

E-Commerce System Based on Information Ecology Research

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Abstract

With the development of information technology, electronic commerce is closely related to People's Daily lives. To improve the efficiency of electric information management has become the key to the development of electronic commerce. Ecological theory and information science as new areas of cross, based on the basic theory of information ecology to build e-commerce system, formulate the related policy, by analyzing the feasibility of the system has better.

Keywords: *Electronic commerce; Ecological information; System research*

1. Introduction

With the development of information economy, more and more enterprises begin to realize information management is an important approach to improve the core competitiveness of enterprises. On the other hand, the development of information technology and the implementation of information management for the enterprise provides a powerful means and tools. As a result, many enterprises willing to invest heavily to build database, management information system, decision support system and information management tools. In the stability of the enterprise information environment, these tools can help enterprise effectively the information collection, storage, processing and transmission, and with the aid of history data and expert experience and mathematical optimization model for enterprise managers to provide the optimal decision scheme. However, with the changing of the enterprise information environment, this is based on stable and predictable environment based on the assumption of, pay attention to technology but ignore the important factors in a person's more limitations of the traditional information management way. Enterprise is common in the information management of this kind of the problem of the technicalization tendencies has seriously destroy the balance of the ecological enterprise information system, which can lead to actual results as expected. Therefore, in the face of the vagaries of information environment, enterprises must set up the new, the information management concept of "people-oriented", systematic and comprehensive to consider the enterprise information environment and the relationship between the main body, formulate the corresponding strategy so as to adapt to the constantly changing information environment, help enterprises to improve the efficiency of information management, and improve its core competitiveness [1-3].

Ecology is a concept of modern science. So-called ecology is a biological state of survival, it include survival condition, the relationship between organisms and the relationship between the organic and inorganic environment. At present, the awareness of ecological concept, already is not only limited within the scope of the biology and natural science disciplines, but extend to environmental science, sociology, management and the whole humanities and social science. Ecology is the study of organisms and the environment, the relationship between biology and biological a biological basis discipline, is the study population, community, ecosystem as the center of the macroscopic biology. Ecology because of its research ideas, research contents, research objectives, and

constantly update and transformation method of research, it has become one of the most active frontier science in social science today. At the same time, the ecology and sociology, economics, management science, anthropology, and other areas of the discipline cross penetration, also greatly broadened people know their own field of vision, knowledge organization, knowledge society. As the ecology theory and the mutual penetration of information management science, ecological information problem increasingly become one of the hot issues of modern information management research. Unlike previous concept of one-sided emphasis on the role of technology, ecological informatics through to the information, people, technology, environmental factors such as comprehensive inspection, review the technical dilemma caused by the many problems, for the modern enterprise information management provides a new perspective. At present, ecological informatics has become a new model of the enterprise information management. More and more enterprises have realized that, with the changing of enterprise information environment, traditional, with information technology as the core of the information management mode is to restrict the serious limitations of e-commerce information management efficiency, and seriously damage the ecological balance of information, enterprise must use ecological system theory and method of thinking, from the perspective of ecological system to construct the ecology of this enterprise information system.

2. Related Works

2.1. Ecological System Theory

Is an important research object of modern ecology, ecological system is an important branch of modern ecology. The basic concept of ecological system is to use the "system" of the whole physics, this system not only includes organic complex, but also including the forming environment of the whole complex physical factors. About the definition of ecological system, many scholars from different angles are studied, did not form a unified definition. Ecological system is to point to in a certain space range, composed of biological communities and the environment, have a certain pattern, with the aid of function flow and the formation of the steady-state system.

As a unified whole, composed of biological and environmental ecological system not only has a certain structure, but also has a certain function. Ecological system's main function is to energy flow and material circulation, energy flow through ecosystems at each trophic level, is decreasing step by step, the flow is not a one-way cycle. Substance is a global cycle, between biological communities and inorganic environment can be repeated, circulation flow. Energy flow and material circulation both contact and there's a difference, complement each other, inseparable unity of the whole [4-5].

2.2. Ecological Informatics Theory

Ecological information is used to express the ecological ideas and become increasingly important and complicated relationships between information environment. At present, the understanding of the concept of "ecological information" still differ. Among them, the representative of understanding includes: (1) ecological information system is the information quality, management, product, and the sum of the value, and demand for information service, and the reliability of the evaluation;(2) the ecological information is under a certain environment, behavior and value of human resources and technology, ecological informatics research is mainly research on man and his environment, the information technology and the people in the local environment as the main content of ecological information theory to explore the relationship between. Key problems in the information system of ecology is not technology, but by the technical support of human behavior;(3) ecological information is a special branch of knowledge and the research

direction, is the study of how to control information influence method, the core problem is based on the formation and mechanism of natural ecology, study individual, interpersonal relationship and the entire human race, through the study of human health, psychological, physiological and the social welfare, and to explore a method to optimize the information environment.(4) ecological informatics refers to the impact on organization internal information utilization way of various complicated problems to the overall point of view, shown in many different phenomena of interaction must use the system theory to analyze the problem.

Ecological information system is a information, inspiration, insight, and self-organizing system consisting of organizational ability, influence each other and promote each other between the elements in the system. Ecological information system by the network, knowledge network and technology network three network integration. Ecological concept of information system, its meaning is the human information activity and its related factors to look at it as a unified whole, to avoid artificially dividing the information environment for unrelated fragmented parts. Ecological balance refers to the information, the equilibrium between people, the environment; Ecological information imbalance is refers to the state of disequilibrium between information, people, environment, ecological information system internal and external information exchange is blocked or its elements and the ratio between the subsystems. The primary cause of ecological information imbalance: on the one hand, due to system internal metabolism, order and disorder in the structure of alternating tend to generate unbalanced phenomenon; On the other hand, external force disturbance to the system beyond a certain limit when also can produce the phenomenon of imbalance.

Information environment refers to a country, a region and even the growth of the global information, dissemination and use of the relationship between the form or coordination state. With the increasing of social informatization trend, the position and role of the information environment in social system is becoming more and more significant. Ecological informatics refers to the concept of information environment in ecological information system in the human and the social organizations around the sum of all the communication elements, including human and social organization, all kinds of information resources, all kinds of information technology and the social information infrastructure, information law policy and ethics, culture, etc. Between information environment and social environment are interrelated and influence each other, restrict each other, promote each other.

Information environment management refers to the law of development according to the information environment, with the management of system on the information environment of human society have the destination to plan, organize, control and coordination. The principle of information environment management is the study of individual elements in information environment change and its effects on ecological information system as a whole, find out the weakest link in the system, explore the optimal strategy of improving and strengthening the link to ensure the coordination of ecological information system internal factors as well as the information environment and balanced development of the society as a whole.

2.3. The Electronic Commerce Theory

Narrow sense of electronic commerce refers to the use of information technology processing commodity trading business activities. This understanding is formed in the early stages of e-commerce development. At this stage, the main technical implementation of e-commerce is discussed and the application. With the deepening of the application of Internet and electronic commerce continuously explore, people gradually realize that e-commerce is no longer a technical problem, but should pay more attention to enterprise, focus on management, focus on the Internet for various industries, various enterprises brought about by the profound influence. As a result, the generalized

electronic commerce now, by means of electronic information network system, realize remote trading of commodities marketing system and marketing activities. The concept of e-business model is the general abstract description of e-commerce activities in the real world, it is composed of trading main body, electronic markets, trading transactions and information flow, cash flow, cash-flow and other basic elements. For each e-commerce transactions subject, it faces is an electronic market, must through the electronic market to select the content and object. The concept of e-business model can describe for each abstract the main body of e-commerce transactions and electronic market transactions between relations, as shown in Figure 1 [6-9].

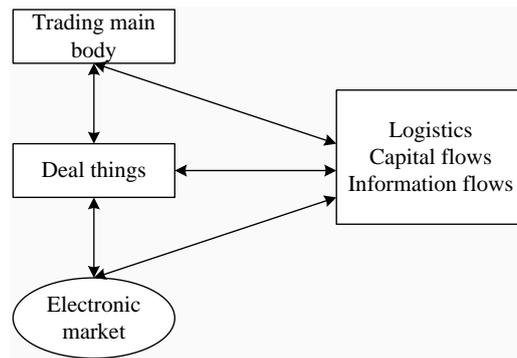


Figure 1. The Concept of E-Commerce Model

(1) The market main body: refers to the objective object can engage in e-commerce activities, such as companies, Banks, shops, government institutions, scientific research and education institutions and individuals, etc.

(2) Electronic markets: refers to the electronic commerce entity engaged in the exchange of goods and services, it is composed of a variety of business activities participants, use a variety of communication devices, through the network connection into a unified whole.

(3) Transactions: refers to the electronic commerce between entities in the content of the specific business activity. Such as inquiry, quotation, transfer payment, advertising, goods transportation, etc. Any transaction of electronic commerce, there is a three basic "flow", namely the logistics, cash flow, information flow.

(4) Logistics: mainly refers to the channels of distribution and transport of goods and services, for most goods and services, logistics may still through traditional distribution channels; For some goods and services, however, can be directly for distribution in the form of network transmission, such as all kinds of electronic publications, information consulting services, valuable information, etc.

(5) Flows: mainly refers to the transfer of money process, including payment, transfer and conversion process.

3. E-Commerce Ecological Information System Analysis

3.1. The Feasibility Analysis of Building E-Commerce Ecological Information System

From the perspective of ecological system, the electronic commerce information system and there are many similar to natural ecological system, mainly manifested in the following aspects:

1. The system components

Natural ecological system is composed of biological system and environmental

system. In the ecological system, there is a "person" the active factors, make the ecological system internal elements can be based on the change of environment, follow the principle of benefit maximization to make decisions and behavior. Cultural factors influence the development of ecological system, making human and animal populations there are cultural phenomena such as cooperation, distribution. Technical factors for the ecological system in the environment, waste and the use of solar energy and so on provides an important means of implementation. Electronic commerce information system is a "person" a highly intelligent and can carry on the choice behavior consciously active elements, so that the whole system shows the characteristics of the ecosystem initiative. Corporate culture can affect the development of e-commerce and information sharing in the enterprise, information technology, decides the efficiency of the operation and management of the electronic commerce system.

2. The system composition is complicated

Natural ecological system is composed of biological and abiotic components. Abiotic components including sunlight, temperature, humidity, soil, all kinds of inorganic and organic substances, etc.; Biological ingredients: producers, consumers and disintegrators. Consumers, for example, consumers in the animal ingredients including the wissien, omnivorous animals, parasitic animals, the complex nature and predators such as species, complexity and diversity of ecosystems. The electronic commerce information system is made up of numerous information subjects with different information ability of complex systems. Information professional determines the enterprises along with electronic commerce needs to have all kinds of information of different types of information between the main body of the joint collaboration and hard work, thus formed the diversity and complexity of e-commerce information system component. As a matter of fact, it is because the e-commerce also constitute the diversity and complexity of information system, makes the electronic business activities in the ecological information imbalance phenomenon.

3. The system similar to internal relations

Natural ecological system of network through the cycle of material flow, energy of one-way transmission as well as the various forms of information transmission in the system and so on way to maintain and develop. Ecosystem in the interaction between the various species, can use the basis of the interaction mechanism and the influence. Of the interaction between the more common species include: competition, predation, parasitism and mutualism, the main types of interactions are competition, kill each other and altruism. Enterprises in the process of e-commerce activities, between enterprises, enterprise between various departments, enterprises is a kind of symbiotic complementary relationship between employees. E-commerce companies need alliance cooperation, resources complementary, coevolution between; Enterprise internal between employees also should undertake the analysis of the ecological niche, realize ecological niche complementary collocation, promote the collaboration between employees, and then promote the staff, organization and the coordinated development of the enterprise, promote the health of e-commerce activities.

4. The composition of the food chain and information chain is similar

Energy flow in natural ecological system in the food chain as the main line. Food chain is to point to in the ecological system, set up by the trophic relationship between various kinds of nutrition, forming a series of prey and predators of the chains. In the ecological system of all kinds of creatures, including producers, consumers and disintegrators, among them there are a series of food and to be the relationship. In the electronic commerce information system, the nature of the relationship between the each composition composition is implemented through the information chain, namely through

information chain to connect the information main body into a whole. There are different kinds of information within the enterprise the main body, the different relationship exists between the information subjects, which determine the contact between them - the information chain of diversity and difference. Therefore, the study of e-commerce ecological information system is mainly based on the research of the electronic commerce information ecological chain, and then build e-commerce ecological information system, make e-commerce ability get promoted, finally enhance the ability of the enterprise information management.

5. The system adaptability to environment

Natural ecological environment changes, often in order to adapt to environmental changes, biological change genetic gene mutation. Adapt to environmental changes of genes in a population have spread, is not adapted to the change of genes have been eliminated. Biological evolution in natural selection by this way, the survival and development. As biological constantly adapt to the environment, the population of new genes, ecosystem evolution to a higher level, the formation of the ecological transition of the system level. Information economy under the environment of electronic commerce is faced with rapidly changing social, economic, legal, cultural, technical and other environmental factors. Any changes in the environment will affect the normal operation of electronic commerce, lead to the electronic commerce deviated from the original goals. In order to adapt to changes in the environment, the enterprise must in technical, strategic, management method and strategy adjustment, technology and strategy to adapt to the new environment be preserved, and will not be able to adapt to the new environment of technology and strategy to be eliminated or improved by learning. With ecological factors constantly adjust, e-commerce information system has been the transition to a higher level. [10-11].

3.2. E-Commerce Ecological Factor Analysis of Information

Under the perspective of ecological system, according to information, bionic relationship between information mainly includes the interaction between symbiosis, symbiotic, partial, mutualism, competition, predation, *etc.* In the enterprise electronic commerce information ecosystem, the related members between the main relations are shown in Table 1.

Table 1. E-Commerce Ecological Relationship Between Information System Are Analyzed

	Information producers	information transmitter	Information consumers	Information disintegrator
Information producers	competition	coexistence	coexistence	---
information transmitter	coexistence	diversification	---	---
Information consumers	---	coexistence	neutral	---
Information disintegrator	---	---	---	---

Ecological factor refers to the information environment for growth, behavior, development of human and social organization, flow and distribution, and social evolution and development has a direct or indirect influence of various factors. E-commerce ecological information factor is in the process of enterprise in the electronic commerce of directly or indirectly involved in the various factors that affect e-commerce activities, mainly includes the information and the information environment. From the perspective of ecology, ecological information factor has the following features:

(1) The systemic

As a system, ecological information factor has general characteristic of the system, namely, wholeness, hierarchy, openness and dynamism. Ecological information factor consists of information and the information environment, there is a strong correlation between them and mutual dependence. Ecological information factor also has obvious hierarchy, the interdependence between the various levels, to contact each other. Ecological information system is not an isolated system, but there is a material, energy and information flow, has the openness. Open itself and embody the dynamic, the dynamic performance not only in ecological information system as a whole is dynamic, its each component at the same time, all levels are dynamic. In terms of dynamic, the interaction between them and lead to their mutual evolution of the ecological imbalance and balance information.

(2) Comprehensive

Ecological information factors do not exist in isolation, each ecological information between factors and other factors are interrelated, mutual influence, mutual constraints play a role, any information factor changes will cause changes in other factors in different extent. For example, the change of information policy is bound to cause the reconfiguration of information resources, the updating of information technology, information behavior change and improving the efficiency of information, this is the embodiment of the ecological factor comprehensive information.

(3) The equivalence

Play a role of ecological information factor with the equivalence of information, that is to say, in the ecological information system will have one or two factors is the dominant factor plays the leading role. Dominant factor in the event of changes, often can cause obvious changes in other factors. For example, when the information of ecological information system changes, the information environment of information culture, information policy, information law could be showed significant change, so relative to other factors, information play a dominant role, information is the dominant factor.

(4) Periodically

Ecological information factors at different stages, different period will appear different important degree, due to the different stage of ecological information system development demand for ecological factors are different, so the role of ecological factors on the system also has the stage, the stage is caused by regular change of ecological environment. Information technology in the electronic commerce, for example, ecological information system development time than subsequent growth stage appears more important, it shows that information technology factor function periodically. E-commerce ecological information system of the existence and development of information people need to constantly and its ecological environment of information communication. On the one hand, ecological information environment provides information to people's growth, development, innovation necessary for all kinds of information resources, make the information by the role of information ecological environment; Again on the other hand, the electronic commerce information through various channels constantly influence and transformation of e-commerce ecological information environment, information human and ecological environment of this interaction makes without ecological information environment, the enterprise may not exist. Such as: information people can collect, transfer and use of information resources, to research and development, the improvement of information technology, and promote the development of information technology; And information technology can extend information of organ function, improve the ability of information of information. Information culture is worked out by information and to adapt to the other "software" of information environment factor. It provides a kind of

"incentive" through rational expectations, tell information and encourage people should do, how to do it, as well as the expected return, and it can provide a "limit", namely dissuade information people don't do, as well as the necessary to do this price. E-commerce ecological information system of the interaction between the information factor relations as shown in Figure 2.

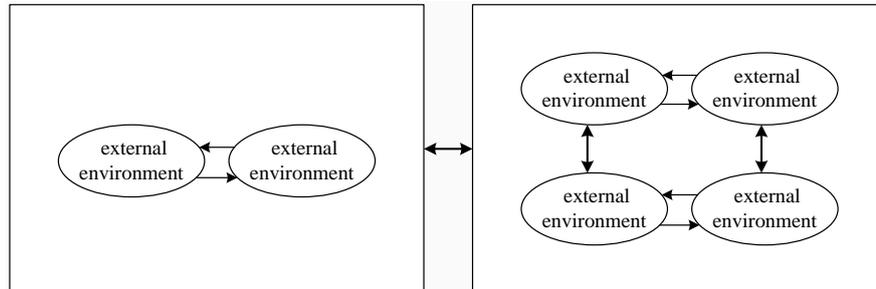


Figure 2. E-Commerce Ecological Information System Factor Interaction Relations

4. E-Commerce Ecological Construction of Information System

4.1. System Function

Ecological system function in electronic commerce information system, the arrangement of any elements are not static, but dynamic combination; Information and the interaction between people, environment and other factors, formed with various function, causes the entire system from simple to complex. In general, the function of e-commerce ecological information system mainly embodied in the following aspects:

1. The function of information sharing

E-commerce ecological information system based on group interests as the center, as the main body in the e-commerce to build ecological and intelligent information sharing platform. It from the perspective of the integration of sharing, each subject between interdependence and in reality Strain of the ecological relationship, build a common information space of survival.

2. The function of cooperative coevolution

E-commerce ecological information system members realize coevolutionary through mutual cooperation and competition, thus promote the evolution of the whole ecosystem. The information system of e-commerce ecological co-evolution is through the system synergy between members or subsystem, the interdependence of the various subsystems interact movement, self-regulation, cooperative coevolution, finally lead to a new ordered structure, the new ordered structures is the result of coevolutionary ecosystem members.

3. The function of the balance of ecological information

Enterprise ecological health information system is the system of all elements, scale, input and output quantity is in a state of stable flow. Ecological enterprise information system, without any a enterprise's behavior can be seen as an isolated. The information of an enterprise of health, is not only its own ability, at the same time or is it with the result of the interaction of the whole ecosystem. E-commerce ecological ecological enterprises information system construction to avoid the imbalance of information, maintain the balance of ecological information.

4.2. E-Commerce Ecological Information System Structure

Circle is a kind of ecological information consists of information, information, environment of complex ecosystems. Ecological information for all of the process of enterprise life circle provides all kinds of information requirements, distribution, integration, use environment. Enterprises in the circle of ecological information released by various along with the change of time, space, and change of demand information, constitute the dynamic information reflect market change. Market first ecology reflected in the enterprise information system, the change forced the enterprises to change its strategy to adapt to the market. Ecological function and structure of information by the information age, information circulation chain and ecosystem balance. The information in the ecosystem is a life and adapt to each other. Can not adapt to changes in the enterprise information will lose living space. Enterprise ecological circle the information in the circulation of information, the communication of all kinds of enterprise and its upstream and downstream enterprises, survival and development environment and the relationship between consumer has important economic and business sense. The best way to realize effective circulation and ecosystem balance, is the interaction between full open, full, full dynamic enterprise ecological information network system.

E-commerce ecological circle including two levels of meaning: one is from outside of e-commerce, for the operation, growth and development of the electronic commerce to the regeneration process, transformation, and decline to provide more objective and multi-level information services; From the electronic commerce enterprise, provide enterprises with the whole process of production and operation, which provides logistics, production flow, capital flows of finance, information, personnel, sales, logistics, customer the whole process of electronic, intelligent, standardized management and business solutions. E-commerce ecological information mainly includes four levels, respectively is the core layer, extension, related layer and outer layer, all were respectively formed by various organizations involved in e-commerce. Establish enterprise symbiotic circle of ecological information, provide high value and high quality information service system is the inevitable trend of e-commerce development, ecological information circle is the network information service and the inevitable choice of e-commerce enterprises. (1) core layer mainly include e-commerce enterprises, buyers and sellers, they are the main body of e-commerce transactions, e-commerce is also the core part of ecological information circle. (2) extension layer mainly includes the financial payment institutions related to e-commerce transactions, logistics companies, credit agencies, software service providers, advertising companies, such as search engines, they provide support services for e-commerce transactions, to promote the smooth completion of the e-commerce transactions play an important role. (3) related layer mainly includes e-commerce transactions related government departments, trade organizations, education and scientific research institutions, etc., they are under certain conditions and related transaction subjects into contact. (4) the external layer mainly includes the economic, social, legal, credit, logistics environment, etc. They are on the operation and development of electronic commerce play an important role. Like a natural ecosystem, e-commerce ecological information circle has the function of the implementation and improvement of enterprise information flow and circulation, every industry can be seen as a small ecological information system, can have their own unique content of information, industry small circle of ecological information system constitutes a major ecological information, and influence each other, constraints, and fusion. E-commerce ecological information circle has the function of automatic adjustment recovery and stability. Enter the circle type of enterprise information, the more diversification, information interaction and information circulation is stronger, the more rapid, the stronger the regulating function of the system.

4.3. E-Commerce Ecological Information System Model

E-commerce information ecology chain mainly consists of information people factor and environmental factor, information mainly includes information producers, the relay, consumers and disintegrators; The information environment including the internal environment and external environment. Information - people - the interaction relationship between information environment constitute the e-business information ecological chain. E-commerce ecological information system is based on electronic commerce on the basis of ecological information ecological chain and ring, combined with the feature of system, based on the principle of the system to build to build, as shown in Figure 3 [12-15].

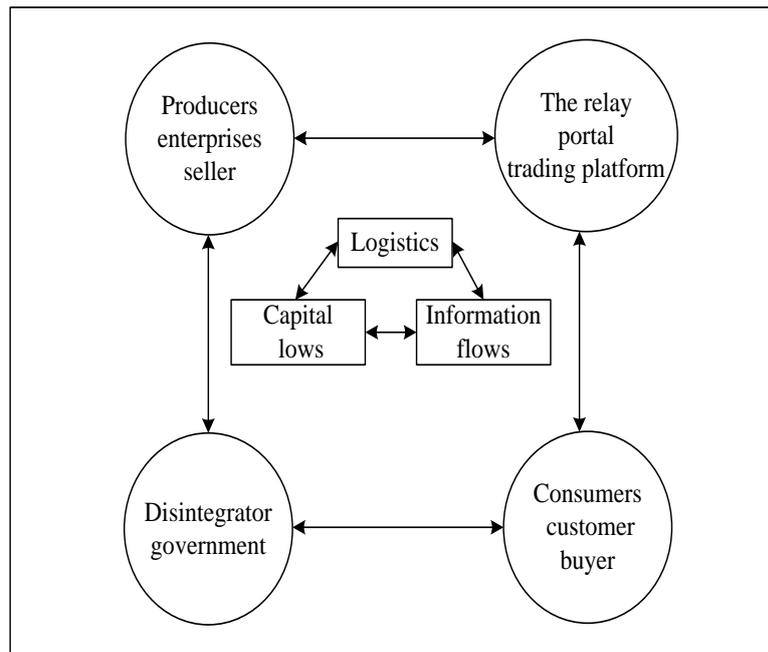


Figure 3. Electronic Commerce Information Ecosystem Models

Ecological information under the environment of e-commerce ecological construction of information system is the system thinking method and the "people-oriented" management concept. In e-commerce ecological information system model, system internal and external environment there is interaction between each factor and influence each other relations. Internal and external environment to a certain extent, determines the supply of the merchants and customers demand, companies also supply and customer demand change affects the internal and external environment of electronic commerce; There are interactions between both parties, information producers and information consumers, guides merchants supply requirements of customers, at the same time supply strategy affect the customer purchasing power. Information transmission and information disintegrator on e-commerce operations have played an important role in supporting and auxiliary. In a good e-commerce ecological information, system structure and function of each part are still in each other to adapt to the dynamic balance and coordination, known as the electronic commerce information ecological equilibrium. Therefore, e-commerce ecological information system building is first need to change the concept of electronic commerce, the construction of ecological information system overemphasizes the role of information technology and information network, and should pay attention to the development of its own people and the mutual adaptation between information environment, in order to avoid imbalance of ecological information.

5. Conclusion

Based on the basic ideas of ecological system, the integrated use of ecological system, informatics, e-commerce, such as theory and method, to study the ecological information system to the electronic commerce. Based on e-commerce ecological information system factor, ecological information based on the study of the circle, puts forward the relevant concepts and characteristics of e-commerce ecological information system, and build the e-commerce ecological information system model, system to guarantee the effective operation of management strategy, by analyzing the feasibility of the system has better.

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