foremost book and local newspaper triumph era. Unlike the Middle Ages, where all or almost all information was oral, a man of the Reformation and subsequent Enlightenment learned to trust printed word and use it to learn, receive and disseminate information. This, in turn, significantly influenced service sector of that time development.

With replacement slave-holding by manufacturing production in the Western countries at that time credit and financial institutions that enabled production development, largely due to borrowed capital extension, appeared. New forms of commodity-money transactions formation became a distinctive feature of that time.

It was then that lombard and bill transactions were distributed. Thus, in XVII-XVIII centuries municipal lombards performed "departments on social support of population" functions by obtaining small loans to save the citizens

from starvation or final ruin, thereby protecting them from theft and other criminal ways of earning their living. And in the XIX century the so-called “shoe lombards”, where workers handed their weekend shoes in on Monday, and on Friday, after receiving wages, redeemed their shoes and went out to social events, emerged [97].

As for the bill transactions, this written documentary monetary obligation evolved from the bank credit to the traders’ popular tool form that is to trade credit.

Bill circulation of that time characteristic features became the following:

- bills longtermness (3, 6, 12 and more months);
- large bills currency;
- promissory bills dominance in the internal circulation. In turn, bills of exchange were generally used in foreign commerce and in obtaining foreign bank loans;
- large share of bank capital in bill circulation lending.

Along with this, professional-corporate relations form in trade was also improved. At that time trade companies, associations, i.e. Hanseatic Leagues, which allowed regulating internal norms of trading activity (sales, trade security, etc.) were established.

Similarly, industrial corporate associations, handicraft workshops, which regulated labor standardization, production conditions, and etc. issues, were developed.

The process of capitalist relations in social and economic spheres emergence and market services distribution served as a preparatory platform for the Industrial Revolution that occurred in the countries of Western Europe in the XVII - early XVIII centuries.

In the so-called Modern Period Western European civilization intensified fundamentally new social development factors such as science, technology and industrial production, which formed a new industrial society basis.

It should be noted that simultaneously with these innovations in a society life of that time the role of Christian religion was lost. There was a change in the worldview itself: from religious and dogmatic it turns into a rational-cognitive one. The main thesis of the time was that a person was recognized as his destiny creator. Along with this, his main goals, which started concentrating on internal self-improvement, education and self-actualization also changed.

The West intellectual life was determined by Francis Bacon’s (1561 – 1626) slogan “Knowledge is Power”. Wisdom understanding finally merged with knowledge. G. Leibniz (1646 – 1716) said: “Wisdom is a perfect knowledge of the principles of all the sciences and the art of applying them”.

It was the Enlightenment era that marked a rapid increase in population literacy rate. This process was facilitated by reproduction and distribution of newspapers, magazines, books, as well as art objects such as pictorial reproductions.

Education sphere of the Modern Period developed in crucial for humanity social conditions. The Netherlands Revolution (1566 – 1609), the English Revolution (1640 – 1660), the war for the independence of the United States (1777 – 1783), the French Revolution (1789 – 1794) had an enormous influence on new school and pedagogy formation. Two stages of the Western pedagogical thought development could be designated, they were: the early Modern Period (first three quarters of the XVII century), and the age of Enlightenment (late XVII–XVIII centuries). It should be noted that the feudalism ideology and social institutions of that time turned into an increasingly obvious brake for education and training. Practice when success in life was ensured not by education and business qualities, but by belonging to privileged estates and various circumstances, which often led ignorant and insufficiently educated people to the top of the power, contradicted with the time. An unprecedented number of treatises that expressed the desire to make a person free renew and influence him through a human spiritual nature upbringing and education emerged in Europe. Pedagogical issues became one of scientific researches of that historical period priority. Historical and pedagogical development in the Modern Period was opened by an amazing phenomenon: pedagogical system, extraordinarily challenging in design, formulation of pedagogical issues and proposed solutions, distinguished by complex architectonics creation. With this system Pedagogy “detached” from Philosophy as a new branch of scholarly knowledge with its own scope of research, scholarly armament, research issues and its own “language”, i.e. definitions.

Medicine sphere continued to improve as well. Industrial production growth attracted attention to occupational diseases research. At the turn of XVII–XVIII centuries Italian doctor B. Ramazzini initiated industrial pathology and occupational hygiene research.

With medicine development medical schools were emerging in different countries. In the middle and especially in the second half of the XIX century new scientific and practical branches were detached. For example, Paediatrics, which had existed as a practical healing branch before, was detached into an independent scientific discipline, presented by departments, clinics and societies. Neuropathology and Psychiatry were transformed into scientific disciplines on the basis of success in studying anatomy and nervous system physiology as

well as clinical activity. Along with therapeutical medicine preventive medicine was developed. The search for not only effective but also safe methods of preventing diseases that is vaccines led to the population mass vaccination expansion. X-rays discovery marked the foundations of X-ray diagnostics, without which an in-depth examination of the patient could now be impossible to be presented. Advanced doctors and medical scientists saw the future of medicine in the development of public preventive measures and therapeutical and preventive medicine interrelation.

Further society transformation led to the role of information in the life of an ordinary person increase. Mass media were widely used to stimulate the process of the society with religion and tradition separation.

This period also included political communication emergence – from parties and social movements to electoral process emergence (in some cultures it had existed before, but was not a media phenomenon, because elections took place within closed territorial or professional communities). A Modern Period person, whose knowledge and opinions were formed by humanism of Enlightenment and freed from church dogmatics secular knowledge and secular philosophy, demanded self-actualization – and it was primarily available through local and municipal government possibilities. Even in very conservative cultures at that time city councils, senates and parliaments emerged, works on life of urbanized communities organizing began.

Modern service industry emergence was accompanied by transport rapid development. From the early XIX century a real transport revolution broke out in the world.

In 1803 American R. Fulton invented a steam vessel and conducted a test on the Seine. However, Napoleon government did not appreciate his invention. Upon arrival in America, the inventor built the steamer Clermont, which in 1807 sailed the Hudson River from New York to the state capital city Albany. During the Anglo-American War of 1812-1814-s the world's first military ship was floated out and tested and in 1819 an American steamer Savannah crossed the Atlantic Ocean in 26 days. Further world shipping development was facilitated by the Suez (1869) and the Panama (1914) canals construction.

Railway transport development start-up was made in Wales in 1803. It was there that the world's first steam locomotive was built, though its design proved unsuccessful. An English self-taught mechanic J. Stephenson who invented the first working model of a steam locomotive in 1814 is regarded to be the real railway transport founder. He was railway construction and a locomotive plant founder. The first railway line was opened in England as late as in 1825 and

four years later Rocket locomotive for the Liverpool — Manchester railway, which accelerated up to 50 km per hour was built. From 1830 to 1840 in Europe, as well as the United States, extensive rail construction was launched. In 1858 J. M. Pullman invented a sleeping car and a dining car and introduced lighting and other improvement systems for the passengers' convenience. Later underground railways were constructed in the largest cities of the world.

In 1863 the first underground was launched in London, and then, literally 5 years later, the subway was placed in service in New York City, in 1892 in Chicago, in 1896 in Budapest, in 1898 in Vienna, and in 1900 in Paris.

In 1881 the first electric tram line was put in operation near Berlin.

In 1885 a German inventor G. Daimler constructed the first motorcycle and the following year K. Benz patented the first gasoline-fuelled vehicle. Mass vehicles production was launched in 1890 in France. And in 1908 in America G. Ford entered "model-T" production which was the world's first inexpensive car designed for mass consumer.

In 1903 brothers W. and O. Wright performed the first flight on a gasoline-fuelled sailplane to Kitty Hawk (USA, North Carolina) which lasted about 1 minute. As late as 1909 they launched a company for aircrafts serial production [162].

The world telecommunication and information technologies history began with the fact that the first public telegraph was launched in America in 1844, and as late as in 1858 4,500 kilometers of the reinforced telegraph cable was laid across the Atlantic Ocean. Owing to A. Bell phone was invented in 1878 and long-distance voice communication became possible. By the time telephone was invented telegraph communication had already connected all the major capitals of the world, and the first transatlantic voice communication took place in 1915.

The early XX century was characterized by national and international telegraph lines, as well as city telephone networks mass construction. Invention of radio led to a qualitative leap forward in the media industry development. The first radio receiver was invented by A.S. Popov in 1895 and as late as in winter 1899-1900 a regular wireless communication line started operating at a distance of 40 km in Russia. Radio communication development was most closely connected with radio and television broadcasting. In 1920 the first radio station got on the air in the USA, and the event took place in 1922-1924 in the leading European countries including the USSR. The basis of television was laid by V.K. Zworykin, who in 1923 demonstrated the world's first TV in the laboratory of Westinghouse Company.

A significant contribution to infocommunication services development was made by AT&T and its Bell Labs. Personal mobile communication, as well as long-distance communication development should be recognized as one of the most significant achievements. As early as in 1834 AT&T in St. Louis in the United States developed the first personal mobile communication network with one 6-channel base station. The global communications network construction launch can rightly be considered as laying the first telephone transatlantic cable in 1956 by the Company. The starting point for space communications was the first artificial satellite launch by our country in 1957, but as late as in 1962 AT&T launched the first commercial communications satellite Telestar. In 1977 it also laid the first fiber-optic line, and in 1988 the first transatlantic one. These events have radically influenced qualitatively new services in many sectors of service industry development.

In parallel a significant leap in service and hospitality spheres development was made. Technical Innovations: sewerage, water supply, elevators and electricity were immediately taken over by service organizations owners.

Wealthy Englishmen and Americans to Europe influx changed traditional culture of services. That's when English words such as "express", "comfort" and "design" were included in everyday life. At the same time a need for specially trained personnel training emerged.

In the XX century service industry was flourishing. The United States and Europe were the leaders in this area. Technical equipment of service industry enterprises growth was based on industrial production branches specialization further deepening.

Significant changes also affected the world of work and leisure time activities. The role of professional education and a specialist qualification level increased significantly. Human labor in production became standardized: working hours and leisure time were fixed during a day, a week, a month and a year. On the one hand some prerequisites for intensification occurred but on the other the worker experienced gradual fatigue accumulation. In such an intense life rhythm recreation and leisure value was of great importance. This contributed to leisure and entertainment sector importance in the countries' economy growth.

As a result service activity received an impetus by new forms of self-organization and diverse services of a modern type within itself developing. Service activity acquired an opportunity to generate new socio-cultural needs and thereby increase consumer market volume.

Special attention should be paid to one of the major countries that have become a pioneer in service industry creation and new types of services

development that is to the United States of America. There rather than elsewhere else at the late XIX century construction industry development through which multi-apartment buildings - skyscrapers for offices and permanent residence, and individual cottages were possible to quickly erect was launched for the first time in the world.

In addition, favorable prerequisites for entrepreneurial activities in service sector organization were accumulated. It should be noted that American service industry was formed in a society free of traditions limiting entrepreneurial initiative. Economic system of that time was developed on the basis of such factors as market-based principles, technical equipment of production and regional approach to any kind of activity. All this enabled to increase service industry development.

It is noteworthy that American businessmen were the first to sell goods on credit with payment by installments. By the mid XX century standard of living of the majority of citizens of Western Europe and North America was the highest in the world. This meant that each of those citizens receiving high salary could not only feed the family, give a good education to children, buy housing, arrange life and buy means of transportation but afford to relax in prestigious resorts as well.

It should be noted that service sector scale expansion and development dynamics in the economic system throughout the XX century structure in the world countries context was not uniform. Thus, in the first two decades of the new century dynamic expansion of service industry was mainly observed as a result of advanced development of rail and water transport, trade, and consumer services in many developed countries. During this period favorable economic conditions led to a large-scale exit mobility of labor into service industry, and also became a catalyst of active capital construction, as well as boom of development of education and healthcare sectors. By the end of the 1920s service sector of America and a number of European countries was transformed into one of the most important branches of economic activity and the largest sector of the economy.

Historic period of the next two decades was marked by a sharp deterioration in economic development indicators due to destructive economic crises, economy militarization and military industries post-war conversion.

The Second World War further adversely affected the entire service sector development which demanded productive capacity for industrial purposes complete reorientation. Those countries which territories were affected by enemy hostilities and where services sector material base was destroyed overcame

a long way of development restoring in the post-war period. In the future, service industries outstripping development has largely resumed, and this sector positions in economic structure has steadily been expanding till the present day.

In the first post-war decades mass processes such as automobilization, women large-scale involvement in production, urbanization and city dwellers to the suburbs movement gave a strong impetus to its dynamics. As the generation born in the first post-war years matured the population's needs for education, health care, social welfare and services were systematically increasing. The Welfare State formation in many countries was of great influence on these spheres development. The increase of free time value generated additional further demand for consumer services, cultural and entertainment services, etc. from the population. Under the increasing, especially in global markets, competition pressure, business of all industries was increasingly in need of scientific, management, consulting, marketing, advertising, etc. services [56].

The next historic period (1950 – 1970) was Postindustrial Epoch which was characterized by acceleration of events, emergence of new previously unknown tasks in business; technological progress affected both demand and supply. A sharp increase in the amount of investments in research and development, international markets development and leisure industry as well as rapid change in production technology should be noted. The society became alerted to the environment pollution, monopoly abuse and demanded socially responsible business from the enterprises.

It should be noted that service industry quantitative and qualitative parameters were greatly influenced by fragmented market structure of a number of economic system branches restructuring during this period. Thus, large business, which previously held a significant share in credit and financial services, transport and communications and film industry markets, started to develop such areas as recreation, hotel business, retail, catering, etc. by using effective organizational models such as multi-level marketing, franchising, etc. for market expansion purposes. Large companies began to conquer new services markets very often growing rapidly from small businesses.

Thus, the investigated events, as well as a number of reasons and factors of service sector since the late 1970s development were significantly supplemented by new processes and phenomena that accompanied economic system into the postindustrial stage entry impact. Their cumulative result was radical changes in a number of key characteristics which had been considered to be imminent inherent in services production and its result before this period. Transformations progress and extent in the sector under consideration in the

world countries varied considerably, but nevertheless, on a common motley background a number of new trends and shifts inherent in most or many types of services can be traced quite clearly.

Thus, material base of the sector under consideration transformation and almost all industries to modern technologies transition formed innovative changes; the core of which were information and communication technologies. The global information revolution in service industry development is of particular significance: implemented information technologies are universal and in demand in all sectors of national economy, but at the same time the most favorable and especially high effect they bring in many types of an intangible product production.

It is with information and communication technologies that the most profound breakthrough in many areas has been connected throughout service industry evolution. It is noteworthy that at present they form technological basis of production processes and operations in many sectors and types of services. Transition to new technologies and technical means of services production became a strategic direction of investment strategy and modern business development practice and their effective use is the key condition of scales, productivity, market expansion, quality, efficiency and competitiveness growth.

One of the most important regularities in service sector evolution, which is confirmed by the history, should be noted. It is in the fact that services sector does not develop isolated from material production, but rather in close interconnection and integration of these activities. Most significantly, modern economy development effectiveness depends on this interconnection strength and this integration depth.

In the last decades of the XX century the two types of economic activity convergence escalated to a new level: in new technologies of universal application services and material products were practically inseparable and merged together. This convergence process was most strikingly expressed in information and communication, transport complex, media business, and publishing industries.

It is noteworthy that scientists often call modern transformation of production and society toward services as “quiet revolution,” thus emphasizing not only fundamental nature and social significance of this phenomenon, but also gradual changeover progress, as well as any cataclysms, destructive forms and consequences of “ingrown” intangible activities into the overall economic management system unavailability.

Thus, summing up all the above, it can be argued that service evolution is a service in quantitative and qualitative development transition from one

historical form to another, which is caused by external and internal political, economic and social factors of specific time periods.

Our service evolution analysis allows summarizing that services differed from each other in different historical periods:

- 1) by content;
- 2) by their accessibility to general public extent.

Panoramic historical analysis allows asserting that the very essence of a service changed from one period to another and was determined by various factors, including human awareness level that is his consciousness of the surrounding world realities reflection degree. It is logical that more informed people not only broaden their mind, but also change their behavior, values and view of life based on the knowledge gained. It follows wherefrom that the degree of a person awareness correlates with consumed services content. As a result, if a service does not meet the requirements it will provoke a refusal to use this service, which, in the absence of alternatives, is fraught with consumer discomfort and dissatisfaction.

One of the significant factors that have been influencing the awareness level is the degree of interpersonal as well as multicultural communications development. In the conditions of open information space other needs that were peculiar to other people, as well as known and consumed in other countries of the world have been formed. It is quite logical that due to trade development awareness level of nations was expanded since it was the simplest means of interpersonal and multicultural communications, and consequently, largely defined the services content. Trading activities development in this context has not lost its value till the present day.

The next important criterion characterizing a service to a specific historical period distinctive feature is its availability. From our perspective, service availability is an analytical construct that allows judging a particular service wide use possibility. Service availability level depends directly on its cost. In some historical periods the determining factor of service availability was belonging to certain classes, estates, social groups and races.

In conclusion it is important to note that service industry itself was radically transformed over the past century. While at the outset of the XX century composition of services provided was limited and the overall structure was dominated by trade, transport and domestic services, and a large proportion of domestic workers predominated in the general structure, today more than 160 types of services are available (according to the WTO classification) ranging from research to repair services, from education to social services for elderly

and disabled people, and sectors based on the use of sophisticated intellectual work are in the foreground.

## 1.2. Theoretical Analysis of the Services Sector Development

Despite the fact that a certain economic sector dominated at each stage of a society development, changes in the services sector have always been an integral part of the world economy development.

Many domestic and foreign scientists have devoted their works to theoretical conceptualization of services importance and scale in economic and social development. Scientific interest in this problem is currently dictated primarily by the scale, depth and nature of services industries transformation over the past decades (before the financial crisis). Systemic crisis of the 1970-1980s pertinently completed the industrial era; and the developed world economy and society to the post-industrial phase transition has given a new impetus to the services sector dynamics and its development as a strategic sector of the economy. Multilateral transformation in the next four decades has dramatically increased services impact on virtually all aspects of modern development. Most significantly, new trends and changes that distinguish new social development phase from the industrial one are mainly concentrated in services [56].

In order to implement this theoretical analysis, among other things, the term “services sector”, which is widely used in many scientific and journalistic works and interpreted by different authors with different meaning and varying degrees of latitude and detail, should be noted. This is mainly due to the fact that such a phenomenon as services sector in a sufficiently holistic, systemic and more or less mature form has evolved and begun to manifest its importance and significance relatively recently. Therefore, economists-theorists directly engaged in its study only in the second half of the XX century. Thus, in Western countries it started in the 1960-1970s; and in the post-Soviet countries – in the last decade of the XX century, when the awareness of this sphere of social reproduction importance and complexity emerged. It should be noted that to date, its applied area (especially in marketing) is more developed, and the least developed one is in economic theory field.

Service economy emergence and establishment extremely heightens the services sector importance, but at the same time, the lack of terminological clarity and meaningful certainty that contributes to misunderstanding and

misinterpretation should be noted. Thus, a number of concepts used along with the services sector, such as: “non-productive sphere”, “intangible production”, “social”, “socio-cultural sphere”, “non-material sector”, “servicing sphere” “spiritual production”, etc., can be met in the modern palette of scientific publications. Herewith, very rare attempts are made to consider these concepts relationship. The fact that despite all conventionality and controversy, servicing activities are related not only to intangible production, but to the material as well should be noted.

In other primarily educational and methodological works a list of industries related to the services sector can be found. Herewith, a certain complexity of such attempts is manifested in the circumstances, which F. Kotler clearly highlighted 28 years ago: “The services sector spheres are extremely diverse. The servicing sector includes public sector, with its courts, labor exchanges, hospitals, loan offices, military services, police services, fire protection services, post-offices, regulatory authorities and schools and private non-profit sector with its museums, charities, churches, colleges, foundations and hospitals. The services sector includes a good part of the commercial sector with its airlines, banks, computer servicing bureaus, hotels, insurance companies, law firms, management consulting firms, private practitioners, film companies, plumbing repair companies and real estate firms” [89].

The relevance of the “services sector” concept broader interpretation, which “is no longer viewed as a single industry, but as a large-scale sector of the economy with a developed and complex structure with movable boundaries” is indicated by A. Avanesova. [2, p. 91].

A fairly general interpretation of the “services sector” definition is presented in the Encyclopedic Dictionary: “The services sector is a part of the economy, which includes all types of commercial and non-commercial services; a consolidated generalizing category, including reproduction of various types of services provided by enterprises, organizations and individuals. Other parts of the economy are considered to be productive, i.e. industry and agriculture” [145].

The scientific position of A.L. Pastukhov is fully supported by the authors and it is considered that “... the service sector is a part of the global economy, including all types of services provided both on commercial and social basis. In proportion to the human society evolution, scientific-technical progress advance and physical labor mechanization and automation the services sector is gaining its momentum and becoming a key providing sector of the economy” [110].

A panoramic review of scientific evidence indicates that the widely used and intuitively understandable term “services sector” (“services provision sector”) is not mono-semantic. Thus, the services sector can be considered “as a special, the most promising sector of the economy with specific subject-to-subject relations and connections in the exchange” [6, p. 18]. Along with that, a number of services provision sector interpretations taking into account its functional area are available. They can be conveniently divided into two groups. Within the first group, this concept combines services provided to individuals and organizations and is interpreted as follows: the services sector is “... a wide range of economic activities directed on satisfaction personal needs of the population and production needs, as well as the needs of the society as a whole” [55, p. 24]. At a fundamental level of the second group of definitions is the functional prerequisite for services specifically to the population provision: “The services sector is the aggregate of sectors, sub-sectors and activities, which functionality in the system of social production is expressed in production and sales of services and spiritual wealth to the population” [148, p. 5].

The services sector currently performs economic and social functions [112].

The main economic functions performed include:

- Material production sphere servicing, that requires transport and communication services, legal advice, maintenance, advertising, etc;
- Labor power reproduction: through services rendered to the population by educational, sports, recreational and cultural-entertainment institutions;
- Additional material wealth creation: is carried out through durable goods production, or previously lost consumer properties restoration.

Let us turn now to the services sector basic social functions:

- meeting the population needs in various types of services; this function is performed by organizations servicing the population;
- costs cutting and working conditions in households improvement through entities of housing and public utilities and household services activities;
- rational use of the released free time of the population; this function is realized by various cultural and entertainment institutions;
- activities related to state security and public order ensuring [13].

As L. I. Donskova writes in her work [62, p. 179] “...contributing to the social needs realization, this feature (social – author’s note) strengthens the country social security, makes a significant contribution to the production teams modern development, as well as by satisfying individual needs allows organizing each person’s work, life and leisure, strengthens his social, family and friendly relations and helps to develop and realize his inherent abilities.”

Further another controversial issue is revealed in modern scientific literature. The fact is that practically no publications are devoted to disclosing the sphere of servicing as a special branch of the economy essence. More importantly, the study of this aspect indicates the terms “servicing sector” and “services sector” different interpretation and substitution in most cases. Thus, according to some authors, the servicing sector is a part of the services sector, while other researchers believe that the servicing sector is much wider than the services sector.

The services sector consists mainly of nonproductive sectors, but partially includes manufacturing industry as well. In turn, non-productive sphere covers not only sphere of services, ensuring the needs of specific people, but some others, servicing the society as a whole. As a result, introduction of a broader concept of servicing sector, which components will be the entire non-production sphere and the entire services sector is quite justified.

Concept of “sphere of services provision” content definition is even more ambiguities. Definition analysis of the term “services provision” indicates that many authors identify it with the “service” concept, suggesting using it in three senses:

- as a form of human activity;
- as a way to meet the needs;
- as a form of services rendering.

As a form of human activity, services provision is a system of socially approved actions, enshrined in regulatory acts. As a way to meet the needs it is expressed in the consumers’ needs targeted satisfaction. And as a form of services rendering, services provision involves different types of servicing activities allocation – trade, transport, communications, healthcare, education, entertainment, tourism, etc. are among them [129, p. 72-73]. This approach gives a common ground for “service” and “services provision” concepts and makes their use as synonyms possible.

In the analyzed literature, the following options for the considered concepts correlation are the most frequent:

- services provision and services sector synonymization due to the “services provision” concept to the “service” concept narrowing;
- services sector and servicing sector identification;
- services provision sector and servicing sector identification;
- these spheres differentiation with their interrelations realization.

From M. Y. Gorbunova [43] perspective, a significant difference between service and services provision is expressed in the consideration of the first as

an activity or interaction process aimed at the final result, and of the second as an indicator of this process quality, requiring certain professional knowledge, skills and competencies, as well as organizational context. With such review, services provision can be represented as a qualitative characteristic of organized activities in providing certain professional services aimed at consumers' needs satisfaction.

The services provision sector product and its central element is a service that brings these two concepts together and makes their use as synonyms possible. However, the "services provision sector" concept focuses on the processes that occur between the services producer and consumers, and the "services sector" concept emphasizes a specific service or a result of this interaction importance. In addition, the "services sector" term can combine various activities for these services provision with a certain servicing support level. Thus, the services sector is the space for services provision activities implementation.

The following theoretical task is to comprehend a "service" concept essence.

I.V. Shavandina [170] in her work exploring services socio-economic efficiency essence and their classification notes that scientists paid serious attention to the services sector only in the 1950-1960s. The first publications of scientists in the former Soviet Union devoted to the services development were published in the early 1990s. It was at that time that the services sector of the developed countries began to generate about the same amount of GDP as the industrial and agricultural sectors of the economy combined.

"Service" diverse definitions and many approaches to its classification in scientific literature should be noted. In this regard, the existing definitions of a "service" concept have been analyzed and then systematized.

Theoretical views of the "service" concept essence study makes interpretation in the following context of its conception possible:

- a service as an activity, type of activity;
- a service as an interaction process;
- a service as activities result.

These approaches to the service concept analysis are due to the fact that in the first group a service is associated with a useful action implementation. The second group is based on interaction process between a service provider and consumer. And in the third group services essence is viewed as the result of activities that act on the market as a purchase and sale object, as a special commodity that has no tangible form, but at the same time has utility for the consumer.

Scientists, who in their research are based on service definition as an action or activities, tend to interpret services as activities that do not create an independent product or tangible values, but define the service essence as a useful action, willingness and ability to carry out activities. It is noteworthy that scientists who characterize service as a result of an activity are geared to the result tangibility. Thus, services definitions in this context provide only an additional characterization of services tangibility and intangibility concepts (Table. 1.1).

**Table 1.1. “Service” as an Activity, Type of Activity Concept Essence Characteristics**

<i>Author</i>	<i>The author's Definition</i>
UNCED	A service is an economic production of intangible commodities that may be produced transferred and consumed at the same time, cover a diverse spectrum of intangible products and activities that are difficult to enumerate in one definition, and sometimes may be difficult to separate from goods [208]
K. Marx	A service is nothing more than a particular consumer value of goods and useful effect of labor [98, p. 363]
I.Fisher	A service is an action that provides its owner with income through the rendering process [164, p. 864]
F. Kotler	A service is any event, activity or benefit that one of the parties can offer to the other party and which is mostly intangible and does not lead to mastering anything [90]
T. N. Sofina	A service is an economic benefit in the form of activity, this is an action (or sequence of actions), which purpose is to increase the consumer utility of the service object, and the task is the service object impact [139]
R. Maleri	Services are intangible assets produced for the marketing purposes. By definition, intangible assets (or intangible values) are values that are not physical material objects, but have monetary value, i.e., pecuniary valuation. A service is a process, a series of actions. These actions can be a tool for values production, they can create value, but are not an independent value themselves [38]
T. P. Danko	Service is a kind of activity that creates useful result that does not have material form, but satisfies a certain human need [52, p. 363]
B. A. Raizberg L. Sh.Lofovskiy, E. B. Starodubtsev	Services are types of activities, works, in the process of which a new tangible product that has not existed before is not created, and the quality of already existing, created product does not change. Thus, services very provision creates the desired result [124, p. 495]
Yu.P. Sviridenko, V.N. Solovyova, V.A. Baburina	A service is an activity aimed at satisfying a need by providing (production) benefits relevant to this need of tangible or intangible nature [133].

E. M. Aghababian	A service, like a product, is the subject of value equivalents exchange. The exchange purpose is value embodied in the service realization, its objectification in money, i.e., in the universal commodity acting as a measure of value [3, p. 160]
P.S. Zavyalov, V.E. Demidov	A service is an action that results in either a product or some useful effect [65].

From the presented in Table. 1.1. definitions the scientific position of F. Kotler, who proposes a very broad definition which includes a service with an action and with the result connection (the benefit is still a certain result, not a process) should be noted.

Note that the scientist admits services tangibility possibility, which coincides with the authors of the Monograph point of view. The only disadvantage of this definition is that it is too abstract and difficult to perceive. P.S. Zavyalov and V.E. Demidov, who indicate obtaining a result in tangible or intangible form in the proposed definition, think in the same direction.

Further, theoretical analysis of the “service” concept essence from its interaction process perception perspective is proposed (Table 1.2.).

**Table 1.2. “Service” as a Process of Interaction Concept Essence Characteristics**

<i>Author</i>	<i>The author's Definition</i>
K. Grenroos	A service is a process that includes a series (or several) of intangible actions which necessarily occur in the interaction between customers and service personnel, physical resources and systems of the service provider enterprise. This process is aimed at addressing service customer problems [27]
T.Hill	A service is a change in the state of a person or goods belonging to an economic unit that occurs as a result of another economic unit with the prior consent of the first [159, p. 534]
L. A. Sosunova	A service as an activity is inseparably linked with this service rendering or performing process, i.e. servicing. The servicing objects can be individuals and legal entities i.e., population and enterprises [138]
A. P. Chelenkov	A service is a coordinated process of interaction between two or more market entities where some entities affect [30]
L. P.Dashkov, V.K. Pambukhchiyants	A service is the result of direct interaction between the seller and the buyer, as well as own activities to meet the needs of the buyer when buying and selling goods [54, p. 700]
V. D. Markova	All kinds of useful activities that do not create material values are often included to services, i.e. the main criterion for classifying a particular activity to the services sector is intangible, invisible character of the product produced in the given sphere [99, p. 126]

The totality of definitions presented in Table 1.2. discloses system properties that affect all elements in services provision (K.Grenroos), as well as services criteria properties, i.e. their intangible and invisible nature (V. D. Markova).

Finally, the third group of definitions reveals a service as a result of an activity essence (Table 1.3.).

**Table 1.3. “Service” as a Result of an Activity Concept Essence Characteristics**

<i>Author</i>	<i>The author's Definition</i>
M. Porter	The term «service», covering a wide range of industries, reflects the performance of functions for buyers, but does not include a real product random sale [119, p. 715]
S. V. Dzhabrailov	In general terms, a service is an action that brings help, benefits to another person [57]
G. Assel	Intangible benefits that are purchased by the consumer, but not related to property should be considered as a service [10, p. 803]
Economic Encyclopedia	A service is a specific product of labor that does not acquire a tangible form, and the consumer value of which, unlike the real labor, is in human labor useful effect [36]
J. - B. Sei	Services as a special form of wealth can bring income to their owners [130, p. 129]
P. Doyle	A service is an activity or a benefit and its buyer does not obtain any material object ownership [60, p.560]
H. Voracek	A service is intangible assets produced for the marketing purposes [20]
E.P. Dyatel	A service is the result of servicing irrespective of who or what it is carried out by – a person or any other outside world object [63, p.7]

As can be seen from the above review, many “service” essence definitions are available in modern scientific literature, at that each interpretation reflects this concept to solve the set by the research issues. The reason for the term “service” objective definition elaboration is that service itself is a fairly flexible research object. Its boundaries may vary depending on requirements and desires of services provider or consumer.

At this, it is stated in all cases that a service does not create things, that is, it is only about intangible services. In addition, a service is the result of an activity and labor, but service is nowhere stated to be a commodity. It is implied, or can be assumed that the authors share the view that, unlike goods in material form, a service affects the user or other objects or both conditions.

In their work “Services Socio-Economic Essence Genesis“ I. V. Shavandina, T.N. Kutaeva, E.A. Kutaeva also try to conduct research on modern interpretations of this concept and note that regardless of the term “service”

scientific interpretation both advantages and disadvantages can be identified. The authors observe several reasons for this. Thus, it is obvious that researchers, when formulating the term “service”, proceed from the fact that actions that can be called services are numerous and diverse, as well as the objects to which these actions are directed. In most cases, upon “services” contents reflection, scientists are considering its specific side and present its separate characteristic. Purchase of goods is often accompanied by related services, and a service purchase may occur to be accompanied by related goods. Another reason stated by the authors is the fact that official statistics combines these actions into a single class of services. It is logical that domestic and foreign scientists search for the general in the phenomena registered by official statistics. In addition to the above, another reason for the complexity is that the researchers on services theory in most cases deal with a flexible object without clearly defined boundaries [171].

The scientific position of I.V. Shavandina, who believes that the three presented approaches of the service concept essence allocation, suggests that service is an activity aimed at satisfying different needs of people (physiological, intellectual, social, etc.), is rather valuable. According to the author’s definition, a service, in contrast to tangible goods, possesses a special complex of properties, such as: intangible (non-material) form, volatility, inability to be stored, non-satiation (absolute value for the consumer), inseparability from the source, and ability to be materialized [27].

Based on the above, the following specific features of a service as a product, which manifests in certain properties, can be distinguished, the main of which are:

1) *Services intangibility*: Services cannot be touched, picked up, heard, seen or tasted until purchased.

Services intangibility means that a service only exists as an action, which cannot be judged before it occurs, i.e. it is not possible to display, transport, store, package, or examine a service before purchasing it. This property makes demonstration the offered services advantages difficult. However, it should be noted that services intangibility is relative. Tactile perception is a human perception of touch, pressure, stretching, the core of which is various skin receptors and mucous membranes irritation and the received information into the appropriate form of sensitivity by the brain cells transformation. Therefore, some types of services can be tangible (beauty services, hairdressing etc.) [115].

In this regard, the degree of uncertainty of services purchasing is only increasing. Services consumers in this case are compelled to search for the service

quality prerequisites proceeding from the used equipment cost, means of the service provision and the personnel professionalism. That is from everything that the consumer can see and assess. In this, it is extremely important for an enterprise (organization) operating in the service sector with the aim of the customers' confidence strengthening to increase the service tangibility level, demonstrate its usefulness and benefit and emphasize its importance which the consumer will obtain in the process of receiving it. This is one of the key tasks of services marketing.

According to E.A. Chernova [165], when purchasing a service the client receives the right to use it in a certain place and at a certain time. The client can only judge the service by indirect signs before its use, which can reduce the uncertainty. For example, tourist services quality can be judged by the customer through various characteristics, which include: promotional materials describing tourist services, the company appearance and its interior, the employees' professionalism and their ability to locate the customer and provide comprehensive information about the tour, tourist enterprise brand popularity, travel agency image, etc.

2) *Inseparability, services production and consumption continuity*: The process of services provision and consumption occurs simultaneously, that is the interests of the service provider and the recipient are realized in a single bundle.

Services, unlike tangible goods (which are manufactured, packaged, stored in warehouses, sold and, as a result, consumed), are first sold, and only then a simultaneous process of production and consumption occurs. Services inseparability means that a service cannot be separated from its source regardless of this service provider. It is noteworthy that a person will be considered a part of the service if he provides this service.

Production and consumption inseparability reside in fundamentally different pattern of tangible goods and services creation and sale. Tangible goods characteristic is that their production and consumption are separated in time. In other words, the customer almost never knows who exactly produced this product, which mood the person had at the time, what his appearance was, etc. [165].

It should be emphasized that with inseparable relationship of services production and consumption, the contact degree between the service provider and the client may vary. For example, some services can be provided without the buyer presence (clothes dry-cleaning, shoe repair, text translation, of household appliances fixing, etc.). Others, as a rule, are provided by means of information and communication technologies (bank account management, terminal

services, cash withdrawal through ATMs, etc.). In addition to the above, many services are inseparable from those who provide them. For example, medical assistance is impossible without specially trained personnel, banking services are not possible without bank employees, audit services – without certified auditors, etc.

4) *Fragility, services inability to be stored*: Services cannot be, for example, accumulated, stored for the purpose of further resale or use in the future.

Note that in the case of a stable demand for certain services, their fragility does not cause serious problems, but if the demand is subject to significant fluctuations services producers are faced certain difficulties.

4) *Quality volatility, variability*: Services quality can vary significantly, depending on when, whom by and under what conditions they were provided.

It should be noted that quality variability in services provided appears much acute than in tangible goods delivered. In terms of quality, tangible goods can be bad or good; however, in modern production technologies conditions their quality will be almost constant.

This is primarily due to the human factor. For the services producer services quality volatility or variability are very often connected, for example, with personal traits of the employee mismatch, his qualifications, lack of information and poor communication, lack of competition and lack of experience and skills.

The authors of scientific papers [158] indicate that consumer expectations regarding the services quality depend on several components, such as: how the service was developed; how well the staff is trained; what kind of remuneration the staff will receive; how the personnel are controlled. Compliance, which is manifested in the same dependent services to the same consumer and other consumers (for standard services) provision, is very important as well. However, servicing compliance is particularly difficult to be managed compared to production compliance. The reason is that services are created by people, who are much more difficult to be managed than machines.

Regardless of what type of services are provided to consumers, all companies (organizations) seek to minimize their quality volatility by implementing standards, monitoring, staff training, their skills enhancing, labor intensity reducing, etc.

In addition, according to N. Zaitseva [67], it is necessary for service providers to create a culture at the company level to encourage employees to provide high quality image services during staff with consumers' personal interaction. In the companies dominated by culture, the highest level of true autonomy

is achieved. Culture strictly regulates several essential variables and fills them with meaning. But within those quality values, people are encouraged to express themselves and offer innovations.

In her thesis research L. L. Pokrovskaya notes that the main problem is in the fact that in order to ensure satisfaction, parameters of the consumer, enterprise and environment need to be measured simultaneously. If in the material production sphere commodity has relatively stable characteristics within a certain period of time, service is a dynamic phenomenon, making it difficult to determine its characteristics. In other words, in the process of servicing the services enterprise-producer must provide the consumer with the required characteristics in its external environment, despite the environmental instability [116].

In this regard O. A. Podkopaev states: “When customer evaluates the quality of services he compares some actual values of the quality assessment parameters with these parameters expected values, and if these expectations coincide, the services quality is deemed satisfactory. For each parameter of the service quality evaluation two values are available (conditional) – the buyer’s expected and the actual ones. The difference between these two values is called a discrepancy (mismatch) and it estimates the customer satisfaction degree with the service quality”[46].

5) *Lack of ownership*: The service consumer usually uses it for a limited amount of time.

The matter is that services unlike goods which have material form cannot be someone’s property. That is, in most cases, the service provided cannot be used for an unlimited period of time. Ultimately, it either becomes obsolete or irrelevant. For example, any theatrical performance, exhibition, football match and seaside holiday package tour terminate sooner or later.

Due to services property rights lack, service companies should make every effort to strengthen their brand image and attractiveness. For the purpose to enhance sense of ownership Internet forums, membership clubs and associations are created. Special attention is paid to a brand creating and maintaining. Along with that, a system of discounts and incentives for introduction regular customers, thereby motivating them to re-purchase services, is very effective.

To clarify “service” concept its description as an economic category is of particular importance. Categories of economic science are social relations reflection, that is, relations between individuals should be reflected in the economic category. In this context service as an economic category can be considered in three specific complementary relative to each other aspects:

1. This public relations structure is as follows: the subjects of the relations are, on the one hand, a person who provides the service – services producer, and on the other – a person to whom the service is delivered – service consumer. Public relations content is a human activity, the process of rendering services, which in scientific literature is most often called “servicing”, “services provision”.

2. Rendering services process reflects relations as to labor value in use utilization, as well as relations as to this labor on people immediate impact.

3. The relations object, that is, a product in relation to which this social relation is formed, is a service as an economic form of labor and which is consumed as an activity.

General and essential characteristics of economic relations of services are most fully reflected in the concept of service as a process and product of labor unity. According to I. V. Shavandina, T. N. Kutaeva, E. A. Kutaev [40, p. 193], subjects are inherent in any social relation, but specific properties of such a phenomenon as a service are not revealed in them (in these subjects), but in mutual relations. Therefore, the authors imply services economic category as a service in terms of process and product of labor unity (i.e. all services phenomena in general), and bearing in mind that services exist only in relations between people and that people as the relations subjects are services economic relations elements.

A very important aspect noted in the work of V.A. Lazarev [93, p. 57] is that intangible services are aimed at a person and their target function is personal needs or wants satisfaction (education, culture, medicine, safety, etc.). A significant part of them refers to the socially significant and is perceived subjectively. These services are defined as consumer (by analogy with consumer goods in retail, where they find their owner – the end customer).

In the course of servicing activities its production process is carried out at the end of which the customer, passenger, patient, spectator, etc. pays for the service, recognizing and agreeing with the quality of the services consumed and with the fact that it has been delivered in a specified amount. It is important that intangible services are provided to a particular person; it is the subject of the service seller (producer) labor. In this case, capital turnover is described by the formula

$$M - C - D - M', \quad (1.1.)$$

that is, after production, bypassing goods distribution phase, follows the process of payment by the buyer; in other words, production is immediately followed by marketing.

Accordingly, capital turnover in tangible services production can be described by the formula similar to the formula for an industrial enterprise capital turnover, by replacing “C” – a newly created commodity by “S” – a service produced. Commercial product in the service sector lack was noted previously.

$$M - S - D - S - M' \quad (1.2)$$

Intangible services process description by the previously presented formula is not possible, as there services production and marketing (consumption) occur simultaneously (according to the specific service property indicated previously). In our case, a time gap between production and consumption is in evidence.

A very important aspect is that services are subject to the law of diminishing marginal utility, according to which with the increase in a particular product consumption, at other goods constant consumption, the overall utility increases but at a diminishing value. As noted by L. I.Podachina, Yu. Yu. Suslova [115], marginal utility diminishing is the basis of the order choice theory, the meaning of which is that consumers spend a limited household budget based on various goods and services usefulness comparison, maximizing the overall utility in the process of consumption structure rationalization.

However, within the theory of utility framework, a service is a specific type of product, which, according to the authors, should be considered in two aspects:

- on the one hand, any service possesses a utility separate from the consumption process (e.g. consumers buy culinary products in retail trade through the purchase and, accordingly, this process is not accompanied by public catering services);
- on the other hand, visitors to businesses (e.g., public catering) perceive these businesses from the two points of view: both in terms of satisfying their specific material needs (for example, in food) and in terms of satisfying non-material needs (for example, in communicating, spending leisure time, relaxing, etc.).

Given this, a service as a specific type of market product possesses useful for the consumer effect in the form of a new product or quality of an existing product changes generated in the productive labor process [115].

This interpretation of the term “service” allows allocating additional specific intrinsic characteristics to the described and grouped in this paper earlier:

- relation regarding productive labor nature and effect; subjective utility; nature duality;
- demand fluctuations; non-transferability; a service result and servicing conditions coincidence.

From the information provided in the first paragraph of this Chapter of the Monograph, it follows that historically every type of service was considered separately as a special field of activity with its unique peculiarities. And the scope of services itself was a combination of these many activities and in fact was limited to their enumeration.

Service industries enumeration demonstrates their diversity, but does not reveal specifics. Services specifics, their economic essence, and, consequently, services sector development management methods specificity cannot be disclosed by mere enumeration.

The entire set of services can be subdivided into homogeneous groups, subgroups, types and varieties according to a sufficiently large number of independent and interrelated classification characteristics. This requires various classification methods application.

Services classification and their accounting improvement is one of the major problematic issues in all countries of the world.

Study of domestic and foreign economists, representatives of different time periods and different areas of research works leads to the conclusion that currently no single approach to the types of services classification is presented. This hinders their study, systematization and evaluation sequencing and necessitates the issue further elaboration.

Approaches to the services classification generalization has revealed that, despite services classification fundamental design, this process cannot be considered fully completed.

Many approaches to services classification are available in economic and legislative-regulatory literature. The main objectives of services classification are:

- this phenomenon most important characteristics which distinguish it from others and therefore deserve special attention determination;
- the extent to which these distinguished characteristics may be inherent in other classes consideration;
- the essence of the phenomenon under study deeper concept [115].

For example, within the World Trade Organization (WTO) framework more than 150 types of services are grouped into the following 12 sectors:

- business services;
- communication services;
- construction and related engineering services;
- distribution services;
- educational services;
- services related to the environment protection;

- financial services;
- health and social welfare services;
- tourism and related services;
- leisure, cultural and sports events organization services;
- transport services;
- other services not included in the listed [193].

In addition to the WTO classification, Organization for Economic Cooperation and Development classification, International Standard Industrial Classification of All Economic Activities and others, including the lists of industries and types of services provision activities are used in the world practice.

The European Union Directive divides them into three categories:

- 1) Services provided to end consumers;
- 2) Services provided to business;
- 3) Services provided simultaneously to end consumers and businesses [146].

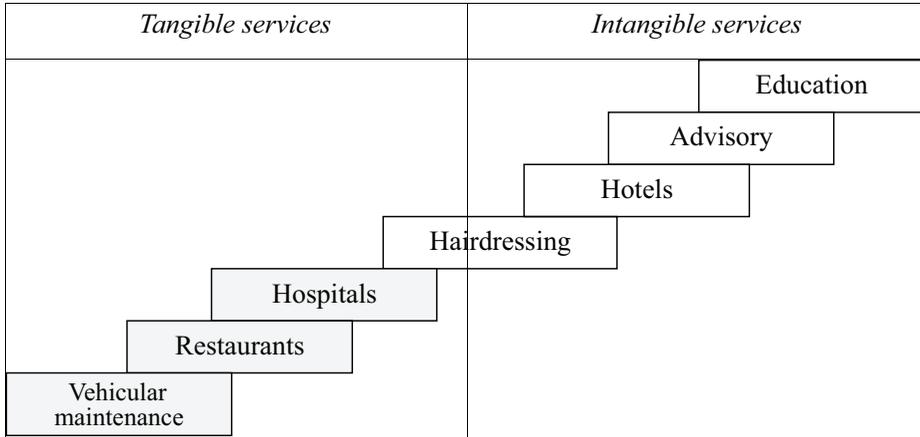
Many scientists have contributed to the services classification structures development. Thus, among many principles of services classification, F. Lovelock classification (Table 1.4.), which is provided in V.D. Markova presentation [99, p. 24], is of particular interest. According to this theory, the main thing in classification is who (what) the services are directed at and whether they are tangible or not.

**Table 1.4. F. Lovelock’s Services Classification**

<i>No.</i>	<i>Basic services classes</i>	<i>Service industries</i>
1.	Tangible actions directed towards human body	Healthcare, public transport, sports facilities, restaurants and cafés, beauty salons and hairdressers
2.	Tangible actions directed towards goods and other physical objects	Housekeeping, freight transport, equipment repair and maintenance, security, laundry, dry cleaning, veterinary services
3.	Intangible actions directed towards human consciousness	Television and radio broadcasting, information services, education, theatres, museums
4.	Intangible actions towards intangible assets	Banks, insurance, legal and consulting services, securities business

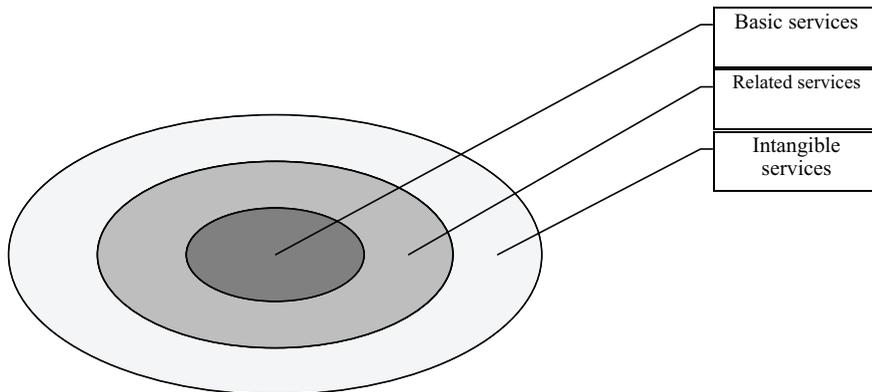
This classification reflects the most general approach to the services classification and is the basic services classification in intangible production field. It can be successfully expanded and supplemented with new types of services. Thus, for example, services can be classified according to the following classification criterion: by legislative and regulatory acts regulation degree, by degree of contact with consumers, by consumer segments, etc.

Services classification by their intangibility degree may be presented (Fig. 1.1.).



**Fig. 1.1. Comparison of Services by Their Intangibility Degree**

M. McDonald (Deputy Director and Professor of University School of Management in Cranfield, UK) and J. Dunbar (practicing marketer, founder of Market Segmentation, co-author and partner of M. MacDonald) provide services in the form of three spheres that absorb and embrace one another. The core is basic services. The following with the respect to the core shell is a scope of related services to which the authors attribute servicing and other types of services provision. External, in their opinion, shell is intangible services sphere, to which they attribute the value and quality perception.



**Fig. 1.2. Services Segmentation [47]**

Services, with all their species diversity, can be grouped into several groups.

**Table 1.5. Types of Services Characteristics [52]**

Services types	Service industries
Manufacturing	Leasing, engineering, equipment maintenance (repair) etc.
Distribution	Trade, transportation, communications
Professional	Banks, insurance companies, advertising, consulting, etc. firms
Consumptive (mass)	Services associated with household and pastime
Public	TV, radio, education, culture

A review of extensive foreign and domestic theoretical material allows the following services classifications criterion identifying (Table. 1.6.).

**Table 1.6. Services Classification**

<i>Classification Criterion</i>	<i>Services type</i>
By property type	– private; – state
By the providing nature	– paid; – free
By functionality	– manufacturing; – consumer; – welfare; – distributive
By the spot in the processes	– end; – intermediate
By legitimacy	– legal; – shadow
By tangibility degree	– tangible; – intangible
By mediation criterion of commodity-money relations	– commercial; – non-commercial
By consumption nature	– mass; – collective; – individual
By involvement in the services providing process degree	– performed by a person; – performed by a machine
By the role	– basic; – support

By participation in international exchange degree	<ul style="list-style-type: none"> <li>– internationally traded services;</li> <li>– services that cannot be exported;</li> <li>– services that can be produced both for internal needs and for export</li> </ul>
By the complexity degree	<ul style="list-style-type: none"> <li>– factor;</li> <li>– non-factor</li> </ul>
By the delivery method	<ul style="list-style-type: none"> <li>– services related to investments;</li> <li>– trade-related services;</li> </ul>
By activity types	<ul style="list-style-type: none"> <li>– educational services;</li> <li>– medical services;</li> <li>– construction services;</li> <li>– legal services, etc.</li> </ul>

The listed classifications are distinguished not only by services grouping principle, but by certain types of economic activity to the services or industrial production sphere classification as well. This often creates contradictions and inaccuracies in statistical reporting, as well as complicates information and analysis of economic activity exchange, including at the international level.

Thus, theoretical conceptions of modern domestic and foreign scientific publications genesis study allows to generalize existing literature point of view on this concept essence and substantiate that a holistic theory of services as a branch of scientific knowledge has so far not been formed.

### 1.3. Services Sector in Modern Economic Paradigm Transformation

As early as in the XIX century it was realized in the developed countries that despite the fact that the services sector did not directly produce material values, it created underlying determinants for this production. Consequently, services sector (tertiary sector) in modern statistics is considered as an integral part of production, equivalent to agriculture (primary sector) and industry (secondary sector).

Services sector was considered a relatively incidental economic activity until the mid-XX century. Although it accounted for a very high proportion of employees, it was mainly lower qualification employees (especially in the trade sector, the largest service industry). It is precisely due to the services sector low importance in the economy from the XVIII until the mid-XX century; it was believed that work in this sphere did not increase social wealth [11].

The period from the second half of the XX century to the first decade of the XXI century is characterized by cardinal phenomena and trends occurrence that fundamentally changed society life and the global economy. Services sector phenomenally rapid development was one of such changes. World statistics demonstrates dynamic development and significant growth of various types of services markets. Sphere of services development degree has become an advocate criterion for the society development. Currently a country cannot be classified as the world developed one if its services sphere generates less than 60% of the Gross National Product.

40% of foreign direct investment in the world is placed in services sphere. According to the IMF, in the early XXI century all services amount to about \$1,500 billion (about 70% of the total world output). Today, international services trade is one of the fastest growing sectors of the world economy [32, p. 33-34].

The trend of increasing income share from the service sector in the GDP structure was identified in some countries as early as in the 1960-1970s. Currently, according to the World Bank estimates, the share amounts to about 68% of the world GDP. The services sphere development level varies in different countries.

Not only the GDP structure shift, but the trend towards employment in services over industrial production predominance, traceable in many countries, is attributed to the services sector development. The highest rates of employment in the services sector are in the USA (78% of the employed population), Luxembourg (77%), the Netherlands (77%), Australia (75%), the United Kingdom (75%), Canada (75%), Norway (74%), Belgium (73%), Denmark (73%) and other countries [76, p. 23].

Despite the fact that the growth trend in services sector in global economy value was clearly apparent only in the 1970s, it had been predicted much earlier. The services issue from the economic science standpoint was addressed as early as in the XVIII-XIX centuries by F. Quesnay, A. Smith, K. Marx, J.-B. Say, A. Marshall, F. Bastia. Since the 1930-1940s the above mentioned scientists suggested options for economic development shift towards the services sector justifying. The most significant concepts in this regard were developed by A. Fischer, K. Clark, W. Rostow, D. Bell.

It should be noted that material production played a major role in providing people with livelihoods, which, constantly complicating, was the leading sphere of all social production for many centuries. Now in the industrialized countries it includes more than 55 branches, sub-branches and types of production, while in the early XX century there were only about 2 dozen branches in the industry.

At the same time, with the economy development and complexity this, the most general, two-sector structure of social production inadequately reflected the ongoing changes both within the material production itself (extractive and manufacturing industries ratio), and in terms of non-material sphere position and importance, that objectively demanded a slightly different view at the economy structure.

A. Fisher was one of the first who examined the production structure of the economic system from technical and industrial sectors point of view. In 1935 he proposed to allocate three sectors of the economy in the economic system: primary (extractive), secondary (manufacturing) and tertiary (services sector). At that he identified services as industries, which did not fall under extractive and manufacturing industries definitions [132].

A more modern approach, based on social production as a three-sector model representation, was proposed later by Colin Clark in his "Condition of Economic Progress" published in London in 1940. He examined the three main sectors of the economy as well. The primary sector included agriculture and mineral industry. Secondary sector was manufacturing industry. The tertiary sector was concerned with all services related sectors. The basis of C. Clark's model is the theory that each of the historical stage of economic systems development corresponds to one of the sectors development.

According to C. Clark, each country undergoes three stages of development: agricultural (the country productivity is growing slowly), industrial (productivity growth reaches a maximum) and services sector significant growth stage (productivity growth rate slows down). In the employment sector structure agriculture share is steadily declining, industry share first increases, but in the long term is declining, services share is constantly increasing [117, pp. 176-178].

Collin Clark (1905-1989), an English economist and statistician, taught statistics at Cambridge, was a consultant on economic issues at the government agencies of several countries of South-East Asia and Australia, worked at Oxford, as the Head of the Institute of Agriculture Economics [6].

In accordance with the proposed sector theory or structural changes theory these sectors ratio shift (primary, secondary and tertiary) in the developed countries is proposed:

1. Primary sector: as experts underline, its share in the GNP has fallen to the greatest extent possible. Thus, in the late XX century it amounted to less than 3%. If in the late XIX century agriculture generated up to 40% of the GNP in the USA, after the World War I it was 14%, and now it accounts to no more

than 1.4%. All this was reflected in the primary sector employment structure: in the mid-XIX century up to 60% of the workforce were employed in the agricultural sector, now, for example in the United States, this figure is less than 3%. The same trends are typical for the developed European countries; although it is worth noting that the figures for the number of employed in extractive industries there are slightly higher.

2. The secondary sector was considered a leading dominant in all developed countries for almost two-thirds of the XX century, but the situation in it is changing as well, though not so clear as it happens in the primary sector. Two main trends regarding the secondary sector can be distinguished.

On the one hand, since the 1970s the absolute decrease in the number of employed in it was observed as well. But on the other hand, despite its quantitative extent decrease, the secondary sector in modern society is a highly efficient production system with high productivity levels. This is due to the fact that it is precisely in it the ever-increasing technological advances mass finds its application. Although, the fact that along with high-tech sectors the secondary sector includes relatively primitive production should be recognized.

3. A note is necessary to be taken of the fact that the tertiary sector is conceived as exactly the services sector. It is the one currently experiencing rapid development. If the first two sectors total share in GDP of the leading countries has stabilized, as we have noted, at the level of 30-32%, and employment amounts to not more than 25-30%, the tertiary sector respectively occupies about 70% (more than 75% in the developed countries) in the GDP generation [2, p. 39]. Growth dynamics in this sector is so great that many experts consider structural transformation of social production in the developed countries and this production into the services economy transformation process to be completed by the so-called tertiary revolution. However, it should be emphasized that not everyone interprets this to be a benefit. For example, Professor S. Cohen of the University of Berkeley expresses concern that such a process will lead to de-industrialization and industrial production stagnation, which can cause a catastrophe.

Whatever it was, but “if in 1900 the ratio of Americans that produced material goods and services was estimated at 63 : 37, ninety years later it amounted to 22 : 78, and the shifts greatly accelerated since the early 1950s with the number of employed in all sectors reduction, which in some extent can be attributed to the material production sphere” [75].

In general, opposing views availability suggests that this issue requires serious consideration in all of its multidimensional and contradictory nature.

Note that the presented three-sector model fully corresponded to reality, i.e., economic reality of the mid-XX century in the developed countries, and therefore, better met economic analysis needs. It turned out that all sectors (primary, secondary and tertiary) were coordinate in that period both in the number of employed and the importance in social wealth creating.

However, from the 1960s to 1970s the disproportionality between these sectors in the developed countries started to increase, which took a steady and obvious nature. The uniformity was violated due to the services tertiary sector over the secondary and primary sectors strongly marked predominance. Such shifts are regarded as essential attributes of postindustrial society and its servicing model emergence.

Note, at the turn of 1960-1970s, again, in the developed countries, attributes of the new – post-industrial society emerged. Its development was determined to a greater extent not by massive production of goods, but by knowledge-intensive, information-computer technologies and the increased role of services in socio-cultural servicing. These processes are identified in science as “information revolution” and “economy servicization” [59].

When developing an economics three-sector model, W. Rostow distinguished five stages of economic growth determined by technology development level, economy industrial structure, capital share in national income deepening, and consumption structure. The first stage called “traditional society” is characterized by high specific weight of agriculture in the aggregate output, primitive agriculture and low level of technological development. At the second stage – “the period of take-off (recovery) preconditions” – science and technology achievements active penetration into manufacture, productivity growth in agriculture and trade development take their rise. For the third stage labeled as the “take-off” the industrial revolution is characteristic. For the next, the fourth stage – “moving toward maturity” – rapid development of science and industry, new industries emergence, increasing the share of skilled labor are evidenced. And finally, at the fifth stage, called the “high mass consumption era”, the economy is almost entirely subordinated to the personal consumption challenges and the services sector, rather than industry, is in the forefront.

The basic methodological principles of the post-industrial society theory, contained in the works of A. Fisher, C. Clark and W. Rostow, were further developed in the scientific research of D. Bell, who distinguished three stages of the society economic development, that are: pre-industrial, industrial and postindustrial. In his works he proves the expediency of completing the

three-sector model by another two – quaternary and quintuple, reflecting transition stages from industrial to postindustrial society.

Daniel Bell (10.05.1919 – 25.01.2011, New York) is an American economist and sociologist, specialist in social thought history, political trends and social forecasting fields. The developed by the author concept of post-industrial society placed him among the leading representatives of social forecasting [15, 16].

In his book “The Coming of Postindustrial Society” (1973) he developed the notion that modern societies are not only post-industrial ones, but information societies as well, in which science and technology, professional and technical employment has occupied a central place [15].

Indicating the services sector development at the modern stage of the society functioning significance and trends D. Bell noted that the services sector accelerated development is one of the defining characteristics of the post-industrial economy. “The post-industrial society is based on services. The main value in it is not muscular strength and energy, but information. A professional becomes the main actor, as his experience and education allow him to meet all the requirements set forth in the postindustrial society. If the pre-industrial society is determined by the number of goods indicating the standard of living, the postindustrial society depends on the quality of life as measured by services and amenities such as healthcare, education, recreation and culture” [40, p. 171].

**Table 1.6. Sectors of the Economy (D. Bell)**

	Pre-industrial society	Industrial society		Post-industrial society	
<i>Economic sector</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>	<i>Quaternary</i>	<i>Quintuple</i>
	Extractive industries Mining Agriculture Fishing Logging	Production Industry Processing	Transport Leisure	Trade Finance Insurance Real estate	Education Healthcare Scientific research Government

According to D. Bell the tertiary sector decreased to transportation and utilities, while trade, finance, insurance, and real estate transactions were subsumed into the quaternary one. The quintuple sector includes healthcare, education, leisure, research and government institutions.

D. Bell’s approach advantages include: a) reflection of the services sector itself complexity and heterogeneity, need for its structuring by dividing Clark’s integrated service sector into three relatively distinct “areas” of servicing activities;

b) greater adequacy to the current economic realities, characterized by expanding and increasingly complex services. As noted by V. L. Inozemtsev, in turn referring to D. Lyon's work "The Information Society, Issues and Illusions", "the proposed by D. Bell and his followers approach provides improved classification of service industries based on quite fair (and increasingly common) idea that integrated whole understanding has become an anachronism, impeding a detailed analysis of its very heterogeneous constituent elements".

The lack of services clear classification can be highlighted as one of the approach drawbacks. As noted by V. L. Inozemtsev: "the central methodological principle, which allows to detect main facets of this complex multi-factorial model around which a fundamental division of the entire social production into the corresponding spheres could be constructed and the analysis of which would effectively contribute to the identification of the most significant trends of economic progress, is not evidenced in the classification" [207, p. 63].

Confirmation of this opinion is that around the same years John. Zingelmann proposed to allocate six sectors in the social production structure, including four sectors in the services sphere. At that, if the first sector includes traditional components like agriculture and mining, the second sector includes not only manufacturing, construction, but utilities as well.

According to Z. Brzezinski [187] modern society is becoming a "technetronic society," that is, the one that is formed in cultural, social and economic relations influenced by electronics, especially developed in computers and communications fields. The term "information society" appeared in the early 1960s in the works of M. Porat [217], J. Masuda [210], etc., and was used to describe the stage that came with the information-computer revolution onset.

Then, M. Porat in his work "Information Economy" (1977) put forward the idea of the four sectors, such as agriculture, industry, services sector and information sector, i.e. knowledge production sector. Herewith, he classified information sector into the primary, producing information, and the secondary, applying it.

As for M. Castelles, he identified six major economic sectors, such as extractive, transformative sector, distributive, social, domestic services and services to producers.

In contrast to the presented researchers, considering services evolution in detail, and consequently, sectors in structural development model increase, Russian economists V.L. Inozemtsev and G.S. Batishchev propose to consider only two sectors: subject-object (interaction with objects) and subject-subject (interaction with people). It is obvious that such an approach, according to V. L. Inozemtsev, is aligned with the currently recognized thesis of D. Bell,

according to which industrial society is characterized by human with nature predominant interaction and the post-industrial one is a contest between people [4].

With regard to information economy structure consideration the work of S. Bagrinovsky, in which he identifies four main components: information dissemination and processing sector, educational system, material production, and health and social protection system, is of particular interest. A similar point of view is expressed by E. A. Hasanov, considering the three-sector structure of information society. The services sector is represented by information technology, service and humanitarian sectors, and production by scientifically-industrial [40]. Information technology sector includes brand new information and telecommunication technologies production. Service and humanitarian sectors are the aggregate of sectors, sub-sectors and activities, which functionality in the system of social production is expressed in production and sales of services and spiritual wealth to the population. At that, four complexes are distinguished on this sector basis. The first includes bringing up, education and public services sectors. The basis of the second consists of healthcare, social security and physical training. The third is leisure, entertainment and tourism. Finally, the fourth type is municipal, commercial and utilities sectors. Scientific-industrial sector combines agriculture, mining and manufacturing sectors, as industrial production is intellectualized in modern conditions. The presented structure is characteristic only for the information economy which limits its employment. At this, if economic system has not reached this level in the process of evolution, the economy development degree is difficult to be assessed, since all major sectors are combined into separate blocks. For this reason, such a structure for countries at different development levels assessment is ineffective.

Well-known Russian researcher of post-industrial society problems V.L. Inozemtsev in 1998 interviewed several America's greatest sociologists and economists (Peter Ferdinand Drucker, Lester Carl Thurow, John Kenneth Galbraith, Marshall Goldman, Francis Fukuyama) to explore their attitude towards the post-industrial society notion and concepts. All of the respondents expressed negative attitude towards this notion and these concepts.

They believe that they live in an industrial society, although experiencing changes in recent decades. M. Goldman, for example, definitely declared: "I suppose that use of the term "post" has become a kind of anachronism. I do not think that we really are in the post-industrial era. The reason is that industrial production not only remains very significant, but to a certain extent becomes even more important than ever, although it's technological bases is reshaping. We must not forget that even the software industry, though it differs

significantly from equipment or vehicles assembly remains one of the industries” [111].

S. D. Bodrunov and A. I. Kolganov focus on essential parts of the modern development in their work [27, p.27]. According to them, even the quite obvious fact of innovative processes intensification and information and telecommunications revolution cannot obscure the fact that no technology to escape from the industrial base of the production mode has been widely spread in recent decades.

Emerging non-industrial technologies (for example, biotechnology) possess a small share in total production volumes. And technology, which is a hybrid of industrial and information, that is things 3D printing is still in the experimental application phase. This implies, therefore, that such service industries as R & D, computer science and telecommunications, etc., on which the main hopes for production to a fundamentally new phase of development conversion were set, do indeed show spectacular progress, but not a radical leap to a new level.

According to the scientists, another serious problem in the relations between services sector and material production is financial sector hypertrophy and its ambiguous influence on the real sector of the economy development. Originally the financial sector provided for temporarily free funds accumulation and monetary capital into the most efficient sectors of the economy redistribution (although, along with this function, the financial sector was always purely speculative).

All these factors together in crisis economic development conditions are capable of forming significant risks, which have a devastating effect on the real sector of the economy [18, p. 28].

In her thesis E. V. Selifonova draws attention to the fact that modern post-industrial stage of the development involves several areas of society and economy ontogeny typology, each of which is regarded as economic systems ultimate development stage (Table. 1.7.).

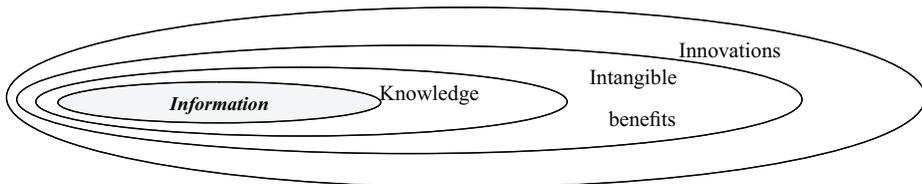
**Table 1.7. Comparative Characteristics of Economic Systems Development Mainstreams**

<i>Theory</i>	<i>Post-industrial economy</i>	<i>Information economy</i>	<i>Knowledge economy</i>	<i>Innovative economy</i>
Development determining sector	Services (education, health-care, science)	Information and communication sector	Education, scientific-research complex	Innovative production
Basic production product	Intangible benefits	Information	Knowledge	Innovations
Activity basis	Quality of life conditions creation	Transfer of information	Information into knowledge transformation	Commercialization

This table presents a comparative analysis of the current stage of development basic concepts, which allows identifying differences and similarities between terminologies determining different types of economies. It should be noted that these theories cannot be considered separately from each other, since they form the units of the same process. Separate application of the terms “innovation, information, post-industrial economy” and “knowledge economy” does not reflect the system integrity as it is based on certain aspects of modern economic life characteristics. As pointed out by E. V. Selifonova, all of them are simultaneously found in the economic system structure, forming a consecutive chain of the postindustrial stage formation. In the postindustrial economy intangible goods are created, in the information economy information through information and communication technologies is transmitted, and the knowledge economy transforms information into knowledge, which is further commercialized through the innovative economy [131].

New technologies, socio-economic changes in the society, population incomes and needs growth, aspiration for a better standard of living, the need for more free time for creativity and spiritual growth were laid on the basis of the services sector rapid development since the second half of the XX century.

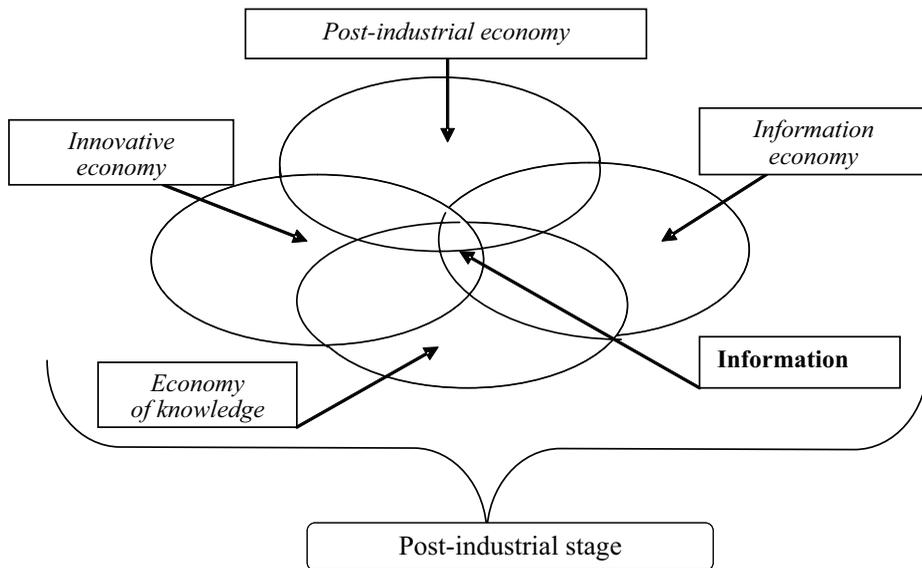
These and other factors acted as a driving force for the traditional services development leading to new technologically-equipped and complex services emergence, with information technology, education and research, insurance, banking and investment, franchising, leasing, outsourcing, and logistics support services being at the leading edge. These types of services reflect the trends in the services sector in national economy of leading and developing countries development; have a significant impact on the GDP structure, division of labor, business entities productivity growth and the quality of life level.



**Fig. 1.3. The Basic Concepts of Post-Industrial Development Correlation**

E. K. Selifonova in her work indicates that the concept of “information” acts as a “focal point”, that is, the point of intersection of the main types of economic systems development, which allows identifying semantic field of categorical apparatus interaction in their systematic consideration [131, p. 10].

This, in turn, enables to conclude the complementary intersection of the main types of economic systems development and allows identifying semantic field of categorical apparatus interaction in their systematic study.



**Fig. 1.4. Semantic Field of Postindustrial Development Theories**

In this regard, the current stage can be described as a system of economies, each of which performs a specific function. Furthermore, they are all aimed at information creation, transmission, transformation and implementation with the ultimate goal of its commercialization in the innovation form that leads to all areas of economic life qualitative and structural transformations. Thus, the industrial sector evolution requires education quality improvement, science and information and communication sector development and quality of life improvement. All these processes are interrelated. Innovative industry development plays a pivotal role, but at the same time, it is impossible without the other components evolution.

In this regard, information transfer process is studied in the information economy context, received information into knowledge transformation and its creation processes within the knowledge economy framework and innovation in the industrial sector are provided in the innovative economy framework.

Thus, the key information factor value combining allows considering the post-industrial development theory in the form of a semantic field, which

proves their complementary intersection and the need for systematic consideration for qualitative assessment of economic systems development [131, p. 11].

The services segment in the global market growth is due to information technology services active dissemination. Information technology market covers the following: software development (intangible product); support and consulting; software in integration projects distribution and supply; system integration services; network services, including e-commerce.

According to economists, information technology contribution to the GDP of the developed countries growth in the mid-2000s amounted to about 20-40%, and they constitute 70-80% in the positive dynamics of aggregate productivity factor. Expenses on information technology reach 9-10% of companies' total revenue and 5% of their capital. For example, IT expenditures share in the GDP of New Zealand is 10.3%, Sweden – 8.8%, UK – 8.0%, USA – 7.8%, Canada – 7.7%, Japan is 7.1%. These figures are more modest in the developing countries: Chile – 5.5%, Brazil – 5.4%, Slovenia – 3.7%, Mexico – 3.5%, Bulgaria – 3.1%, India – 2.7%, Indonesia – 2.1%, Romania – 1.5%. In Russia the corresponding figure is 2.9% [128, p. 91]. This indicator is clearly insufficient to talk about scientific and technological transformation.

All of the above noted in this Section of the Monograph confirms that despite sectors concepts and classifications required to conduct socio-economic systems structural analysis diversity, a common feature can be distinguished – the focus on the services sector complexity and its growing importance in social development.

As already noted, services undoubtedly play an important role in the current development. It should be noted that not all sectors contribute to the development, but only the knowledge economy sectors [94].

In this context one of the key points should be noted. Not just knowledge production is crucial, but their commercialization and transformation into innovations as well. It is precisely innovations into industrial production introduction that contributes to both enterprises profit and the economy as a whole competitiveness increasing.

Innovations are the closing circuit that forces all the components of the knowledge economy to move, and ultimately result in the economic growth and quality of life improvement [100, p. 129]. Thus, high-technology sector share in the German economy is 20%, France – 11%, Norway – 8%, Japan – 15%. Share of high-tech products exports is increasing year by year. Over the past 25 years the share of high technology exports of Germany increased by 14%, France by 56%, and Norway by 58% [220].

Many industries of services production have acquired a key importance for the economy in the long-term functioning; have become the “locomotives” of the country’s scientific-technological and socio-economic development. It is referred to primarily science and scientific services, education, healthcare, various professional services, communications, information services, etc. development. Although services sector fairly traditional branches — finance, trade, personal services, etc., still play an important role in the economy, the specifics of the early XXI century is that the group of new industries acquires an increasing importance both for the economy and for society [173].

The above-mentioned evidences a fundamental new stage in the social (including international) division of labor occurrence. According to the most scientists, the services sector rapid development is an indispensable prerequisite for the successful completion of the world economy restructuring. Given this process significance and its influence on the modern society, the United Nations that notes every decade with a relevant to the mankind motto, called the period from 1990 to 2000 the services sector development decade.

Most scientists agree that modern structural transformations in terms of importance are similar to the industrial revolution of the past. Those countries that have not had time to “fit” into the present process have inevitably been discarded to the world’s economic system periphery.

It should be noted that social production is a permanent developing phenomenon. As a consequence, it is inevitably reflected in the economic system structure modification through its on-going inter-sector and intra-sector shifts. As a result, a shift in the entire composition structure is observed which affects the ratio of the largest sectors and the whole economy spheres. Anyway, the economic nature structure is reshaped fundamentally, which allows talking about its new paradigm.

Domestic and foreign experts note services growing importance, their transformation into national and the global economy. The economy gains strongly marked services features, when services dominate GDP and when intellectual production era is gaining momentum.

Growing importance of services in modern post-industrial society is characterized in the literature as “servicization” process and result. Economy servicization is a broad concept, describing two interrelated processes, that is: firstly, services share in macroeconomic indicators increasing proportion (GDP for the country, gross regional product (GRP) for the region), the number of employed population, the number of business entities, capital, investments, families’ expenditures, etc.; secondly, service activities into material production process penetration or integration (softization).

Society servicization led to the fact that in the last quarter of the XX century in the USA, Western Europe and Japan the services sector as secondary phenomenon perceptions changed radically, and a number of production services, such as banking, financial, informational, managerial, and computer, were even determined as the leading elements of national and regional development [62].

According to many scientists, the most common fundamental characteristics of the transformations were the following:

- first – reorientation of production from simple material goods creation to services in the broad sense provision and information generation;
- second – such a society dynamics is determined largely not by the industrial mass production, but by science-intensive information and computer technologies and the services increased importance in social and cultural segments servicing;
- third – within the services sector the processes of labor and employment structure transformation are not the most intensive in the sectors offering traditional services (domestic, transport, commercial), but in the sectors where consumers act as individuals, and services production and consumption are personified and inextricably linked [53].

Since about 2010 the process of the US and Western Europe economies re-industrialization has started [113], which is accompanied by information and computer technology into the products entire life-cycle management – from the design to after-sales servicing and disposal – introduction. The new industrial revolution, as it is increasingly known in the West, should lead to a leap in labor productivity and all aspects of social life modernization. We consider that the ongoing transformational processes essence is the most accurately expressed by the term “neo-industrialization” or the economy “neo-industrial development”.

Neo-industrialization is the process of breakthrough technologies complex into production large-scale introduction, resulting in:

- industrial activity paradigm partial shift (additive manufacturing instead of subtractive);
- integrated continuous electronic control of the extended production cycle (industrial Internet or Technotronic society), allowing to shift to the cyber-physical production type;
- new stage of robotic production, allowing machine and man labor organic combination.

The emerging trend of new industrial technologies introduction may result in substantial modifications of the world economy industrial landscape in the coming years due to:

- labor productivity sharp rise in the manufacturing sector;
- new markets creation and some traditional activities disappearance;
- logistics and quality management formats modification;
- a fall in demand for unskilled types of labor and global problems of unemployment aggravation;
- technological superiority of the industrialized countries over the rest of the world increasing [114, p.53].

As noted by S. A. Pobyvaev, S.A. Tolkachev, neo-industrialization is the technological revolution continuation and its mainstream from the field of information-financial services and R & D directly into the production process transfer, that is, intellectual production sphere formation. On the basis of the extended production cycle integrated electronic control, a person is relieved from routine management operations and can focus on higher-level management functions.

Neo-industrialization driving forces or factors in the modern world economy are the following:

- crisis of capital accumulation efficiency due to the downward phase of the long cycle or the fifth technological order transition;
- economic potential model of technological division of labor, based on increasingly detailed subject matter, exhaustion, and the concomitant paradigm of “local design – global manufacture” rejection;
- innovative developments applicable in the processing industry, which have a synergistic effect (NBIC convergence) and capable of technological production method in key industries radical modification, accumulation;
- the need for neo-industrialization as a way to consolidate domination over the world by global division of labor system radical reformatting awareness by the ruling West elites [28, p.54].

We can assert that two distinct trends are clearly distinguished in modern production practice, they are:

- 1) products knowledge-intensity increasing results in the cost of services in goods prices increase;
- 2) certain types of goods into the services category transition under the scientific-technological progress influence.

Almost all material production branches are becoming more and more “service-providing” both internally and externally.

Note that the services sector in modern society is actively developing not contrary to, but on the basis of means and objects of material production foundation. Constantly complementing each other, the two spheres (physical and

service) in cooperation are able to produce synergistically more innovations in information technology, communication and telecommunication, education, medicine, commerce and consumer services fields.

Since the subject of theorists and economists dispute is services true importance in modern society determination, in the presented Monograph framework we are inclined to the version that the progressive qualitative development of the society in the future will be closely linked with services in all spheres of human activity availability [123, p. 29].

It should be noted that the services sector structure is reshaping rapidly. Developing in tandem with the social economy evolution, it acquires new qualities and objectives, plays an important role in the GDP formation, international division of labor and sectors of the economy and society.

Global economy structural transformation has led to the new types of services need that can meet challenges of the global economy, real needs of business, production and the society as a whole.

Research on the services sector in the modern economy transformation should be completed with the statement of V. Poplyko: “The past century embraced an impressive dynamism of the services industries development progressive movement. If at its beginning this sphere was associated with few activities, often in their infancy, then at the end it took a diversified sector shape, which constitutes the post-industrial economy backbone. Along with the XX century common ideas of services as auxiliary activities distorting, allegedly, material production resources driven out of the industrial sector by labor productivity growth, have finally disappeared in the past. Apparently, ahead are modifications of as much depth and significance, specific forms of which, with the modifications increasing dynamism, are not easy to predict. Technological level and sector structure of the services sector further complexity, products quality and diversity improvement, advanced development of intensive industries, social and humanitarian orientation services and services on the economy efficiency and competitiveness and quality of life of the population impact further enhancing are beyond doubt “[118].

## CHAPTER 2

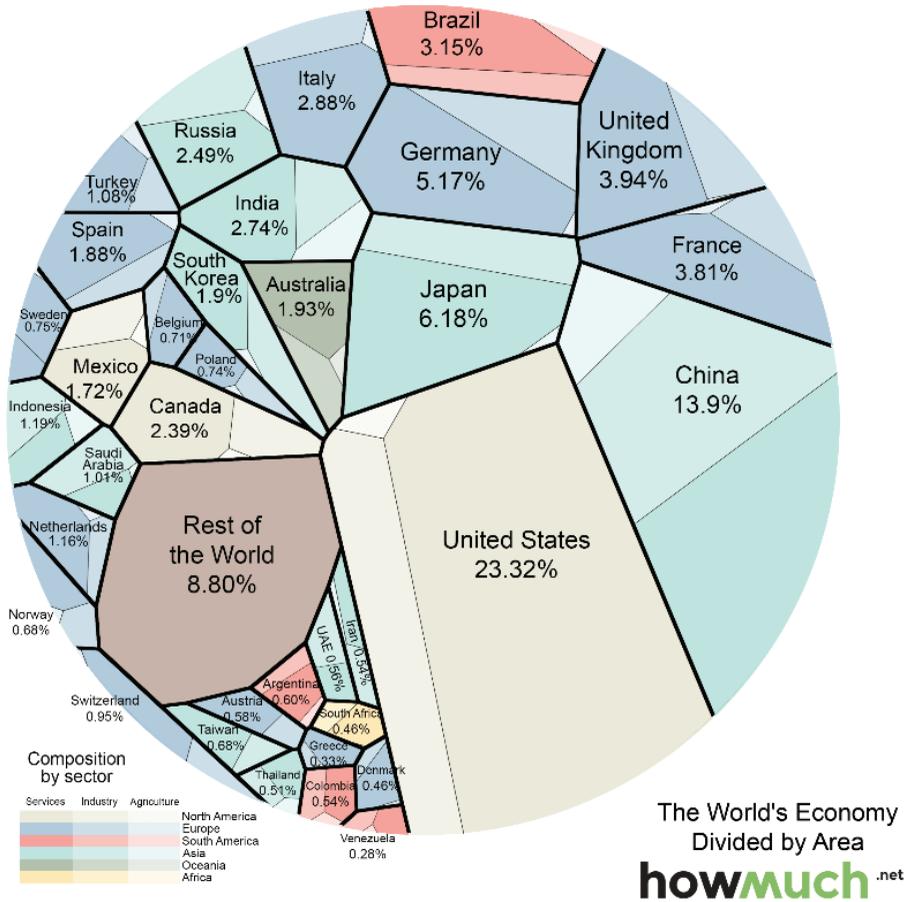
# ANALYSIS OF THE SERVICES SECTOR MODERN DEVELOPMENT TRENDS

### 2.1. The Services Sector Role and Importance in the Global and Ukraine Economy

The service sector has become one of the most promising sectors of the economy in recent years. Today both developed and developing countries set a goal to boost the services sector development to influence economic growth.

The country's participation in the global services trade can be determined by its share in world trade calculating. In the developed countries it is much more important than in the developing ones. The country economic development level affects its specialization in certain types of services as well. Thus, the industrialized countries mainly provide financial, business, information and telecommunication services. USA, UK, France, Switzerland and Germany are the major exporters of educational and healthcare services. And the developing countries in most cases specialize in tourism, transportation and offshore services. For example, Egypt obtains some fraction of revenue through various transportation through the Suez Canal. The Bahamas and Antilles, Hong Kong, Singapore, etc. are called "Financial harbors". Intermediary services provision at goods through the territory of the country transit can also yield high income. The USA, being the largest computers manufacturer, is widely supplying computer services to the world market. In addition, the US is considered to be the leading commercial services exporter since 1998.

Fig. 2.1. depicts nominal GDP of different world countries in the form of planes. Their size depends on the country's GDP of in the world GDP share. Each plane is divided into 3 parts — the services sector is marked with saturated color, industrial — with more faded, and agriculture — with completely faded.



**Fig. 2.1. Countries GDP in the World GDP Share in the Context of the Service Sector, Industry and Agriculture,% [49]**

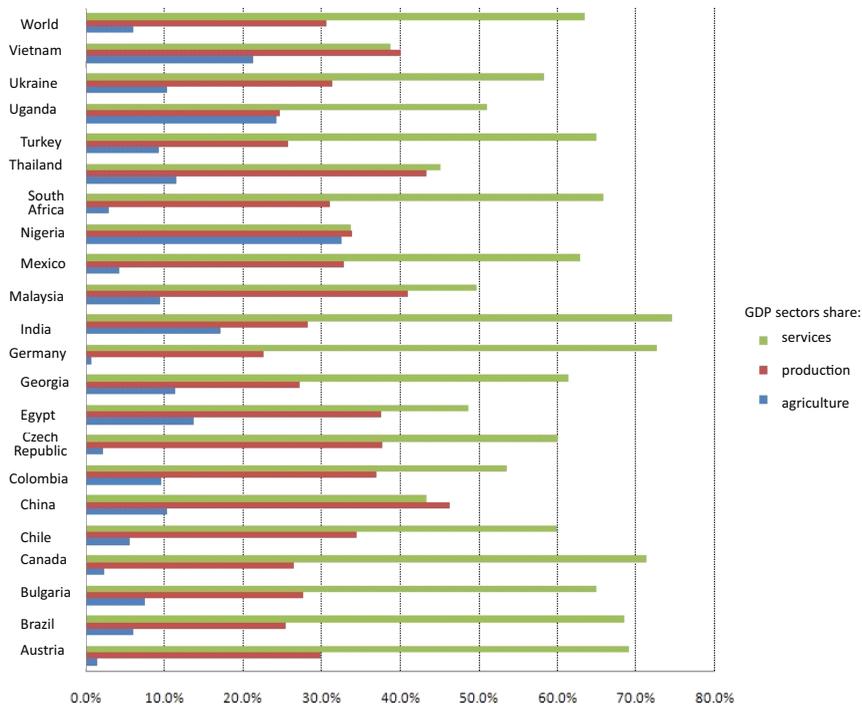
A detailed study of the presented in the figure data allows to draw the following conclusions. Thus, the USA is the most powerful country, their GDP amounts to a quarter of the world. America is focused on services provision, and the industrial and agricultural sectors are rather small, but still rank second and third in the world respectively due to the huge GDP. China ranks the second. The services sector and industry in The Celestial Empire are almost equal, but the services sector growth rate has increased in recent years.

Share of Poland in the world economy is 0.74%. Its nominal GDP in 2014 amounted to \$547 billion.

The Ukrainian economy is so small that it is not even depicted in the figure. Ukraine's GDP amounts to \$131 billion. In fact, Ukraine's share in the world GDP is 0.17%. Industry generates only 29% of the GDP in our country. Further, the domestic services sector should be analyzed.

Analysis of the data reveals that only six countries provide more than 50% of the services market, and the other half of the market remains to the rest, more than 200 countries. More than 7% of the market belongs to China, which has reached such a level over the last 15 years. The services market leader is the United States owing 34% of all services produced in the world. About 30% of the global services market belongs to Eurozone countries largely due to such traditional leaders in this area as Germany (6%), France (5%) and UK (4%). The rest of the world, despite its level of development occupies less than 4% of the market, but the developing countries of G20, such as Brazil, Turkey, Australia, Canada, South Korea, India and Mexico, which are rapidly developing in the services direction, should be noted. As for the CIS countries, they jointly occupy about 3.5% of the market and do not have a particular impact on the international trade in this area. The highest development rate among them belongs to Russia [84]. The countries of the former Soviet Union are trying to increase their share and influence in the global market primarily through their advantageous geographical location and productive capacity and infrastructure formed in those days. According to experts, this market has not been saturated since the collapse of the USSR; it is still promising and attractive for investments. First of all, it concerns dynamically developing transport and communications, telecommunications, consulting, construction, financial-banking sector, aviation and shipbuilding branches.

A steady increase of the services share in total GDP is observed in the global economy. Currently it amounts to about 75% of its total volume, herewith significantly exceeding sphere of material production share (Fig. 2.2.).

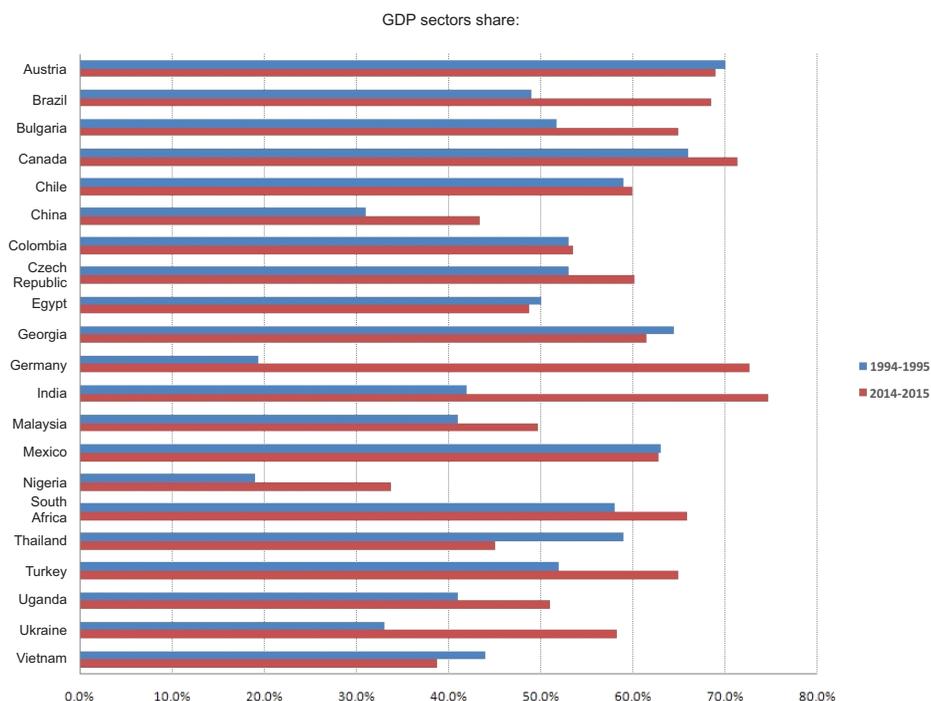


**Fig. 2.2. The Services Sector, Manufacturing and Agriculture Share in the Global GDP, %**

The first thing that stands out on the figure is the services sector in most of the countries represented and the world as a whole prevalence.

However, upon closer examination another extremely interesting detail is visible: in East Asia, which is a kind of the modern world industrial platform, the services sector role is substantially lower than in the rest of the world.

This is another touch to the imbalances portrait, which the world economy is experiencing currently – the services sector is mainly oriented to the domestic market, which is relatively underdeveloped in the East Asian countries due to the local development model specifics [92].

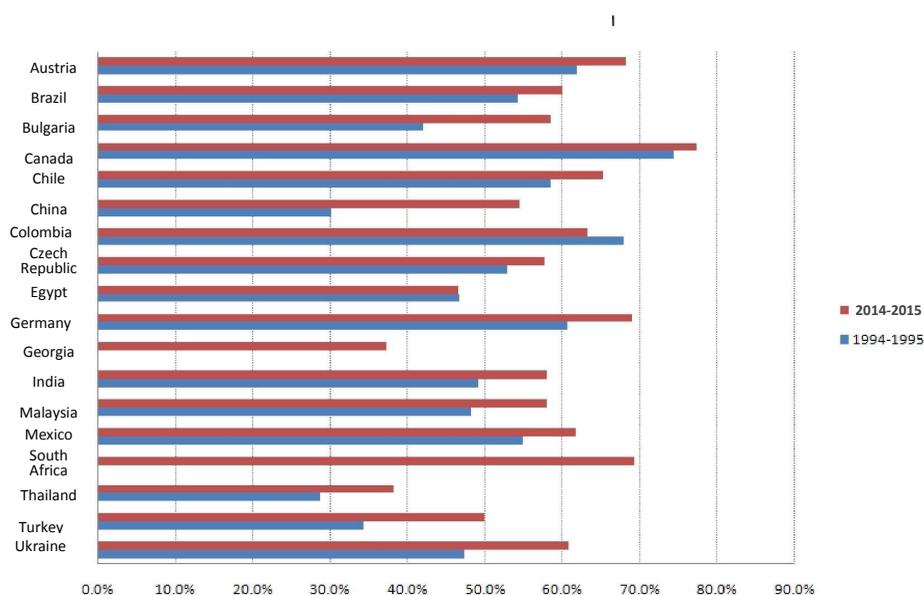


**Fig. 2.3. The Services Sector Share in the GDP of the World Countries in 1994-1995 and 2014-2015, %**

The data presented by Figure 2.3. demonstrates a trend towards the services share in the GDP of developing countries outside East Asia and some Latin American countries significant increase over the last 20 years. The reverse process of the services share decrease is observed in Vietnam and Thailand.

It is noteworthy that the trend towards services importance increase is typical not only for the developed economies but for the developing countries as well. The given trend is reflected in other structural indicators of many countries, which in turn have affected the global economic situation. For example, in many states a decrease in industrial and agricultural employment and a significant increase in the service sector jobs is observed.

In the most developed countries the share of employed in the services sector currently accounts to more than 70% of the total employment in the economy. This sphere is also characterized by a sufficiently large involvement of the female labor force. This is due to both the activity nature and the services sector to the female behavior peculiarities sensitivity (Fig. 2.4.).



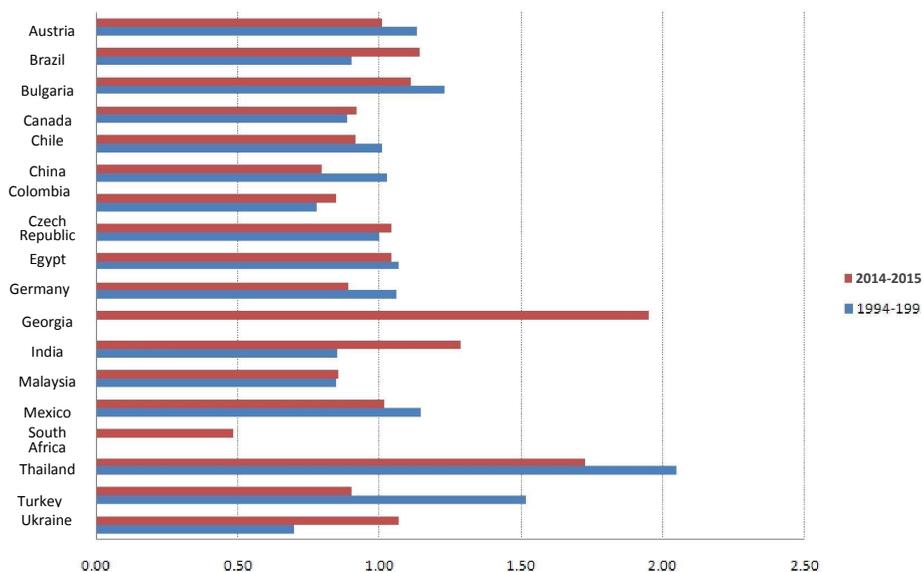
**Fig. 2.4. The Share of Employed in the Services Sector in the World Countries Context, %**

In the presented Figure indicators of India, Brazil and Ukraine in the context of the period under study should be emphasized. The employment ratio in these countries growth demonstrates economic models focused on the tertiary sector and domestic demand specificity.

As for our country, then, presumably, such a difference in the indicators of the periods under study can be caused by, in addition to the above, the economy's unshadowing growth, as well as reduction in the state and increase in the private sectors share in services.

It should be emphasized that the trend of growth increase is observed in almost all the presented countries; if in the 1990s employment in the services sector amounted to less than half of the total employment in about half of the presented economies, there were only two such economies in 2014-2015 (Georgia and Thailand). It is noteworthy that despite the services share in GDP slump or recession, conversely, the employment in this sector in the East Asian countries is increasing.

Ratio of the services sector productivity relative to the overall productive efficiency is presented in Fig. 2.5.

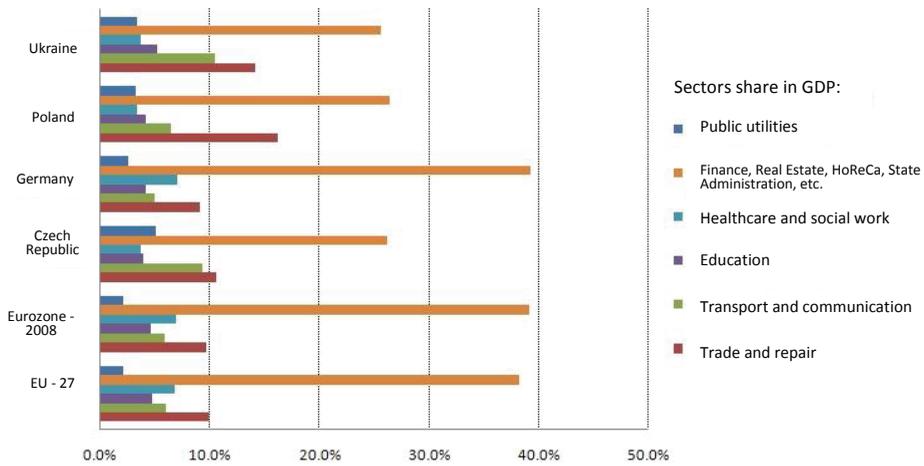


**Fig. 2.5. The Services Sector Employment Relative to the Total Employment Ratio in the Context of the World Countries**

More detailed analysis of the services sector in Ukraine and Europe structure is presented in Fig. 2.6.

The presented data allows to conclude that the leading position among the types of services in the GDP is occupied by finance sector, HoReCa real estate and public administration. Germany consistently ranks first in this sector of services. Trade and repair rank the second by specific location among the services types.

## New Trends in Development of Services in the Modern Economy



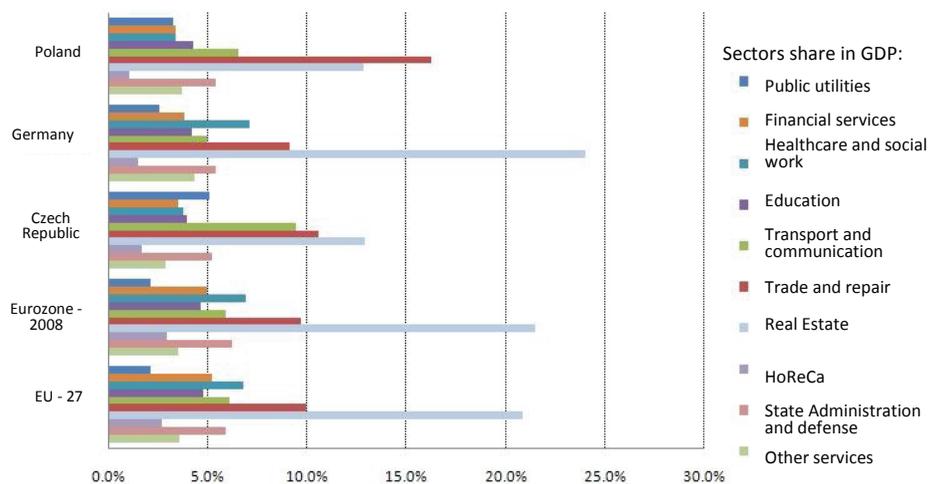
**Fig. 2.6. The Services Sectors Structure in Ukraine and Europe, %**

Poland is the leader in this sector of services. The leading position of Ukraine among EU countries in the transport services sector is observed. This sector share is almost twice as high as in the EU countries. The Czech Republic ranks the second in terms of transport in the total GDP structure share.

According to the European services classification a diagram of the services sectors shares in the GDP of the EU countries is presented (Fig. 2.7.).

From the diagram data it follows that the largest share in GDP structure belongs to the real estate sector. Among the presented European countries Germany is the leader in this position. Trade and repair services rank the second. Poland ranks the first in this sector. Transport and communication rank the third. In this area the Czech Republic is the leader.

The financial and banking sector as a supporting sphere of other branches of the economy has experienced dramatic shifts over the past half-century. Currently, in the conditions of developed commodity and financial markets the banking system structure is much more complicated.



**Fig. 2.7. The Services Sectors Share in the GDP of European Countries, %**

New types of financial institutions have emerged; banks have come to provide new types of services; new methods of customer servicing have appeared. Our country credit system is moving to a qualitatively new development stage.

Since, as we wrote in the previous Chapter of the Monograph, a transition to a new stage of social development is taking place in the world, the services sector is one of the determining factors of economic growth. In the current development period the problem of finding optimal structural relations for the future economy model is particularly relevant in Ukraine. This is indisputably related to the services sector place and importance definition in the context of socially oriented market economy development, since it satisfies those needs in the society that actually determine economic growth, promote entrepreneurship and a middle class in Ukraine that makes economic reforms irreversible formation. Funds invested in the services sector are regained at a high rate, thus creation of the economy structure, which would employ the existing production and labor facilities of the state in the best possible manner, is required. The services sector under optimal branching and priority industries selection conditions could become that liaison, which effective operation would give an impetus to the economic growth of the entire production chain and the national economy recovery.

Global trade in services growing scope has inevitably led to an international regulatory mechanism need. An important role in regulation is played by bilateral agreements, both sectoral (such as transport and communication), and trade-economic. International services market is regulated in the framework of international organizations. An example is the World Trade Organization (WTO). An equally important role in world trade in services regulation is implemented by multilateral agreement of GATS (General Agreement on Trade in Services) [95].

One of the most important trends in the national economy in the last two decades' development is the services sector increasing role, which has become the object of relevant theoretical and empirical research of domestic scientists, mainly economists. Along with economists and marketers' increased attention to the services sector (since the 1990s), an insignificant number of sociological developments in this area is currently observed. Meanwhile, according to economists, "the services sector development degree has become an advocate criterion characteristic for the development of the society. Currently a country cannot be classified as the world developed one, if its services sphere generates less than 60% of the GDP [147, p. 125].

## **2.2. Structure and Dynamics of the Services Sector Development**

Changes in the services sector are performed at different structural levels. In the world technology area the fifth technological structure is being consolidated and transition to the sixth technological structure based on nanotechnology application is being implemented (knowledge-intensive technologies are becoming the defining ones, intellectual resources are being placed at the leading positions; processes of rendering services in the form of scientific knowledge exchange are being expanded, intellectual resources application is being intensified, entrepreneurs orientation towards appropriate forms of information resources creation and application is enhanced). Dramatic shifts in the services production are in process. Customization and the individual consumer targeting are enhanced.

Business sector (commercial organizations, entrepreneurs with no corporate status) strengthens its position in the services sphere; entrepreneurship has become the main services rendering subject.

The services sector development level is one of the society welfare degree indicators.

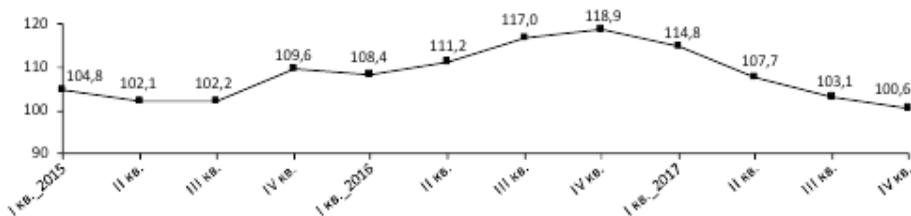
Ukraine’s economy ranks 50th in the world in terms of GDP at purchasing power parity — \$353 billion (IMF estimates for 2016). Diversified industry, agriculture and services sectors are the basis of the Ukrainian economy.

The services production is a discrete feature in the process of effective non-resource-based innovative economy creation, since it is 2-3 times less energy-efficient, material- and capital-intensive than goods manufacturing. The services sector of Ukraine value added share in the gross output amounts to 54.3% and exceeds the similar indicator in industry and agriculture by 37.6 and 42.2 points respectively.

The services sector includes 11 types of services (according to statistical reporting). The largest share in the GDP in the reporting year was held by such types of services as: trade and car repairs (13.8%), transport and communications (6.8%), real estate operations (6.2%), education (4.2%), information and telecommunications (3.4%).

In 2014-2016 the output of such types of services as trade and car repairs, information and telecommunications, hotels and restaurants, financial activities, transactions in real estate increased more rapidly. At the same time, growth rates of such services as education, healthcare and public, utility and social services provision were low.

Dynamics of services sales growth is presented in Fig. 2.8.



**Fig. 2.8. Rates of Growth (Drawdown) in the Volume of Services Sold in Ukraine (in% to the corresponding quarter of the previous year in comparable prices) [143]**

According to statistical data, in the IV quarter of 2017 the volume of services sold to consumers by service enterprises amounted to UAH 181.8 billion, which in comparable prices equals to 100.6% of the corresponding period of the

previous year volume. Herewith, services provided to the population amounted to 20.5% of the total volume of the services sold.

The policy of Ukrainian economy modernization assumes the services sector in the socio-economic development of the country and its position in the global market importance increasing. The services sector level and quality improvement are among the top priorities.

Foreign trade in services in Ukraine in 2016 is as follows (Table 2.1. and Table 2.2.) [6]:

**Table 2.1. Services Exports Structure in Ukraine (as of 01.01.2016)**

Service	\$, billion	at%
Transport services	5.23	54.8
Telecommunications services, computer and information services	1.52	15.9
Services in material resources processing	1.06	11.1
Business services	0.78	8.2
Other	0.967	10
TOTAL	9.55	100

**Table 2.2. Services Import Structure in Ukraine (as of 01.01.2016)**

Service	\$, billion	at%
Transport services	1.15	22.3
Services related to financial activities	0.85	16.5
Public and government services	0.76	14.7
Business services	0.69	13.4
Travel services	0.6	11.6
Telecommunications services, computer and information services	0.54	10.4
Other	0.57	11
TOTAL	5.14	100

The main partners of Ukraine in trade in services among the EU countries are the UK, Cyprus and Germany.

Transport, business services, services for material resources processing, telecommunications services, computer and information services prevail in the total volume of Ukrainian exports to the EU countries. The largest share in the total imports volume is occupied by transport, business, as well as services related to financial activities, royalties and other related to intellectual property services [143].

Analysis of the services market in Ukraine current state forms justification to characterize it as one that requires further development, investments

attracting, exports restructuring and diversification, as well as legal framework improvement and extension. The services market openness to competition from foreign suppliers increase in the long-term prospect may result not only in their share in the services provision increasing, but in dynamic growth, as well as services supply in the domestic market expansion, their exports and local services producers' competitiveness growth. Services market development can provide an additional impetus for the overall development of the Ukrainian economy. However, this largely depends on the state policy in this area; appropriate regulatory and legislative framework formation, as well as favorable investment regime creation.

Congenial investment climate directly affects foreign direct investments (FDI) volume received by the economy of Ukraine (Table. 2.3.)

**Table 2.3. Foreign Direct Investment (Equity Capital) in the Services Sector of Ukraine, 2016. (\$, million) [143]**

	As of January, 1	As of December, 31
TOTAL	36,154.5	37,655.5
Housing and utilities services	493.1	431.4
Wholesale and retail trade; motor vehicles repairs	5,247.4	5,485.5
Transport, warehousing, postal and courier activities	1,088.0	1,054.0
Temporary accommodation and catering	332.6	326.7
Information and telecommunications	2,089.4	2,089.3
Financial and insurance activities	8,382.0	10,324.4
Real estate operations	3,882.1	3,670.6
Professional, scientific and technical activities	2,222.6	2,196.2
Administrative and support servicing activities	1,222.7	1,188.3
Education	16.0	24.1
Healthcare and social assistance	44.0	45.7
Arts, sports, entertainment and leisure	112.5	110.4

The largest FDI share of 24.8% was invested in financial and insurance activities. Wholesale and retail trade and motor vehicles repairs rank the second by the investment attractiveness (14.3% of the total FDI). And the third rank for the investment activity is occupied by the real estate operations sector, which attracted 10.0% of FDI.

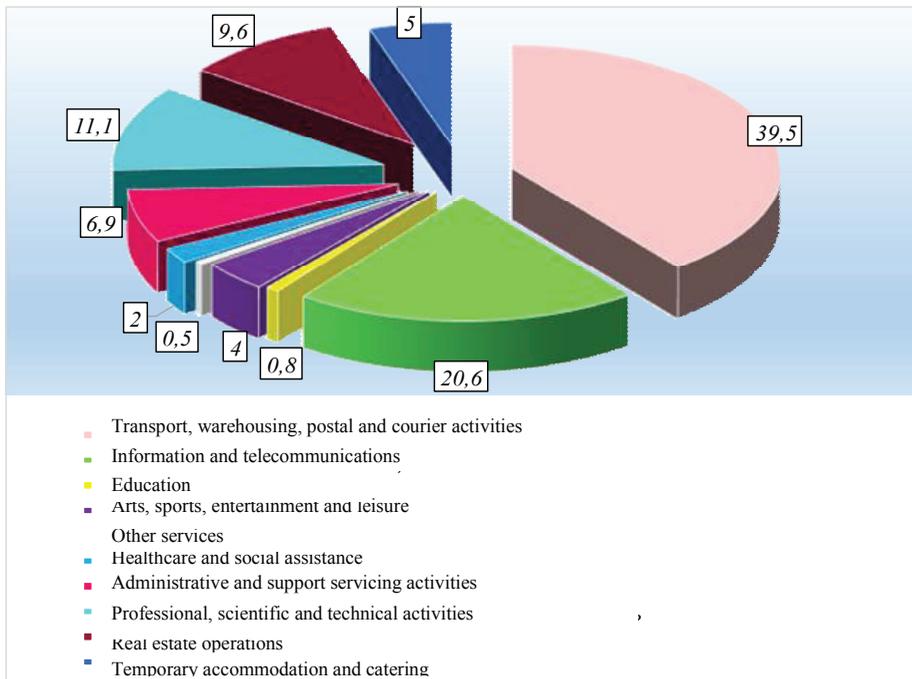
In globalization and macroeconomic stagnation period the need for recognition transport-communication system as a priority sector capable of generating gross domestic income into the state budget growth and become one of the main tools of national competitiveness is strategically significant.

In Ukraine, as in other developed countries, transport is one of the largest basic sectors of the economic system, the most important part of industrial and social infrastructure. Transport communications combine all parts of the country, which is a necessary condition of its territorial integrity and its economic space unity. They link the country with international community, being simultaneously material basis of ensuring foreign policy and foreign economic relations of Ukraine and its global integration.

Advantageous geographical position of our country determines international transport corridors passage through its territory, namely:

- Pan-European transport corridors No. 3, No. 5, No. 7 and No. 9;
- Organization for Railways Cooperation (OSJD) corridors No. 3, No. 4, No. 5, No. 7, No. 8 and No. 10;
- Transport Corridor Europe-Caucasus-Asia (TRACECA).

Transport services, warehousing and courier activities in total volume of realized services share in 2014 amounted to 39.5%, which is the highest indicator in the structure (Fig. 2.9.).



**Fig. 2.9. Volume of Realized Services by Types of Activity Distribution, as at 01.01.2015 (% of total) [143]**

Information and telecommunication services rank the second, these services share amounted to 20.6%. This demonstrates services of transport-communication system of Ukraine strategic importance in pumping up the state budget revenues.

One of the important components of the services sector of Ukraine transformation in modern period is its restructuring in terms of business entities format. Most services in the country turn out to be private and collective ownership subjects. Small enterprises prevail in the general structure (from 91.7% in transport to 98.6% in real estate operations). The trend to more active development of small businesses in this area has emerged in recent years. As of the beginning of 2016, 66.9 thousand micro and small organizations operated in the services sector.

The share of employed in the services sector in the country total employment was equal to 63.1% in 2016 (Table 2.4.).

**Table 2.4. Employment in Ukraine by Types of Economic Activity in 2016. [143]**

	Thousand people.	%
<b>TOTAL</b>	<b>16,276.9</b>	<b>100</b>
Agriculture	2,866.5	17.6
Industry	2,494.8	15.3
Construction	644.5	4.0
Wholesale and retail trade	3,516.2	21.6
Transport, warehousing, postal and courier activities	997.2	6.1
Temporary accommodation and catering	276.7	1.7
Information and telecommunications	275.2	1.7
Financial and insurance activities	225.6	1.4
Real estate operations	255.5	1.6
Professional, scientific and technical activities	428.1	2.6
Administrative and support servicing activities	304.3	1.9
Public administration and defence; compulsory social security	973.1	6.0
Education	1,441.4	8.9
Healthcare and social assistance	1,030.4	6.3
Arts, sports, entertainment and leisure	201.6	1.2
Other economic activities	345.8	2.1

Data of the Table analysis allows to conclude that among all the activities the largest number of people are employed in wholesale and retail trade (21.6%), followed by education (8.9%), the third ranks medicine (6.3%) and the fourth rank is occupied by transport sector (6.1%).

Average wage is one of the most important indicators of the services sector in Ukraine development (Table 2.5.). Data analysis makes elaboration of this indicator current development trends possible: average wage in the services sector is 26.6% higher than the same indicator in agriculture, 17.2% higher than in construction and 9.3% above the average wage in Ukraine in 2016.

**Table 2.5. Average Monthly Nominal Wages of Regular Employees by Types of Economic Activity in 2016, UAH. [143]**

	2016.	% to 2015.
<b>TOTAL</b>	<b>5,183</b>	123.6
Agriculture	4,195	126.8
Industry	5,902	123.2
Construction	4,731	133.3
Wholesale and retail trade	5,808	123.8
Transport, warehousing, postal and courier activities	5,810	124.8
Temporary accommodation and catering	3,505	125.8
Information and telecommunications	9,530	134.0
Financial and insurance activities	10,227	118.9
Real estate operations	4,804	131.2
Professional, scientific and technical activities	8,060	119.6
Administrative and support servicing activities	3,995	128.3
Public administration and defense; compulsory social security	5,953	135.9
Education	3,769	120.3
Healthcare and social assistance	3,400	120.2
Arts, sports, entertainment and leisure	4,844	117.2
Other economic activities	4,615	127.0

In addition to this analysis of this indicator, the analysis of prices dynamics for the basic services should be included. In the aggregate, a number of negative phenomena in the domestic economy is worth noting: political and economic instability, which results in inflation growth, rising prices and unemployment (Table 2.6.).

**Table 2.6. Consumer Prices for Basic Services in Ukraine Indices,% [143]**

Types of services	2015 to the previous year	2016 to the previous year
Housing and utilities services	215.8	135.1
Healthcare	137.6	111.7
Transport	136.8	106.5

Communication	105.9	103.9
Leisure and culture	142.7	112.2
Education	117.9	116.5
Restaurants and hotels	124.3	113.1
Other services	138.6	110.3

As is seen, a significant increase in consumer prices is observed for all types of services. Thus, prices for housing and utilities increased by 1/3, educational services –1/6 and restaurant and hotel business services –1/8.

A negative factor is insufficient state financing of this sector development taking into account the fixed inflation index of 12.4% (Table 2.7.) [72]. Thus, given the inflation index housing and utilities sector in 2016 was funded 3% less, 6.8% less was allocated to the healthcare sector, and 8.8% less resources were allocated for spiritual and physical development. In addition, given the rise in prices the situation is not optimistic, for example, in energy and housing and utilities services.

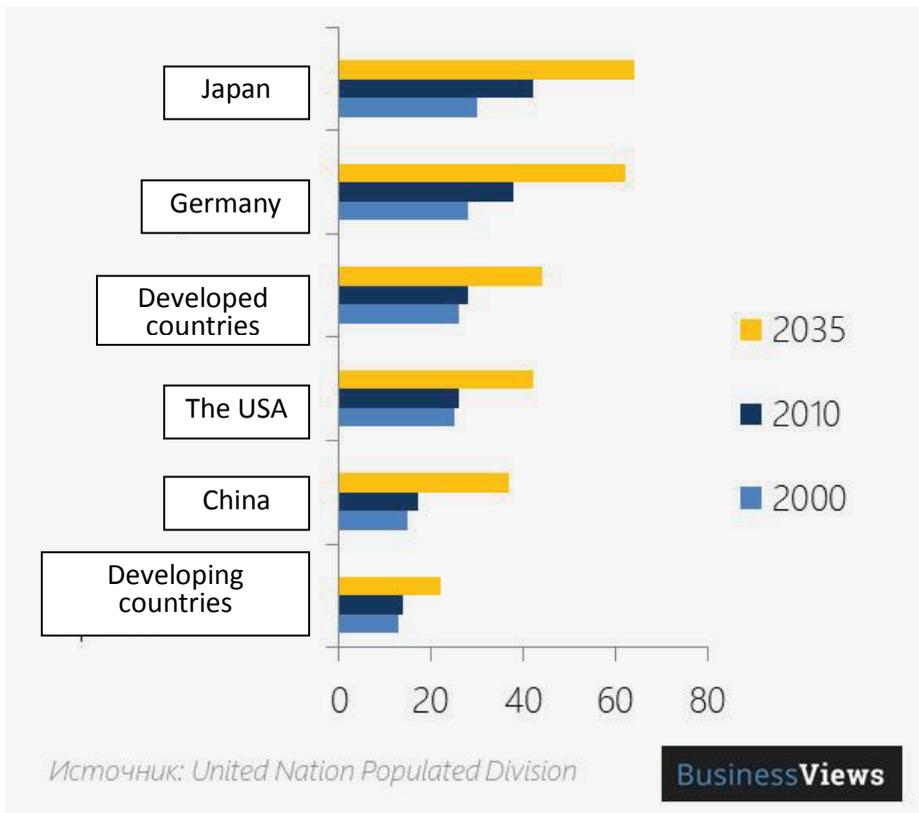
**Table 2.7. State Funding of the Services Sphere of Ukraine (UAH, million) [143]**

	2015	2016
<b>Funding total:</b> <i>including:</i>	679,871.4	835,832.1
- public utilities sector;	15,700.4	17,547.5
- healthcare;	71,001.1	75,503.4
- spiritual and physical development;	16,228.3	16,897.8
- education;	114,193.5	129,437.7
- social protection and social security	176,339.8	258,326.1

In general, of the total budget expenditures in 2016 the largest funding amount was allocated for social protection and social security of the population – 28.5%. Education sphere ranks the second by expenditure. 15.5% of the state resources was allocated for this sector in the current year. Healthcare occupies the third rank, 9.0% of the state funding was allocated for the sector needs.

Global trend of life expectancy of the population growth should be noted as well (Fig. 2.10.).

As demonstrated in Figure 2.10 increase of the average age of the population is observed and projected in the world. The longest life expectancy was recorded in Japan and Germany. All this testifies social services and social security of the population increasing role and importance.



**Fig. 2.10. Average age of the Population in the World Countries [143]**

In particular, if it is about the situation in Ukraine, the level of social services development is still unsatisfactory. Expenditures on pensions reached 11% of the GDP, which is slightly less than the agriculture contribution to the country's GDP. Officially the number of employed almost equals to the number of pensioners — in fact, every employed funds one pensioner. All this is an enormous burden on the state budget expenditures. Unfortunately, the level of domestic social security is at the quality level that is well behind the developed countries.

An important indicator such as the Human Development Index (HDI) is important to assess the state's success in terms of integrated development, which applies to all society segments. It is commissioned annually by international experts under the auspices of the United Nations Development Program (UNDP).

The index is calculated on the basis of three components: the population standard of living, life expectancy and education. “The Human Development Index is not aimed at any particular region, but rather demonstrates how well a human lives. If the position in Doing Business can be improved fairly quickly by the government actions and changing the estimated indicators, the HDI is a more comprehensive, long-term index, the result of a longer policy,” an advisor to the Center for Economic Strategy Paul Kuchta explained [125].

In 2015 Ukraine ranked 81st among 188 countries in the HDI rating. This is the second group of countries called “countries with a high Human Development Index”. Sad to report, but Russia and Belarus are much higher – they rank the 50th. Kazakhstan (56), and Georgia (76) are ahead of us as well. In fact, Russia and Belarus have always been far ahead of Ukraine in the HDI rating in the last 10 years. Actually, like both Kazakhstan, and even Armenia. For example, in 2009 Ukraine ranked 85, and Armenia – 84 in the HDI rating [120].

Decent life of citizens ensuring is possible primarily by the economy developing. And here our country needs to make up for a lot. For example, Kazakhstan is comparable with Ukraine in terms of population life expectancy and training duration.

But it is 2.5 times ahead of Ukraine in terms of gross national income per capita, as well as in the HDI rating, ranking 25 positions ahead of us. Russia has almost 3 times more income per capita and is ranking 31 positions ahead of Ukraine.

Obviously, in many respects the well-being of Russian citizens was based on the high revenues from oil sales in previous years, but neighboring Belarus ranks the same with Russia 50 position in the HDI rating. Gross income per capita in Belarus is twice the Ukrainian index. Ukraine has not demonstrated any abrupt changes in the HDI rating. And indeed, where the growth could come from if in 26 years the Ukrainians life expectancy increased by only 1.2 years — from 69.8 to 71. Average training time of compatriots grew up during the same period by 2.2 years — from 9.1 to 11.3.

At that such an important indicator as gross national income per capita, which characterizes the citizens’ standard of living, decreased for the same period by almost a quarter — from \$10,815 to \$8,178 at the exchange rate of 2011.

At the same time, the drafters of the Human Development Index noted a high degree of the state support for the unemployed. Among the Ukrainian job-seekers one in five, or 20.9%, got unemployment benefits, whereas in countries with a high HDI, only 6% of unemployed can expect for financial assistance [125].

“Quality of life” and “standard of living” in the Human Development Index described above is determined by the level of education as well.

The educational system of Ukraine embraces the totality of institutions on three levels: pre-school, secondary and higher education (Table 2.8).

**Table 2.8. Educational Institutions System in Ukraine (as of the end of the year) [143]**

	2015	2016
Pre-school institutions, thousand	14.8	14.9
Comprehensive secondary institutions, thousand	17.3	16.8
Higher education institutions, ea.	659	657

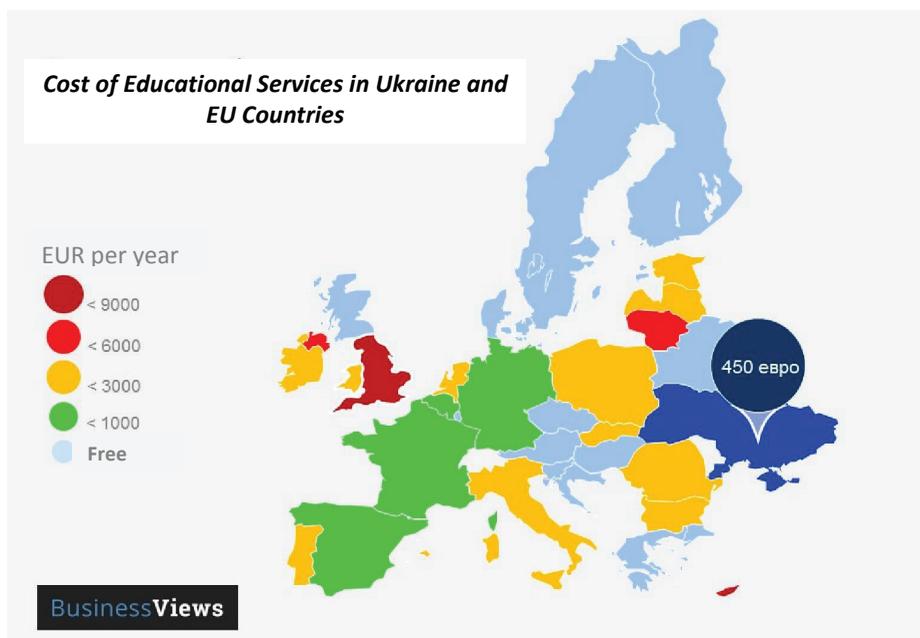
The total number of Ukrainian citizens who received education is presented in Table 2.9.

**Table 2.9. The Number of People Who Have Studied in Educational Institutions of Ukraine (as of the beginning of the year, thousand) [143]**

	2015/2016	2016/2017.
<b>TOTAL</b>	<b>5,692</b>	<b>5,718</b>
Comprehensive secondary institutions	3,783	3,846
Vocational educational institutions	304	286
Higher education institutions	1,605	1,586

It makes sense to focus on the study of current development trends of educational system both in Ukraine and in the world.

In particular, the analysis of the higher education cost in Ukraine and in the countries of the European continent allows to assert, that although in our country educational services cost is far less than in other countries, but their quality leaves much to be desired (Fig. 2.11.).



**Fig. 2.11. Cost of Educational Services in Ukraine and EU Countries [50]**

Regarding the education quality, it should be noted that top 800 universities of the world according to QS World University Rankings® 2014/15 include 6 Ukrainian universities. None of them even hit the TOP-200. Taras Shevchenko National University of Kyiv ranked 421, V. N. Karazin Kharkiv National University — 481, Igor Sikorsky KPI — 551, Sumy State University — 651, and Kharkiv Polytechnic Institute and Donetsk National University occupy 701 position. In Poland, ranking is significantly higher: University of Warsaw ranks 335, Jagiellonian University – 371, Warsaw University of Technology – 651, University of Łódź and Nicolaus Copernicus University in Toruń – 701 [178,179].

Twice a year — in February and July — Cybermetics Lab research group publishes a Webometrics ranking of universities, reflecting higher educational institutions into the “global network” integration degree. A total of about 22,000 universities, academies and institutes around the world are involved in the rating [180].

Thus, the best of the Ukrainian universities presented in the rating ranks only 885 among the world’s higher educational institutions. This University is Taras Shevchenko National University of Kyiv. It is the only Ukrainian

university that managed to break into the first thousand lines of the rating. But, unfortunately, even the National University of Kyiv dropped in the rating — it ranked 789 in the last list. 8 more Ukrainian universities hit the second thousand ranking. This fact is positive, as only six universities “stretched” to the second thousand six months ago, that is, the total number of Ukrainian universities in the “Top-2000” has grown almost 3-fold. The best five thousand were hit by 43 Ukrainian universities. It is noteworthy that six months before they amounted to only 30 — one and a half times less.

It should be noted that the majority of universities in the “Top-5000” are universities with no clearly defined profile. Technical and medical universities rank the second. According to the ratings the best higher educational institutions are concentrated in Kyiv; universities of Kharkiv, Odesa, Lviv and Sumy hit the list as well.

The closer to the rating end the more private educational institutions appear in it. Among the Ukrainian universities ranked in the Webometrics ranking the International Business School (IBS) of Alfred Nobel Dnepropetrovsk University is the last, occupying 21,609 position among the world universities [179].

Current trends of educational services development that are gaining momentum around the world, but so far are weakly concerned with the educational system of Ukraine should be mentioned. Thus, in Europe, the USA and other world countries education has long been transferred into the Internet format. Online education gives more chances to get not only a diploma (certificate), but skills that are really needed as well. It would be not fair to argue that Ukraine is lagging behind globally in this respect, but online lectures in our country are not common — it is a fact. Students in the universities themselves look for educational portals where the courses are free or at nominal charge: Prometheus, Coursera, Udacity, Khan Academy, Udemy, Duolingo. Such platforms are not only designed for learning “from scratch”, they are convenient for advanced training especially when a person is already employed and has no time, as well as opportunities to travel to the educational institution.

Course of study customization helps to focus on really important subjects. Such academic freedom is in force in the universities of Germany, Denmark, Belgium and other countries. But Ukrainian students enjoy this privilege actually nominally. The same situation is with schoolchildren. For example, Finnish schoolchildren who also study on a free system basis and demonstrate the highest level of knowledge in the world.

Practical studies equip with more knowledge, than memorizing the theory. Thus, 75% of the educational process in Austria is practiced, while in Ukraine

theory prevails. Practice is fundamental in the Finnish educational system as well. This should be referred to the fact that Finnish teenagers get the highest scores on international exams, outstripping even schoolchildren from many Asian countries.

In general, according to the UN, Ukrainian education is ahead of French, Swiss and British. But the problem is that this system has outdated. It needs to be updated; a special approach to pre-school children, schoolchildren and students should be applied. And foreign techniques with adaptation to the Ukrainian conditions would be very productive in this [178].

In addition to the above, the global Human Development Index measures achievements of the country in terms of health preservation ensuring.

Thus, a health protection system, which is characterized by a set of indicators, has been created in our country (Table 2.10.)

**Table 2.10. Key Indicators of Health Protection System of Ukraine (thousand) [143]**

	2015	2016
Number of doctors of all specialties	186	187
Number of nursing staff	372	367
Number of medical institutions	1.8	1.7
Hospital beds	333	315
Number of outpatient clinics	10	10

Along with that, modern trends in Ukrainian medicine development should be noted. Thus, today private medicine in Ukraine is becoming more popular, mainly due to the low level of the state medical care. The key difference between private and public medicine is not the staff or doctors' skills level, but new, expensive equipment that allows to quickly conduct high-precision examinations and high-quality medical care availability. Medical staff are interested in employment in private clinics due to high salaries. At the same time, a number of doctors combine work in commercial institutions with public hospitals. It is a common practice now.

In 2014-2015, due to the crisis, little new private clinics emerged in Ukraine. However, already operating medical networks demonstrated active growth. In particular, in the summer of 2016 the ISIDA clinic invested € 3 million in capacity expansion, increasing the number of patient sites and other upgrades. "Dobrobot" Medical Center in turn announced plans to open new centers in all towns with population of over 150 thousand people.

Experts note private medical services market growth due to new hospitals emergence as well as prices for the services growth. As mentioned above, the crisis of 2014-2015 became a deterrent in this segment development. The total market volume tends to decrease, more noticeable in dollar terms. The difficulty of this indicator accurate assessment is shadow mechanisms of services payment existence. In monetary terms the market volume indicator can be estimated from the budget funds allocated for medicine. According to the World Bank, the Ukrainians have been covering about 40% of healthcare costs since 2009. Herewith, residents of large cities spend 3-6% more than the small settlements residents.

To date, about 50,000 private clinics are available in our country, which account to 10% of the entire medical services market. The largest market operators are “Oberig” Medical Center, “Boris” Medical Center, “Oxford Medical” Clinic, “Medicom” Clinic, etc.

The leaders in terms of people attached to the public clinics number are the Dnipropetrovsk, Kharkiv and Lviv regions. Private clinics services are often used by residents of large cities and regional centers.

Medical care quality is one of the determining factors for interaction with customers ensuring. The private sector provides more efficient medical institutions management. Unlike governmental, private companies compete with each other, which results in internal efficiency and innovation constant increase.

The main problem of the paid medical services sector in Ukraine development is the high level of initial investment in clinic launching. Market players are faced with challenges of healthcare professionals finding and keeping [178].

A special place in the services sector of our country is occupied by tourism, hotel and restaurant business, culture and art sectors, which largely determine national competitiveness level.

Thus, the culture and art sector of Ukraine embraces the totality of institutions, presented in Table. 2.11.

**Table 2.11. Main Culture and Art Institutions in Ukraine [143]**

	2015	2016
Theatres	113	112
Museums	564	576
Libraries	17,272	17,003
Films exhibitors	1,118	1,126
Clubs	17,195	17,133

It should be noted that, unfortunately, the sphere of culture of Ukraine until recently was in the background among the state policy priorities, not getting due attention, importance and support from the government. The role of culture, which lost its direct ideological function inherited from the Soviet system, was reduced to “ornamental” designation and other sectors “aesthetic servicing”. The latter in resources allocation and the first in benefits deprivation, culture was thought of an optional superstructure to vital sectors of government activity. Such established false approach has caused, to a large extent, those phenomena and conflicts that the Ukrainian society is experiencing today.

One of the main directions of the necessary state reforms should be cultural support instruments modernization and improvement; this involves existing tools for supporting and influencing the cultural sphere inventory and evaluation as well as their constant monitoring. Cultural values and cultural resources accessibility is an important prerequisite of the national competitive development.

In this aspect, attention should be focused on tourism development importance. International tourism globally accounts for 7% of total world exports and 30% of services export worldwide.

According to the authors of this Monograph this averaged benchmark should become a benchmark in the domestic economy development. Investigating UNWTO data, the growth of international tourism in terms of total exports of goods and services in 2015 amounted to about 6-7%, which largely exceeds the progress of other economic activity spheres of the world economy, demonstrating an average growth of 2.8% [154].

Given domestic potential, as well as features of international tourism in Ukraine development within current geopolitical and geo-economic instability framework, it assumes even greater urgency and significance.

The structure of main temporary accommodation facilities, and in fact, created hotel and tourist business in Ukraine infrastructure availability is presented in Table. 2.12.

**Table 2.12. Collective accommodation facilities in Ukraine, 2016. [143]**

	Number of establishments	Number of places (beds)	Number of persons placed
<b>Collective accommodation facilities</b>	<b>4,256</b>	<b>375,593</b>	<b>6,544,759</b>
<b>Hotels and similar accommodation facilities:</b>	<b>2,534</b>	<b>135,916</b>	<b>5,037,075</b>
- hotels;	1,703	102,002	4,332,043

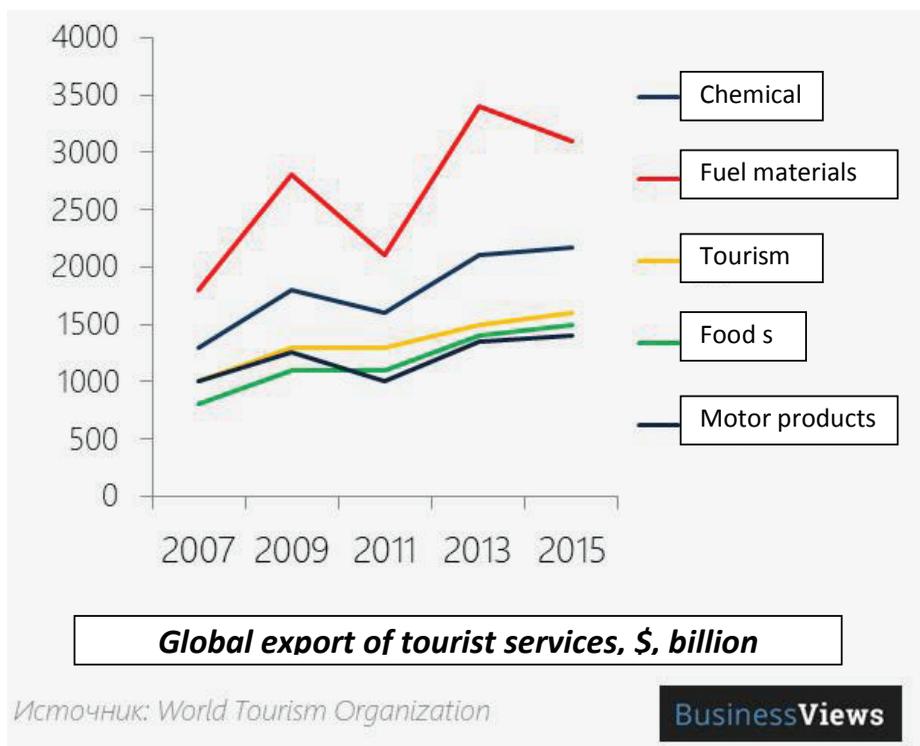
## New Trends in Development of Serviced in the Modern Economy

- motels;	139	3,945	101,300
- hostels;	40	1,577	52,552
- camping sites;	14	709	8,218
- dormitory accommodations for visitors;	90	6,902	181,178
- tourist camps, summer camps, etc.	548	20,781	361,784
Specialized accommodation facilities:	1,722	239,677	1,507,684
- sanatoria;	172	51,224	428,503
- children's sanatoria;	107	16,556	112,463
- assisted living facilities with treatment;	12	2,198	15,632
- children's medical institutions, children's centers;	17	5,485	39,763
- after work disease prevention centers;	63	9,912	65,947
- balneological hospitals, therapeutic mud-baths;	3	589	3,323
- holiday hotels;	11	1,195	8,559
- tourist hotels;	62	12,426	65,956
- leisure centers;	1,265	139,071	762,882
- health improving institutions for 1-2 days stay	10	1,021	4,656

It should be noted that tourism has ranked the fourth position in the world exports, yielding only to exports of fuel, chemicals and food products. This again indicates relevance and importance of priority areas of the services sector operational problem solving at the highest state level.

Tourism these days is a powerful industry that generates more than 10% of the global gross product. It employs a huge mass of workforce, fixed assets and attracted capital. This is a big business, big money and serious global policy. The number of people involved in tourism is commensurate with the number of travelers.

By the early XXI century the tourism share accounted for almost \$500 billion or more than 10% of global revenues [180]. This means that every tenth Dollar, Euro, Yen or Swiss Franc, received by the humanity, is earned in the tourism sector.



**Fig. 2.12. Dynamics of Tourist Services and Other Sectors of the Economy Market Global Development, billion US dollars**

Today the total number of international tourist trips is about 900 million people a year. Every year this number increases by more than 4%. An exception are individual years characterized by a certain decline in tourist activity, for example, due to global and local financial crises, epidemics, terrorist acts, natural disasters, etc.

It should be specially emphasized that one of the most important tasks of modern structural policy of Ukraine is “new economy” based on the advancing growth of knowledge-intensive services development.

Knowledge-intensive high-tech services should become “growth points” for traditional industries, contribute to the country’s export potential further enhance and the services sector on a new technological level formation.

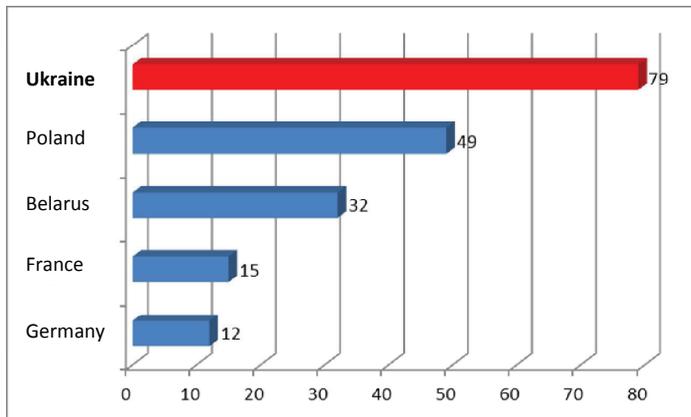
The main objective of the services sector development is meeting the economy and population needs in a wide range of high quality services at affordable prices and advanced services sector ensuring a high quality of life and adapted to the services markets of WTO countries creation.

One of the social development main legal conformities is the services sector in comparison with industrial production outstripping growth and its economic positions expansion. Such key factors of economic growth as scientific knowledge, intangible forms of accumulation, information technologies, as well as economic activity globalization, etc. are formed in services. Accordingly, deep scientific, technical, qualitative and structural changes in services industries themselves, which increase their contribution into the society development and create necessary prerequisites for its further progress are particularly essential.

In the rating of ICT Development Index of the International Telecommunication Union of the United Nations Ukraine ranked 79 among 176 countries in 2017 (Fig. 2.13.) [127].

ICT Development Index is a combined indicator, which characterizes the world countries achievements in terms of information and communication technologies (ICT) development. It is calculated by the International Telecommunication Union methodology, a specialized UN unit that defines global standards in ICT. The index was developed in 2007 based on 11 indicators, which are operated by the International Telecommunication Union in its assessments of ICT development. The index consolidates these indicators into a single criterion that is designed to compare the achievements of the world countries in the ICT development and can be used as a tool for comparative analysis at the global, regional and national levels.

The authors of the study emphasize that the ICT development level today is one of the most important indicators of the economic and social well-being of the state.



**Fig. 2.13. Ukraine’s Position in the Countries Ranking by Information and Communication Technologies Development Level, 2017.**

As is seen, our country's position is lower by more than thirty points from the neighboring countries, which significantly affects national competitiveness in the global community.

Socio-economic efficiency of the countries development is primarily determined by their innovative activity.

As is seen from the data of Fig. 2.14., it is more difficult for Ukraine to catch up with European countries in terms of technology level year by year.

To be economically successful it is no longer sufficient to have a developed industry. Today technological innovations and their implementation speed are gaining more importance. 3D printing, biotechnology, new materials, renewable energy sources and Nano robots — all these accelerate progress, that is, make the country richer. Innovative convergence and intertwining of industry and services have been emphasized in the work previously and will be considered in more detail in the Third Chapter of this work. For this reason, it can be asserted with complete confidence that innovative activity in industry serves as a catalyst for the progressive development of the services sector as well.

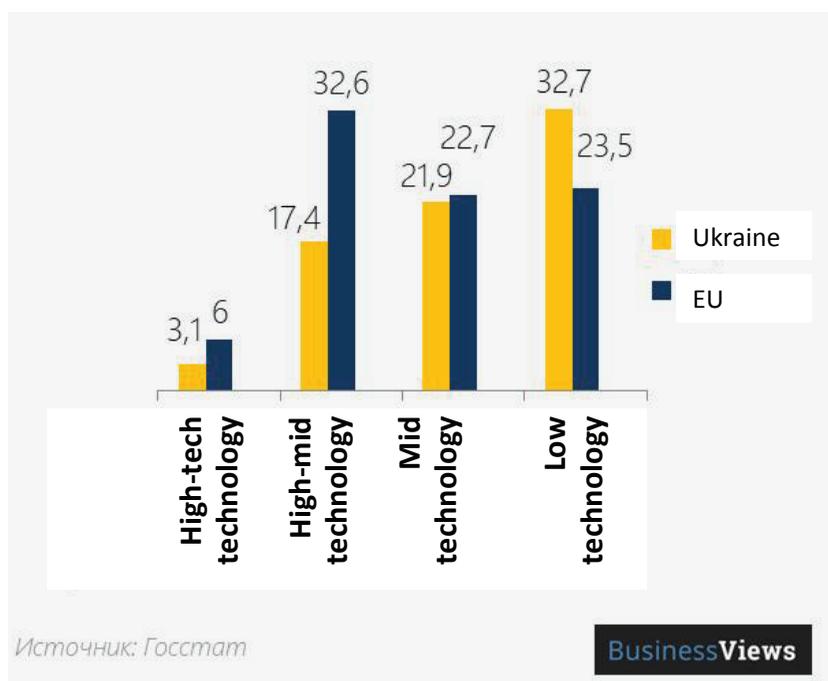


Fig. 2.14. Structure of Industry in Ukraine in Terms of Technological Processability Level, %

Unfortunately, the fact (Fig. 2.15.) that high-tech products share is gradually decreasing in Ukrainian production should be admitted. In terms of such products exports we lag behind, for example, Poland almost 8 times. According to the science development indicators, there are 1,026 scientists per million inhabitants in Ukraine, and 8,255 in Israel.

Another trend of the services sector modern development should be noted – robotic application increase. Thus, cars and trains with self-driving capabilities will do with modern drivers the same as conventional cars once did with cabs — will cause them to disappear. Staff redundancy threatens not only transport infrastructure employees: any work that can be robotized without quality loss and value increase sooner or later will be taken over by machines. According to the World Economic Forum participants, only in the next three years the number of jobs reduced due to robotic application in the developed countries will exceed the amount of created jobs by 5.1 million. For this reason, for example, the UK intends to create 1 million the least affected by robotic application jobs in the next 30 years.

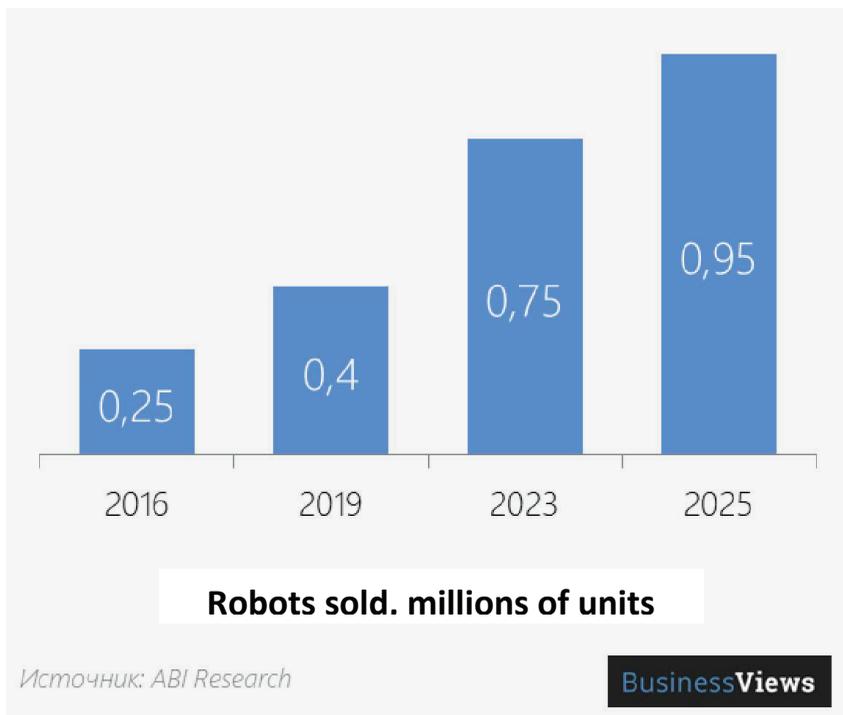


Fig. 2.15. Robots Sales in the World Countries (Forecast), million units.

In Ukraine 40% of industrial jobs are in low technological level production, and 15% of the population are engaged in agriculture and mining. All these people, like other professions representatives, are at risk, and once it is more profitable to apply robots, they will lose their jobs.

To avoid this, it is necessary to obtain new specializations that will be in demand in a few decades and radically change educational approaches — schools and universities should teach to think critically and develop. The experience of countries that have imposed or will impose in the future basic income guarantee would also be interesting to consider.

Along with that, considerable potential for the IT industry in our country development should be noted. Thus, according to PwC, Ukraine is among the top 20 (according to the International Trade Centre — top-25) largest IT services exporters in the world. More than 70% of Ukraine's IT services exports are custom software development.

Even now IT is a key driver of the Ukrainian economy and demonstrates the highest growth among other export industries. From 2011 to 2015, IT contribution to the GDP increased from 0.6% to 3.3% (from \$1.1 to \$2.6 billion).

This growth was achieved due to the young generation engineers; over the last four years the number of IT professionals increased from 42.4 to 91.7 thousand. In fact, 1 professional creates a 3.6 additional jobs in related industries [179].

According to IDC and World Bank, IT costs in 2015 in Ukraine amounted to only \$ 32.2/person. For comparison, the same indicator in Poland amounted to \$ 278 /person, Czech Republic – \$ 500 /person, Germany – \$ 1,092/person, the Netherlands – \$ 1,524/person, Sweden – \$ 1,807/person, Singapore – \$ 2,094/person and the United States – \$ 2,232/person [192].



**Fig. 2.16. Development Trends of the IT Market in Ukraine [14]**

Low level of IT consumption in our country is both a cause and a consequence of the economic well-being low level (GDP per capita).

Since the basis of Ukraine's economy is not technological industry, but raw materials, this causes a lag in the development pace from the developed countries.

Structure of IT consumption by sectors of the national economy in Ukraine is presented in Table. 2.13.

Domestic IT market structure in Ukraine analysis presented in the Table testifies the increase in the rates of their application in banking and financial sector. Thus, in 2016 the largest consumers in the structure were financial, public and education sectors. They account for 51% of all IT services produced.

Ukraine joined the leaders by blockchain projects number in Europe.

Blockchain, cryptocurrency, ICO, and everything connected with them is the top issue in the world economy of recent times.

**Table 2.13. Dynamics of IT Consumption Structure by Sectors of the Ukrainian Economy [143]**

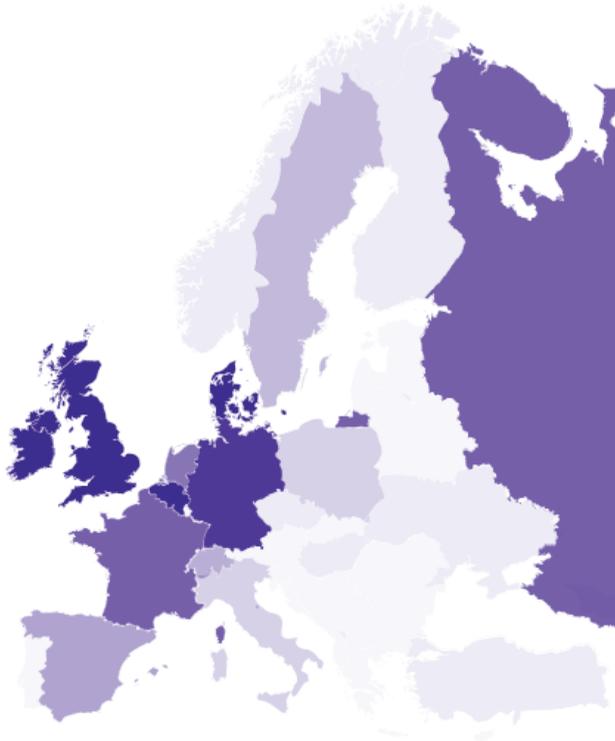
Industry	Sector's share in IT consumption, %	Dynamics by 2015, %
Banking and financial sector	35	9
Governmental authorities and education	16	49
Communication (Telecom)	12	-23
Services for business	7	10
Trade (wholesale and retail)	6	-10
Continuous production (including metallurgy, food and chemical industry)	6	-4
Transport	4	101
Design production (including mechanical engineering, electronics, automotive, aircraft building and ship building)	3	14
Other services	11	34
TOTAL	100	x

Since it is difficult to attract investments in Ukraine, even in the form of bank loans, the business has found a new way to get money — through the crypto industry.

Two hundred projects related to the blockchain are being developed in Ukraine (Fig. 2.17.).

Number of blockchain development projects by country

01	United Kingdom	1,674
02	Germany	1,307
03	Russia	721
04	France	679
05	Netherlands	554
06	Spain	383
07	Switzerland	338
08	Sweden	306
09	Italy	276
10	Poland	273
11	Ukraine	201
12	Czech Republic	169
13	Finland	157
14	Ireland	133
15	Denmark	129
16	Greece	125
17	Norway	119
18	Turkey	97
19	Hungary	89
20	Portugal	86
21	Bulgaria	70
22	Slovenia	69
23	Romania	65
24	Lithuania	48
25	Slovakia	40
26	Belarus	40
27	Luxembourg	34
28	Estonia	25
29	Croatia	20
30	Latvia	16
31	Moldova	13
32	Iceland	9

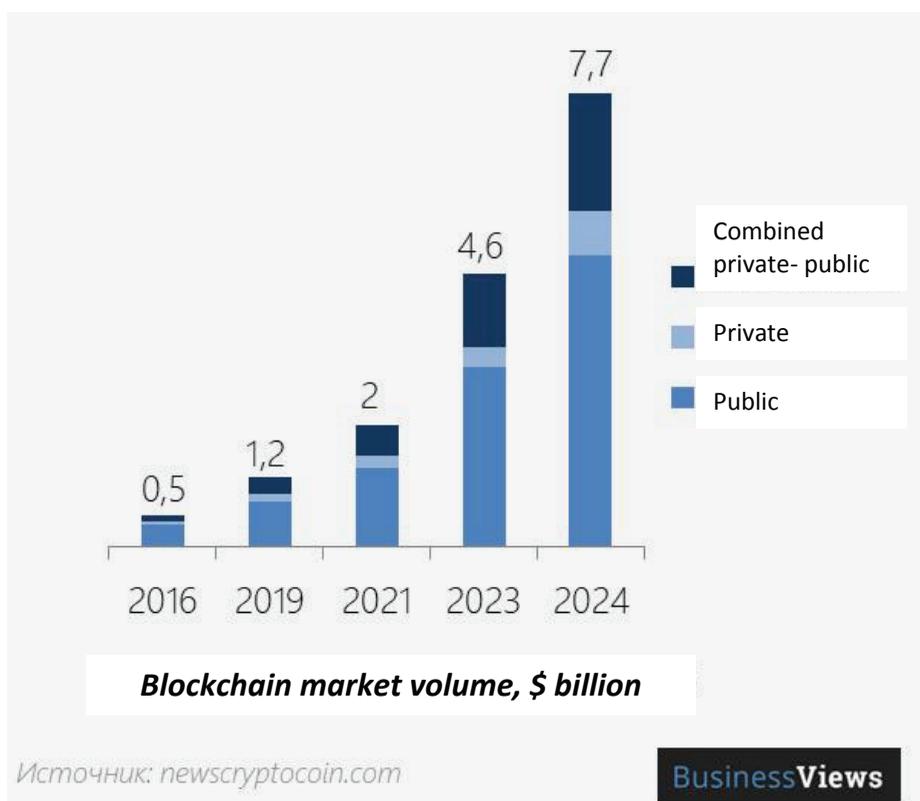


Note: Analysis is presented for GitHub projects for which geographical information is available

Source: Deloitte analysis of GH Torrent data and GitHub API data

**Fig. 2.17. Blockchain Projects Number in Terms of the World Countries [19]**

It is due to this fact, in particular, that blockchain technology application is actively expanding in our country.



**Fig. 2.18. Investment in Blockchain-Projects (draft), billion. US dollars**

Notably, that blockchain economic potential in general is so great that it is called the new Internet. It is believed that it is the financial sector that will be most transformed with blockchain technology application.

Blockchain will doubtless make a significant contribution to the sharing economy development making services of intermediaries unnecessary, particularly in banking, retail and insurance sectors. Officials to validate relevant to the state facts will not be needed as well.

In 2017 Ukraine was one of the world first to transfer the system of electronic trades of distrained property and partly the State Land Cadastre to the blockchain. The Ministry of justice is intended to master the blockchain in a short term. Its application will reduce registries and databases costs and maintenance, accelerate document flow and eliminate some errors caused by human factor.

Due to the developed IT market in the country and an early start, Ukraine has every chance to remain a leader in blockchain projects distribution.

Thus, one of the most notable achievements in this context is the ICO global project to attract \$ 25 million by Ukrainian DMarket company, which is building a virtual shopping center for games fans [137].

That is, it is about new innovative investment forms through ICO application. Thus, ICO, or Initial Coin Offering (IPO token offering) is a project issuance of coupons or tokens that are intended to the future services payment in the form of cryptocurrency.

Actually ICO is another crowdfunding model implementation, when participants are funding a company development now in order to get some benefits in the future.

By purchasing tokens issued by the project the investors expect:

- to benefit from the tokens at a higher price in the future resale (assuming they will be in high demand, for example, on account of the project successfulness);
- to take advantage of their coupons in the future, having received (as is assumed) services at a lower price;
- to support an interesting project [137].

In 2017, according to Smith + Crown the ICO already attracted \$180 million — more than the entire 2016 (\$101 million). And the fundraising volume is constantly growing [203].

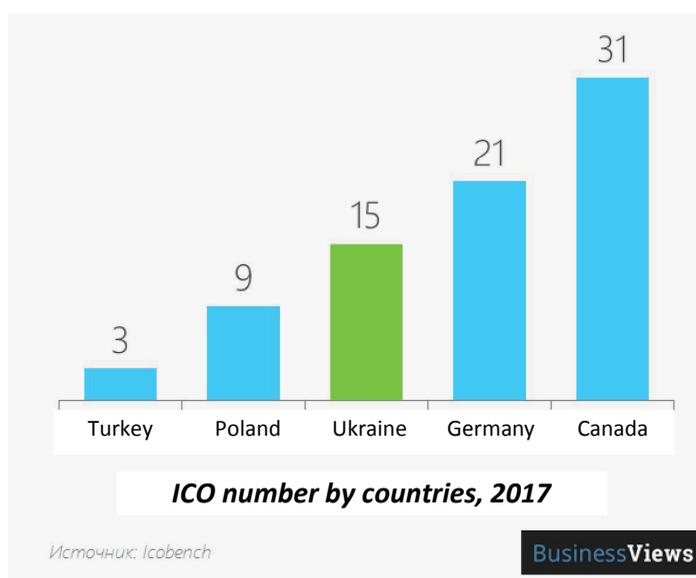
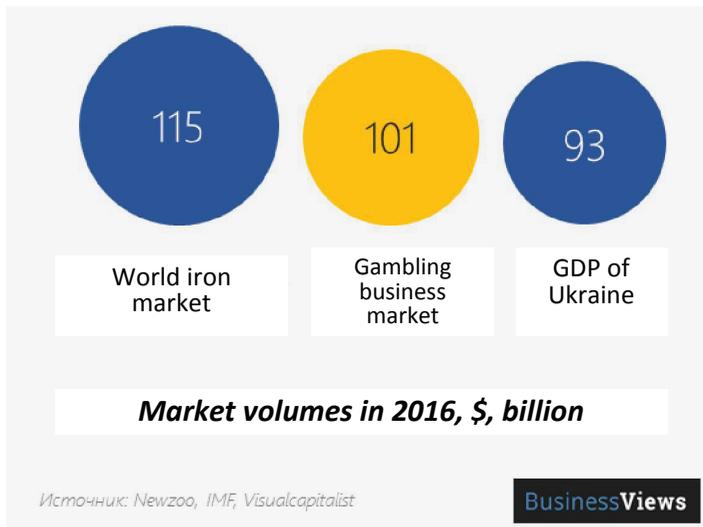


Fig. 2.19. Number of ICO Projects around the World, 2017. [180]

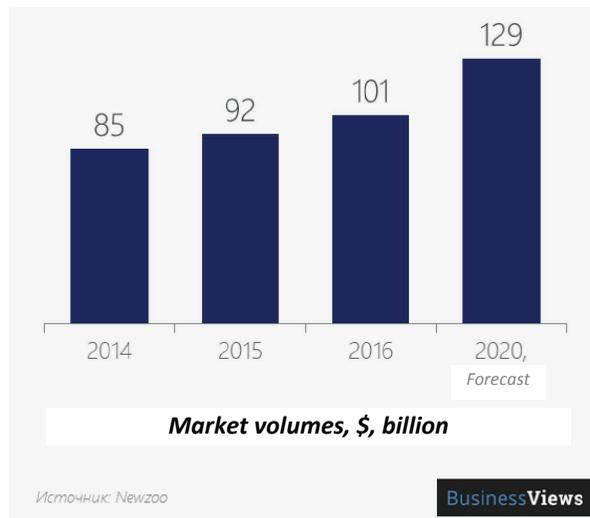
In the context of the DMarket company ICO project described above, gambling business growth trends, which got a new form of implementation in the second decade of the XXI century (a virtual one), should be noted. Thus, the gambling business generates huge cash flows comparable to the GDP of Ukraine (Fig. 2.20.).



**Fig. 2.20. Comparison of World Markets Capacity with the GDP of Ukraine, 2016 (USD, million) [180]**

As can be seen from the data in Fig. 2.20., in 2016 the gambling business market exceeded the \$100 billion mark — which is \$ 8 billion more than Ukraine’s GDP or \$ 14 billion less than the world’s iron market, an important raw material for the global industry.

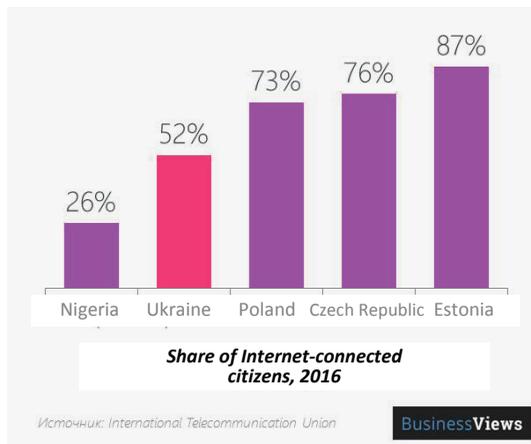
At the end of the analysis gambling business market forecast data up to 2020 is presented. (Fig. 2.21.).



**Fig. 2.21. Trends in the Global Gambling Market Development, USD, billion**

Proceeding from the fact that virtual economy is currently at the forefront, the analysis of the population of Ukraine Internet activity will be significant in this aspect (Fig. 2.22.).

As can be seen from the data presented in Fig. 2.22. only 52% of the population in our country use the Internet for their own purposes. A significant difference of more than 20% separates our country from European countries in the context of this indicator.



**Fig. 2.22. Share of Citizens Using the Internet in 2016,% [180]**

Computers and computer networks application by business entities in the services sector of Ukraine is presented in Table. 2.14.

**Table 2.14. Computers and Computer Networks Application in Enterprises of the Services Sector of Ukraine,% [143]**

	Share of enterprises, which within a year					
	<i>Used computers in total number of enterprises</i>		<i>Had access to the Internet in the total number of enterprises</i>		<i>Had a website in the total number of enterprises</i>	
	2015	2016	2015	2016	2015	2016
<b>TOTAL</b>	<b>95.2</b>	<b>95.1</b>	<b>97.9</b>	<b>98.2</b>	<b>44.4</b>	<b>40.2</b>
Housing and utilities services	98.1	98.0	97.5	98.0	22.1	22.2
Wholesale and retail trade; automotive repair	96.5	96.2	98.4	98.5	45.7	41.2
Transport, warehousing and courier activities	94.7	94.2	97.4	98.1	31.4	26.1
Temporary accommodation and catering	91.7	91.5	96.6	98.1	31.4	26.1
Information and telecommunications	98.2	98.3	99.1	99.2	65.7	62.9
Real estate operations	94.0	94.0	97.3	97.5	29.8	26.3
Professional, scientific and technical activities	97.5	97.6	98.2	98.3	55.4	52.9
Administrative and support servicing activities	89.2	88.9	96.3	97.1	30.7	28.0
Other services provision	98.3	98.4	100.0	100.0	71.9	61.3

From the data presented in the Table it follows that Ukrainian enterprises of the services sector bottleneck is web sites availability. In terms of e-Commerce development, current development trends should be responded promptly.

Thus, an indicative example is that currently 20% of purchases are made from smartphones. According to National Retail Federation of the USA, during the total sales of Black Friday in 2016, the online stores served more customers than conventional retailers [192].

And, for example, such a large online store as Amazon revenue has grown fivefold reaching \$ 80 billion in six years. The retailer founder Jeff Bezos is the richest man in the mankind history. Almost half of American families have a premium subscription to Amazon Prime: usually it is issued to those who makes purchases in Amazon at least once a week [154].

In its study, the US Telecom Association of Telecom Providers found that in America alone the high-speed Internet created 910,000 jobs — that is so many people worked in the broadband Internet industry in mid-2010.

International Communications Union noted the broadband Internet contribution to jobs creation as well — communication technologies, builders and manufacturers of necessary equipment are needed for a broadband network construction.

In addition, the Internet expansion positively affects integration and interaction of people. The FRS study has demonstrated that the high speed Internet emergence has increased the employment of married women by 4.1%.

Freelancers work is impossible to be imagined without the Internet. According to the Freelancers Union and Upwork.com in 2016 the number of freelancers in the US has reached 55 million people, and in Ukraine — 54 thousand people. In the EU their number is around 10 million.

The study of the International Communications Union demonstrated that in the Organization for Economic Cooperation and Development (OECD) countries the increase of the broadband Internet connectivity by 1% resulted in business increased productivity by 0.13%. It would seem not so much, but the OECD includes the most economically developed countries, so it is about tens of millions of dollars (Figure 2.23.).

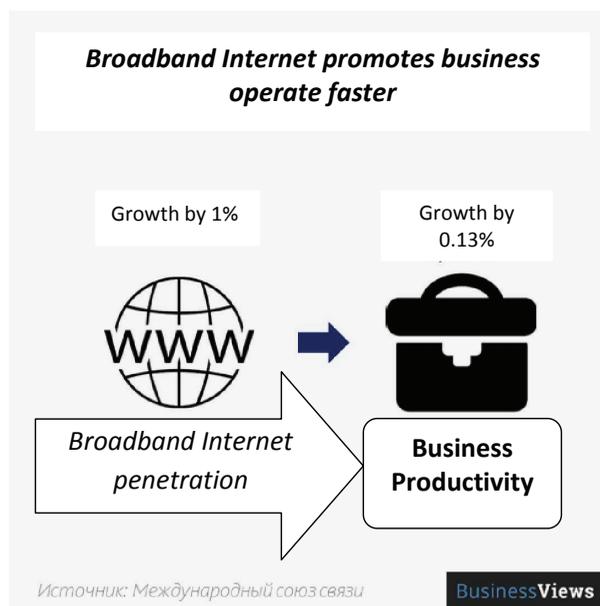


Fig. 2.23. Impact of the Internet Connectivity Increasing on Productivity of Business, %

The same study by the International Communications Union has found that an increase in the Internet coverage area by 10% results in GDP per capita increase from 0.27% to 1.38%. This is due to the fact that the high-speed Internet improves business processes efficiency.

According to the growth rate indicator, business services are currently considered to be leading in many countries (marketing and advertising services, leasing operations, scientific research, facilities security and maintenance services, financial services, accounting and auditing operations and insurance services). Internet services increase their share within these services scope.

In its report the World Bank recognized the high-speed Internet as one of the tools for economic growth in the developing regions — the Middle East and North Africa. It called it a key driver of economic growth, creating jobs and improving interaction between people.

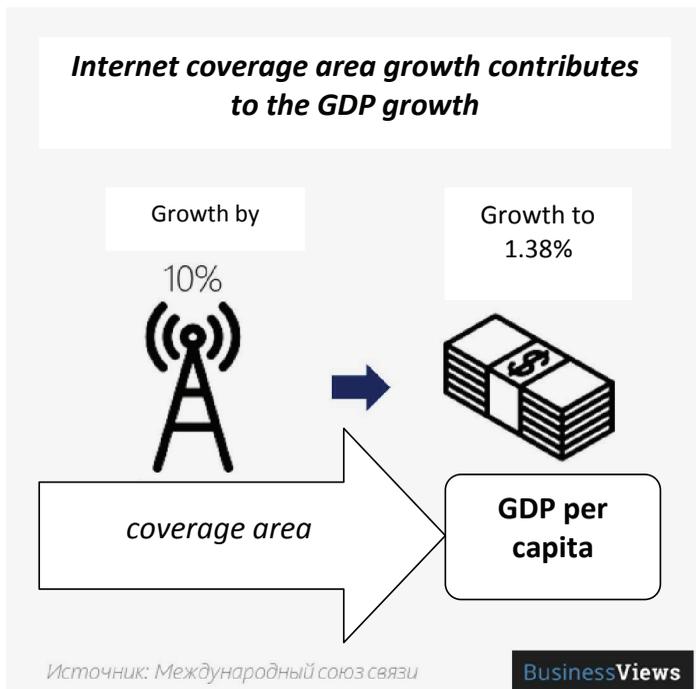
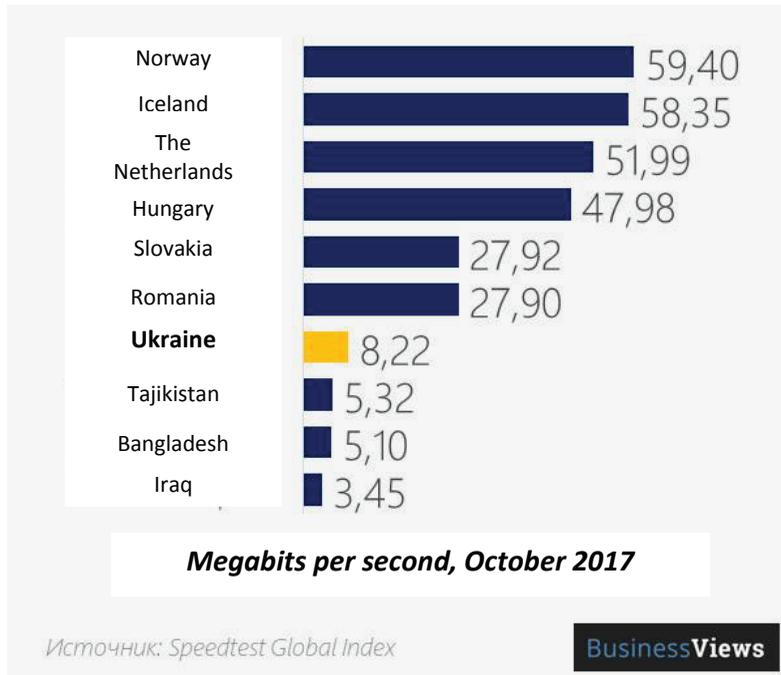


Fig. 2.24. Impact of the Internet Coverage Expanding on the GDP Growth,%

It should be noted that Ukraine, in comparison with the neighboring countries, has a slow mobile Internet connectivity. Thus, in spring 2015 frequencies for 3G launching were finally allocated to the Ukrainian mobile operators.

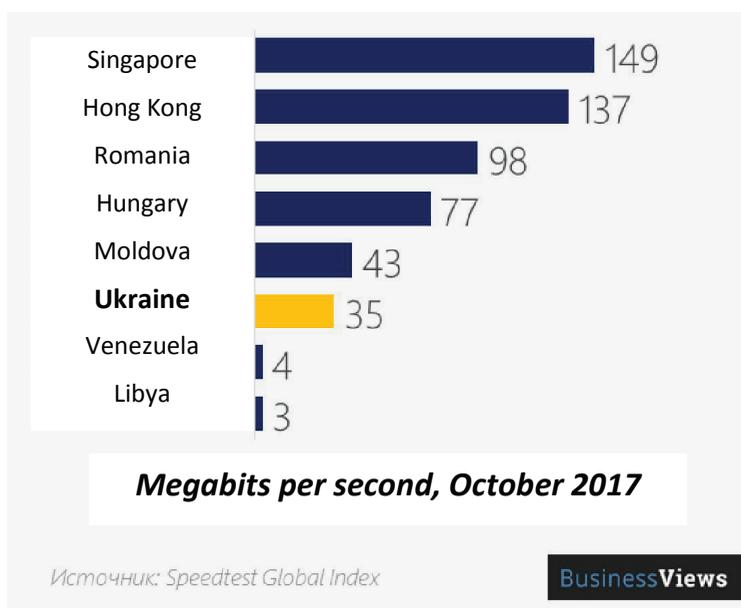
On the one hand, this was a great news, but on the other hand, other countries had already used 4G, which is 4-7 times faster, and had even started 5G testing (Fig. 2.25.).



**Fig. 2.25. The Average Internet Connectivity in Ukraine and in the World Countries, Mbps**

Analyzing the presented data, it should be noted that in neighboring Romania and Slovakia, the average Internet connectivity is 3.4 times higher than in Ukraine, and in Iceland and Norway it is above 7 times higher.

“Cable” Internet connectivity in our country ranks 1.5-2 times below other European countries connectivity (Fig. 2.26.).



**Fig. 2.26. The Broadband Internet Connectivity in Ukraine and in the World Countries, Mbps**

It should be noted that along with the above mentioned, the Internet in Ukraine is one of the cheapest in the world. Since the standard of living in our country is low, providers compete for each user, primarily by low prices restraining (Fig. 2.27.).



Fig. 2.27. Average Cost of a Monthly Internet Payment in 2017, \$

Summarizing all the above, it follows that the Internet is not just a tribute to today's fashion; it is a key driver of the national economy growth, and undoubtedly, including the services sphere [154].

### 2.3. Services Sector Development Major Determinants

Determinants (from the Latin “determinaus, determinautis” - “defining”) are factors that are dominant, determining or of a major influence on economic or any other processes, phenomena, relationships in the society, etc. [124, p. 87].

Those conditions the reasons and factors of which currently affect the services sphere are interpreted as the determinants.

As noted earlier, the world situation is becoming fundamentally different with the society wealth growth and its transition to the information stage of

development changing a habitual pattern of material and non-material production conjugation.

Prevailing for a long time concept, which relegated intangible production sphere to a completely dependent on material production factor determining its development, ignored the fact that in modern conditions the intangible production itself becomes the most powerful qualitatively new factor of economic growth, including material production sphere development and improvement. Efficiency of latter improvement increasingly depends on such factors as: employees training and cultural level, their business ethics, health, social skills, management quality, as well as banking, insurance, auditing, legal and other activities development.

At the same time, it should be noted that the process of material production and services sector interconnection and interdependence is quite complex and multifaceted, which in many respects requires a debating approach and multivariate analysis. Thus, in Western literature two areas with a certain degree of conventionality can be distinguished, proceeded, notwithstanding the foregoing, from the general provision that the basic stimulus of the services sector development are accelerating scientific and technical progress and new technologies introduction. But along with this some authors argue that the services sector share in the economy increase is associated with the developed countries inevitable de-industrialization and their economies into the so-called “services economy” transformation. Other scholars believe that services share in the economy rapid growth is mainly ensured by the volume of provided production and other services connected with goods manufacturing (insurance and financial services, warehousing, transportation) increase. For this reason, the services sector share increase reflects to some extent just the typical for the modern society trend of jobs re-qualification.

As we wrote earlier, analysis of modern production practices clearly highlights two key trends: one is that the products science-intensity increasing is conducive to the cost of services in products price increase and the other is that under the influence of scientific and technological progress and innovation some types of goods are transferred to the services category. Hence, almost all material production branches are becoming more and more “service-providing” both internally and externally.

Thus, as the social economy evolves, economic effect of the “non-productive” sphere becomes harder traceable, only through its interrelation with the material production sphere.

Along with that, current socio-economic processes for nearly a decade in the country and in the world have clearly highlighted a number of important consistencies characterizing material production and services sector interconnection and interdependence, which is characteristic of the neo-industrialization period.

Thus, the following can be attributed to the main consistencies:

1) Material production, which is the “skeleton” of the economy, fundamental role preservation, including in modern conditions, in the same way as a certain measure of a man physical health is a primary condition of his life. But this vital activity (both in man and society) in normal, and especially in improving conditions of the society socio-economic organism functioning cannot be reduced only to the indicated, although the initial, factor. The more stable, perfect and effective the material production sphere, the richer is the society and a person, the more relational becomes the services sphere role and importance and its balanced combination with material production and influence on it. It is an indisputable fact.

It is noteworthy that employment in industry reduction does not itself mean material component of modern economic life role and significance reduction: the volume of benefits produced and consumed by the society does not decrease, but rather increases. Modern production provides the population needs both in traditional and radically new products with surplus; the consumer market of the developed countries is over-saturated with a variety of products and things, and the industry is provided with the necessary mineral and agricultural raw materials. Modern production material basis is and will remain the foundation on which new economic and social processes development occurs.

2) The level of the developed and dynamically expanding services sphere is an attribute of a society that has reached a sufficiently high level of wealth, as well as the well-being of a large part of its population, that is, with a broad middle class. This fact is confirmed (by contradiction) by modern domestic practice: the crisis of material production, which focused on the possibility of at least its “real-product” type ensuring, immediately “disregarded” intangible and budget industries full-fledged development due to financial resources shortage. The situation is aggravated by old management models employment, including at the macroeconomic level.

3) In characterizing the relationship between two spheres of social production the time factor must be taken into account: in the “current time-scale” “non-productive” sphere depends on the material production functioning (including by virtue of secondary income), and in the long-term scale – on the

material production development; its structure and efficiency are largely determined by the services sphere functioning scale and quality (science, education, healthcare, etc. state).

4) Material production itself restructuring is connected, on the one hand, with services share in the sphere of production increase, and on the other hand, with material production development; its process and the results obtained complication requires a wide spectrum of non-production services, including educational and all those which form modern economic growth quality, development.

Thus, further effective development and proper functioning of a society is increasingly determined by the services sector development that promotes transition from the “production of things” to the “production of people”, which is equivalent to a new vision of a human in the modern world and social production importance.

In modern scientific publications on this issue the authors analyze the totality of reasons and factors of the services sector development, which are various in their significance and interdependence. In our opinion, this issue can be deeper dealt with by considering from the development perspective both of material production and of households, as well as by taking into account a number of general economic (and others) factors influence.

The services sector significant expansion and complication in the late XX century was due to several factors:

– *large changes occurred in household that influenced the need for services sphere dynamic development.*

We offer to explore the above factors in more detail:

– *growing abundance, or population incomes growth*, is one of the important factors determining parameters and structure of the services sector development; which is why a well-developed services sector is an attribute of a rich society. This interconnection mechanism is realized through the consumer behavior, considering his income as a means of particular benefits purchasing. It is noteworthy that at the turn of the 1870s – 1880s German statistician Ernst Engel noticed one important pattern that was formulated as follows: “Study of different budgets revealed not only the fact that the lower is the income, the greater its part is spent on the food, but that the food, in addition, is deteriorating; it further revealed that the lower is the income, the greater part of it is accounted for physical content and less remains for spiritual development.”

People’s needs have become more diverse in the modern conditions, and their structure is characterized by complexity. Undoubtedly, services to

a greater or lesser extent are included in all constituent elements of human needs, including physiological ones.

According to Western scientists' estimates, currently around 11 thousand needs, dominated by economic, are satisfied in the developed countries.

Over the last fifty years, the level of per capita income in the developed countries has increased significantly, which resulted in an increase in consumer spending, including specific gravity, which is directed to the various types of services consumption. It is also due to the constant increase of the discretionary income share, i.e. that part of the consumer net income which is intended for spending at their own discretion after the mandatory expenses for taxes and necessities of life.

Thus, in America for half a century, from 1950 to 2000, the share of services costs (within consumer spending) increased from 33% to 58%, including on healthcare – from 4.0% to 14.8%, education – from 0.9% to 2.4%, recreational – from 1.7% to 3.9%, financial services and operations – from 3.5% to 7.7% [101].

Services sector dynamic development and its structure improvement is feasible with the society sufficiently high development and developed needs, and generally is associated with the quality of life phenomenon, since the process of the diverse needs satisfying creates a certain quality of life standard.

Quality of life is a complex synthesizing phenomenon, which refers to the population with their quality of lives in terms of satisfaction different needs and interests.

In the ordinary comprehension the quality of life can be interpreted as the comfort of life.

Quality of life includes a number of diverse components, including the following allocated by the UNESCO Commission on Population and Quality of Life: health; education; rational (adequate) nutrition; stable ecological environment, including housing; security; healthcare; participation in the life of society, necessary services for the society development creation; justice; equality of men and women [142].

It is natural that ensuring a modern quality of life involves a highly developed services sphere that provides the widest range of a wide variety of services.

– *a certain factor encouraging the services sector development and qualitative improvement was free time increase.* Suffice it to say that, for example, in the United States the working week has been reduced from 60 to 40 hours from 1870 to the present. As a result, leisure time increased. A similar trend is typical for all sufficiently developed countries.

It is noteworthy that in the late XIX century the number of working hours per year amounted to 2,900-3,000. Over the past hundred years, the number of working hours in an average year has decreased almost twofold, especially in the US, then in Western European countries and to a lesser extent in Japan. According to Eurostat, since the mid 1950s to early 1980s the average holidays duration in the countries with developed market economies increased from two-three to four-six weeks [101].

This circumstance necessitates constant and accelerated development of various services-providing activities. An increasing number of people are focusing on spiritual growth and physical self-perfection priorities, so, the role and scope of educational, sport, tourist, entertainment and other services has multiplied.

– *mass automobilization* has in a certain way motivated the services sector development. In the period of motor transport accelerated development Western countries territories got covered by a network of car service stations, gas stations, parking lots, motels and other businesses serving a wide range of motorists needs.

– *urbanization process rapid pace* over the XX century, which undoubtedly had a significant impact on the services sector “quantitative” and qualitative state.

If prior to the XIX century the proportion of urban population in the world amounted to only about 3%, over the period between 1800 and 1970 the proportion of the population living in cities increased to 39%, and currently it accounts for almost 50%. In the United States the proportion of urban population increased from 6% in 1980 to more than 75% in 1990. Currently it accounts for about 80% [109].

At the turn of the Millennium the share of the urban population amounted to: Germany – 87.7%; France – 75.2%; Spain – 77.1%; Sweden – 83.2%; Italy – 66.8%; the UK – 89.4% [147].

Modern cities are trade, educational, cultural, scientific, financial, transport and tourist centers. Healthcare institutions, utilities, and firms that provide a wide range of business services, such as banks, insurance, publishing, real estate, advertising, etc. companies are localized in them.

– *demographic changes* also play a role in the services sector development. On the one hand, they objectively determine the services sector scope due to the growth (decrease) of the population, and on the other hand, they determine this sector structure, as the increase, for example, of the elderly people number (which is quite common for the developed countries) imposes a growing demand for medical and recreational services.

New market niche has been opened by American entrepreneurs that are products and services for the elderly, quite a specific and constantly growing consumer group. In all industrialized countries this group is becoming more numerous. Even now there are almost 35 million Americans aged 65 and older. By 2020 a fifth of the US population will be over 65 – and this is 50 million in round figures. Psychologists are increasingly saying that this group of people is gaining more influence in the society and is even able to impose its own style and way of life.

This group of the population, at least in the US, is becoming wealthier. If in the 1960s every third pensioner lived below the poverty line, now only one in nine does. According to available statistical estimates, currently in the USA people aged 70 on average spend more money than thirty-years-old. American pensioners hold half of all credit cards and buy 41% of new cars.

In countries with large proportion of children and young people service activities designed for these age groups of the population with all their specific needs largely determined by fashion race acquire greater development.

– *consumer demand sophistication resulting in the required services expansion.*

Modern society is characterized by consumer demand well-defined and increasing individualization. This applies to services as well the demand for which is becoming extremely diverse one can even say “sophisticated” which determines the trend for the modern range of services (both consumer and industrial) rapid expansion and services quality improvement. The struggle for the consumer money in the services sector is very acute.

– *technological shifts* are one of the most important factors influencing services activities and their sophistication accelerated development, stipulating possibilities of new services emergence, determining traditional services technology qualitative changes, including household (sophisticated clothing cleaning), medical care (complex diagnostics using tomography, artificial intelligence, robotics, 3D printing in surgeries and etc.), etc. Fundamentally new services such as e-Commerce, including electronic auctions, space tourism etc., have emerged and are cumulating momentum.

– *scientific technologies have qualitatively changed the production nature and have organically influenced the services sector.* Thus, information technology rapid development has provoked the following: a) a sharp increase in requirements to the workforce composition and quality, management and marketing level at enterprises, etc. And in turn such specialists training can only be provided by advanced educational sphere, which should provide the

necessary level of qualification; b) material production with complex outfit and sophisticated technology equipment that requires commissioning works process increase and complication, maintenance, servicing centers creation, etc., i.e. servicing activities (internal and external) extension; c) production processes automation, which results in labor productivity significant increase, which in turn will result in labor outside the material production limits absolute displacement and its transfer into the services sector.

In addition, the *softization* phenomenon imperatively demanded the services sector rapid development.

Softization is the process of turning intangible resources (services, society intellectual potential, workforce training level, etc.) into an important factor of economic development. Softization is embroiled with servitization that is the services sector advanced development.

It is obvious that the softization phenomenon imperatively demanded the services sector rapid development. Therefore, the existing opinion that “the society enters the post-industrialism phase when it riches enough to spend surplus on services. The services sector, “white collar”, is separated from the productive sphere and is actually parasitizing it “ [102, p. 74] is debatable. The given thesis proves the views on the non-productive nature of employees engaged in service activities persistence, as well as the primitive understanding of the services sector preservation, which is clearly inconsistent with the modern stage of human society development. If the pre-industrial society was dominated by domestic or personal services, in the industrial society the focus has shifted towards services that had played a supporting role in relation to manufacturing, as well as to financial services. In post-industrial society, preserving all previously existing types of services, the qualitatively new types, which are rapidly beginning to dominate the structure of professional activity, are emerging. In the current environment the words of D. Bell, who, speaking of the tertiary sector noted that “the word “service” should not cause misleading images of fast food and low-paid workers; the main ones are financial, professional and design services, healthcare, education and the social sphere, and only the last in this scale are domestic services “ [75, p. 55] are justified like never before.

The above demonstrates that it should not be about the services sphere dependency, but rather on a more important issue, which a well-known American economist S. Kuznets indicated several decades ago. In one of his works he correctly noted that, despite the services sector dimensions, its contribution measuring is most prone to errors and the data and knowledge of it is too insufficient for an adequate analysis. It may seem ironic, but we know less about the

sector which includes professional groups involved in fundamental and applied knowledge production and distribution, as well as responsible for the major political and social decision-making than about other sectors; and this is not surprising, since an activity, not organized in the form of large-scale repetitive operations, is more difficult to measure and analyze. So far, even in scientific literature, there is no consensus on what areas of economic activity should be regarded as services. Such phenomena as service and services sector require more in-depth study.

The services sector rapid development is, as scientists believe, an indispensable prerequisite for modern structural adjustment of the economy successful completion, as a result of which the so-called new economy, or neo-economics is dynamically formed [31].

Identifying features of the first decade of the XXI century reflect a fundamental shift in the services market. Even without considering them in full, it can be understood why no company can hope for leadership unless it realizes to a full degree why and what in the future world will be radically different from yesterday's world. These differences and changes are primarily due to the following factors.

1. Extended product range offer. Modern market is characterized by many new types of services offer, the assortment of which is increasing every year.
2. Technologies convergence. New technologies and services on their basis are becoming increasingly interdependent and combined. For example, a technological integration of television, cable and wireless communications, computers, and household appliances, phones and software etc occurs. Previously unrelated technologies such as computers, robotics and artificial intelligence are combined, which results in a completely new services production type.
3. Boundaries between sectors and segments blurring. It has become more intense as a result of technologies merger. Industries, where segmentation is difficult to perform are telecommunications, robotics, biotechnology etc.
4. Global competition.
5. Information rapid obsolescence. Such rapid changes in the market lead to the fact that information about services evolution, technology changes, competitors' strategies, consumer preferences, industries delineations is losing its relevance almost immediately. Digital technology emergence has profoundly altered not only the services production and traditional types of services nature, but the relationships with consumers as well. For example, it is referred to customization. This is a new trend of predominantly

Western companies – customization of traditional goods/services to the individual consumers' demands adjustment.

6. Participants great interrelatedness. The activity new nature dictates a new structure of relations with competitors, suppliers, government, consulting, advertising and other agencies, services providers, banks, bulk end consumers etc. Structures that unite enterprises and companies in various industries emerge increasingly. Relations with partners in such structures are built on the network principle.
7. Professionalism growth. Changes in business process engineering are accompanied by changes within companies as well. New technology, other consumer solutions, e-business require high-class professionals, particularly in the management field.
8. Increase in gaps. When combining the above-mentioned factors, the dominant characteristic of the competitive environment is not just changes, but gaps, that is, the transition from the past to the future does not proceed smoothly, but by leaps. The latest products, services, methods of their production, delivery and servicing, changes in relationships with partners and customers, innovative methods of communication dramatically change the market nature and force competitors to act differently and make other decisions [1].

Thus, the services sector position in the economy extension as one of the most important structural patterns of the world economic development is due to the fundamental laws close interactions, which are productive forces and the “elevation of needs” progressive movement to the economy and social conditions extent and standard of living and education complication. Addressed and a number of other traditional long-term causes and factors of the services sector development in the late XX century were substantially augmented by new processes and phenomena impact that have accompanied economics into the modern stage of social development introduction. Their cumulative effect is radical changes in a number of basic, generic characteristics that were considered inherent to the services production and its product.



## CHAPTER 3

# TENDENCIES AND PROSPECTS OF SERVICE SECTOR MODERNIZATION

### **3.1. Qualitatively New Provision of the Service Sector in the Global Economy Generation Process**

To date, it has become evident that a society development state is directly dependent on technologies it uses at one or another historical period. Thus, the early XXI century was marked by the fact that a huge number of the world's population gained access to the unlimited information stream and media space phenomenally quickly due to which the Internet has been developed into an independent industry. Increasing a personal computer as a universal means of activity and communication availability popularization as well as the global computer network at the end of the last century rapid growth caused enormous changes in the mankind cultural landscape. Now this industry not only yields billions of profits, but forms worldview of billions of people on the planet.

Humanity is increasingly dependent on the Internet, a familiar version of which appeared in 1991. It took 50 years for radio to become a universal information system, it took thirteen years for television and the Internet broke all the previous records – it became public in just four years having existed in the “cyberspace underground” of scientific organizations for almost a quarter of a century [81].

It can be confidently asserted that modern info-communication technologies have become the foundation of all areas of material and non-material activities production cycle. High technologies progress causes economic growth and human capital, which is responsible for knowledge generation, acquires strategic importance not only for each country economy, but for its social institutions survival as well.

World community into the globalization era penetration has “mixed” the economies, realigned the state sovereignty concept approach and destroyed the borders for finance and information ... All these factors required a whole range of fundamentally new type measures associated with “information security” notion.

According to different estimates over 120 countries actually deploy or are developing different types of informational weapons. First and foremost, it is weapons of information and technical impact, primarily aimed at computer facilities unauthorized access and disruption, development. Information security products are being intensively developed. Whereby the latter, for obvious reasons, have to be dealt with by the countries that do not plan to conduct offensive informational operations but have a well-developed information infrastructure.

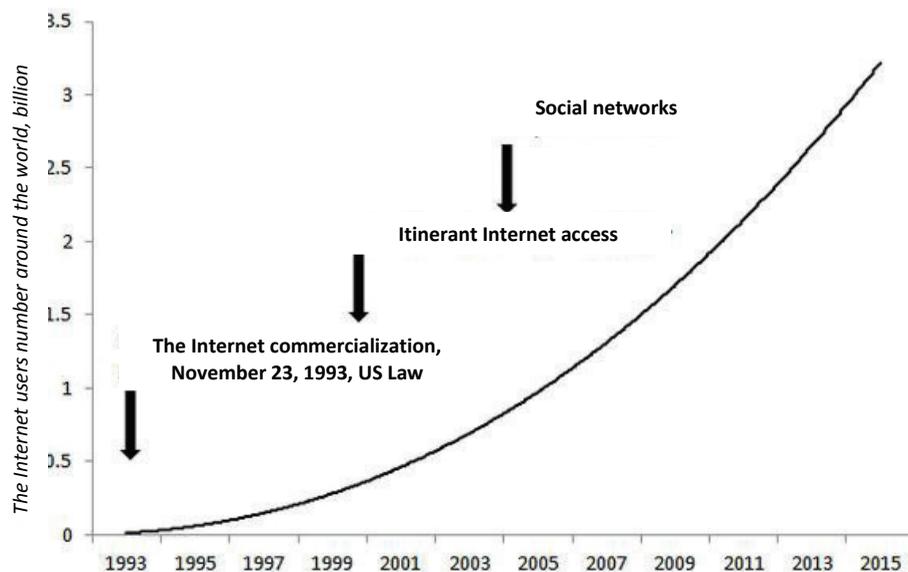
Globalization should certainly be considered as the most important trend in the modern world development. All areas of social activity computerization, information systems of various states into a single global informational sphere integration, single informational space formation, global information and telecommunication networks creation and new informational technologies in all areas of human activity intensive introduction have formed its technological basis. Informational technologies development affects business, management and training policies and guidelines as well as has formed the basis for “Revolution in Military Business” [163].

Historical journey to the past proves that any form of information exchange and flow acceleration destroys conventional traditions as well as necessitates the society fragmentation. So it happened with writing, book, telegraph, telephone, radio, television and now it is happening with the Internet. At present parallel worlds, which are filled with different content, cause different reactions and emotions in people belonging to different social groups and cultures, have been formed in its informational environment.

The New Era key realities are robotic technology rapid development, global communication connectivity and technological breakthroughs in computerization, which have resulted in the fact that the Internet’s informational environment has become a global all-encompassing social network with all those participants who use modern means of communication in one way or another.

It should be noted that electronic means have not yet completely superseded books, newspapers, letters, announcements and other paper-based media. Nevertheless, according to B.S. Karryev [81] as soon as wires connecting computer’s processing unit to the information input/output devices disappear the line between personal computer and TV, radio and mobile phone will disappear

as well, and with electronic paper in everyday life introduction this line with a man's faithful companion, i.e. a book, will also vanish.



**Figure. 3.1. Main Stages of Public Internet Development and its Users Number around the World [81]**

More and more print media are becoming available in digital format. According to Pew Research Center study, almost half of Americans using the Internet obtain news information from social networks. Google has been implementing a project to digitize and search for books since 2004. Within its scope about 15 million digital books were available by 2010. Facebook, the largest social network, started to create “Instant Articles” platform for newspapers and magazines in 2015. In the long term this project is capable of shifting the entire media space image.

Web broadcasting and web television advent has become another milestone in the Internet history having transformed computer networks into a powerful tool for social processes influencing. As correctly noted by Herbert Marshall McLuhan, copying machines gave everyone the opportunity to become a publisher (1964). The Internet has enabled every user to become a civil journalist.

By virtue of new mass communication tools such as Web pages and Web Broadcasting the Internet information environment has started to expand rapidly. By the turn of the new century Internet technologies and global telecommunication

networks made sending, receiving, processing, and broadcasting information to the whole world in close to the real time mode possible for everyone.

New digital technologies offered interactivity and possibility of diverse data both between people and an individual with the society almost instantaneous exchange instead of fixed telephony, traditional radio and television. Thus, a new stage in the mankind development was defined. The Internet has evolved from an environment in which information was sought or exchanged into a mass communication means that began to be used for communication, access to audio and video files, entertainment and games.

About 6.3 billion people lived on the Earth, and 500 million devices were web-connected in 2003. In 2010, as a result of smartphones and tablet computers rapid spread, the number of web-connected devices increased to 12.5 billion, while the Earth population equaled 6.8 billion people. By mid-2013, the number of people using the Internet through various devices exceeded 2.5 billion. According to National Science Foundation forecast, the number of Internet users will increase to 5 billion by 2020.

Cloud technologies active application, which has become one of the main market trends in recent years, should be emphasized. To date, even large companies are willing to carry over data files and automate business processes by external to the corporate IT infrastructure services either private or public utilization. This makes possible to significantly cut the infrastructure capital costs, as well as increase processes flexibility and accelerate various innovations within the company, including, inter alia, new products and services launch. Despite the tremendous popularity of such services, disputes over existing systems to the cloud environment conversion expediency, reliability, security, as well as cloud resources application cost effectiveness, still persist.

Cloud technology is a convenient storage and processing environment that combines hardware, licensed software, communication channels, and technical support for users.

Cloud technologies peculiarity is not attachment to any hardware platform and geographical territory, but the scalability potential. Any client can operate cloud services from anywhere in the world and from any device having access to the Internet, as well as quickly respond to the enterprise changing business tasks and requirements of the market.

Medium and large companies, as well as governmental organizations, independent suppliers and service providers currently apply cloud infrastructures to create private and public clouds and deliver cloud services.

Cloud computing principle is as follows: in a cloud environment a self-managed virtual infrastructure is organized into pools which allow creating shared resources used as a service. Such model enables convenient network access to a common pool of customizable resources and provide the data on demand. Quick allocation and releasing resources with little management overhead or minimal service provider involvement are also available.

Cloud technologies provide quick access to a variety of IT resources and cut costs to the level that corresponds to the actual resources consumption. Change-over to cloud infrastructure provides organizations means for prompt projects launching and new opportunities exploiting at this increasing revenues and quickly responding to the market changes. At the same time IT service ceases to be a cost center and begins to play a strategic partner role.

Difference between standard and cloud models is shown in Fig. 3.1.

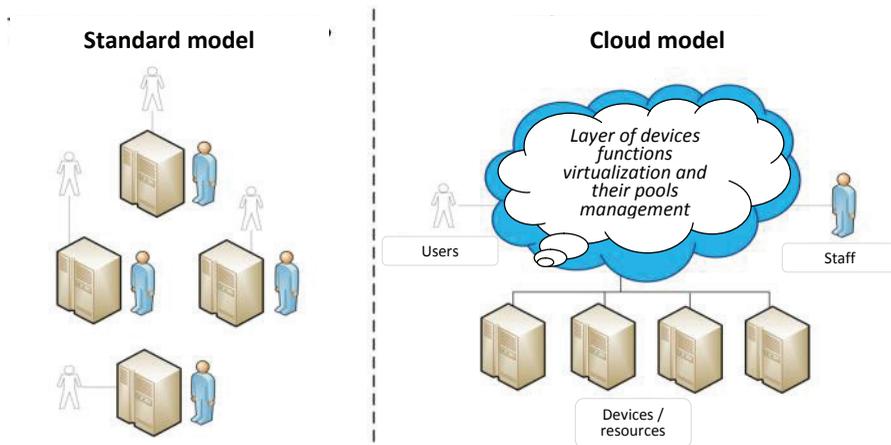


Figure. 3.2. Difference Between Standard and Cloud Models [107]

Three cloud computing servicing models are available:

1. SaaS, Software as a Service. Consumer is provided with software tools that are the provider's applications running on a cloud infrastructure.
2. PaaS, Platform as a Service. Consumer is provided with means to roll out on a cloud infrastructure of consumer-created or purchased applications that are developed by means of provider-supported tools and programming languages.
3. IaaS, Infrastructure as a Service. Consumer is provided with means of data processing and storage, networks and other basic computing resources on

which the consumer can roll out and operate undefined software, including operating systems and applications [156].

In addition, 4 models for cloud computing rolling out are available (Figure 3.2):

- Private Cloud – for use by one entity,
- Community Cloud – for use by a specific consumer community,
- Public Cloud – for free use; as well as
- Hybrid cloud – that is a certain combination of various cloud infrastructures.

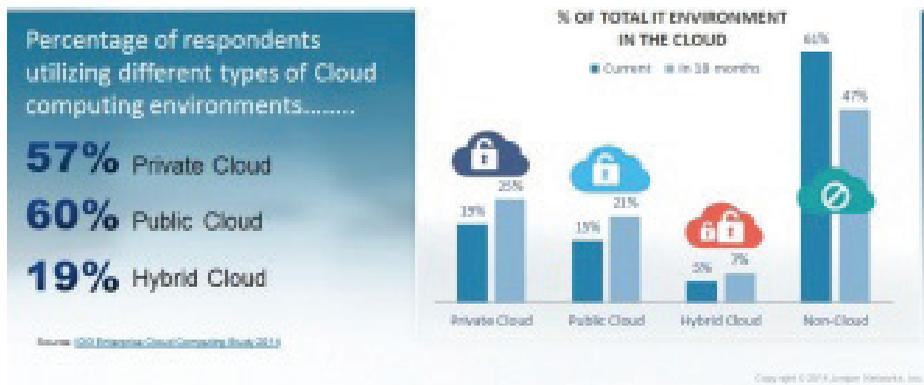


Figure. 3.3. Cloud Technologies Operating Structure,% [107]

On February 22, 2017, Gartner Analytical Company published market research results of the world cloud services provided to a large number of customers by public data centers. Expenses there increased by 20% due to the infrastructure services (IaaS).

Gartner estimates that the total cost of consumers and companies on public clouds amounted to \$209.2 billion in 2016 against \$175 billion in 2015. Sales of IaaS solutions grew by 56% to \$25.3 billion, spurred by a growing demand for IT infrastructure services to the cloud rebasing as well as high-performance workloads like artificial intelligence, the Internet of things and analytics.

**Table 3.1 Cloud Market Development Forecast, 2016-2020 [5]**

	2016	2017	2018	2019	2020
Cloud Business Process Services (BPaaS)	40,812	43,772	47,556	51,652	56,176
Cloud Application Infrastructure Services (PaaS)	7,169	8,851	10,616	12,580	14,798
Cloud Application Services (SaaS)	38,567	46,331	55,143	64,870	75,734
Cloud Management and Security Services	7,150	8,768	10,427	12,159	14,004
Cloud System Infrastructure Services (IaaS)	25,290	34,603	45,559	57,897	71,552
Cloud Advertising	90,257	104,516	118,520	133,566	151,091
<b>Total Market</b>	<b>209,244</b>	<b>246,841</b>	<b>287,820</b>	<b>332,723</b>	<b>383,355</b>

As is evident, SaaS (software as a service) segment showed a rather large growth rate (23%) in 2016 as well and amounted to \$38.6 billion. Stabilization period begins on the world public clouds market. In 2017 growth rate will reach the peak of 18% and will decline the following years.

The study also states that PaaS solutions (platform as a service) introduction was estimated at \$ 7.2 billion in 2016 compared to \$ 3.8 billion a year earlier. Revenues in cloud advertising segments, BPaaS services (business processes as a service) and Cloud Management and Security Services totaled \$ 90.3, \$ 40.8 and \$ 7.2 billion respectively.

In general advantages of cloud technologies application can be summarized as the follows:

- 1) More rational application — virtualized resources are merged into pools ensuring the full capacity of physical infrastructure application.
- 2) Increased flexibility — IT resources can be allocated on demand and quickly returned back to the pool.
- 3) Rapid scaling — instantaneous additional compute resources allocation to meet business requirements during peak times as well as during increasing or laying off the entity structure.
- 4) Cost saving — the pay-as-you-use model cuts infrastructure, electricity and maintenance costs.
- 5) Improving IT performance — automated resource through self-service portal allocation.

- 6) Idle inputs reduction – transparent methods of pricing, measurement and distribution of costs between departments allow IT administrators identify potential areas of costs cutting.
- 7) Efficiency of investments in IT infrastructure growth.
- 8) Information resources security and protection improvement [48].

In 2009 Gartner included cloud technologies in the top ten relevant. Since then discussions on the cloud computing issue have not subsided. Gartner believes: “If there was a list of the most advertised technologies cloud computing would win the lead”. But analysts believe that cloud technologies will change the situation not only in software platforms and services segment, but in information and business processes sectors as well.

The main trend of the cloud market in Western countries is the customers need to buy cloud services in a “package”, the so-called “bundle”. That is, consumers, having recognized the cloud advantages, ask to provide them with a whole package of services payable by one bill, for example, CRM, HR and telecommunications services.

Forrester analytical group predicts that the global cloud computing market will grow from \$ 35 billion in 2011 to about \$ 150 billion in 2020. Clouds will become a critical part of IT infrastructure in many organizations.

In addition, cloud-supporting technologies will be developed and a rapid increase in computing power will make cloud projects even cheaper, so as a result they will become mass technologies which are currently being introduced only on supercomputers.

And of course by 2020 generational shift will take place in organizations. CIOs, grown up in the days of cloud tools application, will appear. They will be much more willing to apply enterprise-wide clouds.

The authors of the “Cloud Dividends — 2011” report of Center for Economic and Business Research (CEBR) [7] argue that by 2015 due to cloud computing the developed European countries economy will receive an additional EUR 177.3 billion per year. The report, commissioned by EMC, was the first of its kind to assess cloud computing value for the five largest economies in Europe at the macroeconomic level. Significantly that the vast majority of these funds, according to the study, will be provided through private and hybrid cloud computing models development.

CEBR estimated that annual economic effect of cloud computing in the context of each country in 2015 will account for:

- in the UK — EUR 30.0 billion;
- in Germany — EUR 49.6 billion;

- in Spain — EUR 25.2 billion;
- in Italy — EUR 35.1 billion;
- in France — EUR 37.4 billion;

It is noteworthy that the amount of EUR 177.3 billion can cover loans granted to some debtor countries of the region such as Ireland (EUR 85 billion) and Greece (EUR 110 billion), and will help the British Government to implement the plan to reduce Governmental spending by EUR 95.7 billion during four years, which it recently announced.

Cloud computing is a new approach to IT, whereby technologies become available to businesses to the required extent and on demand. This accelerates time-to-market of goods, removes traditional barriers to launch and allows companies to take advantages of new business opportunities. By stepping up competition, this direct effect of cloud computing will have a huge impact on the market structure in many sectors of the economy, and, consequently, on global macroeconomic indicators, CEBR states.

CEBR believes that cloud computing will become an important factor in economic growth, competitiveness and creation of new businesses across the Euro Area. This underlines this technology for the economic recovery of the region importance in particular given the growing threats posed by the emerging economies that traditionally benefit from more intense competition [82].

In this regard the fact should be mentioned that in 2011-2013 under the auspices of the British Government, a Foresight for national industry development until 2050 was worked out where the main directions of the “new” industry formation were identified, existing and only emerging technological drivers of cardinal transformations were outlined, tasks of State policy in connection with re-industrialization on new technological basis were set.

Among the main technological drivers of the “overall nature” are:

- · Information and communication technologies;
- · Sensors;
- · New materials;
- · Biotechnology;
- · “Green” technologies.

Specifically, the following were identified as advanced new technologies:

- · Large information flows processing and “smart” automation;
- · Cloud technologies;
- · 3D printing;
- · Autonomous robots;
- · Internet of Things;

- · Mobile Internet.

According to British experts, these technologies into supply chains integration will result in fundamental shifts in products design, production and utilization processes, namely:

- · Blurring the boundary between production and services;
- · Manufacturing flexible spatial layout and “customization»;
- · Consumer goods and services personification;
- · Closed cycle production chains formation.

It should be noted that global markets configuration is currently undergoing major transformations: many traditional industries (e.g., hydrocarbon production) are losing their importance in the world economic system structure against the backdrop of new sectors, oriented at expanding opportunities to meet current demand or generating radically new needs for the end user, rapid growth.

These changes in its structural composition affect the established chains of value added: links in which a significant share has usually been accumulated (for example, traditional retail). These chains are significantly transformed by new entities, platforms and customizations that directly connect supply and demand. Thus consumer becomes a participant-co-creator, a customer of the product, who is increasingly involved in the consumption process.

Consumption customization and product life cycle shortening result in centralized links in the economy to the open networks rebasing, which unite suppliers, companies from related branches of economy, consumers, as well as competitors into unified innovative ecosystems. Consumers are becoming a key part of this innovation process within the modified “co-production” model framework, which determines the need for business community arranging for new industries development and level of society’s readiness to perceive scientific and technological progress achievements improvement.

Importance of “knowledge-driven economy” and intellectual capital as an economic growth driver increase results in innovative changes in the process of goods and services production organization both within individual companies and global value chains framework. Modern companies are simply forced to reorganize their business models in order to increase globalization negative effects resilience and meet rapidly changing and differentiated demand on multiple market segments. The growing interconnection between economies results in an open single market space for goods and services, human capital, investment and innovation formation.

A whole system of global challenges, timely identification and recording of which is the key to sustainable economic growth, population quality of life

improvement and national security ensuring, is these changes driver in the economy and society. These include climate fluctuation, demographic shifts (in particular elderly population proportion increase), urbanization, consumption individualization, food and energy security, and profound changes in society's perception of scientific and technological progress.

All the above noted indicates that a new technological paradigm due to technology convergence, digitalization and production of goods and services "somatization" occupies a special place in this list, which forms a fundamentally new opportunities landscape for both consumers and producers. Under the introduced innovative technologies influence production process becomes more adapted to the end consumers' demands, thus forming competitive demand in all its diversity. In such a case goods and services with fundamentally new properties and low cost of scaling production becomes possible.

Thus, in this context, additive manufacturing technologies and their potential future applications should be mentioned in more detail.

Additive Manufacturing (AM) is a class of advanced technologies for complex shape parts customized production according to a three-dimensional computer model by material sequential application (as a rule, layered), as opposed to the so-called subtractive manufacturing (e.g. traditional machining).

According to the joint study of European Aeronautic Defense and Space Company and EOS Innovation Center raw materials economy with AM application can reach 75%. Due to all these qualities AM, in comparison with traditional manufacturing technologies, possess considerable potential in terms of cost-cutting, energy conservation and harmful emissions to the atmosphere reduction.

Additive technologies unique features provide for the following advantages:

- Reduction of time and cost of a product into manufacturing launch due to the need for specialized tooling equipment lack;
- Small-lot manufacturing possibility and economic expediency;
- Economic feasibility of customized products manufacturing;
- Design operative adjustments at manufacturing stage availability;
- Products functional optimization (e.g. optimal form of cooling lines introduction);
- Production losses and wastes reduction;
- Possibilities for logistics simplification, delivery time cutting, warehouses stocks shortfall;
- Design personalization [5].

Now there are fewer skeptics as to the prospects for additive digital manufacturing development. Imagine that in parts with 3D printing manufacturing

technology long-term development, application of multi-axis machines with sophisticated operating programming, highly skilled personnel, design and use of equipment, availability of injection molding shop for billets, mandatory control of blanks and finished parts, complex logistics, etc. will no longer be required. Additive technologies in combination with other components of Industry 4.0 can significantly shorten logistics operations terms, whereas now traditional machining processes occupy on average less than 5% of the manufacturing cycle, and 95% account for intra-plant and external logistics.

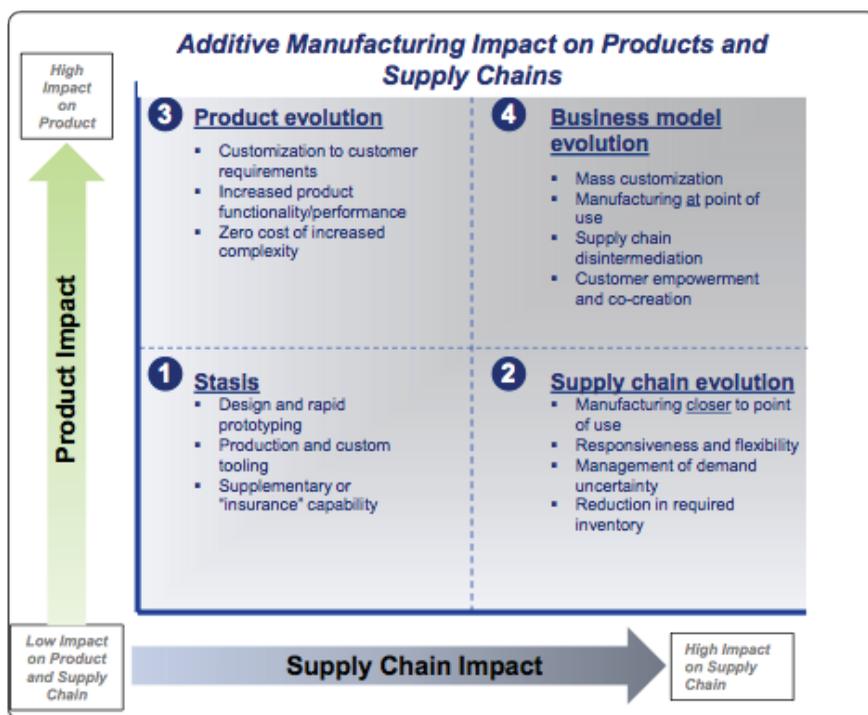
Digital manufacturing is expected to replace some kinds of mass manufacturing in the next 20 years, especially in the fields with high final cost of manufacturing. According to the Industry 4.0 concept manufacturing of the future will not have a large equipment range. They will be built on flexible manufacturing cells basis as a part of cyber physical systems. The cells and systems will be adapted to a specific order by reprogramming, changing production modules, equipment, tools, materials, redirecting logistics flows – all of which will happen within the minimum period of time. Such production centers of the future will have a developed network, be built literally by complete technical and technological cloning and close to the main spots of products consumption.

Additive technologies allow modern production to migrate from product to service segment as well. According to experts, they most likely will take their place in the service segment, reflecting one of the main trends in the modern industrial technologies development, i.e. customization products for consumers.

Summing up the above, it can be argued that additive technologies are one of the main world trends mentioned in the new industrial revolution context. Along with that, a unique case when the additive manufacturing sphere became a story about its poly-variety, about how the technology outstripped possible scenarios of its application is observed. All advanced industrial community is aware that an extremely promising base technology is available, but its application remains an open issue.

3D printing refers to the category of so-called “explosive” technologies (Christensen, 2007), which have not only improved individual technological processes, but have radically changed the approach to manufacturing and business by creating new products and new markets. This is exactly the case when competition can move from resources or the end product competition phase into business models competition phase.

Deloitte’s experts (2014) point of view is that additive manufacturing is an innovative technology that significantly affects not only the product itself, but the ways of its production and distribution, which somehow results in economic entities business models evolution.



**Figure. 3.4. Additive Manufacturing Impact on Product and Supply Chains (Deloitte, 2014) [70]**

It is supported by the consonant statement of a BP Company, which is one of the main oil and gas market players, expert. Delivering his annual extended forecast, BP Chief Economist Dale Spencer said: "I think one of the things that can be really revolutionary is additive manufacturing, including artificial intelligence, 3D printing, and so on. Suppose the additive manufacturing is really going through unprecedented takeoff. More and more things are produced by means of 3D printing. At that time, all conventional trade, as well as all established supply chains evaluate radically. If I need anything, I don't order it from the other part of the world, and then wait a long time for manufacturing and delivery, I just print it on-site "[176].

The market is optimistic as to the new technological achievements. 3D-technologies in the production cycle of most spheres of economic activity full introduction is a matter of time. Active scientific researches on their application are conducted in the world. Certain limitations associated with additive

manufacturing exist these days: equipment and materials high cost, materials narrow option, large initial investments are among them – but these problems will eventually become less acute. Additive technologies potential is really huge.

According to Wohlers Associates 38% of the global additive technology industry accounts for the USA, Japan ranks second with 9.7%, followed by Germany with 9.4% and China with 8.7%.

This market, which in fact has not yet been formed and has no clear boundaries, annual growth varies in the range of 20-30%. Thus, in its annual report Wohlers Associates, the leading consulting company in 3D printing industry (Wohlers Report 2017), reported that additive manufacturing industry grew by 17.4% in 2016 (by 25.9% in 2015) and now accounts for over \$ 6 billion. In 2014 3D printing systems were produced by 49 companies, last year the number of manufacturers increased to 97. Experts give the most optimistic forecasts — according to Context market research company, additive manufacturing market will reach \$17.8 billion by 2020. The Boston Consulting Group analysts have considered: if companies succeed in 3D printing introduction on at least 1.5% of their total production capacity by 2035, then the market volume will exceed \$350 billion by this time.

Dynamically flourishing additive 3D printing technologies are used in progressive industries. Several innovative types of additive technologies are available:

- 1) FDM (Fused deposition modeling) – the product is formed layerwise from a melted plastic filament.
- 2) CJP (ColorJet printing) – the world’s only 3D full-color printing with the principle of powder consisting of plaster gluing.
- 3) SLS (Selective Laser Sintering) – laser engineered net shaping technology that produces particularly strong objects of any size.
- 4) MJM (MultiJet Modeling) – multi-jet 3D modeling through photopolymers and wax use.
- 5) SLA (Laser Stereolithography) – layerwise liquid polymer solidification by means of laser.

We bring to your attention some examples of additive technologies modern application in:

- construction;
- agricultural industry;
- mechanical engineering;
- shipbuilding;
- aerospace industry;

- defense industry;
- science;
- education;
- medicine, etc.

Thus, buildings and various structures additive construction possibility significantly reduces development time. Even today 3D printed construction is in the trend around the world. Experiments performed on 3D laser printers seem unbelievable for ordinary people.

The following positive aspects in construction by means of additive manufacturing should be highlighted:

- time and financial costs saving (construction rate within days, costs on logistics, consumables and large number of staff recruitment cut);
- any design decisions and complex geometric forms introduction;
- buildings with due account for seismic resistance in zones prone to earthquakes and hurricanes construction possibility [8].

Farmers around the world are known to be constantly dependent on the weather. Extra-period shower rain or chronic drought season can damage or destroy crops. For this reason, environmental incidents are vital to be monitored by means of accurate climate forecasts. Thus, Science Museum of Virginia staff has developed a cheap meteorological station that will be affordable even for the developing countries residents. Scientists have connected PVC tubing and solar panels by means of 3D-printed parts. The new meteorological station costs only \$400 compared to similar factory designs of \$15,000. Scientists claim that forecasts quality at this remains very high. These stations are reported to become popular and already erected by farmers around the world.

Agricultural implements as well as drones manufacturing is increasingly gaining popularity. Thus, for example, Italian company Soleon applies 3D printing in pest control drones manufacturing. Printed of polyamide drone is equipped with the real biological weapon, that is with *Trichogramma* colonies. These insects destroy corn borers eggs and larvae without corn crops damaging.

Proximity Designs has developed a system for plants watering and assembled it of 3D printed parts in 3D Printing Studio in the capital city of Myanmar. In particular, a pump operated by solar energy was printed. Farmers liked the new development — they significantly saved on labor costs, and crop yields doubled [134].

As for the aerospace industry, this sphere has been showing a keen interest in additive technologies since their emergence. The ability to eliminate a lot of restrictions on the path from design to production allows design solutions

that increase efficiency and at the same time reduce the parts weight introduction. In addition, it should be noted that by its very nature this market requires high-quality parts small-scale production, so disposal of tool-holding equipment proposed by AP-technologies brings significant benefits. At the same time certification requirements in this area are very tough. Nevertheless, a number of systems and materials have passed certification, and in 2016 additive technologies were used for aircraft parts small-scale production.

In particular, Materialize (Belgium), one of the leading service and software for additive manufacturing providers, successfully deals with plastic parts 3D printing for the new A350 XWB airliners under the Airbus order. As repeatedly expressed by Airbus representatives, during A350 XWB development emphasis on high technology systems and components as well as easy maintenance and fuel efficiency of the aircraft was made. It should be no surprise that many liner components are manufactured by means of additive technologies application.

Software solutions for 3D printing development and distribution, a range of services for such industries as healthcare (biomedicine, surgery, orthopedics, etc.), automotive, consumer goods, etc. provision are among the main Materialize activities. A significant part of the Company's income is yield by production segment, including service [103].

Almost any new technology finds application in the defense industry. It happened with 3D printing as well. It has been widely applied in weaponization. When Cody Wilson presented his Liberator plastic gun it caused a rush of indignation. His invention meant that every user having a home 3D-printer and Internet access can create his or her own firearms. Later it turned out that not only plastic can be used for such kind of pistols production. By means of lasers and electron beams more advanced printing systems are capable of creating alloys from metal powders and produce complex objects by layering. Thus, 1911 semi-automatic pistol which looked identical to conventional firearms and could fire a real shot emerged [4].

National Institute for Innovations in Additive Industry (America Makes) was created in 2012 in the United States; its aim was integration efforts of American companies and scientific community working at advanced production technologies. The total cost of the project amounted to \$70 million, with \$30 million invested by the Government. The main curator of the Institute is the US Department of Defense, that is why the created accelerator supports innovative developments related to the military sphere as well. For example, such as 3D printed RAMBO grenade launcher [48].

Another impressive success in this area is Boston Dynamics' robot created by means of additive technologies, which demonstrated remarkable ability to move and communicate with people. In addition, it should be noted that footwear is an important component of a soldier's uniform and now comfortable boots with regard to individual size and anatomical structure of the foot features creation has become possible. Producing a file in the computer-aided-design program (CAD) and sending it to print will be enough. The same is true for the uniform, which can further be incorporated with electronic sensors for a fighter health status monitoring. In the context of medical surgery 3D printing will support in creating lightweight and monolithic exoskeletons or individual body parts.

Ultimately, this technology involves more positive effects. Additive printing in defense industry introduction biggest advantage will become logistical problems lack. The need for goods long transportation by means of trains, trucks, ships and air transport will disappear. Electronic computer file containing all necessary information about the structure of parts and materials used sending will be enough [4].

As to the automotive industry, additive technologies due to their relatively high cost and low performance for the time being are primarily applied in motorsport.

In mass automobile manufacture to date they are applied for prototyping and tooling that enables companies to shorten development and production cycles. Daimler AG (Stuttgart, Germany) experience, which in partnership with Concept Laser and the Fraunhofer Institute of Laser Technology have replaced expensive and long-term casting into chill molds and sand molds processes, used to fabricate large functional metal parts, by AP-process which allowed to optimize the parts geometry and achieve weight reduction, can be considered a successful example.

Additive technologies in automotive industry application future prospects have been demonstrated by Local Motors, which by means of 3D printing has manufactured the first adapted to travel car – two-passenger electric car, called Strati [5].

Shipbuilding industry, which is considered to be conservative, however, is inevitably enlisted into the 3D world. Three-dimensional scanning and printing possess a unique potential, as they are capable of complicated spatial shapes and objects reproduction. It is an opportunity to achieve significant results in production process optimization in shipbuilding and ship repair industry. Additive technologies enable to cut product cost and spending, save production time and, ultimately, increase the enterprise income.

3D scanners are used in shipbuilding and ship repair for problems of geometry control, operational control, control of tooling, and reverse engineering solving. By means of 3D scanning methods such processes as production, hulls repair and modernization, assembly and welding works, internal communications laying, mechanical-installation production can successfully be solved. As a result, due to high-precision measurements, optimizing units, parts and structures of a vessel, shortening production time and final product quality improvement become possible.

As for 3D printing, it is capable of effecting a real revolution in the shipbuilding industry. Nowadays small parts, prototypes, as well as some parts repairs are 3D-printed. In the future they will be capable of solving such urgent problems as spare parts transportation and storage. The defective part will be easy to scan and print on board, and print materials will be stored in a compact form on the ship. Thus, the logistics chain will be shortening; extra load of the ship will be reduced and useful area will be increased.

Leading shipbuilders (for example, Hyundai) are investing in parts serial 3D printing. CJR Propulsion (UK), which manufactures customized steering equipment and propellers, is one of the many shipyards that print finished products and test models prototypes by means of 3D printers [177].

Additive technology is also successfully applied in science, for example for prototypes manufacturing. Such prototypes are popular among scientists in various fields, including atomic and nuclear physics. Thus, Oak Ridge National Laboratory, a member of the American ITER development team, has proposed to use 3D printing for the reactor parts design in order to save budget. According to American engineers, physical models study will enable to avoid mistakes, detect materials saving possibility and develop more functional designs. In the process of the reactor large parts designing, the developers create “toy” models. As for the smaller parts, such as a high-speed gas valve for malfunctions in a reactor mitigation system, they are printed at one to one scale [82].

Additive technologies in education are not a distant future but an upcoming reality. These technologies in higher and secondary education are already being actively introduced.

According to WorldSkills International Organization, mid-level specialists and skilled workers of the following specialties and professions will be most in demand in the next five years: set-up operator, welder, chemical laboratory specialist, construction electrician. They might directly face additive manufacturing realities in the near future. Even now, educators need to orient students to the in-demand occupations and prepare for modern innovative technologies skills in manufacturing process applying.

Additive manufacturing technologies development “pulls” for a whole string of necessary knowledge in computer modelling, physics, mathematics and programming. Thus, 3D printing is a powerful educational tool that can adopt a student to the habit of not using ready-made things but of learning to design and implement by himself. Study of this technology in educational process introduction will become a necessity for educators themselves who will be able to create three-dimensional visual aids for better material mastering, as well as for students for individual, group design work fulfillment and their scientific and applied ideas realization. Original projects implementation, practical designs and layouts, 3D printing and creative abilities and skills development will become possible.

Note that highly qualified specialists with additive technologies competence are on acute demand. Such professions as a project developer, design engineer, architect and designer also require these competencies formation. In this regard, considerable requirements are applied for training specialists of all social production areas, and hence arises the necessity of higher educational institutions activities modernization taking into account modern technological and methodological approaches of educational process organization: 3D-modeling courses in bachelor’s and master’s basic educational programs introduction; competitive scientific and educational environment that will promote innovative activity and students as well as universities scientific and pedagogical staff creative initiative growth stimulation, creation.

Forming students’ competencies related to additive technologies application will enable them to explore prototypes development process starting with 3D objects computer modeling to their 3D printing, apply the acquired skills to operate technological equipment in other areas of activities and, consequently, become more competitive on the labor market [18].

Additive technologies in medicine application is a separate issue. According to SmarTech Company report “3D Printing in Dentistry: Existing Possibilities and Prospects for the Next Decade Analysis” (2015), the market for 3D printing in dentistry will reach \$ 3.1 billion by 2020. Study of AP-manufacturing development was carried out in three sectors where these technologies application has demonstrated the most rapid and qualitative growth — it is about jewelry, medicine and dental prosthetics. Today 3D printing technology has reached a qualitatively new level (both in terms of equipment and materials), allowing to create relatively small quantities of complex products with a high degree of accuracy, which meets the listed sectors specific requirements.

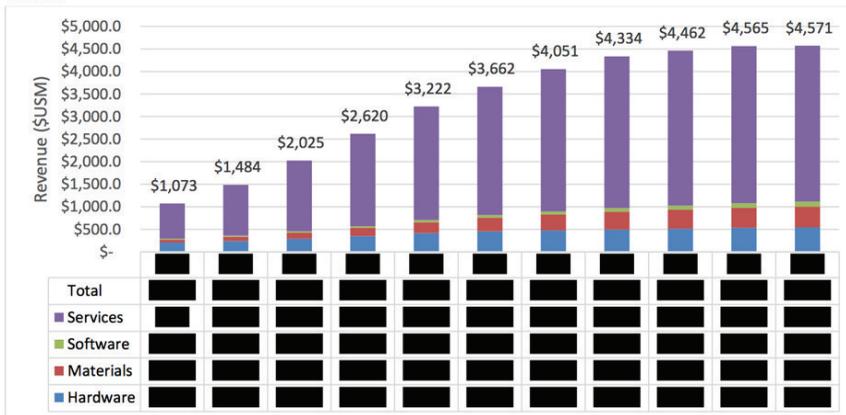
As noted in the report, comparative advantages of 3D scanning, 3D modeling and 3D printing tools are increasingly applied by the dental industry. Recently more industrial models and materials for 3D printers for this sector are produced and their quality continues to grow; software and scanning technologies have already reached a high enough level. Effective integration of all these components into a single system enables to offer a full range of high-quality dental services. Dental laboratories worldwide apply additive technologies to create accurate anatomical models of teeth and gums, dental implants, mouth guards, orthodontic screws, aligners (hyaloid braces), dentures, and appliances for surgical dentistry.

According to SmarTech assessment, today market volume of 3D printing in dentistry is approaching \$ 780 million in revenue from frames for dental crowns and bridge works made of medical alloy (cobalt-chrome), tools for aligners production, molds for dentures casting, dental casts, etc. manufacturing.

Significant dental services improvements introduced by 3D printing will provide a high degree of this market penetration. According to SmarTech forecast, share of application of additive technologies in dental products manufacturing in the next ten years will reach 60%.

3D Systems, Argen, BEGO, Concept Laser, DWS, EnvisionTEC, EOS, Prodways, Stratasys / Solidscape are among 3D printing market leaders actively developing this sector.

**Exhibit 1-4: Total Dental 3D Printing Market Opportunity by Sector, 2014-2024**



Source: SmarTech Markets Publishing

**Figure. 3.5. 3D Printing in Dentistry Market Volume, 2014-2024. (billion US\$) [104]**

According to analytical review, revenues from equipment and materials for 3D printing as well as specialized products for the dentistry needs manufacturing will reach \$ 3.1 billion by 2020, at that as early as in 2016 this amount will exceed \$ 2 billion. It is also noted that total sales of industrial 3D systems to dental clinics and private specialists, currently amounting \$240 million, will be doubled by 2020 [104].

In particular, 3D printing is already successfully applied to create such customized products as ALDs and hip and knee joints implants.

For example, operations on titanium- printed individualized implants of hip joints implantation are already underway in St. Petersburg. Prospects are associated with biological material, including stem cells, possible cultivation.

A 3D-printed titanium implant, manufactured on the bases of compute tomography data, accurately sizes up the patient's bone. Early tests of individual "printed" joints use demonstrated surgery time and rehabilitation time reduction, and the implant improved functionality was also noted.

Given the market volume (\$15 billion), Gartner predicts that hip, knee and other implants created by means of additive technologies for endo - and exo-prosthetics will be widely used in 2-5 years.

It should be emphasized that 3D printing main application for many years has still been prototyping, but in the next 2-5 years, according to Gartner forecasts, the situation will change significantly, and not only with technical characteristics of 3D printers improvement.

A wide range of services will be provided for parts repair and manufacturing by 3D-printing services providers [105].

It can be confidently asserted that due to additive 3D technologies 2016 became a breakthrough period for medicine. Medical services quality increased significantly. Additive process affected several healthcare areas and this reduced mortality among patients in need of quality and urgent medical services. Advantages of additive 3D printing in medicine application are:

With tomographic images a high precision printing of pathological organ to explore intricacies and nuances of the forthcoming operation has become possible.

Note that in this respect, transplantology has leaped forward as well. Additive technologies there solve several problems at once, namely, ethical and moral as well as waiting time shortening. As is known, patients have to wait for a donor organ for several years, but sometimes not years but days and even hours count. As expected, possibility of artificially grown (3D-printed) human organs transplanting will soon become a widespread reality.

Sterile instrumentation by means of additive technologies manufacturing is of great importance as well. In the era of severe and incurable viral infections, disposable sterile instrumentation minimizes contamination during medical procedures.

The following additive technologies products are successfully used in medicine today:

- artificially grown human skin (important for transplantation to people with high ambustion area);
- bio-compatible bone and cartilaginous tissues;
- organs with cancer process printing and drugs on the tumor effects studying possibility;
- dental implants, dentures;
- individual ALDs;
- orthopedic prostheses [8].

Evolution to the “medicine of longevity” in addition to the above noted implies application of personalized approach in diseases treatment based on bio - and nanotechnologies, genomics and robotic surgery.

In this regard, revolutionary changes associated with artificial intelligence, including in services sector, application should be noted.

The ability of a machine to imitate people’s intelligent behavior, that is, the ability to navigate in a changing context and taking these changes into account take optimum decisions allowing to reach the target solution is interpreted as artificial intelligence (AI).

Two AI technologies, namely expert systems and neural network, are massively applied these days. While expert systems are becoming obsolete, neural networks have conquered the market due to the “ability to learn”.

Several AI types are distinguished:

- Narrow AI — designed to solve a specific problem;
- General AI, AGI — will be capable of solving any problems that a human can handle;
- Superintelligence — will outperform a human in tasks complexity.

Thus, for example, artificial intelligence in medicine is increasingly been applied and its high efficiency has been demonstrated. Medicine, which was previously focused mainly on acute diseases treatment, now pays more attention to chronic ailments, many of which were not considered diseases until recently. Doctors face the necessity to treat obesity, depression and elderly age diseases. Diabetes, heart failures, autoimmune disorders are increasingly diagnosed in non-acute phase at the earliest stages, at that it is increasingly not only

about maintenance therapy, but about complete curing possibility and these systemic body failures correcting. Preventive medicine, which makes possible identifying predisposition to certain types of diseases before they occur and taking necessary actions, is being developed. Along with this, medical data volume is growing rapidly as well, and then it comes to realization that patients' health and quality of life depend on their analysis speed and quality. And that this all is the possibility to solve problems by means of artificial intelligence.

It may be difficult for a doctor to correctly diagnose a disease, especially if he does not have too much practice or if a particular case is far from his professional experience. There artificial intelligence with access to databases with thousands and millions of medical reports (and other sorted information) may come to the aid. By means of machine learning algorithms it classifies a particular case, quickly scans released for a certain time period scientific literature on the topic desired, examines access to available cases data and offers a treatment plan. More importantly, AI will be capable of providing an individualized approach taking into account information as to the patient genetic characteristics, patterns of motion collected by his wearable devices and previous medical history — the entire life history. AI probably (at least at the current stage of the technology development) will not replace the doctor, but can become a useful tool, an assistant in the diagnosis and treatment.

In this context, a very interesting fact is illustrious. Thus, a group of researchers at Nottingham University have developed 4 ML algorithms that evaluated the risk of cardiovascular disease in patients. Human lost this battle; ML diagnosing accuracy amounted 76.4%, while real cardiologists demonstrated only 72.8%. Thus, artificial intelligence has overtaken real doctors! [80]

In addition, AI developments, which provide “home hospital” conditions for patients, have already been developed and are being distributed. Thus, for example, patients' wearables enable pulse, blood pressure, breathing and other health indicators monitoring. According to the information received, these devices notify the owners about the actions that need to be taken at the moment (take a drug, change activity type, etc.). Indices, received by these devices, can be transmitted directly to the attending physician via smartphone, so as he is always able to give advice according to the indices variations.

Successful experience of AI in scientific medicine research application should be noted as well. For example, a machine learning system has successfully been applied to verify medications compatibility or to analyze a genetic code to perform tasks requiring deep training, searching for correlations in big data, visual and audio recognition, etc. [77]

Since 2002 technologies have made a big step forward and IT-giants and the entire states have joined the programs of artificial intelligence into medicine introduction (Table 3.2). Today scientists hope that with the aid of artificial intelligence precision medicine, within which framework it will be possible to prescribe individual treatment for each individual given his unique genetic and other characteristics, will become possible in the near future. The United States has announced a launch of pilot projects for the precision medicine development.

**Table 3.2 Global IT Companies Developments on Artificial Intelligence in Medicine Application**

<i>It-company</i>	<i>Current developments</i>
IBM	IBM is developing systems for oncology treatment. It also teams up with Johnson & Johnson in chronic diseases research and treatment [226]
Microsoft	Microsoft is developing the most effective drugs and methods for cancer treatment. The project involves medical images of tumors analysis and cells enlargement mathematical analysis [212]
Google	Google DeepMind platform is used by the National Health Service of the UK to detect certain health risks on the basis of data collected through mobile applications. The second project involves of medical images obtained from patients analysis for «computer vision» algorithms to detect cancerous tissue development [184].
Intel corporation	Intel is developing a software with AI that identify patients at risk and offer treatment options [204]
Medtronic	Medtronic in partnership with IBM are developing an application for people with diabetes. The application is capable of determining sugar level in blood critical reduction within 3 hours before its occurrence. For this purpose, data from glucometers and insulin pumps of 600 anonymous patients is examined. People can monitor their health with a special application and wearable medical devices. [78]

Medical-technological advances that occurred during this fifty-year period have given the opportunity to bring health care to a qualitatively new level. Innovative applications and systems associated with AI possess a number of advantages, namely:

- increased computing power results in faster data collection and processing;
- increase in health-related data obtained from doctors and patients personal and medical devices volume and availability;
- genomic sequencing databases growth;
- electronic medical data recording systems widespread introduction.

Over the past few years more than \$1 billion has been invested on research and development. According to Research and Markets forecasts, the AI market will grow to \$5,05 billion by 2020. Demand for clinical trials, treatment modeling and new research and solutions is growing constantly, so, it is the healthcare that will undoubtedly become one of the fastest growing segments. It remains to be seen when AI will be able to give a 100% accurate advice to doctors, but even today it is capable of assisting in everyday problems solving [79].

AI in the transport sector application is increasingly gaining momentum.

For example, autonomous vehicles are becoming much closer to the reality. This year, Google announced an algorithm able to learn to drive a car in exactly the same way as a person does, i.e. through experience. The idea is that the car eventually will be able to observe the road and make decisions based on the situation.

Since 2012 Google has been testing its autonomous cars on public roads and is planning to launch them into production by 2020. In October 2015, with a new software update, Tesla activated autopilot mode in their cars, allowing them to perform a number of actions independently, but in critical situations pass the control to the driver [196].

In March 2016 General Motors Corporation announced purchase of Cruise Automation, a company that develops technology for autonomous cars [198]. Likewise in 2016 Ford and BMW car manufacturers announced plans to release fully autonomous cars by 2021. [185]

The authors of Stanford University report note that already now there are cities where artificial intelligence timetables underground and buses schedules and determines fair fees for motorways and bridges traffic.

In June 2012 Carnegie Mellon University in partnership with Pittsburgh municipal administration launched a “smart” traffic lights at intersections. These traffic lights analyze road situation and automatically switch to the green if a lot of cars have accumulated [189].

According to Business Insider, there will be 10 million autonomous cars on the roads by 2020. The authors of Stanford University report write that unmanned vehicles will not only be personal means of transport. “We will see unmanned aerial vehicles and cargo vehicles” [181].

AI application has become an integral part of modern trade development as well. For example, it is about merchandise offering. Thus, such large retailers as Target and Amazon earn a good deal of money due to the ability of their stores to anticipate customers’ needs. This ability is implemented in different ways, such as: coupons, discounts, targeting advertising etc. And all this

is performed by processing the array of data and analyzing it by means of AI software programs.

For example, ML Yandex Data Factory with high accuracy predicts how promotions affect sales. The algorithm calculated 87% accurate (accuracy as to a bulk) and 61% precision (accuracy as to a packaging) forecasts [80].

AI application range in the financial sector is expanding as well.

“Banks and financial companies are already applying machine learning technology to detect fraud by nonstandard transactions marking. It is more efficient than tracking money transfers manually, and soon such practice will become the norm in finance sphere,” Banking Tech writes [188].

In October 2015 MasterCard Corporation announced cooperation with National Savings Bank of Sri Lanka. In partnership the two Companies have created artificial intelligence technology-based system, through which MasterCard is capable of detecting and preventing fraudulent transactions [213].

Thus, AI is successfully detecting fraud cases. For instance, PayPal applies ML for suspicious transactions tracking. Standard share of fraudulent transactions in financial sector accounts for 1.32%, as to PayPal with its artificial intelligence it is 0.32% [80].

In November 2014 Goldman Sachs Bank invested \$15 million in Kensho Technologies, a company that creates robots able to respond to “complex financial questions”. A month later, UBS Group financial conglomerate started cooperation with Scream Technologies Singaporean Company, which applies artificial intelligence to give personalized advice to the Bank wealthy clients [221].

In 2014 Swedish Swedbank launched an intelligent assistant Nina. According to the Bank representatives, within a year after the launch the assistant is answering 30 thousand calls monthly, that is about 80% of all calls received by the Bank [223].

In 2016 Santander and HSBC Financial Companies announced launch of applications with voice control due to which the users can hear not only the basic information as to their card spending but conduct transactions and claim the card loss. In the same year Royal Bank of Scotland announced an assistant Luvo, which will assist employees in responding to the customers’ queries, testing [183].

In June 2016 Western media reported that Goldman Sachs, Morgan Stanley and Citigroup and UBS Group Financial Conglomerates initiated means to introduce artificial intelligence technologies for personnel hiring investigation. According to Reuters, the Banks expect that AI will support in staff turnover sidestepping and employees hiring costs cutting.

Mark Newman, CEO of HireVue, which uses AI to conduct video interviews, says: “Up to now technologies have only assisted in the most appropriate CVs selection. Now they provide an opportunity to fully evaluate the applicants”[214].

Interesting facts are known as to artificial intelligence in personal finance application.

Thus, Pefin online platform analyzes such data as inflation and tax rates to show the user his financial position in the future. According to Ramya Joseph, the service founder, in less than five minutes Pefin is capable of synchronizing data with a person’s financial institution and suggesting the sum he can spend and invest.

The service calculates when a user should really retire or have a baby, and how these events could affect each other. Artificial intelligence makes financial sector easier for people [201].

Similar Wallet.ai service manages a person’s finances on the surrounding data basis. “Everything we do is collect information around the user when he decides to buy something or save some money, observe the situation at which these decisions were taken and give the person information on how to better manage his finances,” Omar Green, the service founder, says [202].

Currently AI is actively being applied in civil services, namely in police and firefighting. Thus in 2013 Series Finder software, which analyzes theft patterns and an offender possible behavior, testing was launched. Series Finder takes into account such factors as getting into the dwelling methods, day of the week, dwelling type and geographical proximity to the previous break-ins.

The creators have identified nine main thefts patterns and fed some real crimes from each of them into the software. Series Finder was able to reconstruct most of the crimes, as well as identified nine thefts that had not previously been known.

Thus, machine learning technology can serve as a great tool for crimes detecting and predicting. If crimes templates are automatically identified, the police can stop them immediately [83].

In May 2016 scholars of University of Rochester in collaboration with General Prosecutor’s Office of New York published a study in which possibility of drug traffickers through Instagram tracing was reported. The algorithms are able to identify criminals by hashtags, keywords, number of subscribers and transactions data. The authors of the report claim that the technology identifies drug traffickers more accurately than the experts do [227].

In August 2016 NASA announced its work on AUDREY, an intelligent assistant for firefighters. The agency claims that AUDREY can monitor a group of firefighters, send useful information to each team member, as well as provide

team up recommendations. Monitoring over the firefighters, the assistant can predict development of the situation at the nearest moment [228].

Artificial intelligence in consumer services of population application is impossible to be left out, as the spectrum of performed operations is really great.

Thus, in July 2014 fundraising for Jibo, “the world’s first social robot for home application” was launched on Indiegogo website. According to the creators, the robot can recognize and track faces, talk to people and memorize their preferences. However, Jibo is still in development, the creators had already rescheduled market launch, and in August 2016 it became known that the robot would only be available in the USA and Canada.

And in November 2014 Amazon introduced Amazon Echo home assistant able to communicate with people and handle their queries by means of artificial intelligence technologies. In May 2016 Google demonstrated a similar device named Google Home [197].

In January 2016 Mark Zuckerberg, founder of social-networking website Facebook, announced that he was working on artificial intelligence to manage his house and was going to demonstrate the first achievements in the nearest future. “Due to AI I can already control electricity and temperature as well as manipulate the gates,” Zuckerberg says [167].

Build AI Startup is developing a house prototype where all the controls will be operated by voice and gestures. The Company plans to locate cameras with a total viewing angle of 360 degrees in the room and teach the program to memorize objects location, recognize people and respond to gestures [225].

According to Stanford University report, by 2030 artificial intelligence technology will make domestic robots more reliable. Special-purpose robots will ensure delivery, clean offices and monitor safety.

Artificial intelligence technologies in educational process application importance is quite obvious. At that, the implemented tasks breadth allows to make the process fascinating and efficient.

Thus, according to the Laboratory of Knowledge of University College in London and Pearson report [209] many schools and universities already apply artificial intelligence technologies for educational purposes. Most of them combine AI with Big Data technologies in order to monitor whether the students attend classes and fulfill tasks.

Due to artificial intelligence introduction intellectual training systems that are programs that simulate a teacher’s behavior have appeared. They are capable of checking the students’ standard of knowledge by analyzing their answers, reporting feedback and even scheduling personalized training programs.

Thus, AutoTutor, for example, teaches Computer Literacy, Physics and Critical Thinking by communicating with students in their preferred language. And Knewton Software takes into account each student's training specifics and allows to schedule a personalized learning plan, taking into account the degree of material mastering as well as student's frequent mistakes.

On the other hand, SHERLOCK system has been successfully applied in the US Air Force to train pilots detect problems in aircrafts electrical equipment as well as eliminate them by means of the most effective techniques [205].

For instance, both tests and essays are evaluated by artificial intelligence on such online platforms as Coursera, EdX and Udacity. Such training programs as Carnegie Speech and Duolingo use natural language processing technology to identify mispronunciation and correct it.

The authors of Laboratory of Knowledge of University College in London and Pearson report write that artificial intelligence is actively being introduced into the group learning process. It is used to engage groups of students with the same level of knowledge, analyze the discussion between people and mark the moments when the conversation participants get off the topic.

The report states that artificial intelligence technologies are capable of tracking each students' progress. Such a monitoring may become mandatory in the future to ensure schools, districts and the country as a whole performance evaluation as well as effectiveness of various training programs testing.

Researchers believe that the future will offer "educational partners" that will teach a person throughout his life-time. "Being in the cloud, they will be available on each device as well as in the offline mode. Instead of teaching all subjects, these partners will be able to contact an expert in a certain field on requirement and then inform the user about his point of view" [209].

Particular attention should be paid to the emphasis in the global educational system shifting due to expansion and distance learning or online education increasing role. Thus, according to Erwin Heberle, a German Professor, a revolution in higher education due to university courses via the Internet access is hailing. The fact is that in developing countries, for example, millions of highly motivated and very intelligent young people do not have access to scientific education. They either do not have universities and libraries, or they do not have money to study. Leading US universities offer a completely new remote higher educational model based on free training courses audition possibility and the only payment procedure for verifying the acquired knowledge certification [144].

Sebastian Thrun, a famous Professor, has become an entirely new approach innovator, who set up an experiment: he announced enrollment to a free

Internet course dedicated to artificial intelligence. 160 people applied within a few weeks. He worked at Stanford University at that time. With Google assistance the course itself, as well as validation mechanisms were developed. As a result, 20 thousand of 160 thousand students received a certificate on this course completion. Subsequently he founded Udacity University, which has been functioning on this principle to this day [219].

Massachusetts Institute of Technology (MIT) in Boston has been offering free materials for their courses, distributing them in the Internet for several years. It offers students an open and free access to the materials of 2,260 undergraduate and graduate programs in various fields, including Business, Science, Engineering, Pedagogy, Fine Arts, Healthcare, etc. Materials are available in the form of audio and video lectures, electronic text books and presentations.

MIT President Susan Hockfield said: “Why are we doing this? To ensure MIT a dominant position in the world! Why is it so important? Today MIT is one of the strongest technical universities in the world. European Central Bank President Mario Draghi, Prime Minister of Israel Benjamin Netanyahu, a diplomat and Nobel peace prize winner Kofi Annan, an outstanding American scientist Richard Feynman are among the most famous graduates.

Students and graduates of MIT have a huge number of important discoveries in various fields, Nobel Prizes and other achievements. Some of them are familiar to us: MIT research groups developments can be found in every smartphone. It is this educational institution innovative approach that has given launch to online education in the form we see today.

It is important to note that free training of this type does not lead to obtaining any MIT degree. However, your efforts will not be for naught. After the course desirous students can take the exam and collect a MIT certificate for little money. Such a certificate will be an excellent addition to any young specialist or student resume”[157].

Harvard has paid attention to online education opportunities as well.

EDx, a new global online learning project developed by Massachusetts Institute of Technology and Harvard, the world leaders in education, is based on MITx platform and offers online versions of their courses. The project is managed by a joint Board of Directors from Harvard and MIT. Each University invested \$ 30 million into the project. The partnership is open to other universities accession.

Its main objective is combining the efforts of two leading universities to create a modern online free educational courses and provide them to the students around the world. This free online learning system is planned to bring together up to 1 billion students.

In the variety of courses offered EdX corresponds to a large academic institution format. Courses in a variety of areas can be taken on the platform: Biology, Chemistry, Information Technology, Business, Economics, Finance, Applied Science, Statistics, Mathematics, Physics, Medicine, Nutrition, History, Humanities, Law, Literature, Philosophy, Music and many others are among them. Most of the courses offered are devoted to Computer Technology, the second place is occupied by Biology and Natural Sciences, and the third by Business and Management.

EdX technology platform for this project was developed at MIT. The software is an open source, it can be used by other universities and organizations for their own needs. It is expected that due to the code openness, the platform users will make improvements in it. The educational platform provides for video tutorials, in-line surveys, instant feedback from the teachers, student questions and answers ratings, online labs and student-level learning. The project will allow to determine most successful teaching methods and tools.

Online students who will be able to demonstrate mastery of a subject have the opportunity to receive a certificate of completion, but such certificates are not issued under Harvard or MIT name.

EdX offers three types of certificates: Honor Code Certificate of Achievement, Course Certificate of Achievement, and XSeries Certificate of Achievement. Verified Certificate of Achievement is only available upon some courses completion and in return for a fee. XSeries Certificate of Achievement is issued to those who successfully pass several courses prescribed by a specific XSeries program. All certificates are issued in electronic form [215].

Leading to date, Coursera online education platform was founded by Professors of Stanford University. It has about five million users and nearly 200 basic academic disciplines from 33 of the world's best universities. A special technology to prevent cheating that allows to control a student on a site page presence by using a webcam and measuring his rhythm of keyboard typing was first introduced on Coursera. If he popped out to search for an answer the system would immediately fix it.

“Online services for the developing countries are the only way to bridge the gap in education and give students the skills they need in the 21st century, Duff Couler, Coursera co-founder, said. — Education is the basic human right, but not a privilege. However, even in the United States entering a good university is not an easy task. Let alone the countries where qualitative higher education is generally unavailable. For example, in South Africa 180,000 school leavers annually do not go to universities due to their shortage. “

80 percent of people who applied for Coursera courses has already had a Diploma of Higher Education. The increase in the number of students thus continuing their education is easy to be explained: the world is changing double quick, the knowledge we received in universities 15-20 years ago is not enough for the modern life. Due to the Internet, blurring the boundaries between work and learning has become possible [150].

Summarizing the above written, it should be mentioned that information and production technologies permanent improvement and production evolving mechanization and automation inevitably entail the number of personnel responsible for routine technological operations of material production reduction. At the same time the demand for highly skilled personnel, capable of programming and maintaining mechanisms, as well as information systems, is increasing.

It should be emphasized that high requirements on such employees' qualification and intelligence stimulate a whole stratum of changes in the society structure and importantly in education. Material means of production for mass manufacturing are gradually being considered of secondary importance, and complex devices highly intelligent development is becoming the most significant.

Thus, according to the world economic forum, due to new technologies, in particular robotics and additive technologies, accelerated development about 7 million jobs can be replaced by "machines" by 2020. For this reason, the challenge of high-performance workplaces creating and qualified personnel training is of importance. Large-scale changes in scientific-technological sphere dictate new requirements for the "jobs of the future" as well as for engineering and technical specialists, managerial and working personnel qualification.

Social and economic development today has approached genesis of the future development paradigm elements for which intelligence of systems, mechanisms, products and services, capable of taking decisions depending on many factors involved in the environment and a man interaction will become the core value.

The upcoming fourth industrial revolution, or, as it is called, Industry 4.0 concept, was launched in 2011 due to politicians, businessmen, industrialists and scientists from Germany and was proclaimed the main component of the country's high technology development. The main goal pursued by these concept developers was to increase the country's competitiveness in industrial sector through cyber-physical systems in and beyond enterprises close integration. According to the authors, interaction between production facilities and produced goods without direct human participation, and what is more, its self-adaptation to ultimate consumers' new demands will result from this concept

implementation. This interaction should become so deep and automated that every goods or services consumer will have the opportunity to directly control his order production proses.

After publication this concept has subsequently being developed in the United States, China and other countries.

Nine drivers that have a direct impact on Industry 4.0 concept development have currently been identified. They include:

- self-directed robots;
- additive manufacturing;
- augmented reality;
- computer simulation of equipment, materials and technologies;
- horizontal and vertical system integration;
- industrial “Internet of things”;
- “Fog” computing;
- information security;
- “Big data” and Analytics.

It is noteworthy that many of the identified drivers have already being widely used in the field of services. Nevertheless, for the new concept complete diffusion further improvement, as well as their synergetic functioning spectrum expansion, are required [166].

Production and services provision new format is expected to affect all spheres of life starting with applications that help to keep a household up to a personalized approach to education and medicine depending on a person genetics, psychotype and environment.

Professional services market is one of economic development drivers. Thus, for example, market share in the U.S. accounts for the second largest in the economy by the number of employed population; in the UK it accumulates 15% of GDP; and the annual income of the “big four” is estimated at \$120 billion. No doubt that a new round of technological development will entail changes to the “rules of the game” in this area as well.

It should be noted that services provision approach is being reshaped as well. Assignments are tried to be parceled out for cutting time and quick tasks solution, as well as resources saving. In turn more simple order routine tasks are solved by, for example, services outsourcing and computer technology attraction.

Outsourcing is the result of modern trends in the world economy development, the opposite to the monopolization trends. It is a methodology of an enterprise economic management to market conditions adaptation, enabling to

quickly penetrate a new business and carry out activities by using all external environment available opportunities and sometimes competitors' resources.

Public and private enterprises apply outsourcing principles to many processes they previously performed by themselves. These processes results are bought from outsourcers as a service.

The word "outsourcing" is of English origin and was derived from two words merging: out "external" and source "origin". Thus, outsourcing is, in simple words, the process of delegating a part of production or business processes to another company that is an expert in the field.

By delegating non-core processes, but strategically important for an out-sourcer (a company that takes on "alien" functions), the company effects mutually beneficial exchange [168].

Outsourcing market is divided into two major segments, namely, information processing and business processes outsourcing (including management functions and production functions delegating). Currently the first is the larger segment. This is due to the high complexity of specific information processing.

Currently, the following types of outsourcing are the most widely used:

- accounting;
- IT outsourcing;
- staff outsourcing;
- legal;
- logistics;
- industrial (manufacturing).

One of the most popular forms of outsourcing is considered to be an enterprise accounting and reporting to an outside company delegating.

Several options for cooperation with outsourcing company are available:

- reporting;
- record keeping;
- full service (daily accounting, reporting, primary documents design and conduct).

In general, accounting services outsourcing is a convenient feature that allows not to create accounting department at the enterprise.

IT outsourcing involves delegating a fairly wide range of functions related to computers and other office equipment maintenance. Any service in this area can be attributed to either equipment (printer, AIO, etc.) or software (computer programs development and servicing) maintenance.

It should be noted that it is the IT outsourcing that is the most widespread in the world due to information technology increased application and high requirements to the specialists in this field.

Staff outsourcing is more relevant for large enterprises, which are characterized by staff turnover and a constant need for personnel selection and recruitment. Personnel management issues are very expensive both in time and costs.

Special recruitment agencies can assume recruitment functions, tax burden associated with payroll, as well as bonuses and compensations calculation. Payroll preparation much less often becomes outsourcing services object. Recruitment Agency is not responsible for the staff work quality.

Legal outsourcing is the most convenient service for medium and small companies. A special outsourcing company can offer such companies servicing in tax and labor relations. In addition, outsourcing can be applied to legal entities registration, reorganization and liquidation.

It should be noted that outsourcing companies lawyers high qualification will allow to fully delegate legal functions to them. While an in-house lawyer is likely to be more expensive than an outside specialist, since the specialist workload is usually not very high.

Logistics outsourcing is also referred to as transport outsourcing. It involves transportation functions to an outside company delegating. This is convenient for those companies that use logistics services now for then without the need to keep their own fleet of vehicles as well as appropriate staff on a permanent basis. In turn, a logistics company can take over inventory and finished goods storage as well as their transportation functions.

Manufacturing outsourcing is typical for high-tech enterprises. The companies in technology and telecommunication field delegate the entire production process to an outside organization. The result is conversion cost cut as well as quality and reliability improvement. They meanwhile can focus on existing products promotion and new products development.

Summarizing new trends of outsourcing in service sector development its main advantages for customers should be emphasized, namely:

- cost saving;
- downsizing;
- concentrating on core activities possibility;
- higher quality services availability;
- division of responsibility.

Outsourcing main advantage is the ability to concentrate on the customer company core activities. As a part of non-core functions are outsourced to another organization, it saves resources that are allocated to the enterprise development [169].

It is a fair assumption to say that service sector outsourcing is one of the most progressive trends of modern management. Service sector outsourcing rapid development facilitates the most complete satisfaction of rapidly changing customer requests. As the consumer market in modern terms is a set of mini-markets it requires constant product upgrades, as well as a range of related services provision. In this regard, a large number of individual organizations, such as outsourcing agents of various forms of ownership, with various state and territorial affiliations, are involved in business processes related to the product design, production, delivery, storage, and distribution.

Specialization in provision services in terms of outsourcing, broad supporting infrastructure formation, new industries associated with information technologies of e-commerce application development open new opportunities for national economy in globalization context development, as well as contribute to the labor resources in non-productive sphere infusion, that is alternative employment development.

It should be noted that professional services market, which was previously very closed, is now becoming increasingly more transparent to the client. Despite the fact that companies' brands continue to play a significant role in the service sector, freelance market emerges to a new position where certain advisory tasks are solved by individual professionals and services are provided through video conferencing and calls.

The word freelance is of English origin. Literally it means a free spear.

Modern freelancers are a kind of entrepreneurs involved in selling their services. Just as in business, they do not have fixed income and their financial well-being depends on services quality and demand on the labor market. Freelancers organize their work and take many decisions independently.

Recruitment and online job possibility has accelerated the global freelance market growth. Independent experts from around the globe earn over \$ 1 trillion a year. In the USA, for example, freelancers share accounts up to 34% of the total workforce. Freelancers make a total of more than \$ 1 billion a year on Upwork only.

It is noteworthy that Ukraine is the most attractive European market for talented freelancers recruitment and the fourth market in the world in terms of their earnings. Herewith, the most demanded technical skills are web, mobile applications and software development.

About 16,000 IT specialists graduate from educational institutions of Ukraine annually. Thus, the country can be considered the main world supplier of perspective personnel in this area. In addition to excellent technical education and serious mathematical training, there is a cultural dimension of Ukrainian engineers' world popularity as well. In particular, Ukrainian culture is very close to the culture of Western Europe. This fact allows Ukrainians to successfully co-operate with clients representing both companies from Fortune-500 list and thousands of small and medium-sized businesses from English-speaking countries. Ukraine is also the second time zone, which simplifies the job compared with other regions, e.g. Asia.

In 2013-2014 economic situation in Ukraine, especially in terms of national currency instability, stimulated an even greater number of talented professionals to choose freelancing for customers attracting and payment from abroad obtaining. As a result, Ukrainian freelance market volume in 2014 (in terms of freelancers' earnings) reached a level of over \$ 60 million. As for the Upwork Exchange, about a quarter of our engineering team members live in different Ukrainian cities.

Today 123,000 Ukrainian freelancers signed on Upwork. Only in 2014, 31,000 new specialists from Ukraine signed on the platform, which is 29% more than a year earlier. Most of them are employed in relevant to IT areas, particularly in web and mobile applications development categories. Among the most sought-after skills are PHP, JavaScript and HTML5 skills as well as Android and IOS values. Ukrainian freelancers are hired by clients from around the world including USA, UK, Australia, Canada, UAE etc.

The most valuable specialists at the moment are qualified mobile applications developers and user interfaces (frontend) developers. It is interesting to note that their customers are not only large companies looking for skilled technicians, but promising startup companies wishing to fill their ranks with new staff as well [28].

Upwork, freelancers' international platform, has ranked the most sought after specialties. Bitcoin and the blockchain were included in the top 20 for the first time – the list was based on the third quarter of 2017 research results.

Upwork developer Stefan Kasriel clarifies that it is precisely freelancers who will become the main driving force of the world labor market – they are the most active, easily trained in everything new, so new skills developing or their professional skills improving is not a big deal for them.

The top 20 most in-demand skills for freelancers include JavaScript (React.js), Penetration Testing, Instagram Marketing, Deep Learning, Augmented

Reality, work with Final Cut Pro X video editor, Swift development, JavaScript (Angular) creation, Salesforce development, natural language processing, vulnerability search, HubSpot marketing, Objective-C development, Machine learning, jQuery development and learning management system operating [224].

In general, freelance activity development is a positive indicator of the country's economy as a whole, as:

- freelancers have the opportunity to work remotely with customers from any other country without the country of permanent residence leaving. This minimizes highly qualified personnel emigration level;
- in terms of freelance activity development, its legalization and effective government management may reduce unemployment, increase economically active population level (economically active population to the total population of a certain age ratio), and decrease unemployment level in the economy informal sector, etc. [151].

Definitely revolutionary changes taking place in the global financial sector related to cryptocurrency multidimensional progression should be emphasized. In recent years such new terms as bitcoins and blockchains have appeared on financial market.

The possibility of using cryptocurrency was opened in 2008 and in nine years became widely distributed. So far, cryptocurrencies are only at their development path beginning: at the moment, this revolutionary technology is just expecting for its “big break”. In the near future it will become widely distributed in the world.

Cryptocurrency significant benefits compared to alternative national currencies may ensure the reason. The main advantages of this currency are admissibility to be produced by everyone, transactions anonymity, inflation lack and increased security (it cannot be copied).

The total cryptocurrencies market capitalization now accounts to about \$500 billion, and investments amount obtained through ICO exceeds \$3 billion. One of the Bloomberg authors David Fickling argues that capitalization has the potential to increase up to \$700 billion.

According to Citigroup International Financial Corporation, cryptocurrencies market capitalization in Ukraine accounts to \$2.5 billion. Bitcoin share in the economy is 2.5% of GDP. According to the Company analysts, it is a huge percentage that makes our country vulnerable in the event of cryptocurrencies market collapse. Ukraine is one of the riskiest countries in this regard after Russia and Nigeria [21].

It should be noted that at present more than 90 cryptocurrencies are available in the world, but Bitcoin remains the most common and expensive of them. Since Bitcoin accounts for more than 50% of the total market, all other cryptocurrencies money supply value depends to a greater extent on its growth.

Bitcoins are not issued by Central banks and do not depend on any state monetary policy. Emission occurs only in digital form. Anyone can obtain cryptocurrency (do mining) by applying the processing power of a computer [96].

Among Bitcoin distinctions and advantages is the fact that it is a planetary scale public asset not controlled by any government of any world country. People will be able to directly without intermediaries form economic and social relations that is impossible in the existing system framework. Being a decentralized currency, Bitcoin will lay a new era foundation, i.e. digital economy outside the sphere of state and financial sector influence.

While digital currencies are gaining favor, leading corporations and business organizations are beginning to concern with blockchain technologies.

Blockchain is a continuous sequential containing information chain of blocks (linked list), built according to the certain rules [20].

This data chain is built on three very important principles:

- distribution;
- openness;
- security.

All blockchain users form a computers network, each of which has a blockchain data copy. As a result, blockchain turning off or destroying is almost impossible, as to do this all computers should be turned off or destroyed. While at least one user is available, the blockchain exists. Every new user expands and strengthens the network. It is noteworthy that all computers are equal and without organizers, moderators, supervisors and managers. Everyone is responsible for himself.

One of the most significant advantages is that all blockchain data blocks and their contents are always open for all. Any block can be read out, and all of the entries in this block can be viewed. In addition, even the chain and changes to data can be tracked. Thus, all blockchain data is easily verifiable, and therefore revision with the aim of obtaining a guaranteed accurate data is possible.

Encryption is widely used to protect blockchains data and users. Blockchain reliability and security is kept on cryptographic keys by means of which the data confidence and authenticity can easily be verified. All blockchain data is stored on the blockchain network users' computers.

Blockchain has emerged as the technology to run Bitcoin circulation, and at first was applied only for the cryptocurrency management. However, the scope has significantly expanded since its appearance in 2009.

Goldman Sachs Investment Bank has estimated that in 2016 total investment in blockchain startups already reached about \$1 billion [24].

According participants of one of the recent World Economic Forum polling, blockchain technology will be actively used in the sphere of state services by leading world powers as late as in 2023. More importantly, about 10% of global GDP (according to OECD forecasts) will be generated by means of blockchain technology direct application. According to Credit Suisse, about \$ 62 trillion of gross value added will be generated by the mid-2020s with this technology application [26].

The main benefits from the technology introduction are expected in operating costs cutting (73% of respondents), calculations time cutting (69% of respondents), risks mitigation (57% of respondents), and obtaining additional income possibility increase (51% of respondents) [136].

Blockchain introduction is a complex process by design, but the technology basic idea is simple: a distributed registry or database run simultaneously on the set (sometimes it is about millions) of cross-points distributed between different users (organizations) around the world. Blockchain uniqueness is in downloaded data permanence or irreversibility, which is ensured by cryptographic protection system.

Currently, funds are being actively invested in blockchain technology projects implementation most of which relate to the service sector development:

- in forecasting;
- in banking;
- in stock trade;
- in the field of rules and regulations compliance monitoring;
- in the field of smart contracts;
- in medicine;
- in education;
- in the field of cybercrime defense;
- in networking technology and “Internet of things”;
- in the field of cars leasing and sale;
- in the air transport industry;
- in the field of logistics and food supply;
- in the music industry, etc.

Thus, as a result of blockchain technology introduction a fracture may occur in forecasting and research, analysis and consultancy technologies markets. An example is Augur online forecasting platform. By means of blockchain the service in a decentralized manner is intended to offer not only sports and stocks, but election results, natural disasters probability, etc. betting services.

With regard to the banking sector application the following should be noted. Since banks serve for assets of value safe storage and transfer, blockchain, being protected by the digital registry, can successfully perform these functions. According to experts, a strong blockchain influence on banking industry should be expected in the next few years. Some market participants believe that such a technology will allow banks to save about \$ 20 billion due to intermediaries in transactions elimination.

In addition, according to the World Economic Forum report, decentralized payment technologies, including Bitcoin, can convert money remittance “business architecture” that has not changed for over 100 years. Blockchain is capable of bypassing these inefficient systems and creating a more open, fast and fee-free payments flow around the world.

This technology in stock trading application is connected with online retailer Overstock.com pilot project launch which with its subsidiary TØ has built a system that allows companies to issue shares and take out loans against their security through the blockchain.

Chain in cooperation with Nasdaq Exchange startup is also successful; it operates in private equity trading sector by application blockchain technology.

An example of blockchain in regulatory compliance application is National Land Service of Sweden project launch in which real estate purchase and sale processes are planned to be digitized. Immutability allows to use this technology as a method of the processes with regulatory requirements compliance evidence — all actions records and obtained results can serve as an audit trail for regulatory authorities in the block of chain.

Blockchain is also promising in terms of anti-money laundering (AML) and “Know Your Client” (KYC) procedures. Currently, banks and many financial institutions have to perform a complex and lengthy process for each new client verification which includes a huge number of actions, and collecting and verifying process may be delayed for several months in some markets. By means of blockchain all available information can be optimized, as any changes to the client data are immediately distributed to all system participants. Blockchain can also provide records of each client’s individual actions with regulatory requirements compliance.

In addition, blockchain application to create an operational system for users' personal data management is also possible. Thus, this technology application allows to limit KYC/AML process to a simple automated verification that an appropriate system could be capable of performing throughout the entire market. It is likely that confidential customer information among financial institutions exchange will become the norm as soon as blockchain ecosystem establishes trust relationships. It is noteworthy that international SWIFT system has already announced that its own KYC registry which now includes data from over 1,000 banks will be available to trusted partners and customers in the future. Such action can be considered one of the first steps to digital identities in financial sector introduction — and this is the ultimate business goal of movement in this direction.

Thus, productivity and decision taking effectiveness can significantly be increased by computer design and specialists' experience. Thus, auditors, accountants, consultants are already using this technology to better investigate financial situation and their customers' operational processes. An example is Watson IBM's deployment of KPMG for deep data analytics; some companies use Robot Rosa, which keeps track of court cases and informs colleagues, as well as collects information on specific cases. Goldman Sachs and JPMorgan Chase use Kensho for financial markets data analysis.

New intelligent power allows to obtain relevant and reliable information in real time, cut data processing time by sorting and classifying information, improve its quality and relevance for quick and relevant decisions taking. This, in turn, affects companies accounting information, as well as auditors and consultants' conclusions made on the basis of qualitative information input. Thus, the market needs grow and accelerate and so auditors and consultants should provide quality services with costs minimization within a short time that is possible when investing in modern technologies, integrating knowledge from different resources, proper training and digital capabilities in everyday tasks application.

Consequently, a modern specialist in the professional services market should be aware of a new round of technological development and improve own knowledge background in accordance with market demand. A steady increase in the volume of information occurs in the world these days and those who can process it in the quickest possible way and use it for practical purposes will be able to succeed [73].

In 1994 a cryptographer Nick Szabo suggested computers and cryptography application for contracts automatic auditing. This subsequently resulted in

the so-called smart contracts emergence. Such contracts are issued in the form of a code, and then stored in the system, where their implementation is monitored by a computers network managing the blockchain.

Smart-contract is an electronic algorithm that facilitates or even automates the contracting process. The basic idea is the time-consuming procedure modernization so that all parties interpret the agreement equally and without interpretations discrepancies. Programming languages and mathematical tools (e.g. public key cryptography) are applied to describe smart contracts conditions and outcomes and such contracts are executed on computers.

Smart contracts allow to exchange assets without resorting to intermediaries. In addition, smart contracts do not just contain information as to the parties' obligations: the program code confirms the terms of the Contract fulfillment and automatically determines what to be done with the specified asset (forward to the transaction party, return to the sender or something more complicated). A copy of this document is kept in a decentralized registry all this time, which ensures its security and reliability and do not allow any of the parties to modify the Contract predefined terms.

Since all information is stored in the blockchain as a decentralized Ledger, the smart contracts parties and the third parties (e.g., accountants, auditors or regulators) are able to easily carry out contracts execution audit. Moreover, the audit can be performed in real-time and be easily automated [74].

Insurance industry is already now possible to be rebased into smart contracts and if-then statements structure. Thus, for example, if a customer does not pay contributions, insurance does not apply to him; if he does not declare insurance claims, the amount of his contribution decreases, and he can claim a bonus; if an accident occurs to him, he receives an insurance payment.

In insurance industry smart contracts would be beneficial to both insurance companies and their customers. Under the current system, weeks are taken to even elementary cases consideration due to bureaucracy and administrative delays while the policy holder is wasting money. Smart insurance contracts will work best when clear payment options are determined, for example, if a customer claims adverse weather conditions that adversely affect his business. "One day you will wake up and see that you have already received a payment, not even knowing that the insurance event has occurred" [34].

The fact that blockchain among other breakthrough technologies will inevitably shift medical services market is dared to be argued seriously. It is already clear today that several main areas of blockchain technology application are available, where most of the projects are being developed so far. It is referred to

projects for electronic medical records storage, as well as patients monitoring and medical services providing.

Thus, Guardtime start-up in partnership with Estonian eHealth Fund is implementing a program for all medical cards in the country to the blockchain transfer. Similar projects are being implemented in the Netherlands by Prescript and in the United States by BitHealth. Project on the blockchain in China's healthcare implementation involving Alibaba was recently announced. Medrec project in Israel is developing smart contracts system to exchange medical records between different clinics.

It is the blockchain that offers a versatile set of tools for data integrity cryptographic guarantees, standard audit and formal decentralized contracts to access the data. Patient personal data will possess "portability" due to decentralized storage and be under the patient control.

Blockchain in medicine application will improve patient medical data safety and security, and will enable disparate databases into the one linking, making the patients, doctors, medical and insurance institutions interaction more transparent.

Medical records to blockchain rebasing is not the only possible application of the new technology on the medical market. As explained by the CEO of MEDIGO, international company for treatment search and organization, Ugur Samut, blockchain will contribute to greater transparency in the medicines market, including releasing it of fakes. But most importantly, blockchain can become a technology which in principle will redesign the system of patients, medical clinics and insurance companies' relationships. It is referred to smart contracts, which can become a new form of interaction between all medical services market participants.

Smart contract can substitute certificate of insurance model available now. Thus it will considerably simplify and speed up the relationships within "patient-doctor-hospital-insurance company" chain, as well as increase such operations accounting efficiency.

In addition, we believe that blockchain may contribute to billing management in the medical field optimization. According to various estimates, from 5% to 10% of healthcare expenditures are falsified through inflated services invoices and bills for services that were not rendered at all. Blockchain could prune away costs and eliminate overpricing on the market that will make treatment process more efficient and effective.

Many important problems can be solved by means of blockchain technology into education introduction. In this context blockchain is applied to store

educational experience, certificates and other users' data. Data on the subjects learned by the students and their certificates/diplomas can be entered into the distributed registry. Based on smart contracts technology knowledge will be exchanged as a property in the near future.

The European Commission has published a report [199], which presents the results of their research on blockchain technology in education application. Among other things, the Commission has analyzed such areas as feasibility, possible problems, benefits, and risks as well as technology application at universities and schools. 8 possible blockchain technology applications in education are mentioned in the report. The most relevant issues that can be solved by blockchain is documents accreditation and transfer, digital certification, multi-level accreditation and students' fees payment.

In conclusion, the Commission has recognized the fact that blockchain in this field application is still in its infancy. It also stated that only a "completely open" process of the technology introduction can produce real results and give blockchain technology an opportunity to support educational sector.

2017 was the starting point for education encryption. The University of Nicosia has become the first to officially use blockchain to store their diplomas and certificates. Importantly, it also became the first university to accept Bitcoin as a payment currency. Massive on-line open courses (MOOC) of the University of Nicosia are available in 83 countries. It is also a member of European Universities Association (EUA) and European Association of Higher Education (EURASHE). It means that its diplomas and certificates are recognized worldwide.

Such organizations as Open University (UK), Sony, Massachusetts Institute of Technology and others have become inheritors [24].

Blockchain technology is being actively implemented by air travel industry as well. One of such startups is a single person identifier project, which is developed by SITA, a Swiss international organization providing telecommunication and IT services in aviation industry.

SITA is developing a fundamentally new concept of digital identification of passengers, that is Travel to the Identity of the Future, which is based on blockchain technology application for passengers' identity secure biometric confirmation.

Representatives of the Company said that according to the results of 2016 SITA Passenger IT Trends Survey, conducted annually by SITA in conjunction with Air Transport World Magazine, 93% of the interviewed passengers like customization of their travel parameters and their control possibility. Pre-flight and passport control were determined unpleasant stages of the trip.

Thus an idea of a single person identifier arose, a pilot project of which was presented at Air Transport IT Summit 2016 in Barcelona.

The Company believes that blockchain application will allow to dispose of paperwork and passengers' personal data to the others transfer, as well as assist in bureaucracy, crime and terrorism overcoming.

Currently, SITA Lab research division is developing a digital passport, which is a set of mobile and wearable devices identification codes.

According to SITA Technical Director, the main advantage of blockchain technology is that after having been entered information is impossible to be forged, as all changes are fixed. Other named significant advantages were privacy and security.

Research in digital passenger identification field is one of five research initiatives that SITA applies to address the most acute aviation industry problems.

Others have included luggage tracking in accordance with Resolution 753 of International Air Transport Association (IATA) requirements; new NDC IATA transport sales system support; violations in air transport prevention; information security in aviation industry increase [24].

One of New Zealand's largest air carriers, Air New Zealand has signed a cooperation agreement with Winding Tree, the Swiss blockchain start-up. The parties are conducting research on distributed registry technology in air transport application. The first stages include studies on blockchain application in luggage tracking and airline tickets booking. Air New Zealand Digital Department Director said that in the future it is planned to involve other areas of airline business in innovative technologies introduction. In particular, in the future it is planned to use blockchain to form loyalty programs for customers [37].

QUASA, a created decentralized logistics platform, which offers innovative solutions based on blockchain technology in supply chain management introduction, enables to make a technological breakthrough in logistics industry by a transparent interaction system between all participants creating.

QUASA Platform will support all participants in gaining tangible benefits of decentralized service and a unique transparent economic system based on its own crypto currency QuasaCoin.

QUASA is a decentralized system that gains blockchain advantage and consists of several smart-contracts within the blockchain and its own crypto currency. Such approach shifts logistics technologies development to a completely new level, as well as ensures complete safety and confidentiality throughout the supply chain.

The system functionality is designed to protect cargo owners and shippers by the aid of blockchain technology and smart contracts to eliminate trust issues, information barriers and legal expenses [206].

If the Web development to be chronology divided into the appropriate stages (Web 1.0 (static pages, content browsing), Web 2.0 (information viewing and generating), Web 3.0 (machine data processing)), today the mankind is experiencing a period of the Internet of things development (IoT, 1999). In a relatively short endorsement period IoT began to be used as a conventional method and practical solution for different areas of human activity.

McKinsey experts (Global Institute) have formed their own opinion about IoT. According to them, it is represented by the set of devices eligible to establish control over their environment and function according to the instructions. It turns out that IoT is a set of mechanisms that interact both in a pair and between the network participants.

The Internet of things application is practiced in many different spheres of human activity. Typically, the IoT technology is used in innovative solutions (e.g., environment safety, energy saving, productivity in industry increasing, logistics, agriculture and medical care).

Blockchain is believed to enhance information security and integrity in the Internet of things field. However, innovative technologies potential is much wider, and the two technologies synergy possess incredible potential.

John Wilms, TM Forum (a non-profit Association of telecommunication companies of the USA) expert, believes that blockchain can be applied in a number of areas in which IoT is being developed. Among these are: fighting with intruders, authentication managing, payments posting, different services operability check, information indivisibility ensuring, etc. Mr. Wilms stressed that IoT maturity and blockchain will assist in making some routine processes automatic.

According to PwC consulting firm representatives, the Internet of things may become one of the factors of economic growth in many countries [21].

Decentralized registry and IoT synergy has become the foundation for a new method called “programmable economy” development. This concept was formed by a Garther Company team in 2014. The organization specializes in the field of information technology. According to the Garther Vice-President, David Furlonger, IoT is making the funds “smart”, united with each other and maximally focused on their role in human life enhancing. However, the current concept needs to be monetized. The new economic resource and monetary policy endorsement will result in the Internet of things even bigger success, which will positively affect the renewed economy development.

Garther representatives believe that the global economy will be subject to significant transformation by smart technologies and distributed computing tools combination. Programmable economy based on digital currencies and smart contracts, where values exchange configuration, as well as new markets and economies (attention, reputational and others) will prevail over the existing system.

Thus Bitcoin has played an important role in humanity educating as to the distributed registry wide possibilities, which is ready to lead construction of decentralized economy.

Many interesting examples of these two very promising areas synergy are available. Thus, a group of companies including such giants as Alibaba Group, ZTE, China Unicom, as well as Ministry of Industry and Information of PRC combine forces with the aim of a blockchain framework for the Internet of things (IoT) development.

The Group of Companies has already identified main problems that are on the way of IoT development, among them: connections high cost and centralization, low level of scalability, networks vulnerability and, as a consequence, low level of confidence in technology, etc.

Among other key advantages of IoT with blockchain technology integration the Company has identified a high level of trust, cryptographic data protection, costs saving and operations speed increasing. In addition, blockchain opens up new opportunities for business processes automating without the need to create complex and costly centralized IT infrastructure.

Earlier it was reported that Ant Financial, the online giant Alibaba's payment unit, is planning to increase customer base to 2 billion users and introduce solutions based on blockchain technology within the next 10 years [182].

Context Labs of Massachusetts experts are developing solutions for counterfeit goods evaluation. Dan Harple, the CEO of the aforementioned Company, said that the team was developing solutions in the Internet of Everything (IoE) field and applying the distributed technology to maximize productivity for piracy countering, efficiency of supply chains and security logos, as well as mutually beneficial cooperation with participants increasing.

Dan Harple furthermore has co-founded Open Music Initiative (OMI), supplying tools to increase effectiveness regarding musical information verification and author with copyright holder collaboration optimization. Likewise, the platform is aimed at assistance compositions creators in rewards for digital tracks listening and distribution receiving. Today OMI initiative is supported by more than 50 media institutions (Sony, Warner Music, Spotify, and Pandora).

By the way, many musicians have actively accessing the blockchain for compositions via the Internet legal distribution. Ujo Music and PeerTracks are trying to solve this problem by establishing direct payments to copyright holders and smart contracts application.

The music industry has turned out to be at a technological crossroads. The main problem is to accurately trace what tracks are download or listened online. Another urgent issue is how to streamline music distribution and at the same time sort out how much musicians, songwriters and copyright holders should receive for each of the songs listened to [66].

Blockchain technology has become a potential solution. In fact, it is a distributed registry that verifies transactions validity. Which, consequently, is capable of creating a record without any third party involvement.

Any use of compositions on radio, television or concerts and subsequent payments to the relevant copyrights owners is monitored by a large copyright society network (PRO). But fashionable blockchain, which has long been tight in the banking sector, is capable of making a revolution in the music industry. This technology creates a decentralized trusted registry, which potentially provides instant and absolutely transparent royalties to the music creators directly from the fans. The solution underlying Bitcoin existence can help the modern music market to cope with a huge number of problems, namely:

- minimize delays associated with data collection;
- optimize payments to performers;
- eliminate errors that still exist in music licensing rights field [19].

Distributed technologies and IoT tandem is capable of supply chain monitoring. Currently, an e-commerce giant Alibaba Group in cooperation with AusPost, Blackmores and PwC are exploring a unique technology potential to response food counterfeits. The “Food Trust Framework” project was created to improve supply chains security and transparency.

Intel, which has demonstrated blockchain platform operation to establish seafood supply surveillance, stands out among the other institutions. The resource is specialized in control over marine products harvesting establishing, as well as its accounting accuracy and reliability increasing. The process regulation starts with the harvest and up to the product storage conditions according to the sanitary rules observance [22].

Note that blockchain technology in the automotive industry application is gaining increasingly momentum. Thus, Uservice has been launched and actively promoted; it is a united global service, a decentralized platform aimed at the automotive industry, which is Uremont continuation on the world market.

Uservice is a platform based on Ethereum blockchain, which was developed specifically to serve the automotive industry. The idea is to provide transparency for the industry participants, which allows to record a variety of transactions associated with a vehicle on a distributed basis contract like blockchain without standard legal procedures application.

This service is aimed at providing such services to their clients as:

- vehicles maintenance and statistics provision;
- transactions between car owners and provided services representatives registering;
- wide selection of all required services for the automotive industry;
- spare parts originality verification;
- promotional products purchase as well as advertising on the platform.

The project is focused on a market segment with 283,657 service stations and 87 million insurance companies in the world. The number of cars around the world amounted over 980 million by 2010, plus 93 million new cars that were sold worldwide in 2016 (LMC Automotive) [195].

Uservice platform is capable of facilitating operations of all automotive industry actors: car owners, insurance companies, banks, motor vehicles tuning up service stations, distributors, and many others are among them. It will link goods and services suppliers and consumers by intellectual contracts for services provision, equipment purchase or analytics, etc. between them concluding.

100 thousand service stations have already been signed on the platform. In the future the platform is going to unite water and air transport markets participants [25].

IT-giant IBM in collaboration with AOS Colombian Company are developing a platform based on blockchain and the Internet of things for logistics. It is reported by CoinDesk. Thus, the blockchain platform developed with IBM Blockchain and IBM Watson subsidiaries participation will enable road freighters location and status, as well as transported goods tracking.

The system operates as follows: the road freighters are fitted with RFID tags that contain information about the vehicle, driver and transported cargo. IoT sensors track the freighters movement, as well as information on blank space on the truck availability and then records this data to the blockchain.

According to IBM and AOS representatives, these routine processes automation will provide significant time savings and eliminate a lot of human factor related errors.

In addition, the new solution is designed to be integrated with IBM Watson IoT platform, which will give the opportunity to analyze various factors that can influence trip course and delivery time (e.g., weather, air temperature, etc.).

According to a recent study, market segment of IoT in logistics will reach \$10 billion by 2020. The report, prepared by Cisco and DHL Companies, states that the cash flow generated by IoT technologies in such areas as logistics and supply chain will amount to \$ 1.9 trillion.

Maersk, the leader of maritime transport, together with IBM, having conducted an experiment on blockchain in cross-border global supply chain application, demonstrated that even companies of such level are ready for innovation if it is profitable for them.

According to experts, a large container ship can generate several pounds of paper documents that must be signed manually – a huge expenditure that have long been ripe for automation.

Maersk, which has started testing the technology on several container line routes, is already preparing to receive multi-billion-dollar savings with blockchain successful introduction. Imagine: 90% of foreign trade volume in the world is delivered in containers. Upon each delivery on average 30 links of the logistics chain (including shippers, consignees, carriers, customs, fiscal, controlling bodies) are involved that are more than 200 information interactions. It is assumed that each of the links in the chain will be able to record each entry into the blockchain using a smartphone, and this will eliminate the need to register tons of shipping documentation at each stage of the delivery. Digital technology for data in real time exchange and storage introduction could make a real quantum leap in supply chains.

The technology will help to measure not only location, but temperature, humidity and power supply status in real time as well [152].

Analysis of the recent trends conducted by the authors made reflecting the process of forming a qualitatively new service sector condition in the global economy possible.

Panoramic view of revolutionary discoveries and scientific and technological achievements outlines a concept of the service sector substantial ongoing transformation in the present time and its further development prospects. The data given in the Monograph fully lead to the realization that we are living in an era of significant shifts in the economy, industry, service, education, medicine ... The described innovative technologies development and introduction today set our near future prototype. Major corporations and leaders of 3D printing, artificial intelligence, ICT, green technologies, biotechnology, as well as blockchain-technologies planned consolidation confirms their leadership relative to traditional approaches importance and inevitability. In the modern world only the companies with flexible vision, equipment and technologies able to

instantly reform, adapt to new conditions and challenges, will benefit. It is the new technological mode of Industry 4.0 emergence.

### 3.2. Domestic Economy and Services Sector Fundamental Problems

In modern practice the services sector is “a large-scale area of economic and social interactions, where citizens and groups who want to satisfy their diverse needs and services providers directing their work to meet these needs are in contact.”

It is this sphere of our country that needs to be urgently reformed as it is able to become one of the domestic economy and foreign investment inflow growth factors due to considerable market capacity, investments quick pay-back period and a number of domestic services competitiveness. In modern conditions new jobs are created in the services sector; due to services provision activities household servicing time decreases, which improves the population quality of life [85].

Today the Ukrainian services market is considered one of the most promising business areas. Modern Ukraine is inherent in many global trends of the services sphere development. However, there are a number of problems that need to be solved both at the macro- and micro-levels.

Each of the shown in Fig. 3.6. group of problems consideration is proposed.

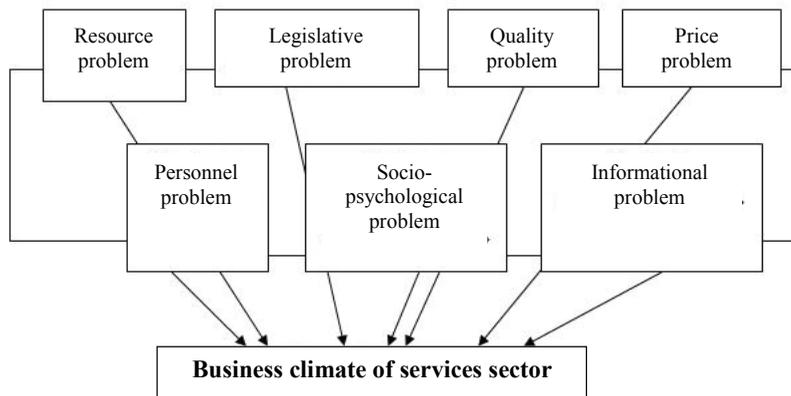


Fig. 3.6. Totality of Problems Hampering the Services Sector Development [2]

Thus, insufficient resource base is primarily caused by the services sector business entities insufficient access to information on necessary resources availability. Business entities resources include: financial-credit, investment, personnel, material resources, etc. Limited access to these resources can be caused by: insufficient start-up capital, obstacles and difficulties in attracting credit resources, lack of state support and guarantees for obligations; failure of investment support; high rent costs for production and office premises and difficulty in obtaining them; unreasonable utility rates; lack of production space corresponding to sanitary norms and rules of accommodation enterprises, as well as production equipment installation.

This problem occurs mainly in small and medium-sized business entities at the initial stage or in the first three years of activity, during their activities expansion and their positions in the market strengthening periods.

Underdeveloped legislative and regulatory framework is one of the serious problems, which is expressed in a single legislative framework for entrepreneurial activity in the services sector development and support unavailability. We agree with the fact that since 1991 and to the present a complex of regulatory and legal documents regulating entrepreneurial activity in this sector has been developed in the country and regions. However, available legal documents are not perfect and currently are not capable of solving existing problems. Primarily, this is the lack of flexibility and imperfection of the tax legislation due to the lack of effective tax incentives for the services sector companies. Legislative and regulatory acts variability, and sometimes their contradiction to one another causes confusion and misinterpretation.

The problem of services quality management. The quality of the services provided and the servicing level in the services sector leaves much to be desired. Due to the quality control function immaturity and internal competition poor level, the service sector progressive development process is adversely affected. Direct correlation of the services rendered with high quality and appropriate price must be observed: the higher the service quality is, the higher should be the price, and vice versa. Quality is primarily the degree to which the system meets the requirements and expectations, which, of course, must be observed regardless of the price.

The problem of pricing policy. In the country (region) there are price barriers in obtaining services by citizens with average and low income levels. The relationship between services price and quality is discussed in the Paragraph above.

It is information base for all participants of the servicing process with feedback opportunity insufficient development. Unfortunately, in our society principles of information openness and transparency for providers are not fully implemented; there is no single database (“single information window”), an information platform, as well as timeliness in providing and receiving information. All of this is an obstacle to innovative and investment activities development. In addition, effective management feasibility is eliminated, since management decisions of various kinds are based on information analysis.

The problem of staffing (lack of qualified, competent staff). Modern business organization in the sphere of services presupposes personnel with the appropriate qualifications provision. To date, high professional level services producers should have better knowledge in the context of innovation and new technologies, as well as continuously improve their professional skills. Organization of labor and personnel remuneration is the services sector subjects functioning problem as well. Since the work of employees in the services sector has its own characteristics, such as increased neuro-emotional stress of the job due to the constant contact with customers; various activities combination; different degrees of work intensity depending on the time period, the organization of work with remote access and a “flexible” working schedule are successfully applied. Regarding adequate personnel remuneration, at present in many cases (types of service activities) there is a lack of direct dependence of the services performance (effectiveness) and the efforts to deliver it. A “lagged effect” can be observed as well, that is, when the result of the services provision occurs some time later. For this reason, the problem requires an individual approach.

Socio-psychological problems. The services sector is the only sector of the economy that provides real opportunities for socially vulnerable categories of the population, such as social protection, employment and obtaining a complex of priority services for supporting normal functioning (social security). It should be noted that modern business is inextricably linked with social responsibility.

The above groups of problems form the business climate in the country and in its regions. The temporal component of the business climate is emphasized by the authors as of particular importance in the proposed Monograph, since it is not constant and can shift significantly in a certain period of time, both for the better and the worse. Changes in business climate in general and in the services sector in particular are facilitated by various factors, such as political, economic, social, environmental and others.

The services sector, including services sector enterprises, development largely depends on the services quality, and therefore Ukrainian business

entities are paying increasingly more importance to the services provided quality improvement. Every entrepreneur recognizes that services quality is of paramount importance and is the most effective means to meet the consumers' needs. High quality services will contribute to a stable market position, improve enterprises competitiveness, ensure consumers and services producers satisfaction and cut costs (overheads) associated with errors in services provision elimination.

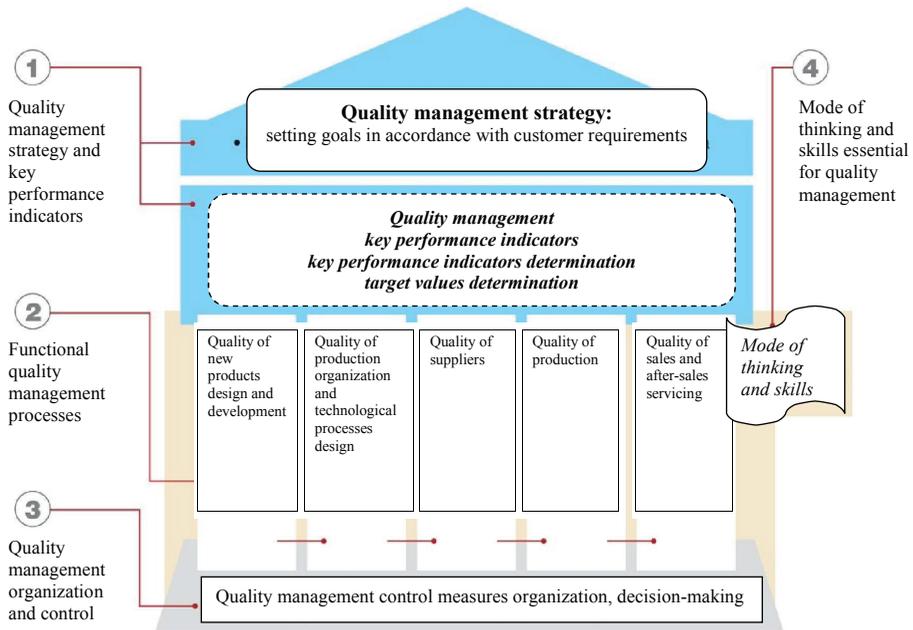
International Organization for Standardization (ISO) defines quality as a totality of the product properties and characteristics that give it the ability to meet the stipulated or anticipated needs. "A service quality is a complex of a service properties determining its suitability to meet certain needs in accordance with its purpose" — the definition of a service quality according to GOST 154467-79. International Standard ISO 8402 "Quality. Thesaurus" quality is a totality of the product properties and characteristics that give it the ability to meet the stipulated or anticipated needs.

Quality issues can quickly neutralize customer loyalty, undermine company image and result in market capitalization sharp decline, but still only few companies apply a truly integrated approach to quality management throughout the entire organization.

Interest in quality issues is growing rapidly. In 2013 McKinsey conducted a survey among companies to discover their quality management systems and challenges they face. During the first two weeks, we received responses from more than hundreds of companies. They were companies operating in a wide range of sectors, from the automotive industry to the financial services market, which confirms importance of quality issues for any industry. It is important to note that the survey respondents were worried about not only the quality issues in general, but their own management processes in this area as well. Having compared the respondents' responses with the recognized industry leaders using best practices performance, we discovered that 80% of respondents had insufficiency in at least one of the four main aspects of the quality management system, and only about 30% of companies were able to demonstrate the cutting-edge experience in one or more aspects [160].

The quality management system is based on four interrelated basic elements (Fig. 3.7.)

**Scheme " Quality Temple ": the most important aspects of the quality management system**



Источник: анализ McKinsey.

**Fig. 3.7. Strategy of Services Quality Management [3]**

In order to make quality the really leading value of a service enterprise corporate culture, appropriate skills and way of thinking of all its employees should be developed. To do this, structured programs for training employees and raising their awareness should be deployed at all levels, as well as incentives depending on quality improvement indicators should be provided. Employees of all departments, whatever they do, should realize how their actions can affect the quality of services provided, and strive to ensure their due level.

Note that many specific features of the domestic economy, including the services sector, are due to regional economic development peculiarities. While in the majority of countries the issues of regional and national economy are identical in content, in Ukraine regional economy issues exhibit a pronounced

specificity and are determined by each individual region type, its economic-geographic parameters, basic resources, industrial base, infrastructure, position in the national economic system and other relevant factors. This determines the differences in the services sector industries development levels, which are significantly imposed by the regional component [121].

Despite targeted programs, aimed at the regions development differences levelling, adoption and implementation, progressive and economically depressed regions are still observable and in their development management their specific nature must be taken into account.

The services sector development level in our country is not always accompanied by availability and quality. Regional authorities and community bodies do not provide proper conditions for the services sector successful functioning, which the population needs. This conviction is confirmed by ineffective regulation of the services sector development processes and the lack of a holistic concept for competitive advantages formation, insufficient informative services security, etc. Thus, not receiving quality services, the population is exposed to poor labor conditions, social factors deterioration and unfavorable living conditions.

To ensure the population of the regions of Ukraine with high-quality services, a number of problems, able to approach the intended results, should be defined. The problems can be addressed at local government and manufacturer levels (Table. 3.3.).

To solve the presented problems, measures to create a system of financial and methodological support for the services sector in the region development should be put in place.

**Table 3.3. Complex of Problems to Meet the Population Needs in Services**

<i>Problems to be solved at the services producer level</i>	<i>Problems to be solved on the local government level</i>
<ul style="list-style-type: none"> <li>– modern science-intensive services of a competitive level development;</li> <li>– optimal operation mode taking into account the client needs selection;</li> <li>– various forms of servicing in convenient for the consumer places provision (at home, at the business site, etc.);</li> <li>– e-Commerce development;</li> <li>– investment promotion;</li> <li>– services affordability for different categories of the population ensuring;</li> </ul>	<ul style="list-style-type: none"> <li>– conditions for an operational information exchange of all participants of the servicing process creation;</li> <li>– investment attractiveness of the services sector in the region promotion;</li> <li>– conditions for innovative activities stimulation creation;</li> <li>– market infrastructure development promotion;</li> <li>– favorable conditions for the territorial distribution of entities with the goal of</li> </ul>

<ul style="list-style-type: none"> <li>– compliance with services quality standards and servicing culture, their compliance with international standards ISO 9001. 2000.</li> </ul>	<ul style="list-style-type: none"> <li>creating all types of services accessibility creation;</li> <li>– population with socially important services provision;</li> <li>– a network of utility companies for vulnerable groups of the population proper servicing creation.</li> </ul>
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Currently, the services sector development is an important indicator of the state’s consistency that reflects all the main trends of national economies. Such important criteria as competitiveness, innovative component, organization, planning and control should be manifested when new types of services developing, as well as stable traditional services provision supporting. These problems solution is the priority in the services sector management organization at micro and macro levels.

### 3.3. State Incentives for the Services Sector Development

Such an industry as the services sector formation and development is unconceivable without the state determining role in the process. By developing and implementing specific economic, legal, and tax policy and setting priorities the state influences the country economic development. As noted by P. B. Evans [191], the government can play three roles in the economy sectors development – the “regulator’s” role, the “guardian’s” role and the role of the owner (manufacturer).

Among the main reasons for state into the services sector intervention are the following:

1) Uneven market relations development in various service industries. In such sectors as trade, tourism, advertising, consulting business, etc. market relations are well developed and allow concluding an effective mechanism and balance between organizations profit making and meeting the consumers needs existence, however, when it comes to education, healthcare and culture spheres, which provide the necessary conditions for human activity, the transition to the exclusively market relations is not possible due to the potential restriction of the access to the services for some segments of the population.

2) Exceptionally the state is at liberty to implement production, regulation and control of services provision in the basic spheres of life such as housing

and utilities infrastructure, transport, public services, etc., which provision implies payment by the consumers obligation expressed in the form of fees and tariffs system established by the tax and customs legislation, as well as tariff regulation systems at different governmental units levels.

3) Negative externalities in the form of market failures existence resulting in the necessity for the state tax privileges and exemptions imposition, exchange rate intervention anti-monopoly regulation, maximum interest rates of the NBU limitation and procedure of small and medium-sized businesses establishment simplification.

4) The state is a monopolist in such areas as postal communication, psychotropic and narcotic drugs production and sale, and underground.

Services sector state regulation allows achieving such objectives as economic development growth stimulation; the services sector small and medium-sized businesses development stimulation; favorable conditions for fair competition increasing the services sector export potential creation.

State regulation objects are spheres, branches, regions, as well as situations and conditions of the country social life where difficulties and problems not resolved automatically or resolved in the distant future have arisen or may arise while these problems dismantling is urgently needed for maintaining the economy proper functioning and social stability at the moment [88, 161]. In such a case the state regulation object is the services sector, and the main purpose of the regulatory policy is those pressing problems that impede its development in terms of expanding the types and quality of public services solution.

S. R. Krivko highlights the services industries, processes and production conditions, in which difficulties not resolved automatically or resolved in the distant future, have arisen or may arise to be basic objects of the services sector state regulation. Among them he named the following: 1) resources – tangible and intangible assets; 2) social infrastructure; 3) employment; 4) money circulation; 5) social security; 6) personnel training and retraining system; 7) environment; 8) human potential; 9) human capital; 10) services market [91].

Note that in modern conditions services, being material production organic and important element, at the same time have grown into a large and significant component of the population of most countries lifestyle, which necessitates the services sector development stimulation and the state impact role strengthening.

The importance of functions performed by the services sector and its heterogeneity define the necessity of the state influence both on specified spheres and its scope, methods and tools. Reasonable state intervention into the services sector functioning justified in terms of a number of well-known criteria of

general economic and socio-political significance demonstrates tangible positive results, as it is illustrated by the developed countries practice.

Before considering the services sector as the state regulation object a number of fundamental issues should be determined: what is meant by state regulation in the economic life, what are its methods or tools.

Most often the following definition can be found in modern scientific sources: "State regulation of the economy is a system of measures of legislative, executive and supervisory nature, implemented by the authorized state institutions and public organizations in order to adapt the existing socio-economic system to changing conditions."

"State regulation of the economy is the state impact on economic entities activities and market conditions to ensure proper conditions for the market mechanism functioning for social and environmental problems solving".

Today, the services sector state regulation in Ukraine is exercised, including, through the legislation regulating the services sector functioning.

Thus, the following version of the "services sector state regulation" concept interpretation can be summarized and proposed: "The services sector state regulation system can be interpreted as legal, economic and organizational support of an external environment conducive to enterprises effective and sustainable development." Being one of the key factors modeling enterprises external environment, the services sector state regulation system has a significant impact on the managerial decision-making process.

The services sector state regulation can significantly reduce uncertainty value of the enterprise external environment, which in turn, is information available to the enterprise counting function. For instance, normative legal acts regulating the process of interaction between the services sector enterprises existence suggests that the enterprise possesses the necessary information and there are reasons to consider it reliable, hence, the external environment becomes more definitive than in a situation where such documents do not exist and it can be said about low or insufficient amount of information. It is precisely the external environment certainty degree that allows the managerial decision-making process facilitating [17].

To date, multidisciplinary economic relations have developed in the services sector. Freedom of entrepreneurship has become a reality. Economic entities of various organizational-legal forms and forms of ownership, which offer a wide range of consumer services to the population, are being formed.

The importance of functions performed by the services sector and its heterogeneity define the necessity for the state influence both on specified spheres

and its scope, methods and tools. Reasonable state intervention into the services sector functioning justified in terms of a number of well-known criteria of general economic and socio-political significance demonstrates tangible positive results, as it is illustrated by the developed countries practice.

In the developed market conditions the services bidding problem is solved mainly by the free competition mechanism. Coincidentally, world experience demonstrates that no country in the world can do without state intervention into the market relations in one form or another.

The role of the state on the services sector impact has always been great. It was implemented through a variety of different management structures and other forms of influence. Excessive concentration of managerial functions and levers on the basis of all production resources and unlimited rights transfer in their distribution to ministries and departments could be observed. It is almost deprived services sector enterprises of self-management capabilities and the most rational production structures and corresponding material and technical basis formation, and as a consequence resulted in servicing quality and efficiency control and services production decrease, certain types of services dissatisfied demand, mass production output growth along with individual orders execution decline, their performance terms and prices increase.

The services sector state management system is being changed with market relations development. The objective possibility of services sector state regulation appears with certain level of economic development achievement, as well as production and capital concentration. The need for converting this possibility into reality is in problems, difficulties and aims to be managed by the state increase.

That is why the state regulation is so essential in terms of managerial decisions-making. Within this framework the tasks of stimulating economic growth, regulating employment, promoting progressive shifts in the sector and regional structure, improving services quality and a number of other problems are being solved.

Specific directions, forms and extent of the state regulation of the economy are determined by nature and acuteness of economic and social problems in a particular country in a particular period. The most developed state regulation mechanism has emerged in some Western European countries (France, Germany, the Netherlands, the Scandinavian countries, Austria, Spain), Japan and some fast-emerging countries of Asia and Latin America. It is less developed in the United States, Canada, Australia, where unlike Europe there were no social and economic disruptions similar to the Second World War, socialism camp

emergence and then disintegration effects, and where private capital possessed a particularly strong position [174, p. 183]. Nevertheless, state regulation of the economy in these countries plays a significant role, especially during contraction periods in business conditions with high unemployment and inflation rates.

Thus, the necessity of the services sector state regulation is due to the following reasons:

- high social and economic significance of the services provided. The services sector status and services availability determine the achieved level of socio-economic welfare of the nation and quality of life of the population. Services from the social sphere to purely market-based principles transfer makes access to them for a significant part of population difficult (primarily it concerns education, healthcare, and culture). In respect of such services the state must take a proactive approach. This implies the need of consumer protection;
- the services sector development promotes many economic problems of a region solving (provides economic growth, increases employment, increases budget revenues);
- low-profit and unprofitable enterprises necessary for the region's population and enterprises exist in the services sector and especially in the social sphere. Such production is unattractive for private investors and is characterized by fixed assets heavy deterioration.

As international experience demonstrates, high levels of state intervention into the services sector is due to the fact that its development is one of the national policy priority areas.

The purpose of the services sector state regulation is the population quality of life improvement by providing conditions for human capital realization. Tasks can be defined as follows [149]:

- progressive shifts in sector structure and development pace ensuring;
- conditions for fair competition creation;
- development of entrepreneurship encouragement;
- optimum private and public sectors ratio in manufacturing and services ensuring;
- population quality of life improvement.

Thus, services sector state regulation is a system of measures of legislative, executive and supervisory nature, implemented by the authorized state institutions and public organizations to adapt the existing socio-economic system to changing conditions [33, p. 317].

State administration methods are divided into administrative, i.e. organizational-distributive, and economic [44, p.54].

Administrative methods are not associated with additional material incentives creation or financial damage risks. They are based on the state power and include prohibitions, permissions and obligations measures. They restrict freedom of business entities' economic choice. The basic administrative method is regulatory framework in the services sector provision and control over the laws implementation.

Economic methods provide for the freedom of choice preservation. They assume the state's influence on the business entities' economic interests and their incentives in choosing such a line of conduct creation that promotes the pursued state policy.

The list of methods of the services sector state regulation is determined on the basis of goals and targets solved by the state policy in the area at a specific time period (Fig. 3.1.).

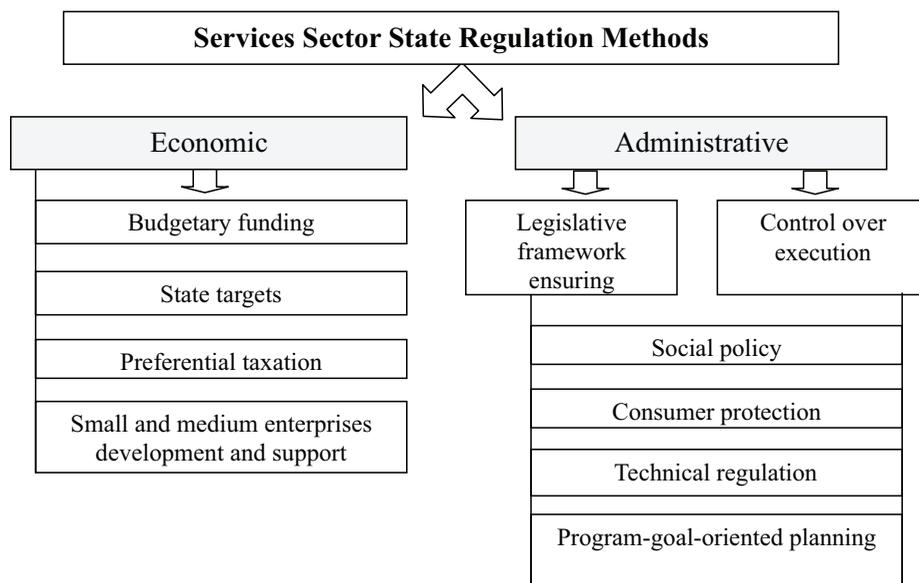


Fig. 3.1. Services Sector State Regulation Methods [69, p. 62]

Direct and indirect methods of state influence are distinguished as well, at that some authors interpret direct methods as those mainly related to administrative ones, and indirect ones to the economic [44]. Other authors believe that economic methods are divided into direct and indirect ones [64].

Various methods of state influence implementation are implemented through a variety of tools, which include:

- licensing, regulations, anti-monopoly measures, rationing systems, standards;
- government contracts, loans, grants and subsidies;
- forecasts, plans, programs;
- taxes, tax advantages, customs duties, discount rate, legal reserve requirement, open-market operations, exchange rate interventions, etc.

Unfortunately, to date, no holistic coverage of this issue in educational and monographic literature is presented; only fragmentary attempts of some aspects presentation are available. And this is despite the fact that the services sector is currently the most important sector of national and global economy.

Analysis of scientific literature on this issue has revealed that the researchers, considering the reasons for state intervention in the services sector need, distinguish the following issues as the main ones:

Firstly, an objective difference in market relations development degree in various areas of the services sector. In some areas of the services sector, such as restaurant, tourism, hotel, advertising businesses, trade and show business market relations have developed widely and created an effective mechanism for meeting needs and making profits. In a number of the services areas that play an important role in ensuring human livelihoods proper conditions market relations are of limited capabilities, since such services to purely market-based principles transfer makes them difficult to be accessed by a significant part of the population (education, medical care, cultural institutions services). For such services the state typically holds an active positions, plays a dominant or significant role.

Secondly, the state performs production, and consequently, regulation of purely public goods supply. Such benefits and their specificity existence (indivisibility, non-exclusion, difficulty of norms setting) determine, among other things, the necessity of consumers for their “payment” enforcement. This is realized in the form of taxation.

Thirdly, the so-called external effects (externalities), especially negative ones, associated with market fiasco (failures) existence. In such a case, more rigid regulation of activities leading to such effects is required. In this connection, the state should strive for property rights clearer specification and liability issue in the event of negative externalities solution.

Fourthly, the state interference necessity is objectively dictated by the fact that in a number of important services the state acts as a natural monopolist (housing and utilities services, postal communication, customs activities, licensing).

In modern conditions services, being material production organic and important element, at the same time have grown into a large and significant component of the population of most countries lifestyle, which necessitates the services sector development stimulation and the state influence role strengthening.

“The state funds a number of services industries directly or indirectly. The government funding scope largely determines material-technical base status and production intensification in educational and healthcare institutions, organizations related to environmental protection, etc. Through direct funding, tax and patent policies the government influences scientific research nature and ensures the appropriate level of cross-sector and fundamental research. Predominantly state funding is provided to such infrastructure industries as roads construction, principal utility services, canals and port facilities construction; postal service, defense, internal law and order, state administration “[172].

Generally, as international experience demonstrates, high level of the state into the services sector intervention is due to the fact that its development is one of the national policy priority areas:

1) The state demonstrates a special interest to the services sector functioning, since its status is to a certain extent an indicator of the achieved level of the nation socio-economic welfare.

2) Another reason for the services sector controlling is the consumer protection.

3) Lack of necessary information on services market (information asymmetry), limiting consumers choice, is another reason of vigorous state activities in this area.

Among the most important objectives of socio-economic processes in the services sector state regulation the following can be distinguished:

- progressive shifts in sector structure and development pace ensuring;
- conditions for fair competition creation;
- entrepreneurship in the services sector encouragement, including small businesses development;
- optimum private and public sectors ratio in manufacturing and services ensuring;
- services export potential increase.

One of the leading American economists, J. Stiglitz, in his work “The Economic Role of the State” (1989) wrote: “In deciding on state intervention the following alternatives should be solved: a) state production or state assistance by the aid of private producers; b) direct control (associated with public production) or indirect control (through regulations or competition from state-owned

enterprises)” [222, p. 41]. For service activities, in which three blocks, stipulating the state regulation, are always distinguished (services as purely public goods; natural monopolies; services as private goods) the alternatives referred to by J. Stiglitz are of particular significance. Their deliberate choice to a large extent determines national socio-economic efficiency level.

Although the main directions of the state influence on the services sector functioning and development are the same for different countries, but their objectives, scope and opportunities are different, firstly, by the specific historical conditions, secondly, by the economic cycle phase and, thirdly, by a country and its economic model development degree. As for our country, according to experts, in general the Ukrainian services industry is characterized as still in the development formation period. This condition requires a balanced comprehensive state impact on its further development process, which must be based on the elaborated concept. Unfortunately, it is still not evidenced.

For modern Ukraine, as well as for many neighboring countries, the most acute problems in the services sector state regulation are: systematic legal framework for service activities regulating creation; incentives for small business, acting as the services sector basis, development; provision of public goods production and modern structures of public enterprises formation; services foreign trade turnover regulation.

Consider them, at least in concise form.

1. Systematic legal framework for service activities regulating creation.

Market economy development objectively requires civil regulation of relations scope (primarily economic but not only) developing in various types of service activities expansion. However, services as a civil rights independent object has appeared relatively recently. And despite the high standard-setting activity in the country, the services sector legal regime development is lagging behind the developed countries level in this matter. As a result, a “mosaic” pattern is observed: certain types of services continue to be subject to the old rules, others are regulated by the new ones, and some of the services are virtually ignored and not regulated. The situation is complicated by the fact that legislation cannot rely on a precise understanding of the “service” phenomenon since it has not been fully developed. Note that even international efforts of well-known specialists in the development of General Agreement on Trade in Services (GATS) have not led to a certain theoretical framework elaboration. Accordingly, the position of legislator, including domestic, concerning services provision and legal regulation has not been definitively determined, which is

not conducive to service activities progressive development and all categories of consumers protection, particularly as regards to services quality.

It should be especially mentioned that regulatory acts adopted at each of the presented levels may have regulatory effects on both the services sector as a whole and its individual branches and types.

The fact should be emphasized that in conditions of domestic legal-regulatory framework active formation maximum coordination and consistency of the accepted documents with their action mechanism clear elaboration is required.

2. Small and medium business, which is the basis of this sector of the economy, is of particular importance for the services sector development. They particularly are able to provide flexibility, adaptation, maximum of consumer demand satisfaction, as well as population employment. For this reason small and medium businesses development encouragement, including through favorable legal environment is a priority for the state.

Thus, "... small entrepreneurship state regulation system refers to economic, legal and organizational environment provision for small enterprises effective and sustainable development. The given system includes various legislative, executive and judicial authorities at the national, regional and local levels "[45].

"Traditional" forms of state support in the forms of tax preferences; concessionary financing and other references should be mainly concentrated on small enterprises meeting the "small business entities" criteria.

Small businesses should also be eligible for limited forms of support, which are generally not related to the direct transfer of financial resources, for example in the field of training, consulting and information.

In addition, small businesses registration simplification; protecting them from large enterprises arbitrariness, including the state in terms of control activities of various agencies frequency; land and other real estate owned by local and other authorities employment by small businesses streamlining should be consistently pursued.

Employment of positive foreign experience in this regard can be proposed as an optimization mechanism for the services sector state regulation. Thus, in many developed countries contract systems are effectively applied, the important object of which is service activities. An example is the Federal Contract System (FCS) of the United States, which is constantly being improved.

3. Scale and effectiveness of the public sector in the economy functioning, its relations and interaction with private sector impacts powerful regulatory effect on the services sector development.

It is notorious that the state acts as public goods scale producer and regulator. As noted by Z.N. Carfantan, “today, much more than ever, the state should ensure collective services development contributing to the social environment quality improvement, which is a dynamism and efficiency factor. Education and training development, collective security provision, territories equipment, social security, major works on infrastructure development – all these relate to the public concerns sphere and accompany modernization process.”

Furthermore, measures provided by the state on services demand and supply value by means of subsidies are of significance:

- 1) consumers on a targeted basis subsidization;
- 2) services producers subsidization.

“Subsidy” (from the Latin – help, support) is an assistance in cash or in kind provided by the state to legal entities and individuals, local authorities and other states at the expense of state or local budgets and special funds, as a rule on the terms of operating expenses shared funding. There are direct subsidies aimed at necessary branches of the economy development, and indirect subsidies, which are the system of preferential tax rates, accelerated depreciation policy, etc.” [106].

“Grant” (from the Latin – gift, donation) is cash provided by government to companies, local authorities and individuals for costs recovery, compensation for losses, lower budgets balancing and other purposes.

The grant does not involve repayment by the recipient and is not of strictly stipulated purposes. Typically, marginally profitable and unprofitable production important for the national economy as a whole is granted. Grants are widely distributed in agriculture, socio-cultural institutions, housing and utility enterprises, and servicing the public entities”[33].

Experts emphasize that state participation in citizens with public goods providing is not confined to these goods direct production. “Compensation of public goods market underproduction may also be carried out through: (a) subsidizing both consumers, and (b) public goods private producers from the state budget. The issue of how exactly should the state be involved in market failures compensation in the context of citizens with public goods provision, therefore, should not be addressed “automatically”, that is by transferring public goods production to the state. This issue should be addressed every time specially, on specific economic analysis of alternative methods of public goods production basis given the existing technology and available organizational forms, traditions and other factors influencing economic and social efficiency of the corresponding method for population with a specific public benefit provision” [122].

The state and state regulation importance is great and vital for the population in terms of so-called socially important benefits (social welfare services, education, healthcare, etc.). According to researches authors, in their influence on market systems functioning and nature of functioning in the economy they are largely similar to public goods, since they are provided to consumers free of charge or at prices that do not cover their production costs.

The problem of socially desirable goods production is very acute for practically all countries and has no “final” solution, since domestic production of such goods excessive expansion or reduction causes socioeconomic efficiency decrease and implies long-term negative consequences. The “golden mean” has to be sought constantly, which results in occasional reforms of healthcare and educational systems necessity.

As a consequence, the issue of state-owned enterprises, including in service activities, is actualized since it is currently one of the most important forms of the state’s impact on the economy and its functioning efficiency. At the same time, the developed countries experience demonstrates that “even the public nature of goods is not sufficient to ensure that its production obligations were undertaken by the state. It can finance their production, but do not participate directly” [61].

Public and private sectors ratio, their interactions are always the state regulation object. The developed civilized states generally try to defer to the public opinion, since it is it which evaluates the public sector efficiency and is a major taxpayer.

Thus, the question “What should be done to overcome economic difficulties: to trust companies and provide them with complete freedom of action or, conversely, to tighten state control and regulation of business?” was asked to the French in the course of public opinion polls in the 1970s, 1980s and 1990s, and the responses differed significantly. In 1978 the liberal method of solving economic problems was supported by less than half of the respondents. After 1982 the number of liberalism supporters exceeded half of the respondents, reaching a maximum in 1986 — 65% favored private enterprise development and 26% voted for the state control strengthening, however, since 1990 the ratio between economic liberalism and interventionism supporters has set off to reshape. In 1994 economic liberalism was supported by just 44% of respondents, with 45% supporting the state control strengthening idea.

Although the French generally remain supporters of the state protectionist role preservation, in recent years they are increasingly criticizing government officials undertaking reforms without prior approval from the citizens.

According to the 1996 survey, 72% of the French respondents conceive that state government reform is necessary at the earliest possible date.

The attitude of the French and citizens of other countries in which similar public opinion polls were conducted, demonstrated both similarities and differences as to the state intervention. This was evident in the issue of the state in the three leading sectors importance. The first group of questions concerned the state in three areas importance, i.e. electricity, hospital services and banking sector. In France the majority of respondents (74%) agreed that the banking sector should be private; slightly less of the French (57%) are of the same opinion with regard to the electric power industry. In contrast, 71% of respondents in France believe that hospitals should be administered by the state.

The responses to this group of questions differed for those living in cities and rural areas, as well as for women and men. Among men and urban residents, the share of private banking sector supporters is higher than the average for the whole sample of respondents. Similarly, the share of private electric power industry supporters is higher among young people than among the elderly. In addition, the share of the considered sectors privatization supporters is higher among right-winger respondents than the average for the sample.

Public opinion as for hospitals and banks in Germany and Spain is close to public opinion in France (29.5% and 20.8% as for hospitals and 63.0% and 55.5% as for banks respectively). This contrasts with public opinion in Sweden, where just 6.2% of respondents were in favor of private hospitals, although 63.3% supported private banks.

With regard to electric power, in contrast to the French, citizens of other countries chose to entrust this sector to the state. Residents of the Czech Republic trust the state considerably more in all the considered areas. The opposite extreme views are held by the United States citizens, who preferred private sector in all three cases.

Regarding the preferred areas of the state intervention, the responses demonstrated that more than 80% of the French consider that the state should:

- control prices;
- provide healthcare services and a decent standard of living for the elderly and unemployed;
- pay scholarships to students from dysfunctional families and narrow the gap between rich and poor.

It seems that our compatriots' opinion is close to the opinion of the French, most of whom remain public services adherents, which are most often associated with the "public good" notion. It is primarily referred to education, medical

care and social security. It is in these sectors that services, which, in the opinion of the majority of the French, should not be privatized, are provided. At the same time the French believe that services in those sectors should be more qualitative and meet consumers' expectations.

Considering the issue of public services sphere modernization, the population primarily indicates the need for services to consumers "proximity", i.e. their interests greater consideration. The French are very demanding consumers. They want better services as well as wish the appropriate services agencies to react quickly to market situation changes and require a greater services diversity and accessibility degree improvement [46].

4. The state is of key importance in services foreign trade regulation. The states governments should play a leading role in services export potential formation and expansion. This role is manifested in creation favorable conditions for private sector development.

For regulatory purposes the state may conduct the following activities:

- put a ceiling on foreign investment in a particular services sector;
- regulate the rules for establishment and operation for foreign companies;
- limit the number of foreign missions, foreign capital share in domestic companies' assets and foreign personnel headcount;
- introduce quotas for specific products and embodied services or limit foreign currency amount provided for services import;
- prescribe preliminary rates, discriminatory taxes and minimum prices for imported services;
- regulate the rules for financial resources outside the country transfer;
- introduce and complicate the rules for issuing documents for national service suppliers leaving the country and foreign suppliers entering the country, etc.

Obviously, if Ukraine develops the services market relying solely on national resources or with minimum foreign suppliers to its market admission, the qualitative level of service industries development in the country will inevitably lag behind the international level. This will negatively affect economic growth dynamics and will not meet domestic consumers' interests.

Due to foreign capital influx the Ukrainian business obtains imperative for the development financial resources and, equally important, advanced technologies, effective methods of services implementation and management; joins in high culture of business relations and customers servicing, etc.

In addition to the cases mentioned, the state may have a regulatory impact on certain types of activities in the services sector development through various tools disposal.

In each case the state regulatory impact on the sphere development must have prescribed limits, since such impact insufficient measure (that is, paid services extension) places the vulnerable segments of population in an inferior position, preventing them from access to vital services. Excessive state intervention generates dependency, deficit and growing financial stress in the state. Optimal combination of public and private sectors in the services sector, as well as various forms and methods of economic activity provide the services sector with flexibility, accessibility and balance aggregate demand and aggregate supply.

At the indicated conditions, the state should formulate impact paradigm through economic and administrative management methods for the services sector of the region development. In such a case its direct participation in services sphere, sectors and enterprises in certain territories development processes regulation is possible. Such participation forms are the following:

- state regional targeted programs implementation for individual services industries funded by the state budget development;
- placement of orders for products and services for national needs supply on the contract system basis [87].

State impact on the services sector development processes should be based on market self-regulation with the state regulation and stabilization methods and social compensation combination. Viewed in this way, the services sector functioning and development model should be adequate to the population needs in the services produced. For its development opposing principles interaction is necessary to be combined that is the plan and the market as a self-adjusting and self-regulating system.

The starting point for such model possibility and necessity justification is paid and free services as a real fact of modern market economy availability [20].

Scientific justification of necessary changes in managing any economic system development must take into account the forms of ownership, which largely determine an entity type, methods and management scheme. State regulation relevant concepts and methodological support availability is especially important for the services sector development, since it is of particular interest in relation to the state special role in addressing the tasks of quality of life and population well-being improvement as well as the territory sustainable social development.

From this position state regulation of the regional economy in the sector context improvement, focusing on its forms and methods should be considered. Of particular importance is their combined impact on the services sector

provision based on content and purpose of state regulation forms and methods, given in Table. 3.1.

**Table 3.1. Forms and Methods of State Regulation of Services Sector of the Region Development [41]**

<i>Name</i>	<i>Purpose and content</i>
<b>Methods</b>	
Direct	Planning, organizational and administrative tasks solution, control as a complex of mandatory requirements for the economic entities on the part of the state
Indirect	The state impact on goods and services producers economic interests through creation favorable functioning conditions and evening-out the adverse.
<b>Forms</b>	
Finance and credit policy	Enterprises financing (state and municipal property institutions). Grants, subsidies, assistance through special funds. Preferential loans, loan guarantees. Service industries funding through regional securities. Financial leasing.
Tax policy	Taxation priorities of service industries determination. Tax incentives (differentiated) and loans. Accounting and reporting system improvement.
Procurement technical assistance	State-owned enterprises and real estate leasing and selling at preferential prices on installment plan. State (municipal) order. Trust on favorable terms.
Informational support	Providing information to businesses and services sector companies on a free basis. Data bank and market models formation for both free and paid services. Enterprises and businesses to the Internet system connection.
Advisory assistance	Businesses and service enterprises on various issues advising. Assistance in development and implementation of projects for new machinery and advanced technology application. Services sector workers training and professional development provision.

The services sector, as well as its individual industries and enterprises effective functioning and development is impossible without state support and state regulation providing conditions for this sector of the economy development. Private and public sectors ratio in services production in different countries depends largely on national specifics, but at the same time some trends are common to virtually all developed countries: services production is increasingly concentrated in the private sector; their production in public sector is either

decreases or stabilizes at a certain level. Currently the search for the most optimal model of the services sector state regulation taking into account the current trends in macroeconomic regulation is in progress.

The question of the state and market sectors ratio in the services sector is definitely very controversial: from the state participation necessity complete denial to the demands for this participation sharp increase. Analyzing foreign experience and taking into account domestic economy specific features, a conclusion as to the state's departure from the services market regulation inadmissibility should be drawn. A reasonable combination of state participation and market mechanisms in the services market regulation is required, particularly with the regard to socio-cultural sphere, where the main role should belong to the state. At the same time, the policy of this sector of the economy nationalization is equally unacceptable. Supervisory functions of the state with a focus on economic methods enhancement are essential. Problems of domestic entrepreneurs support in expanding global services trade conditions are necessary to be addressed at the state level, particularly initially until the ongoing institutional, structural and technological transformations yield positive results and Ukraine creates a well-developed services sector providing the country integration into the world economy.

The existing problems in relations between regional and local authorities associated with programs of socio-economic development of the concerned territories financing inconsistency need solutions. The fact that a service production requires more human capital than industrial or agricultural goods production, i.e. production growth in this sector results in a significant increase in labor demand is of equally great importance for both regional and local authorities.

Strategic goal of the state support for the services sector development is a system focused on industrial and services sectors cooperation with the aim of quality of life improvement and conditions ensuring extended reproduction formation and development; thus the state participation in this sphere should be significantly higher. Market mechanisms introduction in this area should be implemented very cautiously due to the limited effective demand, this is particularly so with such sectors as education, science and healthcare.

A steady trend towards diversification is currently evidenced in the services sector development. Companies, striving to improve their competitiveness, offer a whole range of services, combining previously isolated services types into a total package.

In proportion to production complexity and markets with goods saturation, the demand for services is growing at a faster rate which is due to physically

limited possibility of goods consumption and living standards growth, and hence the demand for services as well.

The forgoing confirms the proposed thesis as to the services sector special role in depressive labor-surplus regions development; as well as that it is the services sector development that should be considered as the most important criterion characterizing regions sustainable development. In this regard, a country sustainable development is impossible without its regions sustainable development ensuring.

As the degree of state participation in the economy is optimized, the importance of searching means for state regulation improvement increases. In this regard, ensuring the state impact on the services sector on the forms content and purposes and state regulation methods basis is especially important. There must be an organic link between them, which will allow to modify the forms from the position of basic methods of state regulation combination optimization (direct and indirect), which will contribute to the state regulation most successful application in management the services sector of the regions development.

In A. M. Gindiev's thesis research [41] main areas which should be regulated by government authorities activities in the services sector of the region are indicated, they include:

- state entrepreneurship in the most socially important sectors development (education, household services, etc.);
- sector macro programming;
- budgetary policy development with regard to socially important branches of the services sector state support;
- enterprises activities credit and financial regulation;
- permissive and stimulating taxation implementation;
- regional targeted marketing realization.

The considered development trends of the services sector are the components of organizational and economic mechanism for the branches and the system as a whole management.

Effective directly applicable methods of state regulation can be program-oriented methods, including development and implementation of state programs for strategic for the region service industries expansion by addressing their socio-economic problems. For their integrated effect various forms of regulation (tax policy, material and technical support, financial and credit policy, etc.) can be applied. On this basis regional public authorities monitor regional budget funds and extra-budgetary funds of social significance formation and

spending. Its effect consists in creation legal organizational conditions for the revenue side of regional and local budgets strengthening at the expense of own sources of financing, rational use of financial resources of the region, services sector enterprises operating on its territory.

With such approach to management regional administration of the services sector development, the main role will belong to its interaction with industries and enterprises managers, which is regarded as the highest form of cooperation and is widely used in the developed countries with market economies. It ensures the partners positive impact and constant feedback consisting in state bodies in real management processes active intervention with adjustments introduction. However, specifics of the economy of each specific region development predetermines a specific set of methods, levers and incentives application that can be determined at the Federal level, but the responsibility for their effective application is transferred to the regional authorities [41].

The ongoing economic processes adjustment by the state, to functional actions of which regulation objects definition, goals and objectives for the services sector development given the existing division of labor and industries specialization formation, management system organization, regulatory subjects identification, functions delineation and regulation methods choice, results of the state influence on the services sector development evaluation can be attributed, allows both the services sector as a whole and its member-industries, enterprises and organizations of various organizational-legal forms and forms of ownership pervading by the regulatory impact. The regulatory bodies' aggregate action should be aimed at creating conditions for internal and external reserves, economic growth factors in the services sector and its components search with regard to sector peculiarities and their development specificity [155].

## CONCLUSIONS

The presented Monograph is a comprehensive study of the services sector modern development trends. A holistic scientific concept of the services sector evolution is presented, within which:

- interpretation of “service” and “services sector” concepts essence is proposed;
- theoretical basis for the services sector development is proposed;
- the services sector importance and current development state in Ukraine and in the world are investigated;
- the services sector development determinants are identified and analyzed;
- primary areas and possible prospects for the services sector modernization are substantiated.

The primary areas of the modern services sector development are described by the Monograph authors as:

- knowledge economy and high technology industries which include education, high-tech medicine, R & d and communication sectors formation and development;
- services markets to the WTO countries services markets customization by standards, sanitary and phyto-sanitary regulations with WTO member states harmonizing;
- participation in international strategic alliances in information, computer, telecommunication, aerospace, aviation services, research and development services areas;
- the services sector dependence on the state funding alleviation as a result of competitive mechanisms to attract private capital introduction and entrepreneurial initiatives promotion;
- formation conditions for capital and labor objective redistribution process into activities with a higher value added share, less energy-, material- and capital-intensive — into the services sector — from other activities,

- including through conditions for economic activities in the services sector and other branches of the national economy liberalization, real estate and labor markets development, extensive financial infrastructure formation;
- efficiency of the services sector enterprises improvement through modern information-communication resources application. This focus area relevance is exacerbated by backwardness of introduction high-performance integrated information systems at services sector enterprises;
  - material production and the services sector integration, primarily in the knowledge-intensive sectors of manufacturing and telecommunications industries;
  - competition in utilities services, banking services, communication services, transport, logistics services and engineering survey services promotion;
  - modern technologies development (blockchain, artificial intelligence, 3D printing, etc.).

In accordance with the social orientation of the national economy, special attention will be paid to the services funded from the state budget development in such areas as education, healthcare and social services, transport and communications, etc., as well as to the socially responsible business popularization.

The Monograph authors emphasize the fact that the services sector development should be based on an innovative principle. This focus area realization is possible on the advanced innovative projects in the services sector selection and implementation basis. In this context it is about: new types of services creation; new technologies and equipment that improve productivity, quality and efficiency of the services provided creation and promotion; new forms of organizational associations in the services sector creation, providing the unmet needs of a certain type of services to the population on the one hand, and on the other, creating new jobs and increasing depressive territories development level.

Ukraine should expand science-intensive high-technology sector of the economy, including knowledge-intensive high-technology services production. Currently, high technology sector low capacity in the country's economy does not allow to produce high-tech, knowledge-intensive services due to the domestic demand lack. Such services could become "growth points" for traditional services sector industries of the national economy, contribute to the country's export potential further development, provide a competitive level of the services sector in a qualitatively new technological level. Knowledge-intensive sector of the economy extension will require an increasingly high level of education, advanced knowledge and modern training methods, since their

## CONCLUSIONS

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higher qualification plays the primary role. Accordingly, this process will be accompanied by the population educational level increase.

Conditions for the services sector development are necessary to be created. The conditions for their development should be: favorable innovation and investment climate; investment attractiveness of the services sphere growth; conditions for the state significant “growth points” in the services sector development and support creation; specialization in the services sector determination; public-private partnership aimed at business and investment risks mitigation development; favorable conditions for individual entrepreneurship “legalization” creation.



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