

Information economics and its application in data-centricity businesses: A review study

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Abstract

Economic issues are of special importance in the world and all countries are looking for new economic methods to improve their country's economic situation. Also, over time, information became known as a commodity, and its sale and purchase were discussed by economists and informants. Today, information economics has become one of the emerging topics in the field of information science and epistemology. Awareness of research trends in a field, unexplored or less researched fields, knowing people with experience and expertise in that field and the research done by them is very important for researchers and there are many ambiguities in this regard. Examining the research conducted in the field of information economics for data-driven businesses, it is clear that the research conducted in one of the data-driven fields, information economics, information value and information economics, business model, business and business Information economy works, data-driven business, data strategy are placed in the business. One of the most important parts in creating this economic activity is obtaining data information in different sections to start a business.

Keywords: Economics, Information Economics, Information Science, Information Value, Data Strategy.

Introduction

Businesses and business centers must use data at the heart of their economic and strategic decision-making and policies, regardless of their dimensions or components. Business managers need to make decisions and policies, and this will not be possible by providing raw data alone (Hull, 2013).

One of the important goals of the information economy policy framework for data-driven businesses is to turn environmental data into insights and use it in policy-making and decision-making. Information and knowledge economics is a new topic in which the processes of production, distribution, dissemination, storage, consumption of information and knowledge; The transfer of symbols and all revenues that are directly or indirectly obtained through the mentioned, are analyzed (Akarkin&Yasinovskaya, 2018).

Today, with the continuous growth of technologies and extensive market changes and the rapid cycle of innovation, it has created a very stressful and chaotic analysis for companies. Survival in such an environment is based solely on information economy policies in businesses with an emphasis on innovation in product areas, work processes and in all different areas of business. To this end, companies in order to maintain the value created at the previous level and try to increase the level of decision value creation, to implement innovation in business models through the use of data capacities, in Take their business model (Leavy, 2021).

Information and communication technology, which is one of the elements of data-driven economy and has caused change and transformation in all aspects of human development and social agreements. In order to develop and expand the data-driven economy and its economic activities, the production and utilization of information technology knowledge has been developed as an engine of economic growth in market economies (Gorbunova et al., 2020). Knowledge-based economy has transformed all areas of trade, economic structure, productivity, type of management, etc. and has features such as trade liberalization and globalization of trade, information and communication technology, knowledge management, structural change in the economy, Changes in workplace and workforce, increased consumer choice, government downsizing, and the growth and development of data-driven businesses

(Matsuoka et al., 2019). Therefore, in view of the importance and necessity of this issue, the present study seeks to provide a model for information economy policy framework for data-driven businesses (Kul&Sayar, 2021).

Information economics refers to the process or system of production, sales, and processes of purchasing goods and services (Shahrah, 2021). Economics is a social science that specifically describes and analyzes the process or systems of production, distribution and consumption of goods and services (Abbad et al., 2021). Della Corte(2021) The economics of information is the study and study of the production, distribution, marketing, pricing, sales, consumption and all revenues that directly or indirectly through the production, publication, sale, storage, processing and access to complete information Be, defines. Augustine mentions information economics as a common theme among economists and managers and informants (Kowalkowski et al., 2021). Information economy policies create value chains and improve the resource efficiency and performance of companies at all levels of the business. Constantly changing technology is driving the next wave of economic growth. To take advantage of this growth, companies not only have to apply new technologies, but also adopt new ideas. Data to information and from information to knowledge (Shahrah, 2021). Information economy is a model whose production system is based on knowledge and information technology (Leavy, 2021).

Business models are essential for revealing the hidden value of existing or new technologies. Information technology alone has no economic value or ultimate value, but the economic value of information is determined when through Develop and commercializes specific business models. Therefore, it is the business models that play the main role in small and large companies and not technology and information (Tronvoll, 2021). Kul&Sayar, (2021) argue that the data-driven business model is based on the logic of creating and maintaining value. Kowalkowski et al., (2021) defines the data-driven business model as an exploratory logic that combines the potential of technology and information with the realization of economic value. The data-driven business model provides a conceptual tool that It consists of a set of elements and the relationships between them that represent the logic of the company's operations in a particular area.

Materials and methods

This study was a library study. In this study of internal studies, library resources, magazines, newspapers and other available sources were used. International sources from the United Nations World Narcotics Organization were also used to study Pakistan's studies. The results were analyzed sequentially.

Results

Based on the above, being informed means using data as an agent and not using it as a basis. In an information business, teams may consider other factors such as brand consistency or subjective customer experience in addition to data when making decisions.

Data-centricity model

In defining a data-driven approach, it should be emphasized that data-driven has a core and a permanent core. Data, applications and services are very effective, they live as long as they are useful. But data is always there. When we say "a single data model", we mean a unified view of the data, not a "single database". This means that you can manage your data for a specific use, but always centrally, with the governing data and processes; To ensure data accuracy, integrity and timeliness (Zhukova&Zubarev, 2021).

Data-driven is a model that is a process based on data. In this type of process, information is decisive, not direct or implicit experience and knowledge. In a data-driven approach, no definite decision is made until there is accurate and sufficient information about an issue (Ciasullo et al., 2021). A data-driven model does not mean that all personal perceptions and experiences and personal experiences are discarded. Every business founder can use data-driven, in addition to their tacit and educational knowledge, to improve rather than maximize the certainty of decisions. Data-driven model means moving in the direction of goals. In this way, data analysis is used. In other words, the data-driven model is a model

based on data analysis instead of relying solely on experience and intuition. Scientists extract data from data and place it in two categories, quantitative and qualitative. Both are important and vital for data-driven decision making (Zhukova&Zubarev, 2021).

In this regard, our method in this research is data-driven. Thus, the IT policy framework is based on data-driven business models in companies that are necessary for the success or flexibility and effectiveness of business models; Has not started and is a challenge for data-driven business models (Shojaei et al., 2021). Therefore, in order to solve this important and fundamental problem, this study tries to identify the factors affecting the information economy policy framework for data-driven businesses and by prioritizing these factors and measuring the impact of each of these factors; To present a new business model with the method of grand theory of relation to create and create value for data-driven businesses, within the framework of information economy policy.

Information Economics

Information refers to data that has a specific meaning and the user can easily collect, classify, summarize it and, when necessary, post-analyze and interpret it. Economics is a science that studies human behavior as a link between scarce resources. In other words, economizing scarce resources is a major issue for the economy. Information economics is the part of the economy that deals with the productivity of information, communication and information methods, sometimes electronically, in order to sell and offer products and services to its target audience (Malamiri et al., 2021).

Information economics is a branch of economics that studies how information affects economic decisions. This type of economy is presented in three separate but related contexts. The first is the context in which information is defined and its economic characteristics are determined, the second is the context of macroeconomics in which the role of information in the structure of the national economy is described and measured as much as possible, and the third is the context of microeconomics in which Information is discussed in specific ways (Cirillo, 2021). The new economic system that has been formed uses the new technologies of communication networks to exchange information and the science that studies information and invests in new fields such as information production, collection and dissemination for economic development is information economics. In the definition of information, data processing has a major role. Four levels of processing include data transfer, data selection, data organization and data reduction (Shojaei et al., 2021).

Information has various economic maps, including the following:

1. Decision-making: The writings of economists about information almost all over the world are focused on its role in decision-making and its application in the allocation of material resources. Von Noman and Morgenstern provide a decision-making framework based on mathematical optimization, in which scientific studies can be performed with mathematical precision. The result includes a series of valuable articles on sequential decision making, effects of uncertainty, and incomplete information (Stoyanova et al., 2021).

Undoubtedly, the role of information in decision making is unquestionable. It has been confirmed in at least one national conference that this is the only important role of information. The argument was that information is not a valuable commodity in itself, but only because of its uses. A clear example is the effect of information in reducing the likelihood of risk in decision-making or the use of information to solve a problem. In this sense, the value of information is increasing, although it originates from the application and is not intrinsic (Zhao, 2021). However, the role of information in decision making is by no means ambiguous and, in fact, in some situations it seems that more information is used to confirm decisions that have already been made than decisions that need to be made (Xavier, 2021).

2- Operational management: Information from a pragmatic point of view is of special importance in operational management, an importance that goes beyond the importance of information in decision making. This role of information in management information systems, which supports the day-to-day operations of any type of organization, is quite acceptable. It is clear that the economic value of management information is higher, because better management is embedded with information (Kingma, 2001).

3- Replacement of physical elements: In some contexts, information can be used as a substitute for physical elements. For example, the role of information in telecommunications is to replace the transfer of data with the transfer of individuals, or in medicine, the diagnosis of disease through imaging can be substituted for the diagnosis through surgery. In both cases, the economic value of the information is high (Fontaine, 2021).

4- Environmental scanning: Information is the basis for environmental scanning and a tool for being aware of events that are happening in the world; It also ensures that management, whether in action or in decision-making, has an understanding of external reality. This role of information is different from its traditional role in decision theory, but it is much more consistent with the methods through which decisions are actually made (Xavier, 2021).

5. Impact: Information is a means to impress and persuade. The economic role of advertising in a market-based economy is very important. In this type of economy, information helps buyers who want to know about available goods and sellers who want to convince buyers of the value of their goods. The importance of information is such that it actually provides a means of financially contributing to other information products, such as magazines and newspapers (Tebekin, 2021).

6- Education: Information is one of the essential elements of education; And in this role as part of the learning process; With books, media, and computer archives; In order to provide the bulk of the training materials; It is also used as a complement to the interaction between teacher and student. They may also be considered educational centers; That is, tools for accessing information and how to use them are among the categories that are taught. Each of these cases has economic importance both for the individual in terms of income during life and for society in terms of increasing the productive force (Raj & David, 2021).

7- Culture, Recreation and Entertainment: Information is the theme of cultural richness, recreation, and entertainment of individuals. Although it is difficult for those who use this role of information to properly understand the economic value, there is no doubt about the willingness of people to pay for these types of information services and goods. This tendency is the basis of the success of industries that are the manifestation of this role of information in the economy as a whole (Motamednejad, 2009).

8- Production, goods and services: In fact, as information comes from each of the mentioned maps, information can be produced as a product and as a single package for sale, production and purchase for any reason. Also, information can be services that are provided to the buyer of a product (Kingma, 2001). In fact, most of the miscellaneous business services, such as the National Accounts Services, are provided in the form of consulting services and similar activities. Experts in statistics and business economics are more likely to measure information goods and services in terms of their physical form, which is produced, exported, sold, stored, and ultimately used and worn out rather than in terms of their information content. As a result, economic scales measure more physical aspects than informational aspects (Castells, 2006).

9- Source of capital: Information can be a source of capital for use in the production of goods and information services. Of course, this role of information is of particular importance in the industries involved in the production and sale of information services and products. For such industries, databases can be a major asset, in which case they are far more important than buildings and equipment. These databases are used as the mother version to produce future versions for distribution and as a source of goods and ancillary services, as well as as a basis for the development of new services and products (Niroumand et al., 2012).

Unfortunately, the usual calculations are to use such capital rather than as capital. As a result, the formal value of such companies does not sufficiently reflect the true value of the source of capital. Nevertheless, film negatives, original editions of books and magazines, index databases and book summaries and collections are all important assets intended for the production and provision of information services and goods. It is also important to understand that in management information systems, archives are considered as important sources of capital as the basis of operational management (Mohammadian, 2016).

Characteristics of information economics

In addition to what has been said, information has features that directly affect information decisions at the micro and macro levels:

1. Intrinsic independence of information: Information may be presented in physical form, but when it is symbolically no longer tangible, it can be made available through any media. Unlike material goods, the production of which requires a large amount of energy and material resources, intellectual goods can often be created using limited energy as a by-product of other activities. Information can be easily transferred and shared. The cost of information has little to do with the cost of making duplicate copies available; The first version is probably the most expensive, but with reproductions, costs are split and reduced relatively. As a result, the amount of information that can be produced without depleting material resources is very high (Hori, 2003).

2- Unknown value of information: There is a direct and clear relationship between material goods and the value of materials used in their production. For example, we know how much steel is needed to make a car. But there is no measurable direct relationship between the production of any kind of goods and information. The value of research or information about the market or advertising in the best possible case also seems unknown (Ebrahimi, 2008).

3. The effect of time on the value of information: The value of information is often determined on the basis of the time it is available, not on the cost of making it available, nor even on its actual content. In fact, there is a complex relationship between the time it takes to receive information and its value. For some, the value of information lies in its urgency; For example, yesterday's stock market information may be worthless tomorrow. For another, the value of information is likely to be perceived more in the future than it is now, and is more potential than actual. In addition, the same information may carry different values for different users at different times. Information about the weather in Italy may not be of interest to a Frenchman, but this information may be important when he is traveling to Italy (Hassanzadeh et al., 2019).

4 - Difference in understanding information: The main problem in economic theory is that people have different perceptions of each economic element. This is also clear in the case of information. People differ in the type of use, usability, willingness to use, evaluation of usage costs, and ability to pay for the use of information. Typically, the dispersion of information usage among a group of potential users is very unusual. This situation reflects, at least in part, on individuals' assessments of the timeliness of time and money versus the uncertainty of value, although this may largely indicate willingness and ability. As a result, individuals may not use information, even if, socially or organizationally, the use of information is important to achieve high-level efficiency (Baimukhanov, 2021).

5. The effect of distance on how to use information: The use of information, like other economic phenomena, is affected by the distance that users must travel to achieve it. The theory of location suggests that the use of any device decreases with increasing distance; Such as travel cost performance. If the cost is linear, the reduction is exponential, and if the cost is logarithmic, the reduction is doubled. This theory is also very true of information sources (Tronvoll et al., 2021).

6- Increasing the value of information through collection: Perhaps one of the most important and distinctive features of information as a source of capital is increasing its value as a result of its collection. When information is combined with other information, it may be transformed, new theories may be formed, and new knowledge may be gained as a result of this combination. In fact, the value of each data set is greater than the total value of the individual components of the information. As a result, the value of information increases as the amount of data and the amount of analysis provided by that data increases (Ciasullo et al., 2021).

7- Spontaneity and scalability of information: These features are of special importance, because, in fact, an unlimited amount of intellectual goods can be created, and information technology has increased this capability exponentially. Databases, processing tools, distribution tools, and the ability to use them are all growing. Growing accumulation provides a very rich resource from which new relationships can be established. There is no doubt that the exponential increase of production capabilities exacerbates the problem of the heterogeneous ability of individuals to use information (Ciasullo et al., 2021).

8. Independence of the cost of information relative to the scale of demand: Economists use the term indivisible in the sense that cost is independent of the scale of exploitation. Information is in fact indivisible, and so there are large-scale economies. This feature, along with the value of information accumulation, as a powerful incentive to motivate users to acquire information on a large scale. For this reason, the usefulness and efficiency of data collection in a participatory manner is greater than that of independent data collection. As a result, participatory consumption is also likely, as it is ineffective to restrict services to those who are unable to pay and to exclude them. It is difficult to gain access to information and deprive others of it (Tronvoll et al., 2021). The one who has the information does not lose it by passing it on. Hence, the buyer of the information can easily sell it many times over. Although information can be obtained at great cost, it can be distributed cheaply as soon as it becomes available. The consequence of this situation is that, on the other hand, organizations facing the open flow of information may face a shortage of capital in research and development, because when the results of research become public knowledge, these organizations can not produce the results of research. Dedicate research to yourself and benefit from investing in research. On the other hand, if it is possible to hide information, the result will probably be too much investment in research, because due to lack of knowledge of researchers, research processes are repeated (Kowalkowski,2021).

9- Publicity of information: Whenever what has been provided for someone can be made available to others for free, economists use the term public goods about it. Information is not lost or exhausted by the use or transfer to others, it can be resold or donated, without compromising its content; More than one person can use or process a single piece of information at the same time, without compromising its value to others. All this indicates that information is a public good (Dey, 2021).

10. Privacy of information: Due to the need for investment to create, produce, and distribute goods and services, there is a similar need to recycle this capital, otherwise no investment will be made. In addition, the true value of knowledge may be exclusive. If information is to be made available to others, there must be an incentive to do so. In this sense, there is competition over information resources, if a company obtains information faster or better, it may be superior in competition to other companies that do not have access to that information. For these companies, the value is in treating information as a private good and restricting access to it. Protection against industrial espionage is a prudent economic measure (Kowalkowski,2021).

11. Frequency of publicity and privacy of information: Most forms of services and information goods are somewhere between completely private goods and completely public goods. In different stages of the transfer process, these two forms exist alternately. Knowledge is certainly a private commodity, because it is unique to the person who knows it and decides to disclose or share it at will. However, knowledge is endless, because even if it is transformed into information and shared, there is still individual awareness of it. However, people buy and own copies of the information, and lack of access to or restrictions on copyright can deprive other potential users of access to the information. But if libraries get information materials, information again becomes a public good that does not run out of use, with each additional use, the cost of use is reduced and minimized, and its use is non-exclusive. Copyright balances information as a public good and a private good. The combination of the aforementioned features means that if the producers of investment information are to make the necessary investment, the protection of private rights must be considered essential. However, a balance must be struck between these rights and the right to use information, otherwise there will be no incentive to buy information. Copyright is one of the tools to balance this. Progress needs to be used and rights need to be supported (Dey, 2021).

12. Information Price Flexibility: Economists use the term price flexibility to indicate the extent of the correlation between price and demand for a commodity. In the case of information, the degree of price flexibility to the nature of the information, the purpose for which it is achieved, the circumstances in which the need arises, who uses it, the level of competition or demand for the information, the level or amount of processing required to make it useful., Its importance for decision making, and the amount of similar information that is available to users from other competitive sources depends entirely (Zhukova, 2021).

The value of information and the information economy

Information economics refers to a new and important concept in the information society, which is the characteristic of information-based modern economics in the information society. The information society has not only economic value, but also is the axis of the economy and anyone who has the purchasing power and the necessary skills and knowledge to use it can benefit from it (Oti-Sarpong et al., 2021). Thus, information and information flows become a necessary condition of the global economy and are utilized by service and financial networks. Information plays a central role in the management and control of internal affairs of multinational companies and their external affairs (Soh, 2021). Information absolutely plays a central role in the development and control of spontaneous change from the factory level and the office environment to global activities. Information may not have caused these changes, but today it undoubtedly plays a more comprehensive role in the survival and adaptability of capitalist economic units and their activities.

Business model

Business models play a positive and powerful role in corporate governance. Although the authors have recently offered various explanations and definitions of the business model, none of them have been generally accepted. Variation in existing definitions has created many challenges in determining the nature and implementation of the model and determining what constitutes a good model, which has led to confusion in the vocabulary, so that the business model Work, strategy, business concept, income model, economic model are used interchangeably. In addition, the business model is presented as architecture, design, pattern, program, method, hypothesis and statement. The business model is related to many other management concepts. The business model encompasses the business components, but the business plan deals with operational and startup issues that go beyond the model. The business model is not a strategy, but includes the dimensions of the strategy, and also the business model is not a set of activities, while the activity sets support each dimension of the model (Saiferet al. 2021).

Acquisition and work of information economy

A product without a service is not a product, and a service without a product is not a service. In fact, one of the best ways to provide service with product and product with service, can be defined in the coordinates of information economics or economics based on information mechanisms compatible with information technology. In the information economy, it is possible to offer comprehensive and online services to the community of different customers and to manage and provide this service in line with various web products (Morgan et al., 2021). If you want to look at information economy based businesses, there are many successful examples. Amazon's large retailer is a prime example of one person and information-driven economy work. The online retailer of this online retailer is worth hundreds of millions of dollars, and this figure is much higher than the annual turnover of the world's most successful and largest traditional bookstores (Kuleshovet al., 2021).

Data-driven business

Data-driven economics is a new economic model in which data is the main driver, and if we take data out of its relationship, it becomes meaningless. Data-driven economics is also often considered as a strategy of digital economy. The ecosystem of this economic model consists of a set of businesses and their relationships, the continuous growth of which depends on the adoption of appropriate policies. These businesses are often interdependent on each other's data, services, and products, and the sustainability of each is important to policymakers and designers of this ecosystem. This means that in examining businesses operating in a data-driven economy, we are faced with an interdependent data ecosystem in which continuous data flow is a necessity (Wanget al., 2021).

Data strategy in business Successful companies

Today are looking to strategically use data that aligns with their business. Having a data strategy that draws its soul from business strategy is one of the basic and vital requirements for achieving sustainable success in the present age. Because we want to control the data before it controls our data. Developing and implementing a data strategy in line with the business strategy can provide a good platform for turning an organization into a data-driven collection. An organization in which data becomes one of its most important assets that can be used to optimize the status quo or create data products. In today's information-based economy, successful companies are looking to strategically use data that aligns with their business. Aligning business incentives with data-driven technologies helps an organization to discover and exploit new business opportunities to increase revenue and profitability. Many organizations are eager to become a data-driven business, but many do not. Perhaps the most important reason for this failure is the mismatch between business goals, information technology and data realities, as well as the slow pace of information technology in meeting the rapid and changing needs of business. Having a data strategy that draws its soul from business strategy is one of the basic and vital requirements for achieving sustainable success in the present age. Because we want to take control of our data before it controls our data and use its benefits for our business purposes.

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