

## **A Research on Information Science Applied to Regional Tourism Cooperation Performance**

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### **Abstract**

*Information science is related to data-intensive, man-machine communication and interactional information application system with main aim to provide for both tourism enterprises and tourism consumers with high quality service. At present, there are two modes of information science roles which is popular used in tourism enterprises: one is mainly used in the international network marketing for their products (service) based on the information websites, the other is linked to the tourism cooperation organization with the demand of tourism products(service) in their special mode. Information science applied to regional tourism cooperation development always plays a more and more important role in the growth of tourism economy and development of tourism industry. In addition, the mature application of information science can effectively reduce the loss of benefits related to regional tourism industry development, but also bring about the asymmetry of the game rulers for the main economic interests of regional tourism cooperation. The findings are the application of information science for regional tourism industry can reduce the cost of the exchange between cooperative organizations and tourism economy growth, and the information science application also improves their own values of the main participants among the regional tourism cooperation performance.*

**Keywords:** *Information science, Regional tourism cooperation, Organization performance*

### **1. Introduction**

The information science for the regional tourism cooperation is mainly consists of some part. The organization of tourism cooperation development needs the application of information science. In fact, more and more tourism enterprises are organized by tourism experiences, by which they can attract tourists (travel agencies may pay more attention to tourists for tourism economy, and other organizations or groups can obtain the respective profits from the function of travel agency), are connected with information science[1]. On one hand, it is the support system for the construction of regional tourism cooperation organization, by online information system of the cooperation organization, that the most basic information channels of communication and ties are established between the regional cooperation organizations. On the other hand, the information science of the cooperation organization is an internal and external compatible operating system, which has openness, external expansion, and members of the tourism cooperation organization, including market information outside the organization. Therefore, the information flow could be passed by the information system cross inside and outside of the regional tourism cooperation organization. Collaborative information system provides collaborative tools for stakeholders who have joined in the regional tourism cooperation, establishing a virtual project workspace and assists the team to

work together. Collaborative information system is used as assistive tools by cooperation, to reduce the incompatibility of the communication cooperation. It strengthens the exchange of information from various stakeholders and sets up the mechanism of information building and sharing by establishing a virtual project workspace. Professional information system: connects the potential tourists (tourists, travel agencies which organize tourists, and other organizations or groups with the function of travel agency) according to their interests, hobbies, income levels and demands of the tourist destination [2]. Professional information science is related to the external environment, by which it aims at the actual tourism market and the potential tourism market. It operates the cooperation organization effectively in the angle of knowledge management and also strengthens the organization performance. Knowledge system is a management application with high level of the online information system. It emphasizes on the coordination and cooperation, and wants to achieve synergies by relevant target management and content management between organizations.

Information science for the regional tourism cooperation is a computer application system with security, comprehensive data and human-computer interaction. Tourism economy mainly comes from different regions of the area re-configure to combine the tourism resources according to the constitution, agreement or contract, result in maximizing the overall efficiency including economic, social, and ecological benefits. During the development of tourism resources, the flow of information from the cooperative region both inside and outside is collected, collated, analyzed, stored, transmitted, fed back and tracked. From the content point of view, the online information system is based on the information system as information infrastructure construction, in order to get wide information sharing, data warehouse, which is used for data organization and processing. It emphasizes on data mining and multidimensional data analysis, provides the ways and means to retrieve information from Intranet and Internet, and then supplies important basis and projects for decision-making, and to achieve a comprehensive grasp of the regional tourism cooperation. The system broke through traditional regional tourism information system, which is information mode only for tourists, or management mode just for tourist destination management sector and related industries sector. Therefore, it is really important to define the online information systems in the regional tourism cooperation, and highlight its effects on the construction of the organization structure, also the improvements of the organizational performance. So it is believed that the online information system is a computer application system with data-intensive and human-computer interaction, which can strengthen tourism cooperation organization structure, improve the organizational performance, as well as achieve organizational synergies. Its basic function is providing information services. Management and decision support are extended functions. This definition helps to explain the importance and significance of online information system for the building of regional tourism cooperation organization and the management of various parts' knowledge, content and performance.

## **2. Literature Reviews**

Many tourism destinations, such as famous cities with abundant tourism resources, derive their main attractiveness from various guests' sources. The main appeal of some destinations, such as the cities without long history and tourism resources depend on their man-made attractions (the presence of modern amusement parks) (Twan Huybers, Jeff Bennett, 2003) [3]. Local government is particularly important to tourism development and promotion in several aspects. Respondents, rural hosts from Gruta region complained of the lack of cooperation

on the part of local government. The experimental research comprises three parts; the first part includes a questionnaire that was conducted in regional and local organizations which have a decisive impact on regional economic development and tourism (Darko Dragi Dimitrovski, Aleksandar Tomislav Todorović, Aleksandar Djordje Valjarevi, 2012) [4]. They defined it as information processing system shared by two or more enterprises. Some scientist borrowed the definition from information systems, defined it as information systems that cross organizational boundaries, support the flow of information between organizations, which are shared by multiple organizations (Wei, 2011) [5]. The information flow of the system is the trend of recovery from outside to inside, and is used for returning information and professional treatment. It is the operation premise of online information system, collaborative information system and knowledge system of the cooperation organization. It collects the information of the external environmental subjects (government, tourists, tourist destination), feeds back to the other three systems after dealing with the information, and then prompts the three systems to adjust the organization structure, performance, management and decision-making, helps the regional tourism cooperation organization reacts timely according to the market at last. Knowledge system: with the functions of above three information system platforms, completes more tasks as knowledge management, content management and business intelligence. The characteristics of the organization of international information systems can be divided more complex than the traditional cooperation organizations, the structure of the system itself reflects the alliance and cooperation relations between organizations [6]. The tourism information science can reach a social computer system with information exchange, transition and share [7]. It provides complete tourism development, planning and protection for government departments, provides query, analysis of tourism information and routes selection for tourists. Information science applied to tourism cooperation organization can be defined that it as a computer system with maps, tourism attributes, images and even sound based on WEBGIS [8]. Its establishment needs the efforts from geography, computer, and tourism scholars. Information science is a web based system that connects regional tourism enterprises, tourism industry as well as tourism authorities, many various industry associations, cooperative enterprises and other government departments goatee the tourism safety based on computer technology, communication technology and CRT technology, which is also called 3C, to improve the management efficiency of enterprises, pass tourism information, expand marketing channels, realize electronic transactions and promote tourism safety [9].

The form is a reflection of the content. Organization elements will be condensed into the appropriate organization structure. Information science could optimize the organization elements of the regional tourism cooperation, then change the form of organization structure subtly [10]. The tourism cooperation organization design can be divided into four main factors affects, which are the formation of knowledge-based economy and economic globalization, the development of information and network technology, the update of staff's values, management philosophy and the changing of management roles [11]. It is believed that, for the four elements, the formation of knowledge-based economy and economic globalization is uncontrollable environmental factor, the update of staff's values, management philosophy and the changing of management roles are changeable soft organization elements, and the development of information and network technology is the hard element (mandatory element) which affects the form of the organization structure. This kind of technical factors promotes the development of organization structure. The adjustment of organizational management function is effective for tourism cooperation development. The development of information science always

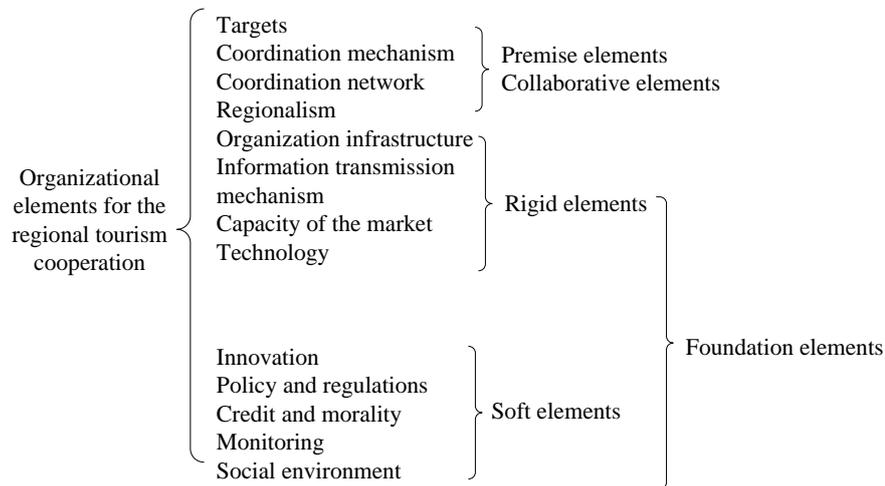
strengthens the tourism enterprises' management function, by which it helps regional tourism organization participators break away from traditional work, result in entering the innovative and creation departments to obtain the high level of work, such as planning and innovation for a new tourism products and service [12]. The cooperation organizations are facing many hard problems resulting from external and internal constraints related to global business competition, fast-changing business requirements, accelerated innovation, increasing cost pressures, and regulatory compliance challenges. Thus, to grow or even survive, the cooperation organizations have to develop solutions to these problems. The effectiveness of such solutions is related on the one hand, to the quality of both the organizational solutions developed in the problem space and the computer solutions built in the solution space and on the other hand, to the effectiveness of the alignment between business and information technology[13]. Information technology supports a wide range of horizontal communication, coordination, control and supervision, which help to improve information transfer rate, and is conducive to the mutual inspiration, communication and information sharing between the organization parts [14]. This shows that information science has played an important role in the change of organization structure of the regional tourism cooperation organization. Information science (integrated information system) has also become one of the dynamic mechanisms of tourism cooperation organization performance, and its position is more and more prominent [15].

By the intervention of the information science (integrated information system), the communication coverage of information science among the regional tourism cooperation organization will be broader, for which the cooperation organization's work will be more efficiently and smoothly accordingly. If the information science platform is formed, each part of regional tourism cooperation organization can share a more comprehensive and standardized information service, which has significant effects on improving the cooperation organization structure and performance.

### **3. Regional Tourism Cooperation Development**

The main economic interests among regional tourism cooperation organization often apply the information science to reach their potential tourists with information messages over the internet website, to manage the information of financial accounts, as well as to optimize their human resources. Governments use the information science to provide services cost-effectively for travelers with digital goods and service (such as APP and WIFI) and online services(such as auction plans and social networking platform). Information science as the e-government system of typical, must adapt to the adjustment of the administrative organization, the establishment and implementation of effective control of the administrative examination and approval system, to establish a good upper and lower and lateral internal communication mechanism, the implementation of evaluation objective of staff performance, auxiliary personnel to collect and analyze information science for decision making of both tourists and tourism enterprises. As regional tourism cooperation organization is related to information science, multi-generalized organization, it realizes the integration of global unified information management by the development of a one-stop integrated service management information system and other series of project construction [16]. It is believed that the establishment of the integrated urban planning geographic information application system, the multi set of geographic information system integration in an application as a driving system. Businesses of tourism cooperation organization performance are typically associated as belonging to the tourism industry, which may find that tourists are only part of their business mix and may or may not strategically target tourists as a

distinct segment. That is, businesses that serve tourists also serve non-tourists(Elisa Backer, Brooke Barry, 2013). Regional tourism cooperation serves as a tool to fulfill the effect created by the whole region. Theoretically, the entirety is more than simple addition of resources. According to the module type that they provide for the cooperative organization system, organizational elements for the regional tourism cooperation can be divided into three categories, which are premise elements, collaborative elements and foundation elements(Yue Yafan, 2014)[17]. The classification is shown in Figure 1.

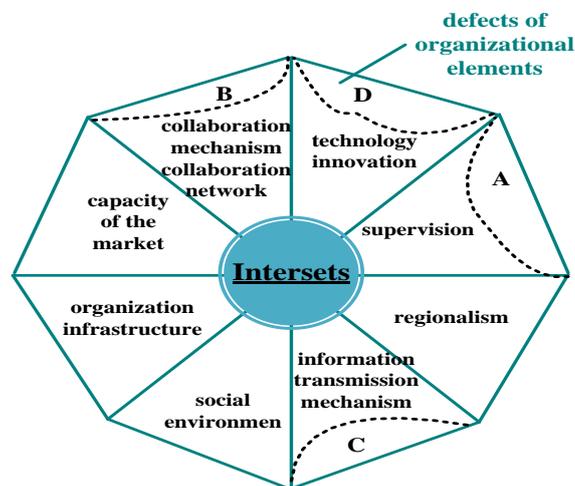


**Figure 1. The Classification Diagram of Organization Elements for Regional Tourism Operation**

The integration of the system application requirements to establish standard planning business office information system of tourism cooperation organization, this standard includes not only the system interface and includes the application operation process for the main economic benefits. Standardization can improve the tourist' learning ability by themselves, easy to adapt to the constantly changing function adjustment, especially the mastery of other business job mobility, reduce the learning and maintenance cost. During the process of operation of cooperative organization, there will be a series of friction and disharmony, but with the application of information science, the unstable part will develop benignly, maintain the tourism cooperation organization and keep innovative with other elements. The regional tourism organization cooperates with each other based on their own interests. Interests is the soul of organization, each element gather together by it. According to the target that should be achieved, they are combined into a variety of tissue morphology.

By the application of information science, complex information data can be adopted the centralized management mode, and the data for the tourism business management have been taken for distributed data management strategy. This is mainly in order to reduce the cost of maintenance of the system, the sharing of network fault risk. By establishing a comprehensive database for travel information, all kinds of information are online, and this improves the collaborative mechanisms for information building, mining and sharing. Meanwhile, information science covers the tourism cooperation organization widely, which has large amount of information, and its connection subjects are numerous. Therefore, the number of information nodes increases, the released energy will become more, and information flow between the nodes of the collaborative network will be strengthened. Through the benign cycle, regional tourism cooperation organization keeps the collaborative network perfect and the collaborative mechanism optimized. Establishment a shared a metropolitan area database, can make them realize the

centralized management of information through the mechanism of publish and subscribe technology of the database. The information science improves information technology by its capacity of integrating information for the tourism cooperation organization. Its technical index mainly includes consulting system of tourism multimedia information, tourism geographic information science, space information science, database mining technology, meta-based technology and other information technologies related to information and data. In practice, the application of high-end information technologies for tourism cooperation organization can help them collect the effective information. In addition, tourism cooperation organization can also improve the capacity of mining, information sharing and feedback related to information science application. Planning information towards tourism cooperation organization is irresistible, and the concrete manifestation of this trend is the establishment of widely advocated the export-oriented information planning e-government system. Such a system is the inevitable and city planning information system existing internal services to implement a higher level of integration of tourism enterprises and tourists to improve the tourism cooperation organization structure and product (service) structure, to extend the capacity of market demand for tourism enterprises, tourism cooperation organization. As shown in Figure 2.



**Figure 2. The Schematic Diagram of Online Information System for Organizational Elements**

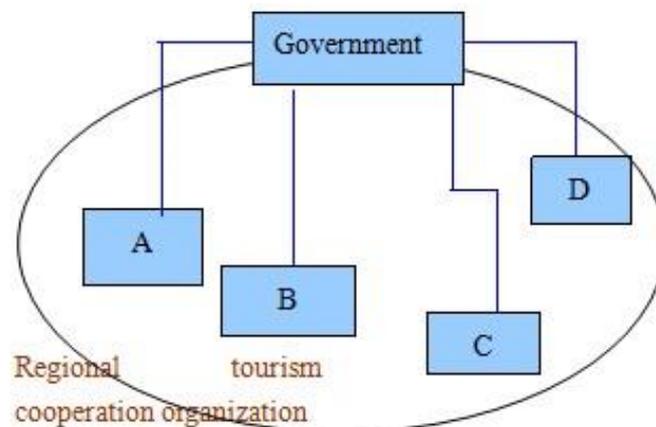
## 4. Regional Tourism Development Process

### 4.1. Government Leading

In the initial stage of regional tourism cooperation, organization members consider their narrow self-interests, and to seek the approach by sharing the organization profit. Information system includes the concept structure, information system, information system of infrastructure, information system structure of information resources and information system software architecture [18]. The decision-making subsystem can also be calculated based on the tourism products and service program, including financial estimates, predictable cost, profits and so on. During the application of information science for the government, the confusion degree can reduce the flow of information to improve the quality of information and value through the effective organization of information resources. Process and structure show some of the information resources for leading the tourism cooperation organization. In the information science system, information resources are generally required by certain ways and links the flow of information resources

from the information producers to users (tourists and tourism enterprises), including information sources, information collection, information arrangement, information mining, information processing, information transmission, information storage to be shared in each person or organization. In this period, organizational performance is affected by government with very low level, and self-discipline and the ability of controlling is weak, the behaviors of individual opportunism seriously affect the operation of the organization.

The tourism cooperation will obey the “zero-sum” rule in this stage. Centralized storage structure of information resources refers to the storage structure to store all the information resources in the information system focused on a physical node, the user can through the information system to access data in the database in other nodes. Tourism enterprises and government use administrative manners to improve the relationship to obtain balanced benefits among many main economic interests. The single administration from government often makes the regional tourism cooperation organization operate smoothly, however, there are still some limits related to ability and performance of the tourism cooperation organization. The administration of government with data warehouse technology is to meet senior decision makers on the need for decision support, and an information system to appear the solution, it is built on the database technology, on-line analytical processing and data mining technology based on the, the communication of information is basically a one-way between the tourism products (service) and tourism consumers (tourists), and there is no information feedback or capabilities of building and mining. According to each sub-body's ability of self-control, market operation and collaboration, the government intervenes and controls in different degrees (the distance between sub-body and government in the diagram). In the initial structure of cooperation organization, the daughter is in extensive parallel relationships. Even main tourism participants are faced to many differences in tourism resources, geographical environment, tourism development potential, the administration of government should use the recourses which are not obvious. In the initial stage of cooperation, communication barriers and asymmetric information, the government can lead the cooperation organization with storage management to undertake business processing logic and page. The receiving participants (tourists and tourism enterprises) browser requests, and according to the task request type transaction execution of the corresponding process, by which the various stakeholders can build the regional cooperation organization together with the administration of government. As shown in Figure 3.

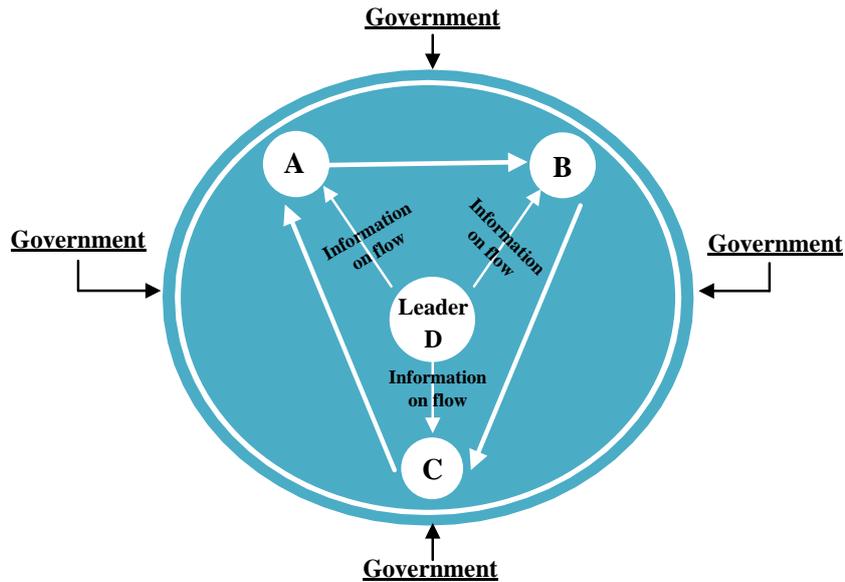


**Figure 3. The Structure Chart of Government-Dominated Cooperation Organization**

## 4.2. Star Structure

With the development of regional tourism cooperation organization from the government-dominated cooperation organization, information science is used to manage the information resource, and the software architecture for regional tourism enterprises' business and management services. The star structure related to information science architecture is also called the information system software architecture. With the application of the improvement of various mechanisms, and the join of information system of tourism cooperation, the relationship of main interests in a certain region gradually changes the structure. There four subsystems of information science in the star structure to increase amount and speed of communication among the main interests to increase the frequency of information both inside and outside of the regional cooperation organization. In order to ensure the data acquisition and data transmission timeliness and long time stable running of the information science, star structure of regional tourism cooperation organization should carry on the strict control of data acquisition and transmission cycle of field instruments, to ensure the lowest internal transaction cost among tourism cooperation organization, thus achieve the longest service life of battery.

During the application of information science, the performance of tourism cooperation organizations with "Star structure" can be turned from "zero-sum game" to "win-win" cooperation model. Meanwhile, the government quits gradually from the game of main economic interests, who becomes the controller and administrator of the tourism cooperation organization, instead of a leader as last stage. During the stage of "Star structure", the government constitutes regulations for the tourism cooperation organization, supplying the sufficient service for its development, without involving in the operation of the tourism cooperation organization. In addition, market mechanisms make the tourism organization operate well (Pavlovichk, 2003) [19]. In fact, there are some differences in tourism resources distribution, and the position of government has some advantages to supply the high quality service for main participants, by which the tourism cooperation organization takes over the government's position to be a new leader in the operation process. "Star structure" of the tourism cooperation organization with information system also needs to support distributed architecture technology, with the rapid development of computer technology, endless variety of distributed architecture, common distribution architecture technology, service *etc.*. Therefore, when the "Star structure" is formed, the tourism cooperation organization will come to be the leader role of operation instead of government. The exchange of information is more extensive and more frequent in regional tourism cooperation organization than before at this stage. In the platform of information science application, each part shows its respective advantages in the cooperation organization with the application of information science, combined with more professional information system related to cooperation organization. In addition, internal management of tourism cooperation organization, which is now operated by knowledge system (new application of information science), will link the main interests more closely than before. Therefore, the regional tourism cooperation organization has gradually become a formal organization with more performance because of the application of information science. "Star structure" of tourism cooperation organization can not only capture tourism market information autonomously, but distribute tourism resources and other related resources reasonably, by which "Star structure" of tourism cooperation organization can effectively share resources and advantages for regional tourism cooperation, result in the overall advantage and the more performance of the regional tourism organization. As shown in Figure 4.



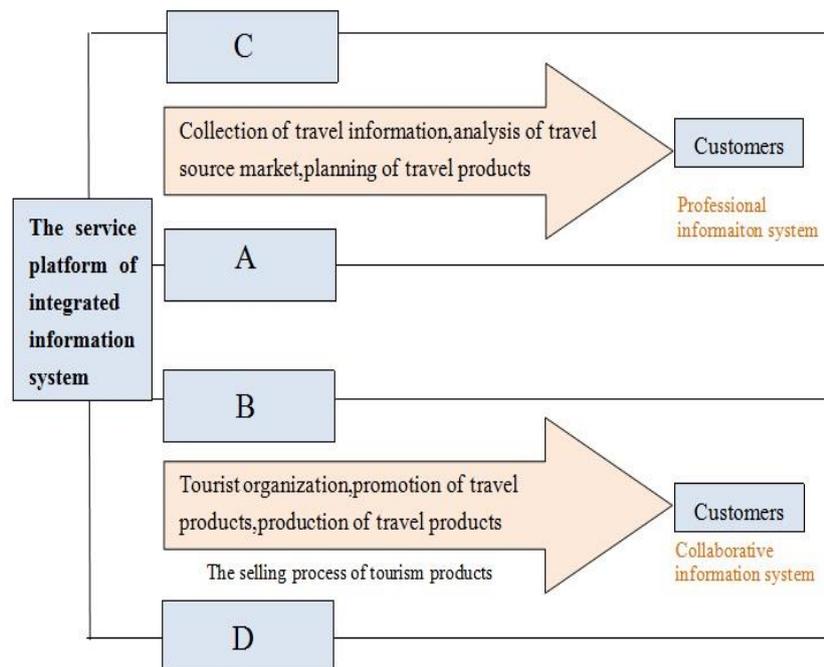
**Figure 4. The Structure Chart of Star Topology Organization**

#### **4.3. Functional Modular**

The structure of “Functional modular” for regional tourism cooperation organization pays more attention to the horizontal relations among all parts of the cooperation organization. The cooperation organization, combined with business, integration and collaboration of the function, need the application of information science. In fact, if the speed of information transmission is slow, the original organization structure should improve the operation speed to reduce the cost of regional tourism cooperation, by which it restricts the organization performance of regional tourism cooperation. The development of online information system provides important technology support for the organization function. Using information science related to analysis method, from the structural perspective, the study on regional tourism competition and cooperation network is a feasible system approach, theory analysis method is beneficial to supplement traditional reduction. In recent years, the academic circles began to explore the regional tourism cooperation and competition from the angle of relationship between the organization structures of “Functional modular” to improve the performance of regional tourism cooperation organization.

With the application of information science (integrated information system) for tourism service platform during the process of regional tourism cooperation organization, each part of organization becomes substructure which has professional functions. Firstly, some parts are responsible for collecting market information to analyze the tourism source markets with the application of information science (integrated information system), by which they can finish the planning project for tourism products (service) development according to the market demands. Secondly, some parts of the organization are responsible for establishing a virtual project workspace through collaborative information science (integrated information system). Thirdly, they combine the production factors for planning tourism products (service), whose products(service) can effectively meet markets’ demands. Finally, these parts of organization can build different sub-organizations temporarily by different subsystems of the online information system, and cooperate with each other according to the availability of resources.

When the structure of “Functional modular” for regional tourism cooperation organization is finished, the performance of integrated information system among tall parts of cooperation organization with the supports of information science can be effectively improved because of deleting the information transit link of the original organization structure. Thus, the faster the organization information transfers, the more greatly improved of the accuracy of the information transfer. Regional tourism cooperation in the area of network of information exchange speed can use different flow of tourists the number of representatives. Information exchange speed has very important economic significance for different regional tourism. Integrated information system becomes the mail source of information collection and distribution for tourists and tourism enterprises[20]. It makes the differentiation between function of each part among the regional tourism cooperation organization, by which the cost of cooperation organization can be reduced while overall performance of the cooperation organization can be improved. Therefore, organization structure of “Functional modular” is relatively stable than before. Each part of organization is responsible for different functions at different times. Some parts do not always want to collect information, to analyze market, and to plan tourism products (service). When the organization performs another project, perhaps these parts are combined into a new project. Therefore, the structure of “Functional modular” is also a flexible organization structure which can strengthen the adaptability of regional tourism cooperation organization. As to the drastic changes in the tourism source markets, the structure of “Functional modular” can respond the changes quickly by building a sub-organization structure related to integrated information system. As shown in Figure 5.



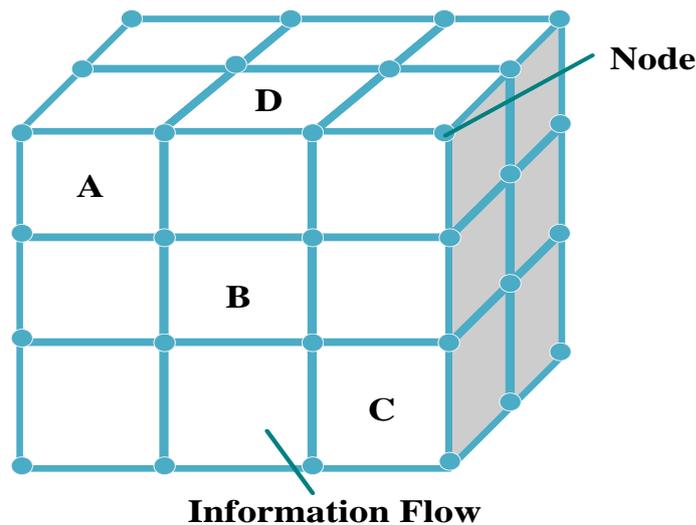
**Figure 5. Regional Tourism Cooperation Organization with Functional Modular**

#### 4.4. Network Structure

“Network structure” of regional tourism cooperation organization can be formed through the integration of the theory of complex network, social network analysis, new economic sociology, new economic geography and new institutional economics

theory and method, the latest research from the relationship of cooperation and competition of economic network, from network model construction, structural characteristics of index measurement and analysis, correlation analysis, evolution model, cooperation and competition balance of 5 systematic analysis on regional tourism cooperation and competition. "Network structure" of regional tourism cooperation organization is some independent courses of business, or tourism enterprise based on information science and communication technology, which is connected to other independent businesses or tourists. And it's a temporary alliance relying on a highly developed network. "Network structure" of regional tourism cooperation organization applied to tourism enterprises is an organization form of dynamic alliance, by which each subject breaks through the tangible boundary, and integrates with outside help by a variety of ways. Depending on information technology and communication network, members of the network organization can cross the spatial boundaries and communicate conveniently. They can share information with the support of complete information science and enough partners[21]. This ensures all members have a better cooperation, and achieve the best combination of time, quality, cost, service and environment, and at last have the strongest competitiveness. Network organization becomes flattened because of high adaptability of information flow. Complex systems and complex networks are exploring the general rules, so between the two closely linked, so the complex network has become one of the important ways to study complex systems. Complex systems and complex networks the combination of the two, may have broad prospects for development.

In the network organization, the information science (including social network analysis) is taking the system thought to the region between the network interaction analyses. Therefore, to discuss tourism competition and cooperation network researchers to use the theory and method of network science, by which they can better understand tourism cooperation and competition structure characteristics and interaction mechanism of regional network, making rational industrial policy, to promote more effective regional tourism cooperation on the whole. Each part can communicate interactively with any sub-block directly based on the efficient transmission of information. Therefore, regional tourism cooperation organizations can take splitting measures to face the changes in tourism markets. "Network structure" is the ideal form for regional tourism cooperation and is consistent with the characteristics of large parts of regional tourism cooperation organization. It rises up to three-dimensional or even multidimensional mode from one-dimensional, two-dimensional space of the organization structure. The links among parts of the cooperation organization could not be built by one or two information flow, but is joined by multiple nodes. And at this time, online information system has the maximum effect, each part of the cooperation organization can accept information from other parts, and the supply of integrated information system and the frequency of exchange are both important which can't be provided during the previous one-dimensional organization structure[22]. "Network structure" is the advanced stage of the development of regional tourism cooperation organization. It has high demands for integrated information system, and the operation of the cooperation organization can be completely controlled by the tourism market mechanism. Reasons for tourism cooperation alliance widespread are the existence of common interests between the subjects of tourism. In addition, consumer demand is changing with each passing day, and the level of "Network structure" cooperation of small and medium-sized tourism enterprises often determines a destination for long tail demand rapid reaction capability. As shown in Figure 6.



**Figure 6. Network Regional Tourism Cooperation Organization**

## 5. Conclusions

The construction of regional tourism cooperation with information science (such network model analysis method) can use complex network theory and social network analysis of regional tourism economic system from the angle of depiction and network structure. Complex network theory and social network analysis method boundaries become increasingly blurred, which are the developing, collectively called the “network science” the trend is clearly. Tourism information science should provide a broader space for the development of regional tourism cooperation because the rapid development of information science and technology should be better applied to. In terms of the technical aspects for information science, the establishment of regional tourism cooperation organization, information science (system) plays a very important role. When the information science was applied to regional tourism cooperation organization, the developments have linked to a higher level of information application (integrated information system). The cooperation organization structure is more reasonable and stable, and its performance has also been significantly improved. With the initiation of regional tourism cooperation, it is necessary to standardize organization operations, enhance organization adaptability to mine, build, share, deliver, and to feed back information. Using the tools and techniques of network science series, explain the network topology or structure is how to influence its behavior and evolution. Information network analysis of the data is not possible in the laboratory to obtain, so it needs to get through the investigation of the world to realistic society. Information network analysis research from the beginning is the analysis of the reality of complex social networks, therefore, for the understanding of the complexity of network, by which this paper hopes to provide useful help for the development of regional tourism cooperation organization with information science. The application of information science can reduce the cost of the exchange between cooperative organizations largely, and improves their own performance of both the cooperation organization and the main participants among the cooperation organization.

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