

Analysis of the Development of IT Outsourcing Companies in The Era of Cloud Computing--Take Infosys as an Example

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Abstract. With the development of information technology and mobile Internet, especially with the impact of the COVID-19 pandemic, cloud computing, which emphasizes distributed patterns rather than the centralized pattern is gradually known and applied. More and more enterprises have to adopt remote work, which greatly promotes the process of enterprise digital transformation, the digitization is greatly changing the world. The emergence of cloud computing is a huge change in traditional enterprises' concept and thinking of IT resources. The characteristics of flexibility, innovation, diversity and scale of cloud computing stimulate the innovation vitality of enterprises and promote the development of enterprises. At the same time, the enterprises in the process of digital transformation are faced with various difficulties, therefore, how to choose high quality and efficient enterprise digital transformation method has become an important task for the current enterprise development. This paper takes India's digital service provider Infosys as an example and analyzes the future development direction of traditional IT outsourcing companies in the current digital environment.

Keywords: Cloud Computing; Digital Transformation; IT Outsourcing.

1. Introduction

In the era of cloud computing, the development of Internet technology has brought about changes in customers' consumption habits and needs. This series of changes promote enterprises to provide higher quality, lower cost, more flexible products and services and improve communication efficiency and innovation competitiveness within enterprises. The emergence and development of multinational companies have brought distributed development models such as remote office, off-site delivery and so on. At the same time, the impact and challenge of the global new coronavirus have accelerated the application of the distributed development model. Therefore, how to grasp the tuyere of cloud computing and carry out digital transformation has become an important means for enterprises to seek innovation ability improvement and higher quality development.

Infosys, founded in the 1980s, relies on cheap Indian labour to provide outsourcing services such as core systems and solutions to developed countries such as European countries and the US and uses its global delivery model to rapidly develop into India's second-largest software outsourcing company. In the era of cloud computing, with the development of digital transformation, the rise of global trade protectionism and the change in labour costs, the development of Infosys is hindered, and the profit rate is also significantly reduced. In the face of the wave of the development of cloud computing technology, Infosys has launched a new generation of cloud computing service platform Infosys Cobalt that promotes the seamless connection of digital transformation and has used it to carry out the transformation and development of digitalization and cloud computing business, which has achieved good results. The brand valuation firm Brand Finance named Infosys "the fastest-growing IT services brand in the world" [1]. By analyzing the transformation strategy proposed by Infosys, this paper takes the transformation strategy of Infosys as an example to analyze the development directions of traditional software outsourcing enterprises in the current cloud computing era.

2. The cloud computing technology

2.1 The development status of cloud computing Technical background of cloud computing

Cloud computing refers to highly scalable hardware and software resources provided by third-party service providers through the Internet. The main services provided include information storage, data analysis, applications and software development platforms. Users of cloud services only need to send data or requests from clients via the Internet, and cloud computing providers would return relevant data and services. Virtualization, as the core of cloud computing technology, first appeared in 1956. Christopher Strachey first proposed virtualization in his article. However, due to technical constraints, it is not until 2006 that Google CEO Eric Schmidt formally proposed the concept of “cloud computing”. Microsoft released its cloud computing platform, Microsoft Azure, in 2008, marking the formal investment and operationalization of cloud computing technology [2]. Several leading cloud computing providers include Amazon’s AWS, Microsoft’s Azure, Google Cloud Platform and SaaS market leader Salesforce. According to Fortune Business Insights, the global cloud computing market grew considerably in 2021 to a total of \$ 250.4 billion and is expected to grow at a compound annual rate of 17.9 per cent to \$ 791.48 billion by 2028 [3].

With the development of the cloud computing market, in addition to the United States, the European Union, China, India, Japan and other countries and organizations have also increased their support for this field, including the “federal cloud computing strategy” issued by the United States government and the “European 2020” issued by the European Union, which reflect the importance attached by governments to cloud computing.

2.2 The technical background of cloud computing

At present, cloud computing includes infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS). These three services provide users with infrastructure, platform and software, respectively. In recent years, with the development of cloud computing technology, event-driven new pattern function as a service (FaaS) has emerged. Cloud computing technology transfers data operations to the cloud built by cloud computing providers, hence customers do not have to buy hardware and software resources alone. There are four types of cloud computing. The first type is the public cloud shared by all users in the data centre technical architecture provided by cloud computing providers. The second type is the private cloud hosted by the local customs. The third type is the mixed cloud formed by the flexible combination of public and private clouds according to the actual demand. The fourth type is the multi-cloud which uses two or more different cloud computing providers to provide clouds and connect different clouds.

The emergence of cloud computing services can free enterprises from the design, development, operation of hardware and software, and focus on the development of their core competitiveness. The operation of the entire application in the cloud also avoids more data errors that make the application collapse and also solves the possible incompatibility of applications in different systems and environments. Even if enterprises do not have sufficient hardware and software resources, they can transfer their data to the third-party cloud computing providers by purchasing or renting the servers of cloud computing providers, and select applications that meet the needs of enterprise development from the standardized software provided by cloud computing providers, then obtain a complete software solution.

2.3 The applications of cloud computing

The applications of cloud computing are quite extensive, and almost all aspects of daily life can be upgraded through cloud computing. Cloud computing is especially suitable for projects and applications that require large-scale storage space and huge computing capacities, such as big data analysis technology, IoT technology, AI technology and meta-universe technology. The powerful data storage and analysis capabilities of cloud computing providers provide important support for the development of these fields mentioned above.

At the same time, cloud computing is also applicable to areas with high-security requirements, such as banking, medical industry and government departments. Enterprises or organizations in these areas usually store very important data information, such as customer bank account password information, patients' cases and medication information, citizens' criminal records and other personal information related to privacy. Once they are not properly kept or leaked, they will have huge losses on the reputation and credibility of enterprises and governments. At the same time, the legal punishment faced by enterprises due to data leakage may even lead to the bankruptcy of enterprises. So companies in these areas have to spend a lot of energy on information and privacy protection, and cloud computing providers themselves have more experience and risk prevention and control methods to deal with Internet risks. Gartner, an authoritative IT research and advisory consultancy, also said cloud services for Infrastructure as a Service (IaaS) could cause 60 per cent fewer security incidents than traditional data centres by 2020 [4]. Therefore, the application of cloud computing can provide effective help to enterprises and organizations in these areas.

3. Digital transformation analysis

3.1 The background of digital transformation

Digital transformation is a way to use modern digital technology and information technology to change or innovate existing business processes, organizational management and service models to create new values and adapt to new market demand. In addition to changing the mode of enterprise development, digital transformation may also provide new business types. The data that is originally difficult to save is stored more efficiently and safely by the digital transformation. The communication between enterprises and customers becomes more convenient because the digital transformation breaks through the limitations of time and space. The deep analysis of data is also helpful for enterprises to find feasible innovation points and shortcomings that can be improved from the current development profit model. Thanks to digital transformation, more and more disruptive innovations appear in the market.

The foundation of digital transformation is the progress and large-scale application of computer software and hardware. The popularity of mobile devices is also an important factor in promoting the digital transformation of enterprises. The popularity of mobile devices has greatly changed people's consumption habits and living habits, which is also an important driver of the digital transformation of enterprises.

Digital transformation can be divided into three aspects:

(1) The most basic digital transformation is to digitize the original assets, including data, applications, and management models, such as the establishment of a users information database, the establishment of applications and an online service platform.

(2) Due to the richness of the current market, the transfer cost of users is greatly reduced, and enterprises must change their original production and development mode of providing products according to their own needs to the development mode of focusing on customer value realization and interaction with customers.

(3) The enterprise through cloud management, accelerate the internal integration of all kinds of resources within the enterprise, the use of coordination management and big data analysis to dig deep into the development space of resources owned by the enterprise, to maximize the effectiveness of various resources.

3.2 The development status of digital transformation

The process of digital transformation has begun as early as the end of the last century. The earliest digital transformation comes from the audio and video products industry. People will transfer music, images and videos stored on CDs, DVDs, and tapes to the Internet, or store them through digital methods, resulting in a large number of online video playback media, such as Netflix, Aiqiyi, etc. Since then, more and more industries have begun to accept the digital transformation. For example,

the banking industry has begun to use IT software services to store its business information. Until today, almost all industries can use digital transformation to change their business methods, optimize the development model and improve the innovation ability of enterprises. Especially affected by the COVID-19 epidemic, the digital transformation process of enterprises has been greatly accelerated. To continue production and development, enterprises need to accept the form of remote collaborative office, do a good job in remote organization and management, and expand online marketing and customer service business. This has not only brought challenges to traditional enterprises, but also an excellent opportunity for traditional enterprises to get rid of the traditional development model and embrace the new digital transformation development mode. After the quantitative analysis of the digital economy of 47 countries, “White Paper on Global Digital Economy in 2021” points out that the global digital economy in 2020 reached \$32.6 trillion, an increase of 3.0% in nominal terms, accounting for 43.7% of GDP [5]. The huge market share of the digital economy and the broad space for the development of the digital economy has attracted a large number of IT enterprises. Cloud computing providers are also accelerating the introduction of digital transformation methods that are more in line with the needs of enterprises.

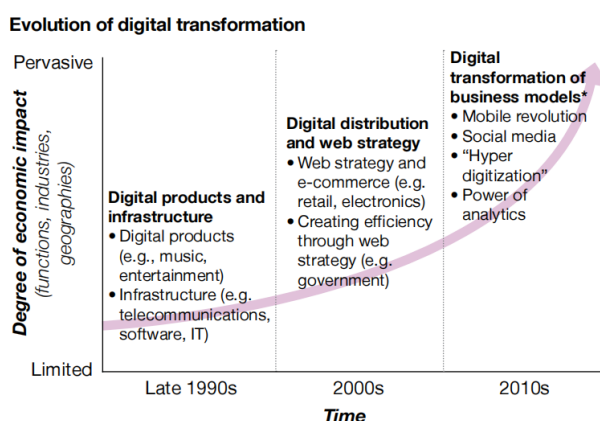


Fig. 1 Evolution of digital transformation [6]

4. Transformation analysis of Infosys

4.1 The status analysis of Infosys

Infosys is the first listed Indian company on Nasdaq and India's second-largest IT company, Headquartering in Bangalore, India, Infosys has more than 300,000 employees in more than 30 countries. Founded in 1981, Infosys, took full use of India's low labour costs and a large number of English-speaking software engineers to provide labour-intensive and low-profit information technology, application software and background services for the European and American customers. Infosys has achieved great development in a short term with its advantages. Infosys innovatively proposed the Global Delivery Model (GDM), which is to deliver the project in the delivery centres of different countries and regions around the world. Through distributed delivery and a rapid software development model, the risk and cost are effectively controlled and the project can be quickly put into use. The distribution and modularization characteristics of GDM ensure that project developers develop different modules at the same time, which reduces the limitations of traditional software development on the location of developers. With the continuous expansion of the company size, Infosys has also gradually expanded its business. It has developed from an outsourcing software service provider to a company which provides business consulting, system integration development projects, enterprise solutions, BPO and other diversified businesses.

4.2 Analysis of the development dilemma of Infosys

Due to the rise of the IT industry in the 1980s and the shortage of technical talents and high labour costs in the IT industry in developed countries, Infosys has maintained rapid growth for many years

since its establishment in 1981. According to Infosys company's financial reports, the growth rate of the company's operating profit in the financial year 2002-2011 has been maintained at more than 20%. After that, the growth rate of the company's operating profit decreased significantly, in the financial year 2017-2018 the company operating profit has even decreased to only 3% [7]. In contrast, Infosys is in an unfavourable position in the competition of the entire IT industry. In the face of European and American consulting companies, such as Eisengel and IBM, Infosys has an obvious lack of competitiveness in the high-end market. In the face of TCS, Wipro and other Indian IT enterprises, which are also the software outsourcing industry giants, Infosys provide products with serious homogenization. Infosys cannot have the financial support of Tata Group for its development, and also lacks the innovation ability of Wipro.

As Indian citizens, software developers and related staffs from software outsourcing enterprises need to rely on visas from the United States and other countries to enter the country where customers are located for product delivery and related operations and maintenance. Therefore, the visa policy of the United States and other developed countries has a great impact on the development of software outsourcing enterprises.

4.2.1 Policy environment dilemma analysis

As Indian citizens, software developers and related staff need to rely on visas from the United States and other countries to enter the country where customers are located for product delivery and related operation and maintenance. Therefore, the visa policy of the United States has a great impact on the development of software outsourcing enterprises such as Infosys. In recent years, the number of high-tech staff holding H1B visas in the United States has continued to decline due to the rise in trade protectionism and the gradual tightening of visa policies in the United States, especially the significant decline in the pass rate of Indian IT companies applying for L1 and H1B visas. The US Department of Labor, foreign engineers and mathematicians' H-1B visas fell 12.6 per cent in the fiscal year to September 2021 compared with the previous year, according to Bloomberg News Agency analysis [8]. With the final rules of the H1B approval process amendment submitted by the Department of Homeland Security (DHS) in January 2018, the processing method of H1B visa applications has undergone tremendous changes, and applicants with advanced degrees in American universities will be given priority to making the first draw, which will not be conducive to Indian IT practitioners entering the United States to carry out business exchanges and cooperation. These changes mean Indian IT companies will have to pay more for their employees to meet minimum wage requirements, and higher application costs mean higher operating costs. Infosys was the 1st place in H1B visa denials as 59% of applications were rejected in 2020 [9].

Table 1. Companies with Most H-1B Filings [10]

Rank	Company Name	Number of H-1B Filings	Average Salary
1	INFOSYS LIMITED	118,698	\$83,584
2	TATA CONSULTANCY SERVICES LIMITED	93,608	\$72,026
3	COGNIZANT TECHNOLOGY SOLUTIONS US CORP	83,367	\$87,927
4	DELOITTE CONSULTING LLP	59,444	\$94,032
5	CAPGEMINI AMERICA INC	50,726	\$86,225
6	ACCENTURE LLP	48,221	\$89,072
7	ERNST & YOUNG US LLP	47,236	\$108,951
8	MICROSOFT CORPORATION	42,178	\$139,337
9	WIPRO LIMITED	41,352	\$74,385
10	GOOGLE LLC	36,219	\$149,120

4.2.2 Development model dilemma analysis

Labour cost. With the development of the IT industry in India, the salary of local IT practitioners is also rising. The traditional labour-intensive development model cannot meet the development requirements of Infosys. At the same time, compared with large American companies such as Microsoft and Google, Indian IT companies such as Infosys have gradually decreased their attraction for talents, and the loss of IT talents in India is increasing. At the same time, other Indian software outsourcing companies, such as Cognizant and Wipro, are constantly encroaching on the market share of Infosys, and also making the homogenization of products in the software outsourcing industry more and more serious.

The development trend of automation and digitalization is also constantly putting forward new challenges to companies such as Infosys. The development of new technologies has led to the continuous elimination of low-end talents, and the whole industry needs a large number of talents of higher quality. At the same time, the development of artificial intelligence, cloud computing technology and automation technology is squeezing the living space of the traditional IT outsourcing industry. In the future, a lot of work will be replaced by artificial intelligence with higher efficiency and lower cost. The emergence of such enterprise-side artificial intelligence will seriously attack Indian IT outsourcing enterprises that originally rely on low prices. Therefore, accelerating the trend of automation, developing new technologies and proposing more standardized products have become the focus of the transformation of software outsourcing companies.

4.3 Analysis of external environment of Infosys

4.3.1 Policy surroundings analysis

As an important industry for India's economic development, the Government of India has taken active supportive policies such as national policy support, financial subsidy support and national infrastructure construction to create a stable IT industry development and investment environment. The Indian government is committed to the development of high-tech industries such as artificial intelligence and provides corresponding tax and legal support. The Indian government is committed to the development of high-tech industries such as artificial intelligence and provides corresponding tax and legal support. The Indian government has spent more than Rs700 billion on India's incentive plan for electronic manufacturing and IT hardware production (PLI), which provides hardware support for the improvement of India's IT industry [11]. At the same time, to encourage the development of IT enterprises and their export trade, the Indian government has reduced the tax rate of technical service fees from 25% to 10%, which provides good tax policy support for Indian IT enterprises to go abroad. The lack of advanced Internet infrastructure construction has been a major factor restricting the development of India's IT industry. The Indian government has launched the "Digital India" campaign, which is worth USD 20 billion, namely, it is committed to improving the Internet infrastructure construction in India and accelerating the establishment of an online payment system and e-government system.

4.3.2 Economic environment analysis

In 2020, the IT industry accounts for 8% of India's GDP, and the number of employees is more than 138000 people. In the meantime, India is the most preferred destination of the global IT industry and the leader in global IT procurement, accounting for 52% of the global IT industry market share. According to Redseer, the market size of India's digital economy has reached \$85-90 billion in 2020. With the rapid growth of Internet users, the improvement of online consumption levels and the consumption scale, India's digital economy has developed rapidly. It is expected that by 2030, the number of the market size of India's digital economic value will grow rapidly to \$800 billion [12]. The rapid growth of the digital economy has given Infosys a great number of market opportunities in digital transformation and cloud computing.

4.3.3 Social environment analysis

India's IT industry has a large number of high-quality technical talents with English as their mother tongue. India has a large number of high-tech software engineers with English as their mother tongue. There are more than 3000 engineering colleges in India, which can cultivate 1 million engineers every year. In 2016, India has more than 6 million labourers, half of whom can work in the IT industry, and the labour market is broad. These high-quality talents have effectively promoted the transformation of traditional IT outsourcing enterprises and the development of cloud computing technology.

4.3.4 Technological environment analysis

Indian IT enterprises adopt many global quality certification standards such as the Capability Maturity Model (CMN) and the International Organization for Standardization (ISO-9000) quality system to ensure timely and high-quality delivery of products. As one of the countries with the largest number of ISO-9000 certification software companies, India has greatly enriched the products provided by Indian IT outsourcing enterprises with a high-quality product delivery mode and technical resources covering the whole value chain.

5. Transformation Analysis of Infosys

5.1 Infosys transformation measures

5.1.1 Infosys 3.0 strategy

In the face of new requirements and development bottlenecks in the digital age, Infosys proposed the "Infosys 3.0 strategy", that is, to accelerate innovation and development, business transformation and efficient operation. After the first non-founder CEO Vishal Sikka took office, he focused on the cultivation of innovative culture of Infosys and put forward the concept of "Zero Distance" to actively launch innovative products to meet customer needs. However, the innovation ability requirements of traditional software outsourcing enterprises are not high, the company staff's innovation ability and innovative thinking are insufficient, and the rigid old work mode is not conducive to the development of team innovation. In the meantime, the lack of a digital delivery platform and advanced delivery technology in Infosys hinders the implementation and application of innovative products, and to some extent hinders the implementation of Infosys 3.0 strategy. Although the Infosys 3.0 strategy has achieved some results and achieved an independent income growth of 14.1% in the fiscal year 2015-2016, net profit has also increased from Rs121.64 billion accounting for 25.8% of total income in the previous year to Rs15.78.9 billion accounting for 29.2% of total income [13]. The traditional advantage of Infosys in European and American markets continues to grow slowly, even with a decline in revenue share. Slow transitions have also led Vishal Sikka, to clash with the company founders over the direction of the company, who resigned in 2018.

5.1.2 Infosys Cloud Transformation Strategy

With the rapid development of the Internet of Things, artificial intelligence, blockchain and big data technology, more and more traditional enterprises choose digital transformation. In the meantime, due to the continuous influence of COVID-19, a lot of company staff have to choose remote office patterns. The demand for flexible work and remote business deployment is growing. Cloud computing technology is an important technology to promote digital transformation, and the growth of this series of needs also promotes the further development of cloud service technology. In general, the market development potential of cloud services is huge, especially the demand for IT services with low code and low entry threshold, but there are also a large number of competitors in the current broad market.

Focusing on the new market direction of the software industry, Salil Parekh, the current CEO of Infosys, has been in office since 2018, emphasizing the important role of cloud computing and digitization in breaking through the development dilemma of Infosys to achieve innovation and development, focusing on the development of digital business, accelerating the introduction of digital products and services, and officially launched the first one-stop cloud computing platform Infosys

Cobalt to solve the digital transformation of enterprises in 2021, which laid the foundation for the strong rebound of Infosys.

Infosys transfers the company's main development directions to provide efficient and safe cloud plan transformation schemes for enterprises and puts forward three main influencing factors of the enterprise using cloud computing: business agility, scale innovation and management ecological security. and actively cooperate with Infosys partners such as AWS and MIT to further quickly hit the digital ecological community constructed by Infosys. At the same time, the design of security integration ensures that the services and products provided by Infosys meet the most stringent laws, regulations and industry standards. Infosys Cobalt starts from the core of the enterprise to help enterprises reconstruct the business structure, and uses cloud computing to accelerate the cloud of the core business of the enterprise. It adopts a variety of cloud computing types that cross IaaS, PaaS and SaaS services, and uses the private cloud, public cloud and mixed cloud to provide seamless transformation of enterprise digital transformation [14].

5.2 Cloud service platform Infosys Cobalt

Infosys Cobalt is the product launched to adapt to the Infosys cloud transformation strategy. It reconstructs the enterprise structure and business model from the core of the enterprise and uses cloud computing technology to help enterprises carry out cloud assets transformation. Infosys Cobalt creates a seamless transition experience across PaaS, PaaS and IaaS environments in public, private and mixed clouds, and selects the most suitable cloud environment and cloud services for enterprise development. Infosys Cobalt is committed to building the largest enterprise cloud community in the world. In the meantime, the important services of Infosys Cobalt are to ensure the integrity and security of cloud information.

Infosys Cobalt provides a series of cloud assets with a wide range of solutions. The services provided by Infosys Cobalt include basic cross-public cloud, private cloud and hybrid cloud environments and professional SaaS products, optimization of cloud testing and cloud security services for digital migration and transformation, and diversified transformation platforms provided by artificial intelligence and big data analysis technologies, such as Infosys Polycloud Platform, vertical business solutions and Infosys Cobalt communities.

The current industry leaders in the cloud computing market, such as AWS and Microsoft Azure, have absolute advantages. Therefore, Infosys Cobalt actively adjusts its role and positions its role as the collaborator of AWS and Microsoft Azure to provide advanced and safe solutions for the blank areas of its services. At the same time, it provides more scientific and effective solutions based on the experience in the vertical areas such as medical care, finance and mobile communication, and accelerates the digital transformation of enterprises and the smooth cloud transformation of assets.

5.2.1 Transformation of product-oriented thinking

Infosys Cobalt Community is an important product of Infosys transformation from "project-oriented" to "product-oriented" thinking. Based on the products and services provided by Infosys Cobalt, Infosys Cobalt Community builds a rich and diverse cloud ecology with the advanced technology companies in the world which set up a partnership with Infosys to help enterprises use cloud computing for transformation and development. The services provided by Infosys Cobalt Community include business solutions, cloud platforms, knowledge and a series of cloud assets, to accelerate the cloud migration of enterprises and help enterprises adapt to the complex cloud environment. There are more than 300 industry cloud service solution blueprints and more than 35000 cloud assets in the community. Cloud assets in the community are divided into four categories, including vertical domain platform and framework, AI / ML model, code fragment, project solution model, etc.

The traditional software outsourcing industry has obvious project-oriented characteristics, which emphasize planning, efficiency and cost operation. As long as the KPI can be delivered on time, the project group would be dismissed and each project must be re-developed. The "product-oriented" thinking focuses on the customer demand rather than the project itself, and continuously iterative new

solutions according to the demand. The entire R & D team will exist for a long time. The transformation of product system thinking in Infosys Cobalt Community has brought about the modularization of enterprise products, which can effectively reduce the coupling of the system. Customers only need to select the appropriate model in the community and put forward relevant requirements. Through the combination and reuse of different cloud assets, they only need to fine-tune the function and interface according to customer needs to provide project solutions in a short time, which greatly reduces the cost of the company.

The establishment of Infosys Cobalt Community makes Infosys company begin to enjoy the advantages of being a platform enterprise. Through the aggregation of different cloud assets, not only product developers in Infosys can use Infosys Cobalt Community, experts and scholars from Infosys customers, partners and other scientific research institutions can also publish cloud assets in the community, to enrich the business solution database in the community. The strong community ecology established by Infosys and its partners will achieve one-stop satisfaction of enterprise needs.

5.2.2 Cloud security service of Infosys Cobalt

Infosys Cloud Security Services, part of Infosys Cobalt offer Cloud Security Advisory, Cloud Infrastructure Protection, Cloud Security Posture & Compliance Management, Cloud Infrastructure Entitlements Management, Cloud Managed Detection & Response, Cloud Data Protection, Cloud Automation [15].

As an important guarantee for the digital transformation of enterprises, the cloud security services provided by Infosys Cobalt include the security guarantee when enterprise data migrate to the cloud, reliable cloud security strategy and architecture, the evaluation of cloud security, the improvement of the operation efficiency of the entire cloud security system, and the help of customers to meet the compliance requirements of network security in different countries in the world. Cloud security services provided by Infosys Cobalt have high compatibility and flexibility, which can effectively adapt to the rapid development of cloud computing and the diversification of the enterprise development environment. The cloud security service of Infosys will evaluate the existing assets of enterprises to determine the assets and methods that can be used for cloud migration. At the same time, it will increase the use of AI and ML algorithms, construct and manage the SIEM / SOAR scheme, help enterprises to predict and prevent risks, and ensure the safety of the enterprise cloud system. In addition, Infosys also uses research institutes within the enterprise to explore new algorithms and models for cloud security.

With its advantages in cloud security, Infosys uses its cooperation with other cloud service providers while directly providing cloud services to enterprises. Based on the architecture of other cloud service providers, Infosys establishes a series of cloud security products and services. For example, it optimizes and enhances network security services through the native tools of AWS, realizes all-weather monitoring and reduces human errors by strengthening access to the entrance and automation system configuration, enhances the ability to resist risks, and reduces the cost of enterprises to maintain infrastructure and pay related technical personnel.

For example, Infosys combines its Infosys Cloud Quality Assessment and Transformation (ICQAT) model with Azure Cloud Adoption Framework (CAF) of Microsoft Azure cloud services to provide Azure CAF with product safety and quality inspection model focusing on more than twenty areas for eight weeks. To provide enterprises with the most efficient, controllable and cost-optimized risk control and the best method for project testing practice. At the same time, building it into a modular product requires only the access of front and rear interfaces to achieve the use of cloud security services.

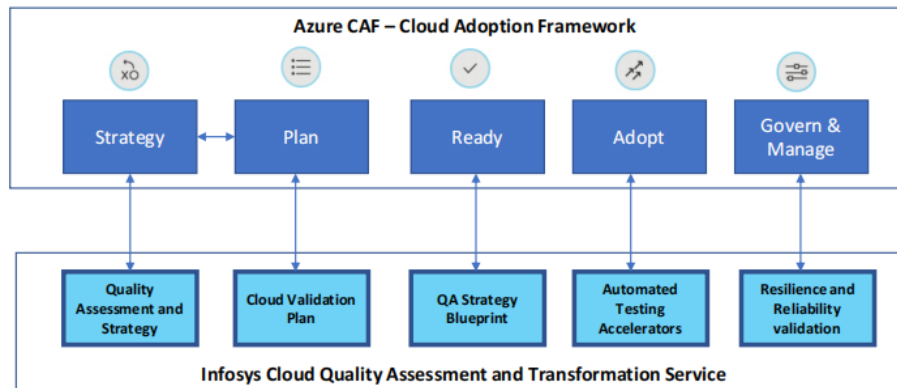


Fig. 2 Infosys Cloud Quality Assessment and Transformation (ICQAT) [16]

5.2.3 Infosys Cobalt delivery change

The traditional way of software delivery is to put forward the demand by the customer, and then provide solutions by the service provider. If the customer approves the scheme, the contract can be signed and the corresponding cost can be paid. Then the service provider conducts product development and related debugging, and finally, the product is installed and used in the enterprise. Therefore, the traditional software delivery customers have all the jurisdiction, and also have the right to specify the location of software installation. The deployment method is local deployment, and the cost is paid at one time. At the same time, they must be equipped with proprietary technical personnel to debug and maintain the daily use of the software. The cost is high, and the decentralized software installation is not conducive to the improvement of the efficiency of updating and maintenance.

The establishment of the Infosys Cobalt cloud platform has greatly changed the traditional product delivery mode of Infosys. Infosys has developed a cloud computing platform, Infosys Cobalt, by using abundant talents and technologies and achieved global cloud delivery with other IT departments of Infosys. Multiple data centres and distributed cloud databases established by Infosys in the world provide Infosys with advanced cloud service infrastructure. After the establishment of the basic cloud service infrastructure, Infosys has stepped up the research and development of the SaaS model, using Infosys Cobalt to transform the traditional software delivery model into cloud deployment. And the payment method is transformed into charging based on the use time or flow. Infosys cloud delivery has several advantages.

(1) In terms of data storage, customer data are stored in the cloud data centre of Infosys Cobalt, so data security and data management are hosted by Infosys to help enterprises reduce related costs.

(2) In the process of development, enterprises can grasp the process of product development on time through cloud services, and put forward suggestions for improvement, to avoid the disadvantages of the traditional software delivery model that enterprises can only see the final product after completion.

(3) After getting rid of the local deployment mode, the limitation of region and personnel is reduced, and the iteration speed of software updates is improved.

(4) The cloud delivery model, which is paid by time or flow, enables enterprises to choose their cloud service usage schemes flexibly and is more flexible than the one-time payment by traditional software.

The emergence of Infosys Cobalt fills the gap in Infosys digital delivery platform, provides a more flexible means for product development, delivery, debugging and maintenance, and enhances the delivery ability of Infosys. The more flexible characteristics of cloud services also help Infosys form a closer relationship with its customers, especially companies that provide large orders.

5.3 Effectiveness after Transformation

The transformation of Infosys has made remarkable achievements in the short term. Infosys was named the fastest-growing IT service brand and ranked third on the list of the most valuable IT service brands in the world in the “The annual report on the most valuable and strongest IT services brands”

released by Brand Fiance in January 2022. Infosys succeeded in raising its market value to \$ 12.8bn at an impressive 52 per cent growth rate in 2021. In the past two years, Infosys has firmly grasped the opportunity of digital transformation, and its brand value has increased by 80 % in the past two years [1]. This also helps Infosys transform from a low-margin software outsourcing service provider to a “global leader in the next generation of digital services and consulting” that provides cloud computing services and business solutions.

6. Conclusions

6.1 Summary of this paper

Based on the development of emerging technologies such as artificial intelligence and machine learning big data in the cloud computing era, this paper analyzes how traditional software outsourcing enterprises seek transformation and breakthroughs in the current state of low-profit margins and slow development. Taking Indian software outsourcing giant Infosys as an example, this paper analyzes its development process from “Infosys 3.0 strategy” to cloud transformation strategy, and gives the transformation scheme from traditional software outsourcing companies to cloud computing platform service providers.

As a leader in the traditional software outsourcing industry, Infosys has a large number of high-level software engineers and rich experience in vertical domains, which provides an important advantage for the transformation of Infosys.

In the era of cloud computing, digital technology has become an important source of power to promote global economic development. As a key industry to realize the implementation of digital technology, how to make good use of the opportunities of digital development is an important problem for the traditional software outsourcing enterprises. Relying on the development model of hybrid cloud, integrating assets such as products, solutions and customer information, to realize the efficiency and quality of cloud services. The goal of cloud services is to make the development of enterprises more economic, more modular, more professional and more efficient.

6.2 Deficiency of this paper

There are few academic research materials about Infosys, so some of the data in this paper are directly from the Internet, and the reference source is relatively single. In the meantime, in the analysis of the effectiveness of Infosys transformation, the data comes from after 2019, and the data at this stage are greatly affected by the COVID-19 epidemic. Since the COVID-19 epidemic has greatly promoted the development and application of cloud computing technology, after the normalization of epidemic prevention and control and the improvement of the global epidemic situation, with the re-development of offline offices of enterprises, the prediction of market heat and development momentum of cloud computing in the future is not clear. Therefore, the real achievement of Infosys cloud transformation needs further research and demonstration.

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