

Chinese Industrial Internet's New Belt and Road

—Case Study of Business Model of CASICloud

中国工业互联网新丝路——航天云网商业模式案例分析

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Abstract: In this article, we will choose CASICloud itself as the case to study. The comprehensive analysis of CASICloud which has operated less than two years will be based on the background, the macro-environment's challenges and opportunities, the capacity of current operation, and the most important one, the business model's current stage analyzing by FCE and AHP. Chapter one will introduce the whole situation of CASICloud, including its parent company, the international version's function, the path of its own growth and the status quo of it. Chapter two will use PEST method to analyze the factors of policy, economy, social and culture, and technology. Chapter three will be based on the micro-environment's situation and also the content in Chapter three. The specific part will be the allocation of the market and the competitiveness in Chapter three. In Chapter four, the quantitative analysis of business model of CASICloud will be adopted. The data will be collected by questionnaire, targeting at the employees in CASICloud and its parent company. According to the Fuzzy Comprehensive Evaluation and the AHP method, the conclusions are as follow: the level of CASICloud's business model is fairly good, however, the disadvantages are also obvious. For example, we find that the performance of the indexes based on not only the evaluation result, but also the weight from the experts, which means that the comprehensive result may not be satisfied if only one part of the factors does well. As a result, we use AHP as a backup. The results show different integration of the indexes will influence the current model. At last, we will summarize the seven major questions and direction of CASICloud based on the background of "enterprises step out" and "The Belt and Road".

Keywords: CASICloud; CASI; The Belt and Road; Business Model; FCE Analysis; AHP Analysis

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摘要:本文选取航天云网作为案例载体,通过企业相关背景介绍,企业所面临的宏观挑战与机遇,企业运营能力评估分析,基于模糊综合评价法及 AHP 层次分析法的商业模式分析等四大部分对运营不到两年的航天云网进行综合性分析。第一章首先对航天科工、航天云网及其国际版的功能、经营方式、发展历程和发展现状作了介绍;第二章运用 PEST 宏观分析法,从宏观视角对航天云网布局“一带一路”运行过程中的政策因素、经济因素、社会文化因素和技术因素等存在的问题进行了分析;在第三章中,本文结合第二章的宏观方向问题,具体针对航天云网的市场定位及其竞争力层面进行了分析;在第四章中,通过前文的分析,以及商业模式的定义,采用对航天科工集团内部专家及工作人员调查问卷的方式,集中采集了围绕航天云网本身在内的一系列指标,对航天云网现有的商业模式,通过模糊综合评价法以及 AHP 层次分析方法进行定量分析。结果发现,航天云网现有的商业模式处于较好的阶段,但仍存在一些不足。例如,航天云网的发展水平在权重较低部分要强于权重较高部分,而这种发展模式并不会为航天云网带来最有效的提升,因为权重较高的指标情况对促进公司的发展更加重要。在此基础上,我们进行了 AHP 分析,分析显示,对于航天云网本身而言,可以通过各种指标集合的不同整合方式,对现有的商业模式进行完善;最后,我们总结分析了七类在航天云网“走出去”参与“一带一路”伟大战略过程中需要注意的问题和可以进行改变的主要方向。

关键词: 航天云网;航天科工;一带一路;商业模式;模糊综合评价法;AHP 层次分析法

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1 Preface

On June 15, 2015, as a large-scale state-owned high-tech enterprise directly managed by the Central Government, China Aerospace Science and Industry Corporation (CASIC) built Chinese first industrial Internet platform-- CASICloud around the core of Smart Cloud Manufacturing, in response to the national strategies Made in China 2025, Internet Plus, Popular Entrepreneurship and Innovation. In a new round of industrial revolution, CASICloud facilitate the resources allocation of manufacturing to an opened cloud model from independent closed model, adapting Chinese manufacturing to the new developing Internet economy. On December 25, 2015, CASICloud International is launched. It is designed to help Chinese enterprises go out and introduce foreign resources of high-quality in, so as to achieve global production resources allocation with the concept of Enterprise Organized, Resources without Borders.

2 The Introduction of CASICloud

2.1 Background and Introduction of CASICloud

As a large state-owned high-tech enterprise directly managed by the Central Government, the China Aerospace Science and Industry Corporation (CASIC) is sticking to the development concept of Overall Defense, Overall Security. CASIC has developed a series of high-tech products in aerospace defense, information technology, equipment manufacture and intelligence industry fields by means of its technology superiority. In response to the Belt and Road Initiative and adapt to the new requirements of the Internet economic development, the CASIC make an effort to create the first industrial B2B Internet platform-- CASICloud in our country whose theme is Internet Plus Intelligent Manufacturing.

Officially launched on June 15, 2015, CASICloud provides the coverage of the whole processes of the industry chain and all elements of the productive services. On the other hand, relying on the CASIC's science and technology innovation and manufacturing resources, the CASIC integrates a wide range of social resources to build an Internet Plus Intelligent Manufacturing product service system. In order to achieve

the goal that Enterprise is Organized, Resource are Borderless and to build the community of interests in the Internet Economy Age, CASICloud makes the Internet playing the role of integration and optimization in the production process and applies the latest industrial innovations and the Internet technology into the socio-economic fields, which through hierarchical collaboration and resource sharing to enhance the core competitiveness of participants. CASICloud not only considers the real needs of using the Internet technology to transform the traditional industries and enterprises, but also fully embodies the spirit of public entrepreneurship, crowdsourcing, public support to set up a comprehensive innovation start-up platform. Up to now, the CASICloud provides five kinds of industrial services including platform portal, cloud manufacturing, big data application, innovation and entrepreneurship, industry sharing center in which the cloud manufacturing is the core function of the Internet Plus Intelligent Manufacturing system solutions.

2.2 Introduction of main functions of CASICloud

2.2.1 Portal Platform

Portal Platform of CASICloud includes the systems in JiangXi, AnHui, GuiZhou and XiaoGan area.

The portal of CASICloud will be used as an exhibition to show the main function of the platform. Based on the old version, the new one starts up by the opportunity of the first Industrial Internet Application Software Innovation Contest and CASICloud Online Marketing Contest and what's more, the buying information and the section of commercial aerospace will elaborate the whole function of platform, in the meantime, it will give a better chance to give high-quality service for the customers and dual creative talents because of the more specific function of each module.

Other platforms and portal clouds are different, and will give more customer-oriented service to the companies around it, such as Jiangxi CASICloud platform provides two modules including Popular Service and Golden Facilitator based on the local enterprises' needs and situations. The same thing also happens in Guizhou that their local cloud sets up the credit of business.

2.2.2 Cloud Manufacturing

As the core function of the CASICloud, Cloud Manufacturing Platform can be divided into four sub-modules, respectively, Cloud Collaboration Center, Cloud Design Center, Cloud Production Center and Cloud Resource Center. Cloud Collaboration Center aims to improve the information management ability of the enterprises and help the enterprise to control the whole processes from raw materials procurement, production, sales, after-sales, return and change to the review of the orders. And Cloud Design Center provides support for online design environment and development of the enterprises. While Cloud Production Center gives the enterprises a platform of production-oriented dynamic collaboration network, Cloud Resource Center can provide the production enterprises with one-stop resources from software to hardware. The functional architecture of the cloud manufacturing is as showed below:

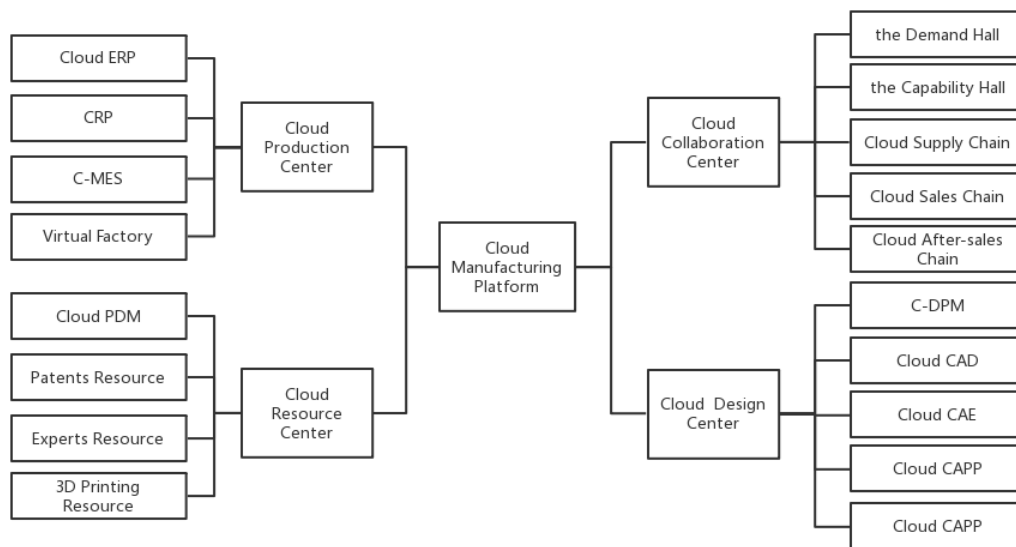


Figure 1 the functional architecture of the cloud manufacturing

2.2.3 Industrial Big Data

Industrial Big Data function is relying on the Aerospace Science and Technology Group subsidiary data company's strong R&D capabilities and the cooperation with the worldwide industry-leading partners including but not limited to the Microsoft, CMCC to provide industrial equipment big data platform to industrial enterprises. Industrial internet of things and big data industry is one of the largest industrial opportunities after

the mobile Internet. With the support of science and engineering group of CASIC, the CASICloud will use its national-level research and industrialization platform to promote the development of industrial big data industry, and to strive building China's leading industrial data platform and ecological with its partners. It has been achieved to provide large data support for the aerospace, oil refining, energy and electricity industry, as well as for the government calculation, public opinion, etc.

2.2.4 Maker Space

Under the exhortation of encouraging people to do business creatively and drive innovation, Maker Space is added to the CASICloud, which is consisted by four sub-modules including Off-line space, Project center, Online School and Cloud Mentors at present. This function aims to provide a full range of guidance and help from the generation of outstanding innovative ideas to the later training and financing for the start-ups. Maker Space has gathered nearly 6000 projects related to more than 10 categories including industrial manufacturing, robots, unmanned aircraft, electronic chips, basic material, medical health, energy, environmental monitoring, smart home, financial services and so on. Some outstanding projects have attracted the attention of social capital and get millions of dollar investment.

2.2.5 Industry Sharing Center

As the national main industrial internet platform, Industry Sharing Center has become the first choice by more and more government departments and industrial enterprises when they need to procurement. While offer the clients a total new interactive procurement experience, Industry Sharing Center helps them complete the one-stop shopping. On the basis of the sub-module of Production Center and Procurement Center, the Exchange center and Leasing Center are developed to broaden the way of enterprise procurement. And 583,591 enterprises have settled in the Industry Sharing Center by the end of February, 2017.

2.3 CASICloud International is Online to Response to “The Belt and Road”

The CASICloud International officially launched on December 25, 2015 with the core concept of Cloud Manufacturing is an international industrial Internet platform providing comprehensive production services for domestic and foreign industrial enterprises. Committed to form the international industrial cloud ecology of Resource Sharing, Ability Collaboration and Mutual Benefit”, the purpose of CASICloud International is to practice the Belt and Road and the international capacity cooperation strategy and to provide a new fast method when the domestic enterprises are going out of China. Now CASICloud International has three modules including Incubator, Cloud Manufacturing and Industry Sharing Center and has four kinds of languages version which are English, German, Russian and Persian and respectively has 1,582, 1,171, 896 and 1,166¹ enterprises settled in.

The CASICloud International will build the structure of One Platform, Two Centers and Three Core Business. One Platform is to build an open, advanced and safe international industrial Internet platform. Two Centers namely are Global Industrial Resource Center and Global Industrial Trading Center. The former center will access the global manufacturing resources and manufacturing capacity and other industrial resources in the form of Cloud to the international industrial Internet platform in order to build a global industrial resources cloud pool. The latter center will get through the cross-border payment, cross-border logistics and other supporting services, aiming to create a global industrial commodity circulation center and industrial service trading center. Three Core Businesses are including the cross-border collaborative and innovational design business, the cross-border collaborative manufacturing business and the cross-border collaborative marketing and after-sales business. With the strong scientific research advantage of CASIC and the huge domestic and foreign industrial market space, CASICloud International will definitely help the domestic industrial enterprises to go global and march towards the world arena.

¹ Data resource: official website of each version of CASICloud International.

3 The Opportunities and Challenges of CASICloud's Globalization from Macro-perspective, Based on PEST Analysis

3.1 The Support of National Strategy

3.1.1 The Belt And Road Leads Chinese Manufacturing Step Out

The Belt And Road strategy brings unprecedented opportunities for China's manufacturing industry to walk out. First, the economic cooperation of the industry is extensive, including railway, highway, water conservancy, hydropower and other foreign contracted projects market, farming technology, agricultural infrastructure construction, agricultural resources development industry, and energy industry development, providing a lot of orders to domestic manufacturers. Second, the Silk Road Fund, Asian Infrastructure Investment Bank, the BRICS Bank will provide Chinese enterprises diverse financing services. Third, in the mode of economic cooperation, traditional products export transform to Investment Plus Trade , improving the level of international cooperation capacity. Fourth, under the push of the Belt and Road strategy, China has signed FTA agreement with 11 countries along and bilateral investment treaty with 56 countries, providing institutional guarantee for the cooperation of China and other countries along. CASICloud International went online on December 25, 2015. The platform is designed to help Chinese enterprises to go out and introduce foreign high-quality resources to achieve "enterprise are organized, resources without borders" global allocation of resources in response to the Belt and Road. Since the strategy the Belt and Road was proposed, it was positively responded and actively participated by all countries, but it's worth noting that the counties along have different the development level of manufacturing, political and economic risk. As the bridge between China's and other countries' enterprises, CASICloud International should consider the foreign government's demand and the policy environment of manufacturing cooperation while helping Chinese enterprises internationalization.

3.1.2 Internet Plus Action Plan Facilitate Industrial Amalgamation

In the meeting of the National People's Congress in March 2015, prime minister Li

Keqiang put forward Internet Plus action plan in his government work report for first time; On July 4, 2015, the state council issued document of the guidance of the state council on promoting Internet Plus action plan, to promote the Internet expanding to the field of production from the field of consumption, improving the level of industrial development, strengthening the innovation ability. Start from here, the convergence of Internet and traditional industry speed up, manufacturing industry paid more and more attention to the function of Internet in the allocation of production factors, optimization and integration, to promote the real economy's innovation and productivity. As Chinese first Internet Plus smart manufacturing" service platform of smart cloud manufacturing dominates with productive service, CASICloud network services all kinds of manufacturing enterprises and user's total factor resources sharing in entire society , and participate in the deep synergy of whole manufacturing process , which fits into the national Internet Plus action plan.

3.1.3 Made in China 2025 Strategy Promotes Industrial Upgrading

In the recent years, Europe, the United States and other developed countries constantly introduced the stimulus policy on manufacturing to let advanced manufacturing back home, speed up the convergence of the information technology and industry. Otherwise, they implement the re-industrialization strategy within the intelligent manufacturing as the core, led by the German industrial 4.0 and American Industrial Internet. China launched Made in China 2025 strategy in 2015, taking speeding up the depth integration of generation of information technology and manufacturing as the main line, and taking promoting the intelligent manufacturing as the main direction, so as to realize the historical leap from big to strong of manufacturing industry .As Chinese pioneers of Industrial Internet platforms Internet Plus Smart Manufacturing enterprise, CASICloud takes advantage of manufacturing resources of whole society which depends on China Aerospace Science & Industry Corp (CASI) its network, depending on offline strongly scientific research and manufacturing capabilities of China aerospace science and industry ,and build up Internet Plus Intelligent Manufacturing Product Service System based on the industrial Internet platform service, productive service, intelligent manufacturing services and big data service, promoting the traditional industry upgrade and reconstruction and manufacturing resource sharing for the society, realizing the online&offline interactive,

so as to build the manufacturing "aircraft carrier" in the industrial Internet age, and to improve the core competitiveness of Chinese enterprises to participate in the international division of labor.

3.1.4 Combine online and offline to support Popular Entrepreneurship and Innovation

In response to the national action Popular Entrepreneurship and Innovation, CASICloud designed the Innovation and Entrepreneurship module. With New normal of Chinese economy, a large number of small and medium-sized enterprises face the pressure of increasingly fierce competition, decelerated growth of manufacturing and rapidly rising labor costs. Otherwise, the informationization level of enterprise is low and lack of innovation. There is an urgent need to upgrade the industry to change the development mode. The service of CASICloud fit in local government's development ideas of industry. Combine online and offline to support the innovation of small and micro enterprise. CASICloud takes full advantages of internal and external resources of CASIC, supported by CASICloud Maker Space online, taking offline demonstration base for backing, actively explore a distinctive way of huge-scale enterprises innovative and entrepreneurial construction which can be copied and expanded.

Since the Maker Space of CASICloud launched in September, 2015, it has gathered nearly 6000 Double Creations projects, which highlights Internet Plus Intelligent Manufacturing, related to industrial manufacturing, robots, unmanned aircraft, electronic chips, basic material, medical health, energy, environmental monitoring, smart home, financial services and so on more than 10 categories. Some outstanding projects have attracted the attention of social capital and get millions of dollars investment.

As for offline space, CASICloud has layout four demonstration base in Zhongguancun Technology Park, CASI Double Creations Demonstration Base, Nanjing and Shenzhen. With the support of local government, CASICloud has successively established Local Industrial Cloud for Anhui and Guizhou and Industry Cloud Zone for Guangdong Dongguan Hengli Casting Tool Manufacturer Co., Ltd and Jiangxi Nankang Furniture Co., Ltd.

Moreover, CASI formed a scale of 1 billion yuan of mergers and acquisitions + venture investment fund to support the development of online Maker Space and offline

demonstration.

3.2 When New Normal of Chinese Economy Meets Industrial Internet

In 2016, the world economic growth is generally weak especially the slowdown in Asian economy, the road of recovery is bumpy. Affected by the global economic crisis and the sovereign debt crisis, the price of commodities is reduced and the risk of currency competition is higher. Otherwise, the federal reserve interest rates expectation is rising, and Brexit affect the development of global economy and increase the employment pressure. As a result, these economic environment factors will impact the countries along the Belt and Road, which need more attractive products and services to increase demand and cooperation.

Now Chinese economy has entered into the phase of new normal, providing historical strategic opportunities for the development of the Industrial Internet. On the one hand, under the background of economic weakness in the world, China's economy is expected to grow 6.7%, which is still one of the world's highest; On the other hand, from the industrial structure, the proportion of secondary industry of China outclass developed countries, and the industrial development of China is facing double pressure, one is from advanced manufacturing flow home in developed countries, another is from the low manufacturing cost of developing countries, and industrial excess capacity has become one of the biggest problems in China's economic operation. And the generation of information technology and industrial integration, can help to speed up the pace of innovation, dissolve excess capacity and balance investment spending, to promote more labor enter services industry, so as to bring a healthy development of the society and economy. Zhou Rongsen (2015) pointed out that the cost structure “Internet Plus Smart Industry” model has significant difference compared with the traditional industry, including: the direct cost of production of personalized intelligent design and manufacturing cost increase, the intelligence tool of the management cost increase and the cost of management staff reduce, the quality cost to satisfy the consumers' personalized value demand is added, as well as the circulation costs, C2M + O2O complex business mode, reduce the non-productive circulation cost. At the same time, the Internet Plus Intelligent Industry will qualify products have higher additional value.^[1]

3.3 Sociocultural Differences Can Not Be Ignored

The social and cultural environment is a considerable factor for CASICloud in the process of supporting the Belt and Road strategy, including population, religion, language, values, social habits, etc. A vast amount of country in Asia, Europe and Africa (now even some American countries plan to participate in) are in the coverage of the Belt and Road, and the difference of population size, religion, race and cultural beliefs are huge, which also deeply affect the economic and trade. So it is necessary to fully understand and respect the local customs so as to deal better. The language barrier is another problem that economic cooperation needs to solve due to the complexity of language used by different countries along. At present, CASICloud have launched four national editions includes English, German, Russian and Arabic considering existing key cooperation areas. However, with the continuous pushing forward of the Belt and Road and CASICloud expanding and deepening business in overseas markets, CASICloud needs to add more international versions in the future, such as French edition for the increasing business with some African countries speaking French.

Chinese enterprises go global need combine the own advantages with the concept of globalization and localization rules for legalized management. Localization rules are the laws and regulations of the country along, which is worth strengthening learning in foreign investment process for Chinese enterprises. If not, it can be the disadvantage in the process of investment abroad. Moreover, recent years, religious problems of some countries and regions began to highlight, extremist religious forces started repeatedly shots, the frequency of violent terrorist activities is in rising. Therefore, in the process of expanding the economic cooperation with the countries along the Belt and Road, CASICloud must consider the changes.

3.4 A New Industrial Revolution with The Core of Intelligent

Manufacturing

3.4.1 Reindustrialization Strategy of Developed Countries

To speed up the recovery and take the development opportunity brought by the new industrial revolution, Europe, the United States and other developed countries

introduced the stimulus policy to promote advanced manufacturing back home. Meanwhile they speed up the convergence of information technology and industry, and implement the Reindustrialization strategy with the core of intelligent manufacturing. The Industrial 4.0 of Germany and the Industrial Internet of the United States are the most representative strategies.

The convergence of information technology and industry speeds up , and intelligent manufacture lead a new route of industrial revolution. With the progress of information technology, the boundary of the physical world and virtual world has become increasingly blurred, the industrial system and virtual communication sensing system, big data and cloud computing analysis are gradually merged. The value chain and industry chain reconstruct and combined into a variety of new industries based on gradually mature Internet platform, network resources and information, the connection of Internet of things and services. The personalized and customized production demands can be met by Information Interconnection and Autonomous Intelligent production mode, though the aim of low cost control can be achieved. This entity type production under virtual network will overturn the opposition between the large-scale production and customization, contributing to combine them together. The new route of industrial revolution featuring Industrial Internet in the United States and Germany's "industry 4.0" has the vital significance for China's upgrade mode of manufacturing industry structure and thinking about manufacturing the future development direction.

3.4.2 Intelligent Cloud Manufacturing

In 2009, Li Bohu, the Chinese academy of engineering, put forward the concept of technical means and forms of Cloud beginning the research and practice of Cloud Manufacturing 1.0. Through the practice of recent years, along with the development of relevant technology, then he began the research and exploration of Smart Cloud Manufacturing (Cloud Manufacturing 2.0). Smart Cloud Manufacturing is a new mode and method combines Internet and Manufacturing based on ubiquitous network. It takes the users as the center, with the help of new manufacturing technology, emerging information technology and intelligent technology and technical methods, which is digital, networked and intelligent, use the manufacturing resources and capacity to build the service cloud (network), by which the users can get the manufacturing resources and capacity needed anytime and anywhere. The people, machine, object, environment and

information in the whole manufacturing system and cycle can be automatically perceived, interconnected, coordinated, analyzed, predicted, decided, controlled and executed. The integrated optimization of the resources and information will efficiently manufacture and serve users, so as to improve the market competitiveness. [2]

3.4.3 Informationization Level Difference Impacts Abroad Layout

The development level of informatization in different countries along the Belt and Road exist diversity, which is unfavorable for CASICloud's overall arrangement. In Cheng Hao (2016)'s study, it is found that along the Belt and Road, countries in Western Europe, southern Europe and some developed countries in the Middle East have a higher level of informatization infrastructure construction, but the others are underdeveloped. Moreover, in the developing countries and regions, there is a large Digital Divide at present. Cheng Hao(2016) uses Informatization Development Index to measure the Digital Divide, mainly referring to the television ownership rate, fixed telephone ownership rate, mobile phone ownership rate, computer ownership rate, the comprehensively reflect the informatization infrastructure construction situation of a country or region. On the Summit of Scientific and Technological Talents Service the Belt and Road construction in August 25, 2015, Guo huadong, academician of Chinese Academy of Sciences suggest building a Digital Silk Road. Through the construction of "Digital Silk Road", the countries along the Belt and Road can strengthen interconnecting in the fields of data information service, Internet service and international communication service. The successful operation CASICloud International depends on not only the technical reserves and experience of the China Aerospace Science & Industry Corp, but also provides more high-end of informatization products and services with Chinese characteristics. CASICloud is committed to building a service mechanism, which needs more investigate and survey in terms of the informatization infrastructure construction of countries along the Belt and Road, so as to promoting the construction of CASICloud International according to different practical situations.

CASICloud holds mass data of enterprises, organizations and other relevant parties, so the data security is the priority for all. That involves the information transmission security, information storage security and content integrity, security audit and monitoring, identification, database security, etc. Mature technology is the important guarantee for the data security of CASICloud, the standardized safety management system is also necessary, including managerial personnel, management organization and

management system.

3.4.4 The Security Challenges of the Industrial Internet

The security of Industrial Internet concerns the safety of national strategy. Network is the basis of industrial data transmission and exchange; Data is the core driver of industrial intelligence; The security of network and the data is the precondition of stable operation of Industrial Internet. Internet security mainly faces 5 layers security challenges. Device layer security challenges, refers to the security challenges from intelligent equipment and intelligent product in industrial Internet; Network layer security challenges, mainly including: common network threat of network data transfer process, the security of hardware and software on the network transmission link, fuzziness of network protection boundaries from wireless network technology. Application layer security challenges, refers to the security of the application software and platform supporting operation of industrial Internet. Data layer security challenges, refers to the security problem of internal production management data of factory, production operation data and factory external data. Huge amounts of data face the security threats such as data loss, leakage, and manipulation. Personnel management layer challenges means that, with the integration of industry and the IT, the enterprise internal personnel, such as engineering, management, site operators and enterprise senior management personnel, whose conscious or unconscious behavior, may undermine industrial system, spread malware or ignore work abnormal.^[3]

4 Analysis of CASICloud's Operating Ability

4.1 Focusing on Market and Investment

4.1.1 The Business Mode Conforms to The New Manufacturing Trend

First of all, there are new market demands. As the living standards improved gradually, customers are no longer satisfied with homogeneous industrial goods. Secondly, diversified demands lead to the customized tendency. The concept of consumerism in modern society will shift from “low price” to “high quality”. Only through realizing interconnection, optimizing production, propelling large-scale customization and implementing intelligent manufacturing, can we promote effective and efficient development of manufacturing. Though the whole manufacturing industry in China is large-scale, it is inferior at the same time. The self-innovation, informatization level, utilization of resource, and equipment manufacturing differences are also evident.

China Aerospace Science Industry Corporation (CASIC) has already looked into the situation that China's value-added in manufacturing economy is low and firstly introduces the concept of Cloud Manufacturing in 2009. Meanwhile, CASIC builds the CASICloud which is an “Industry Sharing Center”. Its core function is Cloud Manufacturing, which is based on productive service. Besides, it adopts advanced technology system, opening business model, low-cost controlled and support system. CASICloud achieves the aim to build the multilateral win manufacturing platform which depends on individualized demands driven. Now, the number of registered enterprises on CASICloud platform is more than fifty thousands, and the average growth rate per month is more than 40%. It stimulates small and medium-sized enterprises from over 30 provinces to commerce the on-line business. With an eye to communications, navigation, and R&D, manufacturing, launching and application of remote sensing satellites, this platform provides a pool for the resources on the cloud. It provides cloud manufacturing services, supporting the enterprises in its demands, capacity matching, and cloud ERP coordination. It also provides industrial product transaction services, including display and sales of aerospace, and material purchasing businesses. Only founded two years before, CASICloud has become the driving force to

promote the transformation of manufacturing because of its target on marketing demands.

4.1.2 Accurate Investing Directions and Improving International Cooperation Orderly

China's direct investment in different regions and fields are unbalanced. Geographically, Chinese government invests mainly in neighbors along "The Belt and Road", but invests less to South Asia and Eastern Europe, which is far away from China. In terms of investment fields, Chinese government invests mostly in the fields of resource development and infrastructure construction. But it doesn't take full use of the comparative advantage in modern manufacturing. Therefore, the emergence of CASICloud may fill the gaps in direct investment of "The Belt and Road" in manufacturing field to some extents.

However, there are still some direct investments which should be noticed. For example, CASICloud should deal with countries along "The Belt and Road". And it also has to take preventive actions to solve the unstable factors from political reforms, economic transformations. Hence, these are also main difficulties for CASICloud's direct investments.

4.2 Domestic Competitive Advantages and Overseas Competitive Challenges

4.2.1 Strong Competitiveness in Domestic Market

"Internet Plus" action is changing Chinese manufacturing. Traditional manufacturing expects to upgrade their products and services by using Internet and finally to realize strategic transformations in their business.

There is not an enterprise as CASICloud in the domestic market. As the first industrial Internet service platform, CASICloud is the crystallization measures to integrate manufacturing in the context of national strategies of "The Belt and Road", "Internet Plus" action, and "Made in China 2025". Developed by CASIC under the guidance of science technology and international cooperation, it is an integrated

platform. Therefore CASI Cloud attracts greater attentions from governments and enterprises, and its competitive advantages are enormous no matter at present or in the future.

4.2.2 Lack of Notability in Overseas Market

In the process of internationalization, CASICloud still faces severe challenges in heightening its popularity. First of all, as an going abroad Internet platform, CASICloud's brand awareness isn't enough. And the brand awareness is one of major factors for B2B platform to attract enterprises to settle in. There are B2B sites in oversea market like MFG, Kellysearch, Thomas Net, Tradekey and their marketing shares are very huge. According to internal data, there's only 4815 foreign enterprises join in CASICloud at the end of February, 2017. So the primary problem in the internationalization is to build up its own brand and to expand marketing shares oversea.

What's more, concerning user experience, CASICloud has to improve many parts. For example, the platform doesn't provide the user manual in foreign languages. It will cause inconvenience for clients and hinder the building of reputation and the raising of awareness of brand. Therefore, CASICloud needs to improve its service standard and efficiency for enterprises to create new profit points and achieve its brand value finally.

4.3 Evaluation of Internal and External Resources

4.3.1 High Utilization of Interior Resource

Above all, CASICloud relies on CASIC's industrial chain resources and utilize the brand influence in high-tech, high quality, and high reputation. By using those advantages, CASICloud can create a convenient, efficient, useful online as well as offline services for the developing manufacturing enterprises. And it also can promote the sharing of manufacturing resources, the ability to coordinate. In addition, CASICloud's pattern is consistent with the technological trend and the strategy is to use Internet and Internet of Things. With the transaction mode for multiple enterprises, multiple orders and multiple collaboration, the work flows and core functionality of the Cloud Manufacturing Service platform were designed. This platform applies collaborative management which effectively integrated manufacturing resources in this

field through online & offline services and an effective management of cloud manufacturing service was realized. The aim of CASI Cloud is to optimize allocations, to enhance the ability of integration and cooperation, and to improve manufacturing cooperative finally. It is also the innovation of utilizing resource advantages.

4.3.2 Low Utilization of External Professional Resources

One of the key factors to CASICloud's internationalization is to obtain the necessary professional resources, but the company's ability of exploit external resources is not strong enough.

Firstly, although CASICloud's delegation visited Germany, Russia and other targeting countries, to promote the publicity of CASICloud International and improve its influence to some extents, there are still some deficiencies in the current international service segments. Therefore it is badly in need of cooperating with chambers and trade agencies in foreign countries to build specialized foreign offices which can provide information about overseas marketing demands, industrial demands in countries along the Belt and Road and the main competitors for Chinese enterprises going abroad.

Secondly, professional and skillful talents are the key of Industrial Internet platforms' stability and development. The figure shows that the number of software developers China's lack is about 300000 to 400000 in 2016. And this figure will grow bigger in the next five to ten years. The whole absence in IT industry may cause bigger risks for tackling technical problems. CASICloud is an industrial Internet platform which developed by CASIC. The non-network operating background also decides that CASICloud need to recruit more business talents with global perspectives to master international conventions, trade practice, relevant standards and norms and get insight into problems of internationalized process. Meanwhile, it also needs interdisciplinary talents who are master in both software development and industrial business processes.

Thirdly, financing management is limited. Capital is dispensable element for enterprises to go abroad. Although CASICloud provides users with online payment, enterprise credit, supply chain financing by cooperating with third-party financing institutions. However, CASICloud has not exploit platforms like the Silk and Road, Asian Infrastructure Investment Bank, New Development Bank and SCO Development Bank to raise money for the Belt and Road related projects. Consequently, it is tough to promote and collaborate externally for the platform.

Though CASICloud's mode have huge advantages in the mode innovation , internal resource utilization and domestic marketing demands. But there are still some operating problems which need CASICloud to improve in management, operation and strategies, so that it can respond to national policies , services for nation and thousands of manufacturing.

5 Analysis of CASICloud's Business Model

Through nine fundamental factors as follows: value proposition, target group of consumers, distribution channels, customer relationships, value configuration, core competence, network of partnerships, cost structure and model of revenue, Osterwalder&Pigbeur(2010) gave a brand new definition of business model. According to this Osterwalder&Pigbeur's definition of business model and the basic structure of analyzing business model² raised by Liu(2014)^[4], we add function of platform, service effects, and brand value to this structure and build an index system with 10 first grade indexes and 20 second grade indexes, in the meantime, we hope we can get the whole picture of CASICloud's business model by using method of giving out questionnaire. The structure of indexes are shown in Table1:

TABLE 1 .CASICloud's structure of indexes of business model

First grand indexes	Second grand indexes
Market localization	Market locking
	Market division
Customer value	Discover customer
	Guide customer
Resource and competence	Ability of R&D
	Status quo of resources
Function of platform	Information service
	Online trade
Marketing model	Promote the combination of media
	Combination of marketing
Service effects	situation of service
	Scale of trade
Value network	Build relationship as partner
	Management of cooperative relationship

²In Liu' s article, the "4-8" structural dimension system is raised to value the business model, and this system can be understood based on value-chain model raised by Michael Porter(1985).

Continue TABLE 2CASICloud's structure of indexes of business model

Profit model	Source of income
	Income mode
Financial management	Optimization of cost structure
	Financing and investment
Brand value	Brand establishment
	Brand extension

5.1 Introduction of business model's indexes

Depending on the decomposition of enterprise's value network, we can get the indexes, which are also the element to maintain the logical relationship of business model. The above 10 first grand indexes can explain the value transition between enterprise and customer and interior value's achievement.

1. Market localization: the market localization is a key element of building the image of product or service, brand or organization, and pinpoint the direction for enterprise. As for platform, only if the market is locked and divided, can the company verify the service industries and focus on the potential market based on customer demands, and on the contrary, the company can divide the potential market based on it.
2. Customer value: customer value is the satisfaction from customer end by using the product or service provided by company. As for platform, it can be achieved by discovering and guiding the customers.
3. Resource and competence: it guarantees the endless dynamic of the company's value creation. The most important resource of platform company is the platform itself and the customers it captured from all channels. The competence refers to maintenance and development to satisfy customer by using the resource. In a word, the core tech.
4. Value network: the value network is generated from interact between the stakeholders. All participants work together to get better by division, transmission and use of generalized value. In some way, it decides the win-win structure of whole enterprises eco-system by cooperating and compiling the resource, which also decide the choice and the mechanism of communication between cooperation partners.

5. Function of platform: the good or bad of it directly affects the experience of customer which includes the richness of the information, the layout of the page, and also the search forms.^[5]
6. Marketing model: marketing model place emphasis on the combination of promoting, media choosing, and marketing mode. Its' purpose is to pass the value created by platform to customer and let customer achieve their own value.
7. Service effects: service effect is a key expression of the development level of company, including the object, boundary, and the supporting services. What's more, the scale of trade directly reflects the service effects of the platform.^[5]
8. Profit model: the design of it must be customer-oriented and profit centers. The core of it is to solve how to charge and whom the company charge for. Only if fixing these two problems can the company generate an unique and competitive profit mode.
9. Financial management: the financial management includes optimization cost structure and financing and investment. The first part is to optimize the cost structure and reduce the operation cost and let cyber economy play an important role. As for financing and operating, the main part is to acquire the external capital and interior capital appreciation.
10. Brand value: as an intangible asset, the reason why brand has its core value is not only the process of generating contains the sunk cost, but also it can be adjusted based on consumer's features. As a result, by building and promoting the brand, it holds enough information to achieve some goals.

5.2 Methods and Analysis

To quantify the above indexes, two methods will be given as follows to try to explain whether CASICloud's business model is better or worse. First, we will invite the experts to help us determine the weight of each index, and then use Fuzzy Comprehensive Evaluation (FCE) to evaluate CASICloud. Second, we will give the potential development path and the tendency by using Analytic Hierarchy Process (AHP).

5.2.1 Fuzzy Comprehensive Evaluation(FCE)

To get further information about FCE, the concept of maximum membership principle is needed:

Suppose: $\forall u_0 \in U, A_i \in F(U) \quad (i = 1, 2, \dots, n, \dots)$, if $\exists i_0$ s.t.:

$$A_{i_0}(u_0) = \max \{A_1(u_0), A_2(u_0), A_3(u_0), \dots, A_n(u_0)\} \quad (1)$$

Then we reckon that u_0 attaches to A_{i_0} .

Second, we will explain the procedure of the FCE.

(1) according to the structure of indexes, we can confirm the evaluation factor set U as follows:

$$U = \{U_1, U_2, U_3, \dots, U_n\} \quad (2)$$

Because of the structure have two layouts, as a result, the first grade indexes set can be written as:

$$U = \{U_1, U_2, U_3, \dots, U_n\} = \{market, customer, \dots, brand\} \quad (3)$$

Then we can write the second indexes set as follows:

$$U_i = \{u_{i1}, u_{i2}, \dots\} \quad (4)$$

And the weighted matrix of first and second grade indexes can be written as follows:

$$W = \{W_1, W_2, \dots, W_n\} \quad (5)$$

$$W_i = \{w_{i1}, w_{i2}, \dots, w_{im}\} \quad (6)$$

(2) evaluation matrix R

In multi-factor FCE process, we will divide it into separate one-factor FCE process, and then combine them all as the result. The process is as follows:

$$R_i = \begin{bmatrix} r_{11} & r_{12} & \dots & r_{1l} \\ r_{21} & r_{22} & \dots & r_{2l} \\ \vdots & \vdots & \ddots & \vdots \\ r_{m1} & r_{m2} & \dots & r_{ml} \end{bmatrix} \quad (7)$$

R_i can be fuzzy evaluation matrix.

$$\begin{aligned}
 B_i &= W_i R_i = (w_{i1}, w_{i2}, \dots, w_{im}) \begin{bmatrix} r_{11} & r_{12} & \dots & r_{1l} \\ r_{21} & r_{22} & \dots & r_{2l} \\ \vdots & \vdots & \ddots & \vdots \\ r_{m1} & r_{m2} & \dots & r_{ml} \end{bmatrix} \\
 &= (b_{i1}, b_{i2}, \dots, b_{il})
 \end{aligned} \tag{8}$$

It can be found that matrix B_i is the evaluation of U_i . Hence, the membership degree matrix R of U to V is:

$$R = \begin{bmatrix} B_1 \\ B_2 \\ \vdots \\ B_m \end{bmatrix} \tag{9}$$

(3) calculation of fuzzy comprehensive evaluation set B and set up the judgement set V

$$B = WR \tag{10}$$

$$V = \{V_1, V_2, V_3, V_4, V_5\} = \{95, 80, 65, 50, 35\} \tag{11}$$

(4) Calculation of fuzzy comprehensive number F

$$F = B \vec{V} \tag{12}$$

5.2.2 Analytic Hierarchy Process(AHP)

In 1870s, American operational research experts T.L. saaty came up with an idea that was researching the study of ‘electric power distribution based on each industrial sector’s contribution to the national welfare’ for the very first time. Depending on the network system theory and multiple-target integrated evaluation, he applied AHP for the first time.

The kernel idea of this method is to decrease the dimension of one single problem, and let it be a mathematicization, rather than complex redundancy one. The key word of this method is gradual change.

The basic principal is: based on the property and the objective of the problem, we can divide it into separate factors, which can be combined by its membership class. The final result is we can transfer this kind of problem into a multi-level structure model, so as to let the question be scheduling problem based on the weight of the factors on top and bottom.

Then, we will show how to use AHP step by step:

(1) Establishment of hierarchical structure model

Based on the target, factors and the relationship between these, we can divide then into three levels: TOP, MIDDLE, and BOTTOM, and then draw the diagrams.

(2) Establishment of pairwise comparison matrix:

Saaty raised the fuzzy coincident matrix method to solve the problem of the only existence of qualitative framework, the kernel thought is as follows:

- (a) Use pairwise comparison rather than all together.
- (b) Adapt the relative scale to reduce the difficulty of comparison when the factors have different properties.³
- (c) Choose the appropriate scaling method.⁴

(3) Consistency check of the pairwise comparison matrix A :

$$A = \begin{bmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \dots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \dots & \frac{w_2}{w_n} \\ \frac{w_3}{w_1} & \frac{w_3}{w_2} & \dots & \frac{w_3}{w_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \dots & \frac{w_n}{w_n} \end{bmatrix} \quad (13)$$

If:

(a) Matrix A is a complete consistency matrix, then $W (= 1) \Rightarrow w_1, w_2, \dots, w_n$ can be considered as an ordering vector. Let $a_{ij} = w_i/w_j$, then do the pairwise comparison, if $a_{ij} * a_{jk} = a_{ik}$, then A is a complete consistency matrix. The rank of A equals to 1, with one and only one non-zero characteristic root n , and the eigenvector it corresponds to can be considered as weight vector after normalization.

(b) Matrix A is not a complete consistency matrix, Saaty suggested that the weight vector should equal to the greatest characteristic root's vector.

The hypothesis of (b) leads to a question, which is if Matrix A is not a complete consistency matrix, how large is the allowed band of it? .To solve this, we need consistency check.

(4) Single order of hierarchy and consistency check

Defining an consistency index:

³ Psychologist believes that the number of factors are no more than 9 factors when it comes to paired comparison.

⁴ Appendix A.

$$CI = \frac{\lambda_{\max} - n}{n - 1} \tag{14}$$

- Case1: if $CI = 0$, matrix A has crash consistency;
- Case2: if $CI \rightarrow 0$, matrix A has satisfied consistency;
- Case3: if $CI \rightarrow \infty$, matrix A has no consistency.

To measure this index, we introduce the consistency index RI , which shows in Table2.

TABLE 3 Consistency index RI

n	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45

Defining consistency ratio as follows:

$$CR = \frac{CI}{RI} \tag{15}$$

If $CR < 0.1$, we can assure that matrix A has satisfied consistency.

5.3 Analysis

5.3.1 Current Situation of CASICloud---FCE

First, let us focus on the creativity of CASICloud's business model by using FCE.

TABLE 4 FCE basic data set

First grand indexes	Second grand indexes	Evaluation result				
		<i>great</i> → <i>poor</i>				
0.2 Market localization	Market locking 0.8	7	2	1	0	0
	Market division 0.2	5	3	2	0	0
0.1 Customer value	Discover customer 0.6	7	3	0	0	0
	Guide customer 0.4	6	3	1	0	0
0.1 Resource and competence	Ability of R&D 0.6	5	3	2	0	0
	Status quo of resources 0.4	6	3	1	0	0
0.1 Function of platform	Information service 0.5	7	2	1	0	0
	Online trade 0.5	7	2	1	0	0
0.2 Marketing model	Promote the combination of media 0.3	5	3	2	0	0
	Combination of marketing 0.7	6	2	1	1	0
0.05	situation of service 0.4	7	2	1	0	0

Service effects	Scale of trade 0.6	6	3	1	1	0
0.05 Value network	Build relationship as partner 0.4	8	2	0	0	0
	Management of cooperative relationship 0.6	7	3	0	0	0
0.05 Profit model	Source of income 0.7	7	2	1	0	0
	Income mode 0.3	7	2	1	0	0
0.05 Financial management	Optimization of cost structure 0.4	7	2	1	0	0
	Financing and investment 0.6	7	2	1	0	0
0.1 Brand value	Brand establishment 0.8	8	1	1	0	0
	Brand extension 0.2	7	2	1	0	0

According to FCE, we can get the weight matrix of the first and second grade indexes:

$$W = \begin{pmatrix} 0.2 & 0.1 & 0.1 & 0.1 & 0.2 & 0.05 & 0.05 & 0.05 & 0.05 & 0.1 \end{pmatrix} \quad (16)$$

$$\begin{aligned} W_1 &= \begin{pmatrix} 0.8 & 0.2 \end{pmatrix} & W_2 &= \begin{pmatrix} 0.6 & 0.4 \end{pmatrix} & W_3 &= \begin{pmatrix} 0.4 & 0.6 \end{pmatrix} \\ W_4 &= \begin{pmatrix} 0.5 & 0.5 \end{pmatrix} & W_5 &= \begin{pmatrix} 0.3 & 0.7 \end{pmatrix} & W_6 &= \begin{pmatrix} 0.4 & 0.6 \end{pmatrix} \\ W_7 &= \begin{pmatrix} 0.4 & 0.6 \end{pmatrix} & W_8 &= \begin{pmatrix} 0.7 & 0.3 \end{pmatrix} & W_9 &= \begin{pmatrix} 0.4 & 0.6 \end{pmatrix} \\ W_{10} &= \begin{pmatrix} 0.8 & 0.2 \end{pmatrix} \end{aligned} \quad (17)$$

Base on 2.1, we can get every $B_i, i = (1, 2, \dots, 10)$. if so , the matrix R is as follows:

$$R = \begin{bmatrix} 0.66 & 0.22 & 0.12 & 0 & 0 \\ 0.66 & 0.30 & 0.04 & 0 & 0 \\ 0.54 & 0.30 & 0.16 & 0 & 0 \\ 0.70 & 0.20 & 0.10 & 0 & 0 \\ 0.57 & 0.23 & 0.13 & 0.07 & 0 \\ 0.64 & 0.26 & 0.10 & 0 & 0 \\ 0.74 & 0.26 & 0 & 0 & 0 \\ 0.70 & 0.20 & 0.10 & 0 & 0 \\ 0.70 & 0.20 & 0.10 & 0 & 0 \\ 0.78 & 0.12 & 0.10 & 0 & 0 \end{bmatrix} \quad (18)$$

Then, we can get the final result of matrix B :

$$\begin{aligned} B &= WR \\ &= \begin{pmatrix} 0.653 & 0.228 & 0.105 & 0.014 & 0 \end{pmatrix} \end{aligned} \quad (19)$$

Finally, we can get the result:

$$F = BV^T = 87.8 \quad (20)$$

The number 87.8 leads to the conclusion that CASICloud's business model is preferable. Based on Table 3, we can find that CASICloud's comprehensive performance in Market localization, Customer value and Value network is better than other indexes. However, we also find that the performance of the indexes based on not only the evaluation result, but also the weight from the experts, which means that the comprehensive result may not be satisfied if only one part of the factors does well. As a result, when we apply the AHP to provide different path to company, the index of value network will be deleted, because it can not only satisfy the fundamental premises, but also can strengthen other indexes effect.

5.3.2 Varies Paths to Develop---AHP

According to Table 3, we find that not only the value network's weighted value is 0.05, but also other indexes. To satisfy the AHP structure, we can properly delete one index which has low weighted value. That is to say the companies have choices to delete the indexes they think are irresponsible. As a result, we will show the results after deleting the value network index.

Picture1 shows the basic AHP structure. As we can see at the bottom of picture1, there are three alternative schemes, which represent different emphasis.

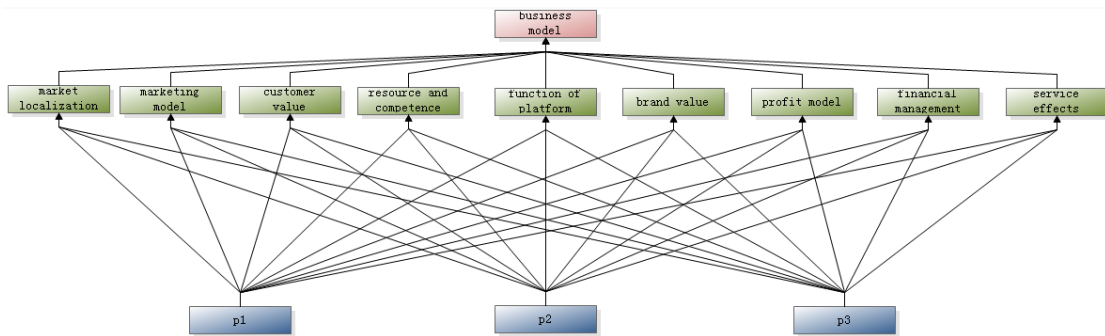


Figure 2 AHP Structure

This article will not show the every detail of the process of AHP. For example, p2 emphasize the function of platform, resource and competence and financial management which will be set up during the process of AHP. As for p1, it mainly concentrates on market localization, marketing model and customer value. And p3 focus on service effect, brand value and profit model. To maintain the consistency of every

matrix, every intermediate index should satisfy the condition which are mentioned in section 2.2(4).

The AHP result shows in Table4. As we can see, p2 has the largest weight, which means company As CASICloud itself, what AHP provides can be considered as its potential path to grow up, because its current platform can be divided into two parts: CASICloud and CASICloud International, based on what we study, the latter's development has suffocated a lot. As for resource and competence, this company can depend on its parent company's own strength to develop the unique services and products, which can lead to company to a higher level.

TABLE 5 Alternative Schemes (sorted by weight)

P2	0.4362
P3	0.2892
P1	0.2746

However, we should know that not only the value network is weighted 0.05, which means during AHP processing, top leaders can choose the appropriate indexes to delete or add. Any enterprises apply the above methods to verify their own ability can be more company-oriented.

6 Summary of Problems and Way to Solve

As the leader of Chinese industrial internet, CASICloud needs to focus on varies situations when doing businesses overseas along the 'belt and road'.

1. CASICloud cannot imitate the western's steps when building our own industrial internet, on the contrary, it should concentrate on Chinese own situations among all the industries. For example, the company should provide an soft-consolidating platform with the ability of sharing resources, waiting for the formation of the core enterprises that can be the leading role. After that, the procession of vertical integration should be settled down by the core enterprises. Finally, these intelligent facilities and companies can be built based on this physical basis.
2. When focusing on the layout of overseas, we should highly concentrate on the differentiation of the IT level among the "belt and road" countries. That is to say, we need to accelerate the construction of digital version of "belt and road", to achieve the interconnection and intercommunication of data service, internet service and

- international communication businesses.
3. It may challenge the industrial internet among the facilities, internet, controlling, application, data, and employees because of the complexity and variability of the network environment, also the vulnerability of the information systems and the industrial control systems. The enterprises of industrial internet, safe security and the surveillance need to form a linked mechanism, which to guarantee the safety of industrial internet based on the reform, optimizing the management, the development of safe scene and the innovation. What's more, it should use the customer themselves, and the power of professional service agency to preoccupy, protect, and make a response to all kinds of threaten and form the tactics more precisely than ever. In a word, these are all for the safety of every part which is in the process of industrial internet.
 4. Actively develop the market, create high-quality brand, backlog good public praise. CASICloud in the aspects of expanding a market, proper match the strategy of the choice"roll snow ball", To a certain extent, reduce the risk of market development, Make the enterprise steady, expanding the scope of the target market, strong foundation for enterprise and brand foundation. It can use Google or other international or local search engine orientation for the international market to seek corporate customers to show the company image in expending brand process ,at the same time, It can also make use of traditional medium, such as television and magazine,etc.
 5. CASICloud should overcome the defects of low utilization of external resources.Strengthen the integration of resources, improve the level of professional platform.First, Make full use of leading role of intermediaries.Accelerate CASICloud's internationalization strategy,perfect international service system.Second,implement talent reserve strategy ,attach importance to the cultivation and introduction of enterprises.Because "The Belt and Road" strategic development needs. For CASI Cloud and platform registered enterprises "walk out" to provide a strong Talent guarantee..Furthermore,with national policy, improve the financing channels.
 6. Based on the FCE method on Chapter Four, we know that CASICloud has certain creativity, and has the advantages of allocation of market and financial management compared to the enterprises among the same industry. However, the lack of using resources and capacity is obvious. As a result, we highly recommend that

CASICloud should build up its own strength by using the resources of parent company and form the channel to enforce it.

7. Under the knowledge of AHP model through deleting the value net index, CASICloud can mainly focus on optimizing the function of platform, share the resource and generate the core competence, and create higher quality financing management. What's more, according to the weight given by experts, we have four indexes which are weighted 0.05, which means, one company can certainly change the index among the structure to generate the different path for company to grow bigger and stronger, and that is simply because different structure means different alternative offers.

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Appendix: The Questionnaire

航天云网商业模式评价指标专家问卷

敬爱的专家、领导：

您好，我们正在进行一项航天云网商业模式研究，想邀请您用几分钟时间帮忙填答这份问卷。

该问卷只是一份学术研究调查，主要目的是了解您对航天云网的评价，通过专家意见确定权重，借此来帮助我们构建评价体系。本问卷实行匿名制，所有数据只用于统计分析，不作其它用途，诚请您能给予客观填写。谢谢您！

注：该调查问卷我们已从问卷星进行微信发放，并进行了回收，调查问卷的样式参考了刘广启（2014）的问卷形式。

第一部分：

一、填写说明

本部分采用层次分析法，有 9 个评分尺度，各个标度意义如 1-1

标度	定义	含义
9	极端重要	因素 I 比因素 J 极端重要
7	重要得多	因素 I 比因素 J 重要得多
5	明显重要	因素 I 比因素 J 明显重要
3	稍微重要	因素 I 比因素 J 稍微重要
1	同样重要	因素 I 比因素 J 比较，具有同样重要性
1/3	稍微不重要	因素 I 比因素 J 稍微不重要
1/5	明显不重要	因素 I 比因素 J 明显不重要
1/7	不重要得多	因素 I 与因素 J 不重要不重要得多
1/9	极端不重要	因素 I 比因素 J 重要极端不重要

图 1-1

运用层次分析法对 10 个项目进行两两比较，以 I 因素为基准，与 J 因素进行比较。例如：您认为“市场定位”与 J 因素“客户价值”相比重要的多，则在“7”下方打“√”。

二、填写问卷

标度 I 因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J 因素
市场定位										客户价值

市场定位										资源与能源
市场定位										价值网络
市场定位										平台功能
市场定位										营销模式
市场定位										服务效果
市场定位										盈利模式
市场定位										财务管理
市场定位										品牌价值

表 1

标度 I 因素 \ J 因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J 因素
客户价值										资源与能力
客户价值										价值网络
客户价值										平台功能
客户价值										营销模式
客户价值										服务效果
客户价值										盈利模式
客户价值										财务管理
客户价值										品牌价值

表 2

标度 I因素 \ 标度 J因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J因素
资源与能力										价值网络
资源与能力										平台功能
资源与能力										营销模式
资源与能力										服务效果
资源与能力										盈利模式
资源与能力										财务管理
资源与能力										品牌价值

表 3

标度 I因素 \ 标度 J因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J因素
价值网络										平台功能
价值网络										营销模式
价值网络										服务效果
价值网络										盈利模式
价值网络										财务管理
价值网络										品牌价值

表 4

标度 I因素 \ 标度 J因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J因素
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平台功能										营销模式
平台功能										服务效果
平台功能										盈利模式
平台功能										财务管理
平台功能										品牌价值

表 5

标度 I 因素 \ J 因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J 因素
营销模式										服务效果
营销模式										盈利模式
营销模式										财务管理
营销模式										品牌价值

表 6

标度 I 因素 \ J 因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J 因素
服务效果										盈利模式
服务效果										财务管理
服务效果										品牌价值

表 7

标度 I 因素 \ J 因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J 因素
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盈利模式										财务管理
盈利模式										品牌价值

表 8

标度 I 因素	9	7	5	3	1	1/3	1/5	1/7	1/9	标度 J 因素
财务管理										品牌价值

表 9

第二部分：

一、填写说明

1、指标评分

将二级指标评价分为 5 个层次，依次是很好，好，一般，差，很差。请根据不同的二级指标对企业商业模式的贡献，在 5 个层次下面打分，每个指标分配到 5 个从集中的分数共计 10 分，打分数字均为 0 到 10 之间的整数。例如，如果认为二级指标“市场锁定”对企业商业模式的贡献“很好”可以分配 7 分，“好”可以分配 1 分，“一般”分配 1 分，“差”分配 0 分，则总分为“7+1+1+1+0=10”。填表示范如下：

一级评价指标	二级评价指标	评价结果				
		很好	好	一般	差	很差
精确市场定位	市场锁定	7	1	1	1	0
	市场细分					

2、权重评分

本问卷对指标权重的打分分为一级指标权重评分和二级权重评分，每一级指标权重总和为 1，打分数字为 0 到 1 之间的数字（最多保留两位小数点）。一级指标共有 10 个，根据这 10 个指标对企业商业模式的贡献度来分配分数。二级指标共 16 个，每两个对应一个一级指标，根据其对该的一级指标的贡献度打分。填表示范如下：

(1) 一级指标权重。认为“精准市场定位”对企业商业模式的贡献度比较大，可以打 0.25 分，其他一级指标同理打分，所有分数综合为

“0.25+0.05+0.05+0.15+0.05+0.05+0.15+0.05+0.15+0.05=1” 打分如下：

一级指标	权重评分	得分合计
精准市场定位	0.25	
创造客户价值	0.05	

利用资源与能力	0.05	1
重构价值网络	0.15	
发挥平台功能	0.05	
营销模式创新	0.05	
实现服务效果	0.15	
盈利模式创新	0.05	
优化财务管理	0.15	
实现品牌价值	0.05	

(2) 二级指标权重。认为“发掘客户”对于一级指标“客户价值”的贡献很大，可以打 0.7 分，而“引导客户”只能打 0.3 分，使两个二级指标权重总和为 1。打分如下：

一级评价指标	二级评价指标	权重得分	得分合计
创造客户价值	发掘客户	0.7	1
	引导客户	0.3	

二、填写问卷

1、指标打分表

一级评价指标	二级评价指标	评价结果				
		很好	好	一般	差	很差
精确市场定位	市场锁定					
	市场细分					
创造客户价值	发掘客户					
	引导客户					
利用资源与能力	技术研发能力					
	资源状况					
重构价值网络	合作关系建立					
	合作关系管理					
发挥平台功能	信息服务					
	在线交易					
营销模式创新	推广媒体组合					
	营销策略组合					
实现服务效果	服务状况					
	交易规模					
盈利模式创新	收入来源					
	收入方式					
优化财务管理	成本结构优化					
	平台融资与投资					
实现品牌价值	品牌建立					
	品牌拓展					

表 1