TALLINN UNIVERSITY OF TECHNOLOGY

Faculty of Social Science

Ragnar Nurkse School of Innovation and Governance

Jiaxin Mu

The Effects of E-governance on Urban Economy: Case Study of Qingdao, China

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Technology Governance

Supervisor: Shobhit Shakya

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I hereby declare that I am the sole author
of this master's thesis and it has not been
presented to any other university for examination.

Author (name)
(date)

The master's thesis meets the established requirements

Supervisor
(date)

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List of abbreviations

ISDC	Information Systems in Developing Countries
BQS	Bureau of Statistics of Qingdao City
ERCC	E-government Research Center of China
EGDI	E-government Development Index

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ABSTRACT

The purpose of this article is to study the effects of e-governance on the urban economy, taking Qingdao as an example. Currently, e-governance is one of the most important areas of information technology. Initiatives in e-governance have been claimed to improve work efficiency and productivity in addition to the quality of public services through the means of information technology and networked environment. The quality of public services by modern information technology and network environment is also improved. Through the method of case studies, the article combines local archives and interview surveys to analyze and process the data to demonstrate the impact of e-governance on the urban economy from three aspects: e-government, e-commerce, and e-payment.

Keywords: effects, e-governance, economy, Qingdao, China, e-government, e-commerce, e-payment.

1. Introduction

From the historical development process, every technological revolution will cause the change of governance. The development and application of information technology have undergone tremendous changes in governance. On the one hand, it makes the processing and dissemination of information more convenient, and the interaction between government departments, the public, and enterprises is enhanced. Information communication, feedback, and response between the government public sector and the public and business are closer. And the inter-linkages and interactions between government departments and the public and businesses have been strengthened. On the other hand, information technology has given the public a growing share of information and knowledge (Wang, 2017). These also put forward new challenges to the traditional way of governance. Therefore, the government's structure, functions, and management methods must be improved through the application of information technology.

"*Informationization*" (Zhao & Chen, 2008) is to make full use of information technology to develop and use information resources, promote information exchange and knowledge sharing, and improve the quality of economic growth. And it is the general trend of economic and social development in the world today. The second wave of *informatization* combined with digital multimedia integration and Internet technology has swept the globe, triggering profound changes in production and lifestyle, and greatly promoting economic and social development. E-governance is one of the most important areas of information technology. Among the five fields of application of "information superhighway" actively promoted by all countries in the world, "e-governance" is listed first in China (Chen & Yu, 2003). The purpose is to use electronic means to handle various administrative matters so that citizens will have full access to the government's various information and services through the internet. From the effect of the practice of e-governance, we can greatly improve work efficiency and productivity, improve the quality of public services, etc. by modern information technology and network environment.

Qingdao's e-governance is the first of China. And as an e-governance pilot demonstration city, Qingdao has continuously innovated in the construction of e-governance technology system, operation mechanism and application mode, and has formed its unique development mode. Qingdao e-governance network - "Jin Hong Network" has become the most complete and largest one of the networks in China (Yi, 2008).

In this context, this thesis argues that although the direct service targets of e-governance construction are the government, enterprises and the public, it also has a greater direct or indirect impetus to the development of the economy. Based on this argument, this research tries to study the concept of e-governance. Secondly, the research will be studying the impact of e-governance initiatives on local businesses to see if there are visible economic benefits from the perspective of local businesses. Then try to answer the following questions:

- How has the e-governance initiatives in Qingdao affected the local urban economy?
- What evidences of economic benefits of e-governance initiatives can be observed from the perspective of local businesses?

2. Literature Review

2.1. General literature about E-Governance

In the theoretical community, the narrow sense of “governance” generally refers to how organization members influence decisions and how such decisions are implemented. Broad “governance” refers to all the ways an organization behaves. This organization can be a government, government organizations, companies, even a project, etc (Zhang & Ren, 2015).

The term "E-governance" is relative to traditional governance and e-commerce. Baum and Mario (2000) defined: "E-governance is the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the internet, and new media." Specifically, E-governance refers to the public administrations applying modern information and communication technologies, making the structure and workflow optimized. It can provide society with all-around quality, standard and transparent management and service. At a deeper level, E-governance is a transformation of the existing government forms in the industrial age. E-governance must take advantage of modern information technology, digital network technology, and office automation technology. At the same time, E-governance is inseparable from the implementation of information infrastructure and software technology.

Regarding the definition of e-governance, different subjects are described from different perspectives, including the national level, international institutions, and experts and scholars. Although different entities have different understandings of e-governance, almost all definitions emphasize government's use of information and communication technologies, and usually mention three objectives, namely “more efficient government management” and “provide better

Service", "improving the democratic process" (Yang, 2015).

E-governance advanced countries are committed to establishing a network system between the government and citizens to make citizens get more convenient and efficient services. E-governance between the government and the business, mainly committed to e-commerce practices, is to create a safe, orderly and reasonable e-commerce environment, introduce and promote the development of e-commerce. E-governance among governments, mainly committed to the government office automation system construction, is to promote information interaction, information sharing, and resource integration, and to improve administrative efficiency (Zhao, 2004).

E-governance is an extension of the development of e-government, a new trend of deepening and evolution (Wang & Yang, 2005). E-governance is the process of applying new electronic and communications technologies to reform government and governance, building a virtual government governance model, improving the provision of public services, and enhancing the interaction between government and citizens (Danzuger & Andersen, 2002).

E-governance is not a simple application of ICT in the field of public affairs, but rather a way of more social and political organizations and activities related to the organization and use of political power and social power. E-governance involves the public How to influence the series of activities of the government, the legislature, and the public management process (Wang & Yang, 2005). This is a broad understanding of e-governance. In a narrow sense, e-governance refers to the use of information technology in the interaction between the government and the economic society and the internal operation of the government to facilitate government administration, simplify the handling of public affairs, and improve its democratization governance model (Liu & Xu, 2006).

Singla (2002) proposed that e-governance is to establish a SMART government. SMART refers to simple, moral, accountable, responsible, and transparent. These five factors are a good summary of the basic characteristics of electronic governance. He (Singla, 2002) believed that

the implementation of effective e-governance needs to meet two conditions: First, better implements of public services by the government; Second, the participation of all citizens.

2.1.1. Development of E-governance

According to its different research priorities, E-governance can be divided into two main stages. The first stage focuses on the construction of government internal management information system. The second phase focuses on E-governance-oriented public service research (Sun et al, 2012).

The first stage was from the late 1970s to the 1980s. Prior to the notion of E-governance, developed-country governments were already actively seeking to harness the power of information technology to improve operational efficiency and enhance internal communication, but at the heart of it was internal self-management. Umpleby (1977) reviewed the research literature and argued that new communication technologies are likely to make a drastic change in the form of government democracy over the next decade. Newell and Simon (1976) argued that technology was considered as a peripheral device in the government and did not have core management capabilities but merely serves as a management tool. In the 1980s, the popularity of personal computers in the public administration sector opened a new phase in the use of information technology in government. During this period, as technology management was dispersed across many parts of the government, technical factors were integrated into the core functions of the government. Karlström (1986) argued that the efficiency of public administration in Sweden comes largely from information technology, and analyzes the impact of using information technology by local government agencies. On the other hand, Brussaard (1988) believed that the management of information resources has been used in different fields. His theory is also widely used at all levels of government in different countries. He proposed a classification model for the use of information resources management in the public sector and evaluated the practice of the classification system in the Netherlands. New information technologies will affect how public authorities communicate with each other and between departments and society. At this stage, the research focus of e-governance has gradually shifted from the research on the effectiveness of information technology to the research on specific

applications.

The second stage is from the early 1990s until now. As the Internet has matured into a cost-effective and user-friendly platform, government officials can use the Internet to communicate directly with their citizens and make a huge amount of information available. The development of e-commerce has further strengthened the transfer of government core and gained the flexibility of goods, services, and information via the Internet. In a certain context, citizens' expectation of customer service has been stimulated. Because of technological advances and economic changes, there has been a further impetus among government policymakers to shift the core of IT use from internal management to external connections with the public, and the notion of e-government has evolved to become a hot academic discussion. Former Vice President Al Gore, in his national performance appraisal report, suggested that e-government "will allow citizens to gain more widespread and timely access to information and services through effective response to customer processes, changing the relationship between the federal government and citizens (Zhang, 2005)." In December 1994, the US government information technology service group put forward a report titled "Prospects for Government Information Technology Services", (Zhang, 2000) recommending that information technology be a key force to completely reshape the government's service to the public, to use information technology to achieve the interaction between government and customers, the establishment of customer-oriented E-governance to provide more efficient and easier access to services, provide people with more opportunities and access to government services. In 1998, the United States passed the Government Paperwork Elimination Act, prompting the government to realize the e-service. In 2000, it announced the construction of "First Gov", the world's largest e-government website, aimed at establishing a customer-oriented "one-stop" government service system (Sun et al, 2012).

At this stage, the research on the application of E-governance and the reform of government administrative system have been further deepened, and the research literature has been gradually enriched in these years. The main contents of the study include four aspects: one is to better fulfill the functions of social management and public service. Saxena and Aly (1995) argued that with the further development of the economy and the increase in the complexity of social

management, government management is in a dilemma. And this dilemma will likely be solved through the process re-engineering of public administration and the innovative application of information technology. Then they proposed a conceptual model of information technology support for the public administration that describes how policies are formulated, implemented and controlled by information systems. Tat-Kei Ho (2002) analyzed the government's process re-engineering and e-government initiatives. The second is the research of the effect of network and information technology on public service. Schelin (2003) argued that prior to the introduction of Internet technology, IT was being used by governments mainly for a large amount of transaction work to improve the efficiency of public administration. The introduction of Internet technology provided a new approach to the innovation of government management. Edmiston (2003) presented the prospects and challenges of e-government for national and local governments. The third is to improve public service capabilities, research on government portal performance evaluation methods and systems. Gupta and Jana (2003) propose e-government assessment models and conduct relevant case studies. Garcia and Pardo (2005) studied the key success factors of e-government and describe the mapping of e-government practices to theoretical foundations. The fourth is the study of the effect of e-government. Klischewski and Scholl (2006) studied the integration of key issues in e-government construction: information management capabilities, organizational capabilities, and resources. Andersen and Henriksen (2006) proposed the E-governance maturity model through the extension of the Layne and Lee model. Reddick and Frank (2007) use a case-by-case approach to analyze the impact of E-governance on public services to cities in the United States through surveys of Florida and Texas.

2.1.2. Model of E-governance

According to the different clients, Brown and Brudney (2001) divide E-governance into three modes as follows:

- G to G mode. The model refers to the E-governance between the government and the government, and it is the interaction among the governments through the multimedia technologies such as electronics and internet information.

- G to B mode. The model refers to the E-governance between government and business. The use of such a model has two roles: First, the government network management of enterprises, services, supervision can reduce the intermediate links to avoid the black-box operation to prevent corruption to reduce administrative costs and improve efficiency. Second, the move will help to create a fair competitive environment, help enterprises find more business opportunities, reduce operating costs and avoid blind development.
- G to C mode. This model refers to the E-governance between the government and citizen. It is an important channel for citizens to obtain the right to know, to participate, to express and to supervise. It is also a favorable way for the government to raise public services.

Scholars have conducted research on the development of electronic governance in China, Australia (Ware, 2009), developing countries in sub-Saharan Africa (Schuppan, 2009), developing countries in India (Paul, 2007), and Caribbean islands in the Caribbean (Palanisamy, 2004). In previous studies, some scholars proposed electronic governance as a dynamic and open "social-technical" system. The system includes "social development trends," "human factors," "technological changes," "information management," and "interaction and complexity. "Government goals and tasks" 6 subsystems, and each subsystem has mutual influence and effect (Dawes, 2009). E-governance as a complex “government-society-technology” system has unique attribute features (Liu & Tan, 2007).

- Visionary governance concepts: Electronic governance embodies the goals of good governance, is committed to building a perfect governance structure, promotes social management to maximize the public interest, highlights the return of state power to society, and also relies on the people's governance philosophy.
- Multiple collaboration governance body: E-governance includes multiple governance entities such as government organizations, social organizations (interest-group organizations), companies, and the public (civil society). Diversified entities play a role in governance within each other's core strengths and cooperate with each other to form an overall joint effort to jointly manage social and public affairs.

- The overall rapid management approach: The e-governance approach has been increasingly transformed and the solution level has become more and more extensive, which has had a huge impact on traditional governance.
- The open governance structure of the Internet: E-governance utilizes information and communication technologies to redesign and adjust the governance structure, fully embodying the "political-social-technical" brand-new network governance structure, openly absorbing and integrating advanced governance concepts and methods, and adjusting the government. The structure is more flat and flexible to accommodate public management and public services in the information society environment.
- Dynamically evolved governance process.
- Multilevel integration governance form: The form of e-governance refers to the establishment of social democratic good governance culture, the realization and satisfaction of corporate interests and public values.

2.2. E-governance and Economy

Avgerou (2003) studied the effectiveness of the relationship between ICTs and economic development built by some influential international development organizations. He also pointed out that the policy analysis and recommendations of the major development organizations will affect the intervention behavior of information system professionals in developing countries, leading to erroneous ideas and affecting the effective implementation of ICTs. Avgerou (2008) reviewed the literature on how developing countries benefited from information and communication technologies and emphasized the contribution of information systems in developing countries (ISDC) to socioeconomic development theory.

In recent years, western economists research is focusing on the relationship between IT and productivity growth, information technology, and economic growth. Because of the large scale of the construction of E-governance, there are many units involved in the construction of

E-governance, and the investment of related funds is very considerable. The role of E-governance in economic society can be analyzed from the aspects of direct and indirect effects.

2.2.1. Indirect Effects

Indirect effects can be considered and analyzed from the following three aspects: construction benefits, management benefit and service benefit (Deng & Peng, 2006).

- Construction benefits. From the view of the practice of E-governance, the construction of E-governance has increased some administrative costs on the one hand, and on the one hand, it will reduce some administrative costs. Although in the general and long-term trend may reduce the administrative cost, but in the short term, it does not decline or is not significant. Therefore, in the construction of e-government, we should pay attention to the control of the cost of E-governance construction and maximize the efficiency of E-governance with a small investment. To solve this problem, we should adopt market-oriented operation mechanism to reduce the direct investment of the government, arouse the enthusiasm of the enterprises, and promote industrialization by the standardization made by the government. Therefore, to do well in E-governance construction will not only directly benefit from cost, but also spillover effects on other related industries in the society, thus reflecting the economic externalization of E-governance.
- Management benefit. The development of e-governance is of great significance for improving the efficiency of government's public management, reducing the cost of internal administration, increasing the output of the government and improving the public's satisfaction to the public services of the government. However, the management efficiency of a government is not only reflected in its social benefits but also through service and management, especially the effective supervision of some special industries, will have a huge impact on improving economic efficiency, environmental and ecological benefits and social benefits. According to official figures provided by the first phase of Chinese “Jinshui” project total investment of 2 billion 200 million yuan, the first year of operation of the income tax amounted to 25 billion yuan (Du & Wang, 2005).

- Service benefits. The government provides efficient services to enterprises and the public through e-government, which can improve the competitiveness of enterprises and indirectly increase economic benefits (Cai, 2003). After joining the world trade organization, the effectiveness of the government's service to the enterprise will be directly related to the ability of the enterprises to compete on the two markets in the world and in the country. Therefore, the E-governance services will increase the welfare of the society and produce indirect economic benefits.

2.2.2. Direct Effects

E-governance plays an important role in the effective use of information. The government is the social management and service, and information collector and processing the biggest, effective use of information plays a fundamental role. According to statistics, its information resources account for more than 80% of the total social information. (Zhou, 2008) Without government *informatization*, social *informatization* is not enough. Only by implementing e-governance can we have the real development of e-commerce. At the same time, the implementation of E-governance plays a very important role in the production and dissemination of information. From the perspective of system economics, E-governance is also an important way to create social productive forces and wealth based on information service.

E-governance has a direct impact on the main body of E-governance construction. E-governance is a profound transformation of traditional administrative management. The essence of E-governance is to transform the existing form of government that is suitable for industrial civilization, that is, to use information technology to construct government governance structure and power operation mode which is more suitable for the times. The government, enterprises, IT consulting institutions is the main course of the E-governance construction in which the government is the core, provide technical carrier IT enterprises, consultancy services and value-added development, they enter the field of E-government in an industrial chain, facing opportunities and challenges, is a kind of interdependent and symbiotic the development of the relationship. Therefore, the economic impact of these participants will directly reflect the economic benefits of the construction of E-governance.

2.3. E-governance in China

The development of E-governance in China can be traced back to the mid-1980s. Reviewing the development of these years, we can divide the development of E-governance into three phases: the initial stage, the advanced stage and the deepened application stage (Wang, 2009).

Initial stage. From the mid-1980s to the early 1990s, all levels of government in China gradually started to use office automation (OA) based on the processing of text forms and application of simple programs. This laid a very strong foundation for the future development of E-governance in China.

Advanced stage. The Chinese government did a series of work. In December 1993, the Central Government took the lead in starting the implementation of the "Three Golden Projects", namely, "Golden Card, Golden Gate, and Golden Bridge." In 1998, the government of Qingdao established the first relatively standard government website in China on the Internet - the "Qingdao Government Public Information Network." In 1999, China Telecom and more than 40 ministries jointly launched the "government Internet project". The portal site www.gov.cn opened to become China's online government's navigation center and service center.

Deepened application stage. In 2002, "State Council Informatization Office" was formally established, and the government identified the "one station, two networks, four libraries, twelve gold," the main body of China's e-government framework. "One station" refers to the government portal website; "Two networks" refers to the government intranet and government extranet; "Four banks" means the establishment of four basic databases of population, legal person unit, space geography and natural resources and macroeconomy; “Twelve Golds” is to focus on promoting 12 business systems such as “Gold Card” and “Gold Tax”.

2.3.1. E-governance and E-government

E-governance is a new paradigm for e-government. It is a governance model that surpasses

e-governance and is a new trend in the development of e-government. The relationship between the two can be summarized into three perspectives: The first is that e-governance equals e-government. Xu Chunyu and Xu Qin (2004) analyzed the source of e-government in foreign countries and considered that "e-government" and "e-governance" are the same. The second is that electronic governance includes e-government. E-governance is a new trend of extension, deepening and evolution of e-government development. E-governance, which includes e-government, is a broader and deeper conceptual system. Chen Xiangrong (2005) believed that the implementation areas of electronic governance include e-democracy and e-government. E-government and -democracy should be considered at the same level. The third is that electronic governance is a staged content of the development of e-government. Some scholars pointed out that "the public-centered electronic governance stage is the scientific model for the future development of e-government."(Ma & Dai, 2008) The other is structural analysis. Scholars such as Liu (2005) have stratified the concept of “electronic governance” from both broad and narrow senses. The final goal of e-governance is the government, which essentially recreates government processes.

2.3.2. Connotation of E-governance

E-governance is a new governance model that differs from traditional management systems and mechanisms. It requires a human-centered approach, wide participation of citizens, open and transparent administration, interaction between the government and citizens, and cooperation between the public sector and the private sector. This is a scientific connotation. Theoretical system. There are two main ways of defining a representative: one is a descriptive explanation. As explained in the 26th International Conference on Administrative Science, e-governance is a form of social-political organization and its activities that are more related to political power and social power. It is an expression of the governance of the information age. (Yang & Wu 2017)

2.3.3. Features of E-governance

The feature is the externalization of the nature of things, and it is a concentrated reflection of the relationships between the various elements of things. Regarding the characteristics of e-governance, Wang and Yang (2005) believe that e-governance has the following characteristics:

e-governance first requires the public sector to provide good management and services; secondly, e-governance should help create a more open and wide-ranging and prolific Public sector. Scholars generally agree that these two aspects are important indicators for measuring the quality of electronic governance. Some scholars believe that the core advantage of e-governance is that it breaks through the capacity constraints of a single government organization, enhances the transparency of public participation in government decision-making, and shapes and exercises the decision-making process (Xiang, 2007).

2.3.4. Role of E-governance

E-governance plays an important role in the overall development of society. The current main point is that e-governance is an important measure for realizing the management of service-oriented government, making the public sector more open and transparent and conducive to the construction of a responsible government, and deepening the reform of administrative systems. The important methods can reduce unnecessary work links, implement the process of democracy and openness, help develop e-democracy, form "negotiated democracy", facilitate public supervision, help build a personalized government, and reduce errors in government work. It is conducive to raising the value of taxpayers' funds; it is conducive to improving the value of public officers' work and their work achievements (Zhu, 2010).

2.3.5. Application of E-governance

E-governance is not only an advanced governance concept but also has practical features. The current application of e-governance mainly remains in e-government, and it is analyzed from four aspects. First, the principle of electronic governance implementation. Liu and Luo (2005) believed that the implementation principles of government e-government mainly include the contents of "eight aspects", and points out that the two focuses of e-governance are network convergence and cybersecurity. The former is the best choice for government governance, and the latter is the primary issue for government e-governance. Second, the application environment for electronic governance. Some scholars have pointed out that in the construction of e-governance, we must attach great importance to cultural construction under the conditions of e-governance, to provide a good environment for e-governance. Thirdly, major problems and

deficiencies in the application of electronic governance. The bottleneck of e-governance is mainly manifested in: obstacles to the transformation of the leader's management philosophy; the huge digital divide in China; the integration of information resources between subjects; technology and security issues; e-governance development and implementation of different subjects in the process of implementation Finally, the electronic governance application mechanism. Kong (2005) pointed out that according to the modern governance theory, the principles of legality, coordination, responsibility, rule of law, and interaction should be followed to construct an electronic governance operating mechanism.

2.3.6. E-governance Policies

Ma and Zong (2006) summed up the establishment of the Chinese regulatory system mainly in the following areas:

The first is the e-government organization law, which mainly includes the e-governance authorities and their duties and responsibilities, as well as the establishment and legal status of e-government, such as the “Guidance on E-governance Construction” promulgated in 2002 and the “Administrative Licensing” passed in 2004; The second is the information disclosure law, which refers to the laws and regulations of the government in making public information available to the public, such as the "Administrative Measures for the Safety and Protection of Computer Information Network International Networking" of 1997 and the "Government Information Disclosure Regulations" promulgated in 2007; The third is the e-governance security law, such as: "The People's Republic of China Computer Information System Security Protection Regulations" in 1994; The fourth is the electronic signature law, such as the "People's Republic of China Electronic Signature Law" formally implemented in 2005; The fifth is the e-governance finance law, which mainly adjusts the sources, budget, use, and supervision of e-governance fiscal funds; Sixth, the e-governance supervision law. In addition, many provinces and cities in China have formulated some local laws and regulations in accordance with the relevant laws and regulations of the state and in light of the actual situation in the area.

The State Council (2015) also proposed that to further promote the scientific and sustainable

development of the e-government system of the government, we must gradually establish an e-government system that suits the government's performance of duties.

Liu Yun and Liu Wenyun (2005) considered that the development of e-governance in countries around the world has created a good international environment for the development of e-governance in China. The further improvement of national policies has created the development of e-governance in China. A good policy environment has brought great significance to the development of China's e-governance.

Hu (2007) considered that the promulgation and implementation of the organization laws and regulations not only provides one-stop services for governments at all levels to use the internet but also establishes a unified law for online collaborative office and parallel approval. The platform also has a far-reaching and positive impact on the development and regulation of China's e-government in the future.

Hu (2007) believed that the introduction and implementation of the "Administrative Licensing Law" have strongly impacted the traditional concept of administration. In the past, e-governance officials did not receive the attention of government officials and administrative staff. The first was because of the old administrative concepts in the minds of officials; second, there was no legal basis for e-governance. Article 33 of the Administrative Licensing Law clearly stipulates that administrative agencies should establish and improve relevant systems and promote e-governance. This has made e-governance recognized by the law.

2.4. E-governance in Qingdao

Qingdao's *informatization* work started in February 1996. After more than 10 years of development and construction, it has formed a unified core local area network system and a wide-area network of city agencies. The whole network has more than 3,000 nodes. In 1997, a comprehensive and versatile office software, the Jinhong e-governance system, was developed.

This system has become the current internal network office system in Qingdao. In Qingdao, Qingdao opened the "Qingdao Government Affairs Information Public Website" in 1998 and renamed it as "Qingdao Government Affairs Network" in 2000, becoming China's first website. In August 1998, the "Macao Policy Making and Office Information Service Network" was opened. In 2002, Qingdao City strengthened the construction of the security infrastructure of the e-governance system and built a reliable security support platform. As a whole, Qingdao City has established a “four-unity” operating mechanism with a unified organization, unified planning, unified network, unified software, and hierarchical management, forming a unique “strong nuclear-radiation” model, and its resources are The city shared. From 2004 to 2006, Qingdao Administration Network won the first place in 333 sub-provincial and prefecture-level government portals for three consecutive years. At the 2006 China IT Wealth (CEO) Annual Meeting and the Annual Meeting of Chief Information Officers (CIO), the “China Information Construction Project Achievement Award” was the only local government e-governance project among the 14 award-winning projects (Liu, 2007).

In 2002, Qingdao City issued the "Tianjin City E-Governance Project 2002-2005 Plan Outline", proposed the establishment of an "integrated government" under the network environment, and provided the "one-stop service" for the society's e-governance development goals from the government. From two perspectives of its own operations management and public service, it puts forward the requirements of using information network technology to promote management and service innovation. Based on this goal, Qingdao City explored and formed a demand for governance and innovation as the starting point, through the construction of an integrated technology system, and adopting an intensive development model to build a unified, one-line collaborative office environment in the city. Based on this, we will realize the integration of various administrative resources, promote the realization of integrated government and one-stop service goals, and ultimately promote the development of governance and innovation in e-governance development, and initially form an “861-10” e-governance system (Yi, 2008).

The most prominent feature of Qingdao's e-governance is the formation of an intensive development model with centralized and unified features. This model is based on the unified

management mechanism, unified planning, unified network, unified software, hierarchical management of the "four unified points" management system, unified network construction of the city's shared GNSP (Government, Network, Services, Provider) network mode of transport and centralized resources of the city's GASP(Government, Application, Services, Provider) sharing application model As the main content, it received the results of low investment construction, large-scale application, low-cost operation and high-level service. After years of improvement, Qingdao has initially formed an "861" core technology system consisting of eight platforms, six centers, and a set of directories, which has become an infrastructure for e-governance shared by the city's agencies. (Meng, 2018)

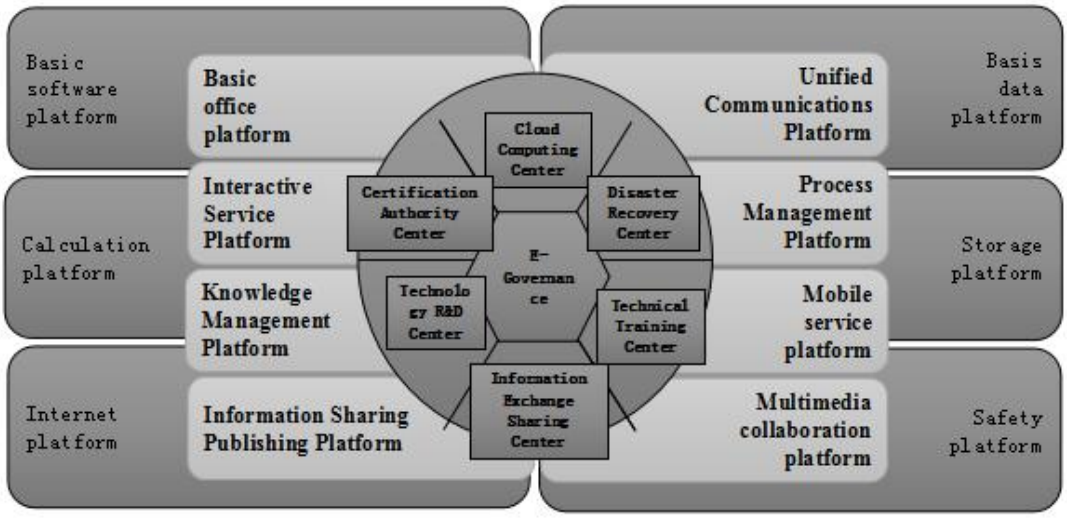

Figure 2.1. One-stop technical system
Souse: Meng (2018)

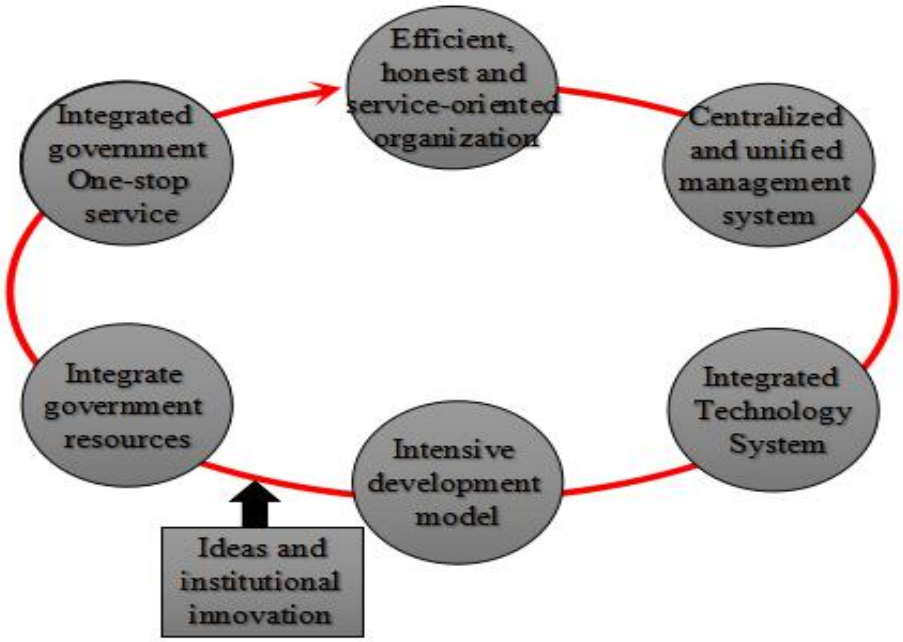

Figure 2.2. Goals and ideas of Qingdao e-governance

Souse: Meng (2018)

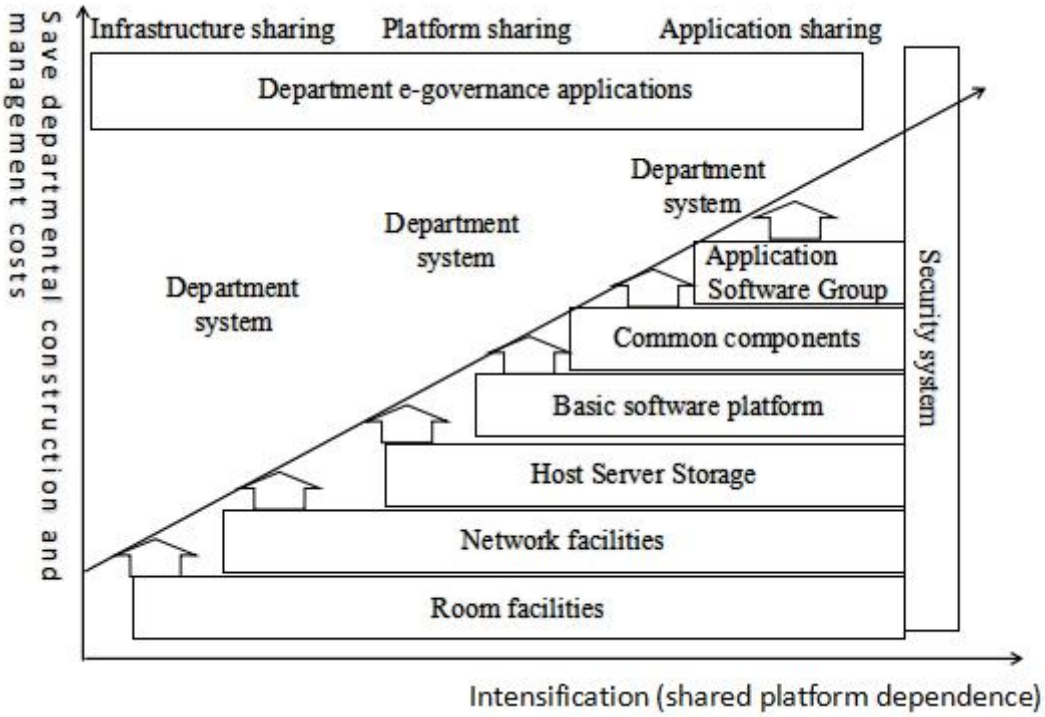

Figure 2.3. Intensive configuration

Souse: Meng (2018)

3. Methodology

This section mainly uses case study methods for analysis. It mainly studies the impact of e-governance on the local economy from three aspects of e-governance. Various data were collected and analyzed in this study. The data mainly comes from survey questionnaires, survey articles and research reports on the Internet. The answer to the interview was mainly obtained via e-mail. The study conducted a survey of 14 local companies. Due to time and distance constraints, it was impossible to obtain a larger survey sample.

3.1. Research Questions

The information industry has become one of the areas with the highest degree of integration, the greatest development potential and the fastest growth rate in the global economy and has profoundly changed the pattern of world economic development and market competition. The information industry has brought new growth points to the world economy and has intensified the process of economic globalization. At present, the development of the world economy is extremely uneven, and the disparity between the rich and the poor, especially the gap between information poverty and information richness, continues to widen. Because of the backwardness of information technology, developing countries are at a disadvantage in the process of global economic integration. Therefore, the following research questions are proposed：

- How has the e-governance initiatives in Qingdao affected the local urban economy?
- What evidences of economic benefits of e-governance initiatives can be observed from the perspective of local businesses?

Solving these problems helps to promote the application of e-governance. The lessons learned from the example of Qingdao can be applied to other cities and countries.

3.2. Data Collection and Processing

The data of this research is divided into primary data and secondary data. The primary data comes from the survey (Appendix 2). The objects are local enterprises in Qingdao and the data collection is mainly through e-mail. Secondary data comes from research literature, government reports, data analysis websites, magazines, and news.

The processing of data is mainly to ensure the accuracy of the data, and the original data is classified so as to be converted into a form that can be further analyzed. Data processing mainly includes three steps: data editing, data encoding, and data entry. Data Editing is to identify errors and omissions in data and correct them as much as possible to ensure the accuracy, consistency, and completeness of the data, and facilitate further coding and entry. Data Coding classifies the first-hand data collected. Data Entry records the collected first-hand or second-hand data to a computer that can observe and process the data. The data processing of this research is mainly through Excel, making figures to show the data more simply.

4. Empirical Research

The object of this research is the local economic situation related to e-governance in Qingdao. This section presents the resulting data classification for analysis. In order to get the answer to the research question.

4.1. Economic benefits of E-government

The positioning of the government's functions directly determines the content and direction of the implementation of e-government. As the Chinese government shifts to a service-oriented government, the public service function of the government has gradually become dominant. Therefore, the construction of "management service-type" e-government is the main direction of China's current e-government construction.

According to the E-Government Research Center of China (ERCC) survey report on the development level of China's urban e-government (2014-2016), the e-government development index (EGDI) of 36 cities across the country was evaluated. It can be seen from the report that Qingdao’s e-government has always been at the leading level in China.

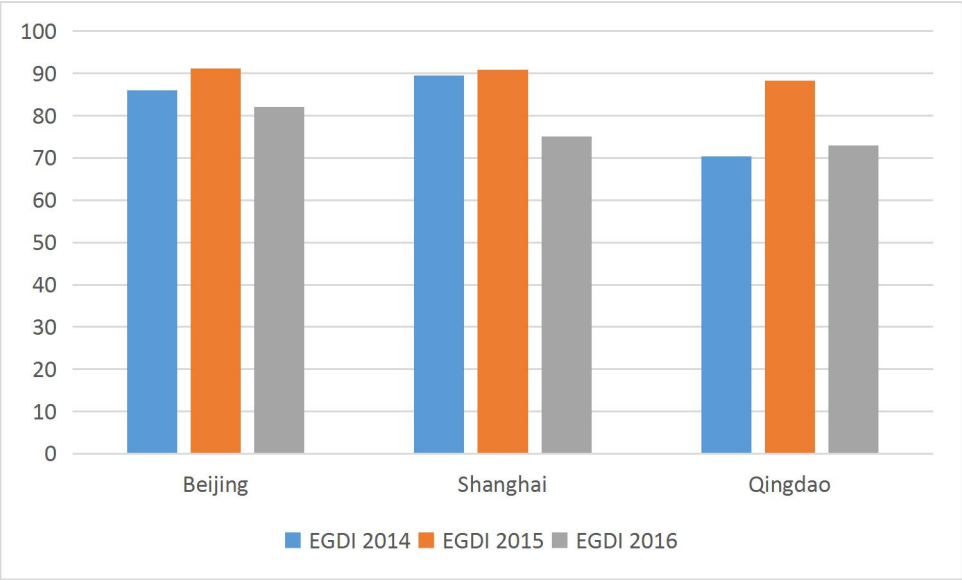

Figure 4.1. The EGDI of Beijing, Shanghai, and Qingdao
Source: ERCC (2014,2015,2016)

As early as 2000, Qingdao proposed the e-government development goal of “integrating the government within the built network environment and providing one-stop service to the outside world”. It can be said that the current state’s efforts to promote “only one door, the most Run once, let the data run more, let the masses run errands "in the same line. In order to further promote the "Internet + government services" to meet the people's yearning for a better life and good interaction experience between the government and the people, Qingdao is currently fully promoting the application of e-government to empower people's livelihood.

Qingdao officially launched the Qingdao Administration Service Mobile Portal “Qingdao Administrative Service”, one-click real-name authentication, covering 130 livelihood issues in 22 departments, social security, provident fund, motor vehicle violations, approval work progress, subway ticket purchase, Appointment registration, immigration documents processing, tax payment, the people have to run multiple departments before they can do a good thing, now only a mobile phone can be easily achieved (Li, 2018).

As the nation’s first strict government website, Qingdao Government Affairs Network has won

the first place in the country in nineteen times in the performance evaluation of national government websites. Through one-stop service, the city formed a standardized list of 15,000 service items to be released to the public, 2.39 million pieces of government information were openly disclosed, 1,072 data sets and 2,146 API services were all open, and 1.7 million people interacted with online politicians and 166 annually. The handling of thousands of public appeals across the entire network has effectively solved various types of public concerns about practical problems and the construction of a new system of “data-for-people” has further enhanced the sense of gains of the people (Li, 2018).

In accordance with the city's unified, distributed application and one-stop service model, the city and district (city) two-level unified online approval system will be established. At present, there are 392 administrative licensing examinations and approvals in 47 departments of the municipal level, and more than 3,600 approvals for all municipalities and districts (including street towns and townships) have been transferred to the unified online approval platform. Formed a hall and network dual centralized and unified new approval service mechanism. At present, the average processing time of the examination and approval items is 70% faster than the legal time limit. Among them, the average processing time for the joint establishment of enterprises was shortened to 1.49 working days, and the approval efficiency increased by 11.1 times; the joint approval efficiency of capital construction projects increased by 50% (Chen, 2009).

Relying on the financial resources construction information platform, the Bank achieved a total of 3.82 million tax-related information exchanges and sharing among 24 departments and 12 districts and cities, monitoring 4,000 investment projects of over 30 million yuan, and monitoring the tax source of 10,150 key tax-control companies. Through comparative analysis of tax-related information, the taxation department has collected 792 million yuan of inbound tax revenue (Lai, 2008).

Since 2001, Qingdao’s construction investment in the core e-governance technology system (including the network) has reached approximately RMB 100 million. However, due to the core technology system providing intensive services for many departments, it has saved 300 million

yuan in one-time construction investment. The annual operation and maintenance cost of the core technology system (including network line rental fees) is 4.8 million yuan, but the annual operation and maintenance costs for the department are saved by about 30 million yuan. After the cloud computing and disaster recovery integration platform is put into operation, it will produce greater savings. It can be said that the "fund black hole" of e-governance is basically blocked in Qingdao (Meng, 2018).

Due to staffing constraints, most departments have very few IT staff, making it difficult to perform professional maintenance on information systems. However, under the intensive model, all departments can enjoy the professional services provided by the computer center of the Municipal Party Committee and the Municipal Government and reliable operation guarantee for 24 hours and 365 days, which not only saves the human resources of various departments, but also avoids the lack of professional and technical personnel in the department. Brings security risks in information system management operations.

4.2. Economic benefits of e-commerce

The infiltration of Internet technology has promoted the birth of a new business model. The use of Internet to eliminate multi-level distribution systems, achieve efficient docking of factories to B-side customers, and solve the pain points in the traditional industry is the trend of the future of “Internet +” infiltrating into traditional industries. From the perspective of the B2B market, the future B2B e-commerce operators will continue to deepen their development in online transactions, supply chain finance, and quality inspection, logistics, and other ancillary services. It is expected that the SME B2B e-commerce market will maintain relatively steady growth within 3-4 years (Zhiyan, 2018).

The “2017 E-Commerce Industry Development Report” published by Iresearch has compiled statistics on the scale of online shopping transactions in Qingdao from the first quarter of 2016 to the third quarter of 2017 (Iresearch, 2017).

Figure 4.2. 2016Q1-2017Q3 Online shopping market transaction size in Qingdao
Source: Iresearch (2017)

According to the Bureau of Statistics of Qingdao City (BSQ), in 2017, the number of e-commerce trading platforms in Qingdao increased continuously, the scale was expanding, and the transaction volume was again innovative. 72 local e-commerce transaction platforms across the city achieved a transaction volume of 927.352 billion yuan, an increase of 35.1% year-on-year, accounting for 51.6% of the province's platform transaction volume, an increase of 6.6 percentage points from the third quarter, and the transaction volume ranking first in the province with a higher growth rate than the entire province. The average level is 8.5 points. Among them, e-commerce platform sales 891.574 billion yuan, an increase of 35.4%, e-commerce platform purchases 35.779 billion yuan, an increase of 28.1%.

At present, the number of Qingdao e-commerce platforms accounts for 20.8% of the province's total number of platforms, mainly self-operated platforms, and the number of small-scale platforms in the early stage of business was mostly large. Although the number of large-scale platforms is relatively small, it has a prominent position in the province. In 2016, according to the seller’s unilateral statistics, there are two large-scale platforms with over 100 billion e-commerce transactions in the city: the Haier Group’s ERP system and the transaction system of Qingdao Huayin Commodity Exchange Center. The transaction volume of the platform ranks the

top two in the province respectively (Third media, 2003).

In 2017, the sales volume to enterprises and units (B2B+B2G) through the Qingdao e-commerce platform was 879.186 billion yuan, an increase of 35.3%, accounting for 94.8% of the city's platform sales. Among them, the number of goods sold was 861.168 billion yuan, an increase of 35.3%, and the number of services provided was 18.018 billion yuan, an increase of 33.3% (BSQ，2017).

The e-commerce online retail market continued to accelerate its development throughout the year, and business-to-person (B2C) sales continued to grow rapidly through the city's e-commerce platform. The number of sales to consumers (B2C+C2C) through the e-commerce platform was 12.387 billion. Yuan, a year-on-year increase of 46.5%, an increase of 5 percentage points over the previous year. Among them, the number of goods sold was 12.242 billion yuan, an increase of 45.7%; the number of the provision of services was 145 million yuan, an increase of 168%, and the growth rate still maintained a relatively rapid growth (BSQ，2017).

4.3. Economic benefits of e-payment

Data from the People's Bank of China shows that since 2012, the growth rate of non-cash payments in China has exceeded 20%, and the growth rate has been on an upward trend. The public increasingly likes non-cash options. The increase in non-cash payments is inextricably linked to the promotion of electronic payments. With the penetration of electronic payments in tips, financial and personal application fields, full coverage of bank cash payment functions has been achieved, and on the basis of functional coverage, electronic payment is better in user experience and greatly promotes currency electronic process.

Figure 4.3. 2012-2016 Non-cash Payments and Growth Rates in Qingdao.
Source: Iresearch (2018)

The rapid growth of China's electronic payment market has benefited from the development of user payment habits on the one hand, and it has also benefited from different hot spots in different years. Before 2013, the growth rate of electronic payment in China was mainly led by e-commerce companies represented by Taobao. In 2013, the balance of credit was good, and finance became a new growth point. In the future, with the development of offline payment habits, offline consumption will become the new support point for the growth of transaction scale.

Since 2014, the growth rate of bank cards has started to decline, and in 2015 and 2016, cash withdrawals have shown negative growth. China is gradually moving towards a cashless society. Before 2016, e-payments played an alternative role in shopping for small-value purchases, but the overall effect on cash replacement was small. In 2016, social payments grew rapidly and accounted for about 70% of the electronic payment transactions, which promoted the cashless process (Iresearch, 2017).

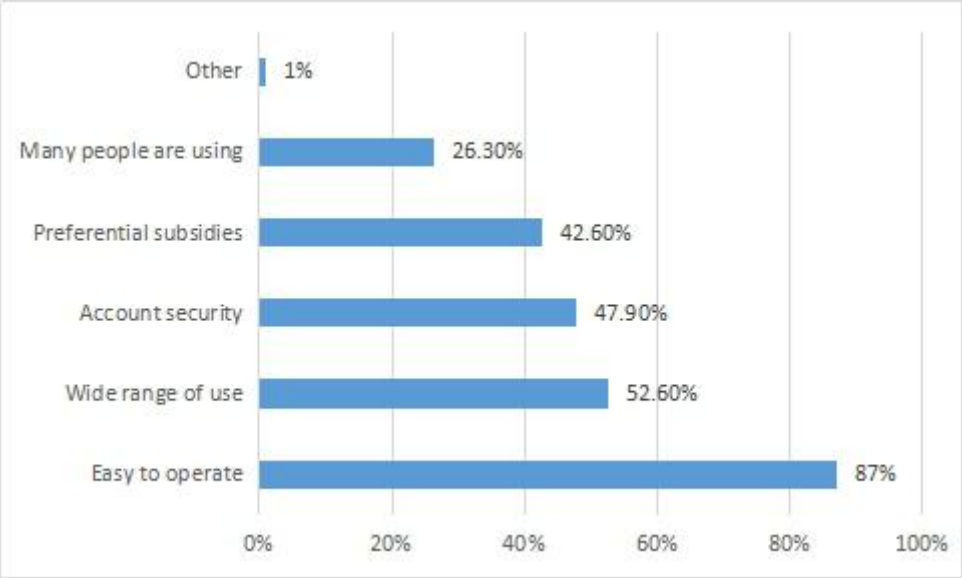

Figure 4.4. Reasons for using e-payments 2017.
Source：IResearch (2017)

The booming of electronic payment is already a big trend in the payment field. The electronic payment market in Qingdao is also experiencing an explosive growth period. In the past few years, the electronic payment market has ushered in an explosive growth period, and Qingdao's electronic payments have made rapid growth in the payment of convenience payments. According to the statistics of UnionPay, residents of Qingdao use e-payments to pay for the convenience of financial transactions, which accounts for about 0.75% of the total national market. They rank first in Shandong Province, and the market growth rate ranks at the forefront in the country, with the total amount reaching several hundred million yuan (Peninsula Metropolitan News, 2013).

To understand more directly the impact of electronic payments on local companies, a survey was carried out on 14 local companies in Qingdao.

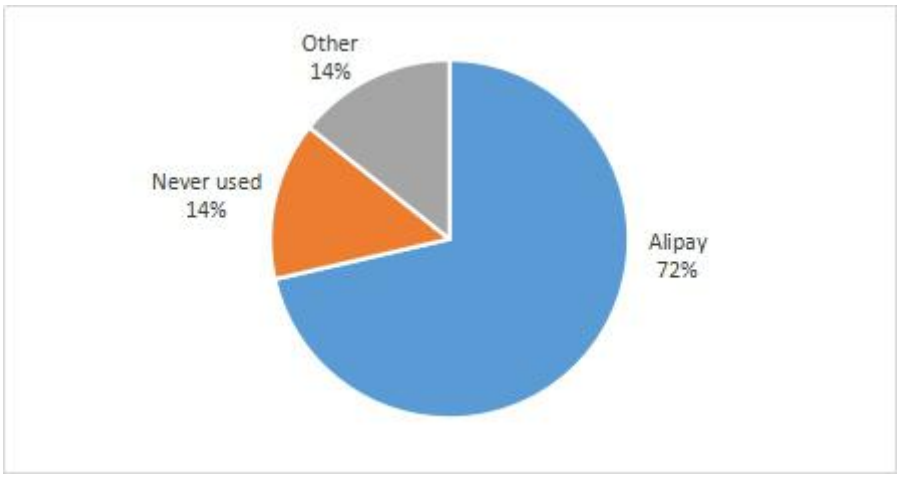

Figure 4.5. E-payment platform usage rate.

Source: author based on the survey.

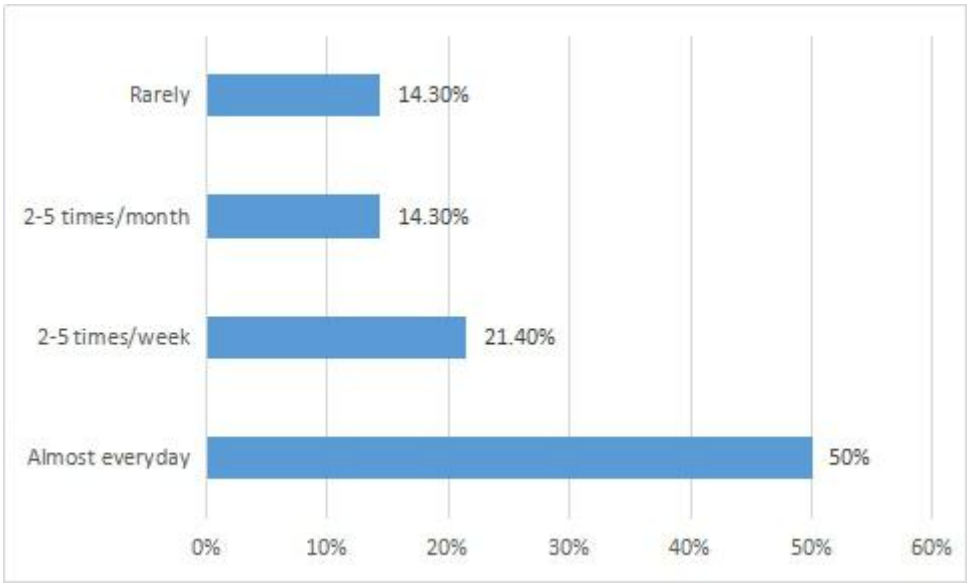

Figure 4.6. E-payment platform usage rate.

Source: author based on the survey.

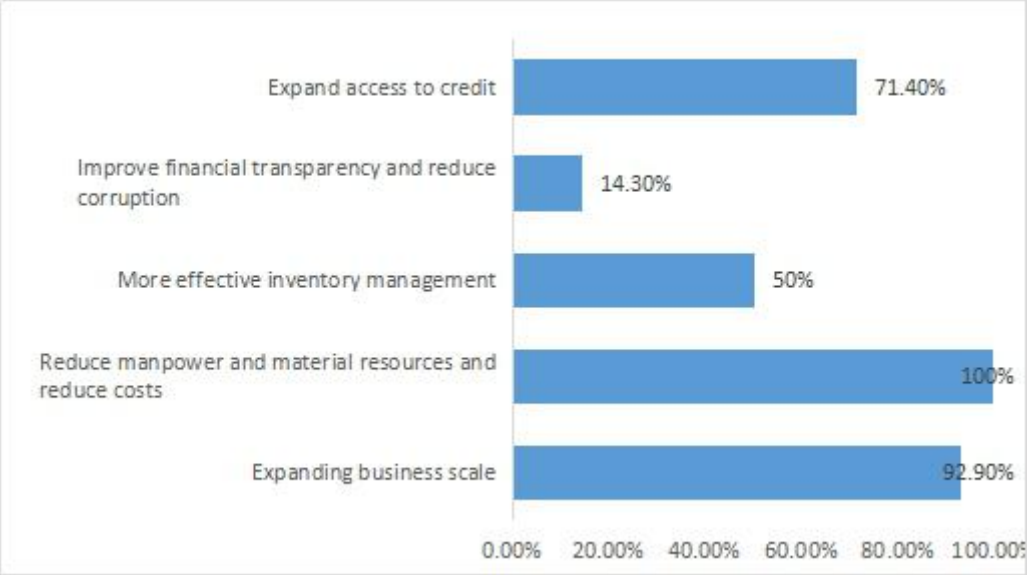

Figure 4.7. The impact of e-payments on the company.
Source: author based on the survey.

Although the number of companies visited is relatively small, it can be seen from the visit that all entrepreneurs have expressed acceptance of electronic payments in the case of security protection. The main share of electronic payment in Qingdao is Alipay. The impact of e-payments on businesses is mainly to reduce costs, increase credit channels, and expand business scale. There are also some entrepreneurs who believe that they can easily track their daily sales with an e-payment system, and they can manage inventory more effectively and expand profit margins. The payment system's participation in e-payment can also broaden the business owner's customer base, increase its visibility, and in turn help expand the scale of its business, making business not just limited to subsistence.

5. Discussion

From empirical research, we can see that the implementation of e-governance promotes the economic development of Qingdao from different aspects.

In the industrial economy and society, whether the infrastructure is sound, whether the transportation system is fast, whether the environmental quality is good, and whether the public security is stable is very important for attracting business investment and starting new businesses. In the knowledge economy society, more requirements have been added to these factors. For example, does the government establish a legal policy framework to promote the development of the information industry? This is the core issue that e-governance must answer (Liu, 2005). Enterprises are the mainstay of economic development. Enterprises usually deal with the government more than residents. A government that is relaxed and friendly to businesses is necessary for the era of the industrial economy, but it is far from enough in the era of knowledge economy. Enterprises face a globally competitive environment. Time is money and efficiency is life. The government must respond quickly to the demands made by the company. The electronic governance, to some extent, achieved the interaction between the two.

Through the network, the government can more effectively perform its macroeconomic control functions on the national economy. The government is an indispensable administrative department for modern economic development. The government's economic functions refer to the government's economic activities in various ways to manage the society to ensure the orderly, sustained, healthy, and stable development of the economy. Under the conditions of market economy, the government no longer directly interferes with the economic activities of the company, but in the macroeconomic situation it must plan and regulate the entire national economy. The government's regulation of the economy cannot be separated from the collection, analysis, collation and prediction of economic information. After e-governance, the network will

become a powerful means for the government to achieve macro-control.

From the literature review and data of empirical analysis, it can be seen that China's e-government has continued to develop, and the growth rate has begun to decline. This shows that the infrastructure of China's e-government has been improving. From the example of Qingdao, we can see that the impact of e-government on economic development is divided into three parts: economic benefits, technological benefits, and social benefits.

The existence of a large number of SMEs is a universal law of economic development, especially with the further refinement of professional division of labor, and the arrival of the knowledge economy and the information age, SMEs are "small and special", "little and live", and "small and special". Its advantages have been more effectively played, and its importance to the national economy has been further enhanced. It is the most dynamic economic group (Zhiyan, 2018).

While SMEs are rapidly developing and making contributions to the national economy, there are also problems such as lack of talents, backward technology and equipment, and lack of financial support. As the market competition environment becomes increasingly fierce, its anti-risk capability is also weaker, and e-commerce can precisely play the advantages of SMEs and eliminate information asymmetry and other issues, so it will play an increasingly important role in the business trade of SMEs. effect. Due to the current high demand for e-commerce application in small and medium-sized enterprises, the tilt of policies to small and medium-sized enterprises, the increasing abundance of e-commerce products for SMEs, and the promotion of foreign investment, China's SME e-commerce applications have ushered in a favorable opportunity for rapid development (Zhiyan, 2018).

The benefits derived by companies through e-commerce are as follows:

- Reduce management costs

E-commerce has greatly reduced the cost of traditional written forms through electronic means and electronic money, which has greatly saved unit trade. Statistics show that the cost of

processing documents using e-commerce is one-tenth of the original written form, which can effectively save management costs.

- Reduce inventory costs to achieve "zero inventory"

A large amount of inventory means that the company's liquidity is occupied, and the storage area is increased. Using e-commerce can effectively manage enterprise inventory and reduce inventory costs. This is the most prominent feature of e-commerce in the production and sales of enterprises. E-commerce can also reduce the time of commodity inventories, reduce the degree of the backlog of goods, and achieve “zero inventory”. The reduction of inventories means that enterprises will achieve substantial savings in raw material supply, storage and management expenses, especially in Today's rising land prices can save a lot of costs.

- Reduce procurement costs

The use of e-commerce for procurement can reduce a lot of labor and mailing costs. In 2005, there were statistics, Xerox, General Motors, MasterCard credit card and other three different industries, different types of enterprises, through e-commerce online procurement, the cost decreased. 83%, 90% and 68% (Zhang, 2007).

- Reduce transaction costs

Although companies engaged in e-commerce require a certain amount of investment (maintenance fees for domain names, software systems, and hardware systems), compared to other sales methods, the use of electricity for business to trade will be greatly reduced. For example, using a job as a medium for advertising and online promotions can save a lot of advertising costs and expand the sales of goods. At the same time, e-commerce transactions can conduct online transactions 24 hours a day regardless of time and space constraints. There are also savings in advertising costs.

- Time efficiency

Through e-commerce, merchants can reclaim the receivables of goods in advance, thereby saving a large amount of capital cost. The effectiveness of aging is usually estimated based on

the number of merchant accounts receivable and the length of time for an early return.

- Increase sales

Through e-commerce, the company's products can break geographical restrictions, expand sales, and gain more profits for the company.

Indirect benefits

- Better customer relationship management

Customer relationship management is the introduction of products through e-commerce. It can provide customers with technical support for products. Customers can query the processed information of ordered products on their own. This makes customer service personnel free from the tedious daily affairs. To better deal with the customer's relationship. And make customers more satisfied.

- Promote the development of the information economy

E-commerce is the most promising development trend in the current information economy. It is the future direction of trade development and will certainly promote the development of the information economy. At the same time, e-commerce has also significantly increased the trading activities of countries around the world, greatly increasing the number of transactions in most of the trade links. In addition, e-commerce has many other benefits that are difficult to measure. For example, after the implementation of e-commerce, a series of cost savings or benefits are obtained due to the rapid and accurate delivery of information.

E-payment is an inevitable outcome of information technology in the financial field. It gradually becomes a new payment method and consumption method in modern economic life, promotes the renewal of consumption concepts, helps to increase the consumption ratio, and then promotes economic growth. Widespread use of electronic payments can also bring the advantages of economies of scale in payment, reduce the average cost of a single payment, help save social resources, and promote growth (Wei, 2012). The many advantages of e-payment have changed

people's payment habits and effectively stimulated consumption, mainly reflected in two aspects: First, providing payment convenience, increasing the propensity to consume, and then increasing the level of consumption. The second is to provide consumer credit, spread credit consumption, and induce early consumption. (Huang, 2010)

6. Conclusion

The research mainly studied the impact of electronic governance on economic development, taking Qingdao as an example. It mainly analyzes the impact of e-governance on the economy from the aspects of e-government, e-commerce, and e-payment.

The impact of e-governance on the economy is mainly reflected in the fact that e-governance will improve the government's ability to macro-control the national economy; and through efficient government services, it will help SMEs grow. The benefits derived by companies through e-commerce mainly reflects in reducing management costs, inventory costs, procurement costs and transaction costs; Time efficiency; Increase sales; Better customer relationship management; Promote the development of the information economy. E-payment can provide payment convenience, increase the propensity to consume, and then increase the level of consumption. It also can provide consumer credit, spread credit consumption, and induce early consumption. Therefore, e-governance has a significant role in promoting urban economic development.

Looking at the status of e-governance research, there are still some places worth thinking about:

- The diversification of the main body of electronic governance. The protagonist of e-governance is not only the government, but it can't stick to the e-governance of e-government. Instead, the e-governance research is still largely free from the “government-centric theory” framework, in the name of “government”. At the same time, government e-government is not just government management. It is also a system with rich content. (Hu, 2017)
- The goal of e-governance is to achieve good governance. Good governance is a direction and trend pursued by civil society. However, it cannot be a standard to measure the success or failure of e-governance. Good governance advances with the development of objective

practice. Its content and form are also constantly improving, and governance models will also be improved. Keep up with the times. E-government is not the pursuit of e-governance, nor is it the goal of e-governance. E-governance research still has ambiguous phenomena and disturbs people's horizons.

- E-governance and e-government. E-governance is developed on the basis of research on e-government. There are obvious boundaries between content and extension in terms of participants, participation methods, information supply direction, and democratic model. Electronic governance is higher than electronics. Government affairs, e-governance research should be separated from the instrumental category of e-government. These issues should be given clear understanding along with the study of e-governance to avoid confusion in concepts and thinking.

Further research will focus on these issues.

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Appendices

Appendix 1. List of Survey Objects

1. Mr. Li, Qingdao Weiguan Xinyang Culture Media Co., Ltd.
2. Mr. Wang, Qingdao Wangshang Trading Co., Ltd.
3. Mr. Li, Qingdao Kunmao Co., Ltd.
4. Mr. Wang, Qingdao Shu Pu Ruier Rubber & Plastic Co., Ltd.
5. Mr. Li, Qingdao Best Swiss Ruibo Trading International Trade Co., Ltd.
6. Mr. Sun, Qingdao Rubber Valley Energy Development Co., Ltd.
7. Mr. Zhang, Qingdao Kufei Electronic Commerce Co., Ltd.
8. Mr. Li, Qingdao Jie Siming Precision Machinery Equipment Co., Ltd.
9. Mr. Wang, Qingdao Hanfeng Packing Products Co., Ltd.
10. Mr. Liu, Qingdao Rubber Valley Industry Supply Chain Co., Ltd.
11. Mr. Wang, Qingdao Delian Trading Co., Ltd.
12. Miss. Liu, Qingdao Oriental Vision Culture Industry Co., Ltd.
13. Mr. Wang, Qingdao Rubber Valley Group Co., Ltd.
14. Mr. Tang, Qingdao Kunhe New Materials Co., Ltd.

Appendix 2. Survey Questions

Q1: Do you accept payment via e-payment platforms?

Q2: What are the e-payment platforms that you mostly use for your business?

Q3: How often do customers pay using e-platforms instead of cash?

- Almost everyday
- 2-5 times/week
- 2-5 times/month
- Rarely

Q4: What kind of effect do you think your business would have had from the availability of e-payment platforms?

- Expand access to credit
- Improve financial transparency and reduce corruption
- More effective inventory management
- Reduce manpower and material resources and reduce cost
- Expand business scale.

Q5: Do you also use other e-service platforms for your business?

Q6: Can you name some other e-services that are very crucial for your business?