

## The Information-Based Economy

Dr. Ahmed Ahmad Hassan Ahmad

Ministry of Science and Technology - Iraqi Atomic Energy Commission, Iraq

**ABSTRACT:** We should pay attention to the fact that the information-based economy is because information has a material value, as it allows all individuals to make choices that result in expected returns higher or more than what they would get from the choices in the absence of information. Today the information became a resource and an essential element in life and the economy. It is called in the most economic literature the (knowledge economy), but it is better to call it the information economy because the dependence on information in it is more.

but although some of them consider it an intangible resource and this is a big mistake, as information is a resource and has a cost resulting from the procedures for obtaining it or producing it in various ways in order to achieve a benefit from its use in the future to increasing profits, reducing costs and increasing their competitiveness.

The organizations attach great importance to spending on information or research and development and it can reach millions of monetary units. The amount of spending on information varies from one organization to another for several factors, perhaps the most important of which are the size of the organization and the nature and objective of the organization. It is also difficult to measure or predict the cost of obtaining information or the benefit resulting from it, in addition to the difficulties in determining its source, the appropriate timing for obtaining it, and determining the beneficiary party also.

**KEYWORDS:** Information economy, The information, Information value, Classification of information, Information society.

### 1. THE INFORMATION

#### 1.1. What is the information?

The concept of information merges with other concepts such as data, knowledge and wisdom, as the relationship between them is known. These concepts can be understood as follows:

**First: the data:** It is a group of raw materials in different forms such as pictures, films, views, numbers, symbols, letters, words, measurements, events or facts for a specific case or more in an unordered scattered manner.[19]

**Second: The Information:** Information in the language is a word derived from the verb (know), and this English word is derived from the Latin language (Informatio), which originally meant the process of communication or what is communicated or received. It also indicates an awareness of the insides of things, awareness, perception, certainty, information, fame, guidance, distinction, defining milestones, knowledge, facilitation, education, learning, know-how ... and other meanings related to the functions of the mind. The term information carries many interpretations, including: [2][10] [19]

- 1- Information is the result of collecting and handling data.
- 2- Is data that has been completed from a set of documents or forms in a prepared and assessed form and in a purposeful way.
- 3- Is the process of communicating facts or concepts in order to achieve knowledge.

- 4- Is that thing that changes or increases the cognitive state of the recipient (the reader, the viewer, the listener) on a subject.
- 5- Information is the set of data, indications, knowledge, and contents that relate to the thing or subject, and help the recipient to identify and learn about it.
- 6- Information is the generalizable facts that scientific research ends with after stages of exploration, investigation, induction and experiments.
- 7- The Information, then, is data that has been processed, analyzed and interpreted to become of value, meaning, significance or a specific purpose for a specific use, for the purposes of decision-making, and thus can be traded, recorded, published and distributed, in an official or unofficial form.[8]

**Third : Knowledge:** It is the state of understanding and realization, which is beyond mere knowledge of facts about a subject, but extends to an intellectual capacity for inductive estimation beyond facts and arriving at original conclusions. It also represents the set of meanings, beliefs, judgments, concepts, and intellectual perceptions that are formed by man as a result of repeated attempts to understand the phenomena and things surrounding him. It represents the outcome or balance of experience, information and a long study owned by a person at a particular time.[1] [6]

**Fourth: wisdom:** means he knowledge and awareness of things, while adding life experiences that we gain from

social and human situations to our perception of things. Thus, a person moves from a mere conscious person to a wise person, as one of the features that distinguishes a wise person is that he can overcome any problem and deal with

it, and is also characterized by being patient when he thinks and decides on an important matter.[9] [10]

Figure (1) shows the hierarchical form of the relationship between the four concepts, including information.

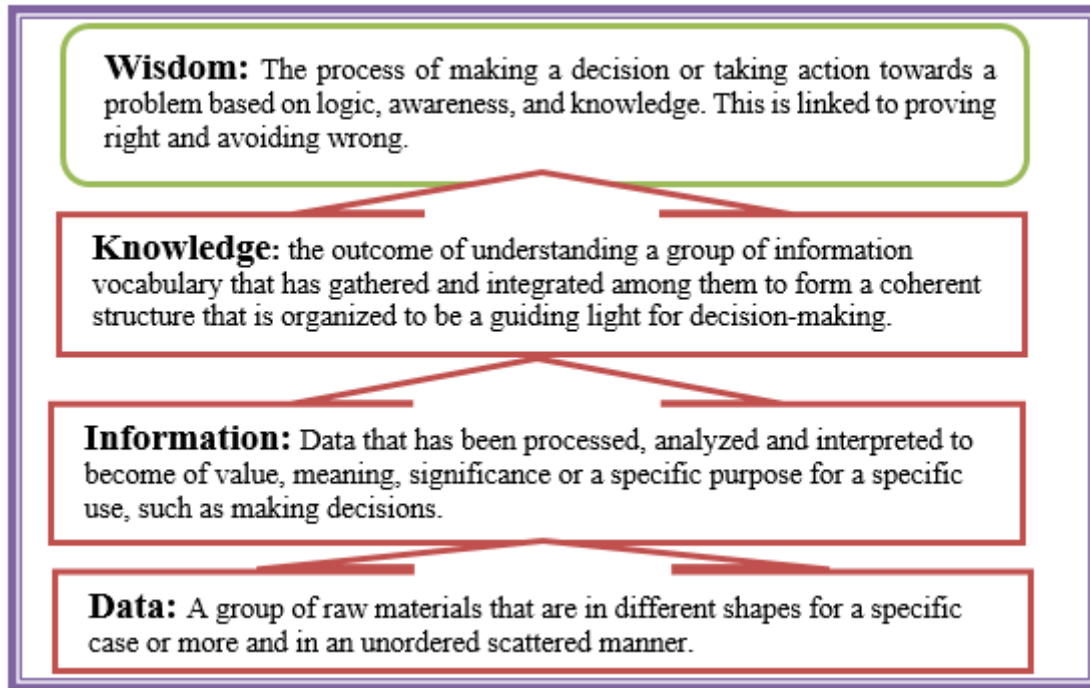


Figure No. (1) The hierarchical figure of the relationship between the four concepts down to wisdom.[9]

**1.2. Forms and types of information:** The information is characterized by having multiple names according to the dimension it presents or is characterized by, including the following:[9][10]

1. Developmental: It is information that is useful in developing and improving the cultural and scientific level of individuals, and broadening their perceptions.
2. Achievement information: It is specific information that is useful to individuals in completing a work, project, or making a decision.
3. Educational: What students receive during their academic studies.
4. Research information: is the information obtained by individuals from experiments.
5. Intellectual: the theories, hypotheses, and ideas that individuals make or develop of the problems.
6. Systematic stylistic information: It is the information that helps the researcher to complete his research accurately.
7. Guiding information: It is the information that an individual obtains through the directives of others to him.
8. Political information: Information that pertains to political issues and decision-making processes.

**1.3. Information properties:** Information is generally characterized by a set of characteristics represented in the form in which it is presented, the content or its time range, as well as being expected or unexpected in addition to the degree of its accuracy and organization, as well as its source,

whether internal or external, and we include a set of characteristics that must be available in the information used by managers To make their own decisions or develop their products, these characteristics are represented in the following:[4][11][22]

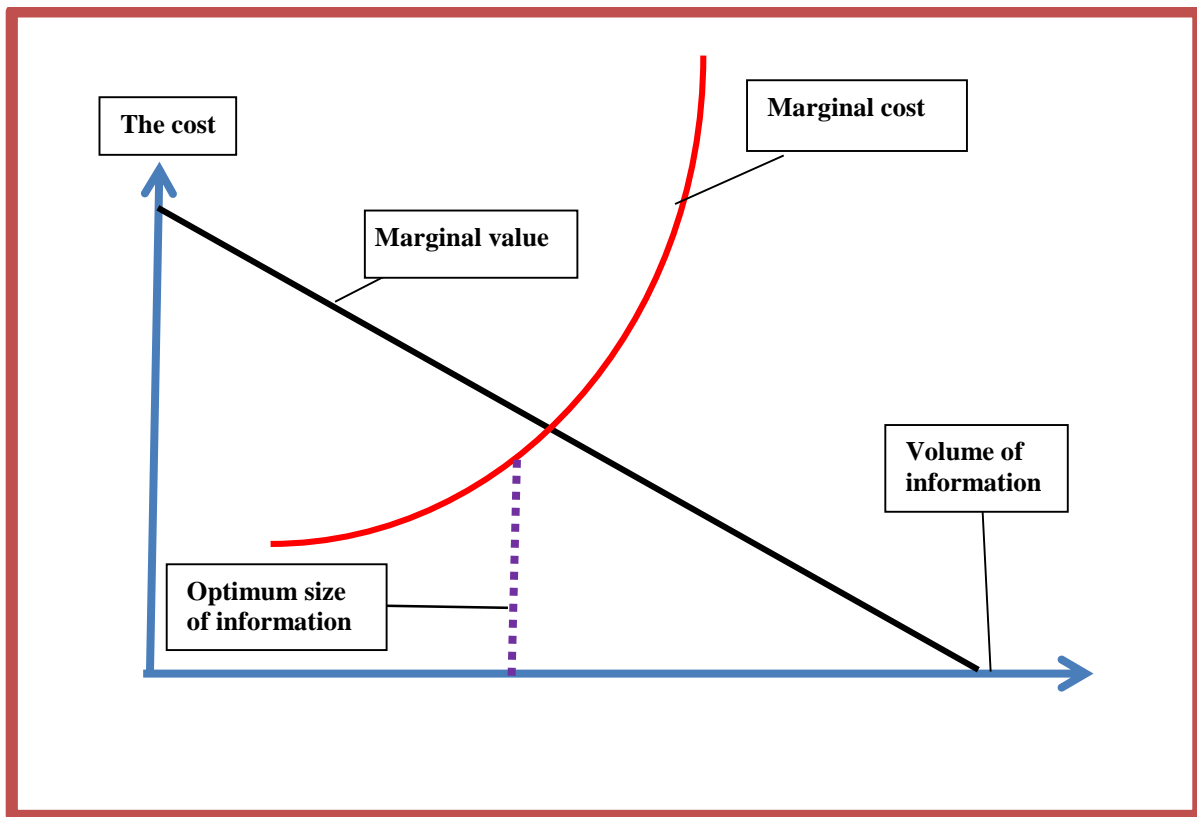
1. Time period: It means the time spent in collecting, analyzing and organizing the data and the processing time on it in order to reach the results.
2. Comprehensiveness and objectivity: the extent to which that information includes, so that it must cover all the facts of the phenomenon so that the beneficiary can use it and benefit from it.
3. Accuracy and clarity: It expresses the extent to which the information is free from error, repetition, ambiguity and complexity.
4. Cost: The expected return from the information should be greater than the cost of obtaining it.
5. Flexibility and convenience: It means the compatibility of information for all, its suitability to the needs of its users, and its flexibility.
6. Measurability and retrieval: The information produced should be quantifiable with easy and quick access to and retrieval.
7. Realism: The information must be factual, meet the needs of the beneficiaries, and the information be effective and efficient.

**1.4. information classification:** The difference in the strategies of organizations, their levels and the nature of their employees, leads to a difference in the need for information in terms of quantity, quality and type. This need depends on the end user of the information, which means that the classification of information differs from one user to another. However, information can be classified according to one of the following criteria:[16][22]

1. Source of information: Information arising from within the organization is considered internal information, while information arising from outside the organization is considered external information.
2. Primary information and secondary: Primary information is what is collected for the first time and specifically for a particular problem. Whereas, secondary information is what is collected, stored, and has the ability to be retrieved.
3. The degree of stability: The information may be fixed such as (names and dates), while engineering designs and inventions are considered as variable information.

4. The degree of official: The information that is circulated within the organization is called official information, while that outside the organization is called informal information.
5. According to the organization's function standard: It is divided into information related to production, marketing, finance, human resources, administrative services or research and development.

**1.5. material value of information:** We noticed that knowledge is clearly based on information, and it turns out that some sections need information only and not knowledge, or they may need data only sometimes, as it turns out to us that information has value resulting from its production or acquisition, so the information economy is the economy that Depends on information, invention and development and helps to achieve high economic growth and competitiveness between countries and organizations.[11] From Fig. (2) below, we find the relationship of marginal value to marginal cost of information.



**Fig. 2.** The relationship of marginal value to the marginal cost of information [13]

From Figure (2) we can conclude the following:[13]

- If the marginal value of the information exceeds the marginal cost, the amount of information can be increased.
- If the marginal value of the information is less than the marginal cost, the amount of information must be reduced.
- If the marginal value of information is equal to the marginal cost, then we reach the optimal amount of information.

But in practice, we find that there is a large financial expenditure on information in order for organizations to meet

their various needs, including increasing returns and investments. Organizations generally aim initially to reach the optimal situation in which the marginal value of information is equal to the marginal cost of producing it, because the increase in the volume of information after the point where the marginal value curve meets the marginal cost curve leads to an increase in cost over benefit. [16]

Accordingly, institutions process data and transform it into information through a set of operations (collecting, analyzing,

storing, retrieval, displaying or sending and others) and for many purposes, perhaps the most important of which is the decision-making process for pricing the organization’s products or determining the number of units to be produced or developing a product what etc. So, information is the main element in increasing the volume of knowledge of managers and organizations together, and those who obtain it, which is positively reflected on their behavior, decision-making, economic growth and competition, and the quantity and value of information is usually determined by its use. As the concept of the value of information does not take its true meaning except in the case of risk and lack or absence of information.

We see that the cost of producing information is linked to one or more specific activities, such as the cost of preparing wages, or the cost of preparing customer orders, or the cost of preparing monthly plans...or others, and costs are usually classified according to their behavior during a certain period of time. It is important to understand and interpret the costs involved in producing information; It usually takes a lot of effort to produce information (such as the effort needed to implement a new way to operate a product).

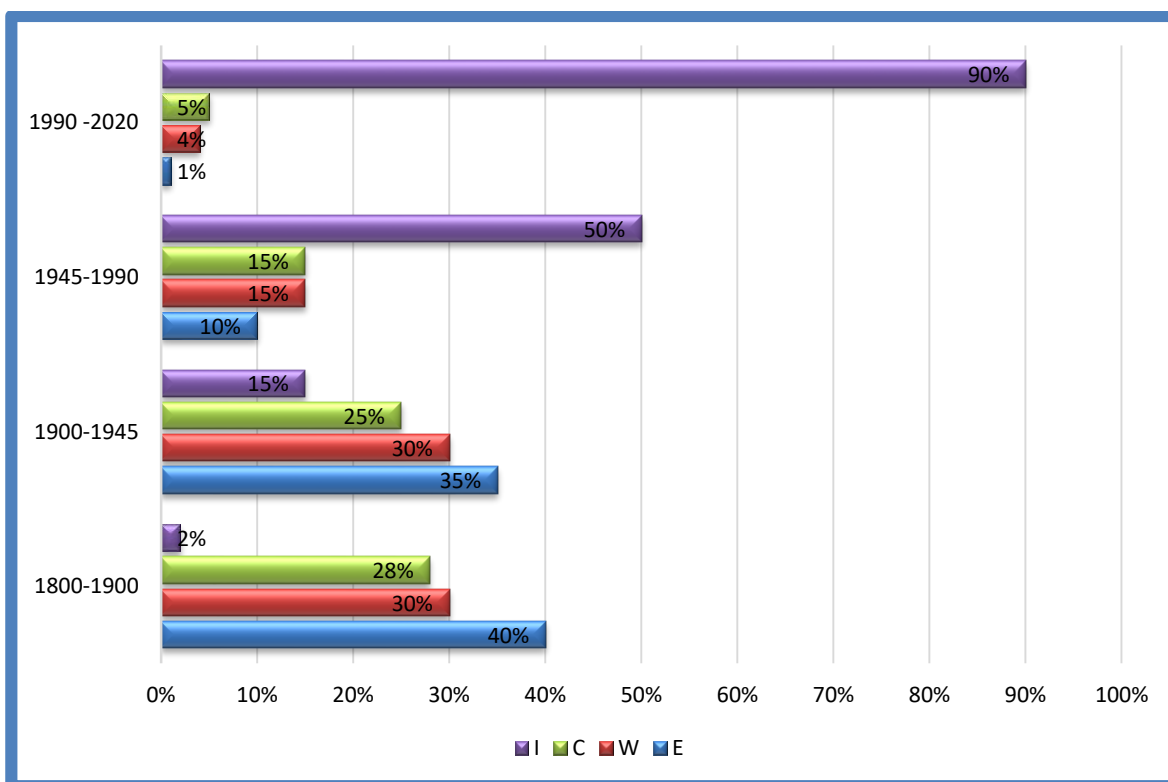
**2. INFORMATION ECONOMY SOCIETY**

**2.1. Evolution information economy:** Interest in information appeared in the middle of the twentieth century and spread gradually, but the emergence of the economy dependent on information became evident, especially after

the spread of the use of the Internet in the world, and companies became interested in the field of information and communication technology together, such as “Microsoft” companies, and “Apple” Facebook, and others, and we see them today, are among the largest companies in the world, and their growth was fast.[2][3]

The development in the circulation of information extended to other areas such as banking services and commercial activities between companies and countries, which encouraged many investors to adopt information in their activities. Thus, the global economy began to depend on information based on data collected from products, prices, customers, and various sciences and knowledge around the world. This combined information allows consumers to see and buy products in the global market, and knowledge and science are invested in the development of research-based industries such as pharmaceuticals.[14]

Accordingly, the information economy can be considered a branch of microeconomics, which studies how information and information systems affect the economy and economic decisions. Information has special characteristics that distinguish it from other economies in terms of buying, selling and trading. It is easy to configure, but it is difficult to trust it. It is easy to spread but difficult to control, and it influences many decisions.[17] Fig. (3) shows the historical gradation of the elements of the economy compared to the information economy.



note: E = Earth C = Capital W = the work I = the information

Fig. 3 The historical gradation of the elements of the economy compared to the information economy

**2.2. Reliability on the information economy:** The productivity and competitiveness of organizations or agents in this economy (whether they are companies, regions, or countries) depends primarily on their own abilities or on others to efficiently create, process and apply data- and knowledge-based information.[12] Electronic and technological developments over the past few decades have enabled the rapid exchange of information to influence the prices of all products such as energy, food, and raw materials. This information has become so valuable that global markets fluctuate due to uncertainty around the world. Some examples include natural disasters, political unrest, etc. in countries.[5]

The use of computers, mobile phones, social networks and instant communications on the Internet has helped and made it possible for third world countries to also compete in the global economy by accessing global markets and global trade organizations and creating new opportunities with the world, and this is part of the information economy as well as intelligence Artificial intelligence plays an important role in this economy. Only humans provide these applications with information, so that the information economy has gradually become a natural part of our daily lives without us realizing it.[15] We note that information about the weather, social unrest, news and political relations drive and influence consumer decisions, so information at the present time has become the catalyst for speculation or investment in light of changes in the national economy.[17]

Thus, in the future, it will undoubtedly be in light of this pace for information economy developments, and because of this new economy based on information circulation, it will be focused on competition to obtain accurate information amid the accumulation of false, inaccurate or useless information. This means that in the future we will witness an information exchange in which information is traded as a commodity.[14]

**2.3. Features and characteristics of the information economy society:** The following areas are at the heart of

information science: Informatics, Information seeking, Information retrieval and Information management.

Accordingly, the feature of the information society depends on (economic growth) based on advanced technology, which is called the information economy. In other words, the information economy is the main driver of the information society, and no program, organization or project that wants to succeed can neglect or postpone achieving or Involve advanced technology.[7][21]

There are also three basic characteristics in the information economy society:

- The first characteristic: the use of information as an economic resource, where organizations and companies work to exploit and benefit from information to develop their outputs or increase performance efficiency, and there is an increasing trend and tendencies towards information companies to improve the overall economy of the state.[18][20]
- The second: is the endless use of information among the general public, such as consumers, manufacturers, or the state in the field of education, culture, or other fields (social, sports, psychological ... and others) that concern the community.
- The third: is the emergence of the information sector, as an important sector of the economy in addition to the three well-known sectors of the economy.

**2.4. Discussion on the role of information in the economy:**

By noting the activities that fall within the information economy community, the work has been divided into two parts:

The first section focuses on a study of the 20 largest companies in the world in terms of revenues for the years 2018 and 2019 and in a sequential order from the highest to the lowest for the year 2018 and then the change in order in the year 2019 as shown in Table No. (1) in which the name of the companies and The date of the activity as well as the type of activity, which is what concerns us here in this study with other information.

Table No. (1) is a list of the 20 largest companies in the world in terms of revenues for the years 2018 and 2019.[23][24]

Rank	Company	Country	Market capitalization (US\$b, 2018)	Market capitalization (US\$b, 2019)	Rank 2019	Founded	Activity
1	Apple	US	703	905	-1	1977	Electronics and communications
2	Alphabet	US	851	896	-2	2015	Electronics and Information technology as Google and other companies (Conglomerate)

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3	<b>Microsoft</b>	US	701	875	2	1975	Electronics and Information technology
4	<b>Amazon</b>	US	719	817	1	1994	E-commerce & Artificial intelligence
5	<b>Tencent Holdings</b>	China	492	494	-3	1998	technology and communication
6	Berkshire Hathaway	US	464	476	1	1839	Group of companies(Financials )
7	<b>Alibaba</b>	China	470	472	0	1999	E-commerce, retail, Internet, and artificial intelligence technology
8	<b>Facebook</b>	US	496	438	2	2004	social media
9	JPMorgan Chase	US	344	372	1	2000	Financials
10	Johnson & Johnson	US	316	342	1	1886	Healthcare
11	Industrial & Comm Bank of China	China	375	331	-3	1984	Financials
12	Exxon Mobil	US	246	314	2	1870	Gas and oil
13	Bank of America	US	246	292	-3	1998	Financials
14	<b>Samsung Electronics</b>	South Korea	336	287	-13	1969	Electronics and communications
15	Royal Dutch Shell	Netherlands	264	280	-3	1907	Gas and oil
16	Walmart Stores	US	307	266	1	1945	Retail + Selling and trading electronically
17	China Construction Bank	China	200	260	-14	1954	Financials
18	Wells Fargo	US	263	256	-12	1852	Financials
19	Nestle	Switzerland	211	245	6	1866	Food Industry
20	Visa	US	197	244	8	1958	Financials

Through the table, we note that activities in the field of information or related to e-commerce, the Internet, artificial intelligence technology or communications and everything that falls under the umbrella of the information economy community is modern in terms of its origin, but its power to penetrate is fast and strong and has entered the ranks of competition for the advanced position where It got the ranks (1,2,3,4,5,7,8,14) out of the twenty selected in achieving revenue, despite its recent establishment. If it is noted that

Samsung, which is the oldest of them, was founded in 1969 and is in sequence 14. It started with industrial activity and worked to strengthen it with communications activity later, but (Alphabet) company ranked second despite its establishment in 2015 because it adopted the Internet activity, where it started with (google) and Others were added to it later, and this is a stark proof of the strength of this economy and the need to pay attention to it.

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As for the second section of the study of the information economy society, it focused on the other side, which is a study of how to achieve rapid wealth and the areas that help with that, through Tables No. (2) and (3) for the world's wealthy

and for the years 2018 and 2019 arranged according to their possessions, the activities they practice and the date of their establishment The activity that brought them this wealth.[24][25]

**Table no.(2) The World's Billionaires 2018**

No.	Name	Company's name	Founded	Market capitalization (US\$b, 2018)	Activity
1	<b>Jeff Bezos</b>	Amazon	1994	112	E-commerce & Artificial intelligence
2	<b>Bill Gates</b>	Microsoft	1975	90	Electronics and Information technology
3	Warren Buffett	Berkshire Hathaway	1839	84	Group of companies (Financials )
4	Bernard Arnault	LVMH; Christian Dior	1987	72	luxury goods
5	<b>Mark Zuckerberg</b>	Facebook	2004	71	social media
6	Amancio Ortega	Inditex, Zara	1985	70	Clothing & Fashion
7	<b>Carlos Slim</b>	América Móvil, Grupo Carso	2000	67	Communication Technology
8	Charles Koch	Koch Industries	1940	60.1	Gas and oil
9	David Koch	Koch Industries	1940	60	Gas and oil
10	<b>Larry Ellison</b>	Oracle Corporation	1977	58.5	Database software and Technology

**Table no. (3) The World's Billionaires 2019**

No.	Name	Company's name	Founded	Market capitalization (US\$b, 2019)	Activity
<b>1</b>	<b>Jeff Bezos</b>	Amazon	1994	131	E-commerce & Artificial intelligence
<b>2</b>	<b>Bill Gates</b>	Microsoft	1975	96.5	Electronics and Information technology
3	Warren Buffett	Berkshire Hathaway	1839	82.5	Group of companies (Financials)
4	Bernard Arnault	LVMH; Christian Dior	1987	76	luxury goods
<b>5</b>	<b>Carlos Slim</b>	América Móvil, Grupo Carso	2000	64	Communication Technology
6	Amancio Ortega	Inditex, Zara	1985	62.7	Clothing & Fashion
<b>7</b>	<b>Larry Ellison</b>	Oracle Corporation	1977	62.5	Database software and Technology
<b>8</b>	<b>Mark Zuckerberg</b>	Facebook	2004	62.3	social media
<b>9</b>	<b>Michael Bloomberg</b>	Bloomberg L.P.	1981	55.5	Technology, Mass media
<b>10</b>	<b>Larry Page</b>	Google and Alphabet Inc.	1998	50.8	Electronics and Information technology

Here we also note how activities in the field of information or related to e-commerce, the Internet, artificial intelligence technology or communications and everything that falls under the umbrella of the information economy community is modern in terms of its origin, but its penetration power is fast and strong, and those who engage in these activities have entered the ranks of competition. On the advanced position in achieving wealth, as they obtained in Table No. (2) of 2018 ranks (1,2,5,7,10) and ranks (1,2,5,7,8,9,10) for Table No. (3) for the year 2019.

Where we note that the oldest date for the sundial of these activities was in 1975 for the company (Microsoft) and its owner (bill gates), and that the most recent activity was in the year 2004 for the company (facebook) and its owner (Mark Zuckerberg), and this is another evidence of the strength of this economy and the need to pay attention to it.

### CONCLUSION

From the previous presentation, a number of conclusions can be reached, including:

1. Information is the basis for increasing the volume of knowledge for managers and organizations together and who obtain it, which is reflected positively on their behavior, decision-making, making economic growth and competition.
2. Information is a resource, because the process of obtaining and providing information in various ways has a cost.
3. the Information will be generates returns in the future (future guarantee).
4. It is imperative that no cost to a particular resource should be sacrificed beyond the benefit of acquiring and using it.
5. Information is a resource that is difficult to measure the cost of its acquisition and the benefit of its use.
6. Information is a new and essential element in the economy and most organizations and people depend on it as well.
7. the Information from somewhat intangible resources like trademarks and patents.
8. There is a difficulty in determining the source of the information, the appropriate timing to obtain it.
9. Our contemporary world is witnessing the phenomenon of increasing dependence on scientific and technological information and its use in various applications.
10. Information is the fastest element in the economy to achieve economic growth and profits.

### RESULTS

The study reached the following conclusions:

1. The explosion in the use of information has become one of the characteristics of the era.
2. Information has become a commodity and a new economic resource.

3. Countries should catch up with the developed countries because there is an effort and competition in the developed countries to invest in the field of information significantly.
4. The emergence of the information economy as a new type of economy and a strong competitor to the rest of the economies.
5. The need for the attention of all societies in this field.
6. The Internet is one of the means of marketing the information.
7. The necessity of spreading a culture of what information management is in societies.
8. As those who invested in this type quickly moved to the ranks of advanced positions in terms of material abundance and value.

**Research problem:** There is a weak interest in adopting and paying attention to the information economy in most countries of the world, especially the third world countries, which makes everyone who neglects this sector lags behind in the process of competitiveness and development.

**Research goal:** The aim of the research is to shed light on one of the most recent types of economics that have emerged on the practical and economic scene, which is the information economy because there is little interest in it.

**Research importance:** We see the necessity of paying attention to the world of the information economy in the economic literature, and highlighting the role it plays in building the economy for organizations or people.

**Research hypotheses:** There is an economic feasibility and great benefits from adopting the information economy in all areas of life.

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