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How AI technology affects in JD.com



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Introduction

The technology changes the world. At present, we are at the brink of new technological boom. Artificial Intelligence, Self-driving, Big data, Sensing city, 3-D printing, Dueling neural networks, etc. The new technologies terminologies are full over the media platforms.

If someone asks you, which scientific or technological word you can speak out immediately. AI must be one of the words you would say.

In the past few years, there were lots of news and articles containing the word of AI. One of the biggest news was “AlphaGo wins the best chess player” made AI be the most popular technology word during that period. What’s AI, how it be applied, how can we take advantages from AI, how does AI link with our daily life, how important of AI in the industries and companies, etc. All of these questions drive us to do more research on it.

Talking about the modern life, E-commerce changed people’s lifestyle a lot. Buy things from different places at home is not a joke. Order online in the morning, receive the product in the afternoon has already realized. Behind the incredible convenient life, that the modern technology support. The computer scientific, the mobile technic, the excellent management, and more advanced technology to forecast the sale, to provide the exact what you want before your search, thus to improve the experience.

The following statement is going to analyze the AI application in the retailing industry. To avoid vague and general description, be accurate analysis, we pick one of new technology companies who devotes AI technology application and regards AI as the important strategy development target.

JD.com is also called as JingDong. It’s a Chinese e-commerce company headquartered in Beijing. It is one of the two massive B2C online retailers in China by transaction volume and revenue, a member of the Fortune Global 500 and a major competitor to Alibaba-run Tmall.

JD.com is the world's leading company in high tech and AI deliver through

drones, autonomous technology and robots, and also possesses the largest drone delivery system, infrastructure and capability globally. It has recently started testing robotic delivery services and building drone delivery airports, as well as operating driverless delivery by unveiling its first autonomous truck.

JD.com and its competitors such as Alibaba, Alphabet, Amazon and so on are not only competing to be the largest e-commerce business in the world but also to build the operating system for retail in the future. JD.com is driving business with artificial intelligence, big data, and robotics while building the retail infrastructure for the 4th industrial revolution.

Extracting from the latest interview report with Richard Liu, the company's founder, CEO, and chairman, has even gone so far to predict his company won't need humans and said, "I hope my company would be 100% automation someday...no human beings anymore, 100% operated by AI and robots."

This essay will briefly introduce AI technology and the JD.com business units, by using the business analyze tools to understand the strategic planning, thus have a better understanding of "How AI technology affects in JD.com" based on the deployment on AI.

Key Words: JD, AI, China, Logistic, E-commerce, Technology, etc.

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The Basic Information of AI

The trends on AI

Based on the data from the website of Gartner.com's top 10 lists for emerging searches, high-growth searches and most popular searches, the term "artificial intelligence" is listed on that. It's easily saying that AI has already been one of the most prominent area of technology industry in recent years, and be the most popular trend for diffident industries.

To adopt AI techonology into the current business unit and invest in the future businesses could be the wise choices for the decision-makers. To survive and be the leaders in the future, the decision-makers have to be sensitive and open-minded on the new techonology. Moving quickly to get the first mover advantages and accumulate the learning effects, to build the industry barrier to prevent the future entrents. It's strategic consideration for the decision-maker to deal with AI.

Based on the research report from McKinsey, the more investment on AI technology, the more profit the company could be returned.

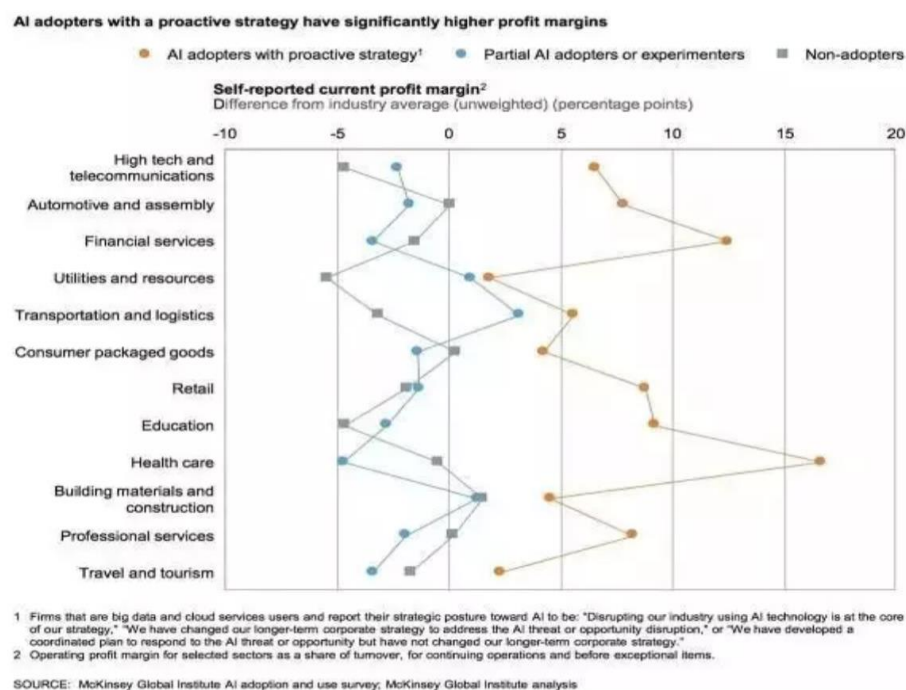


Fig 1. AI investment and returned profit margin

(Source: Mckinsey)

In the pursuit of new productivity growth, artificial intelligence is working and making its presence felt. This is because the traditional process optimization, outsourcing and offshoring models are approaching their limits. After decades of high expectations and disillusionment, AI is ready to be applied - many business use cases are already at hand. Here's a chart to showing the funding for AI startups which proved the AI's development these years.

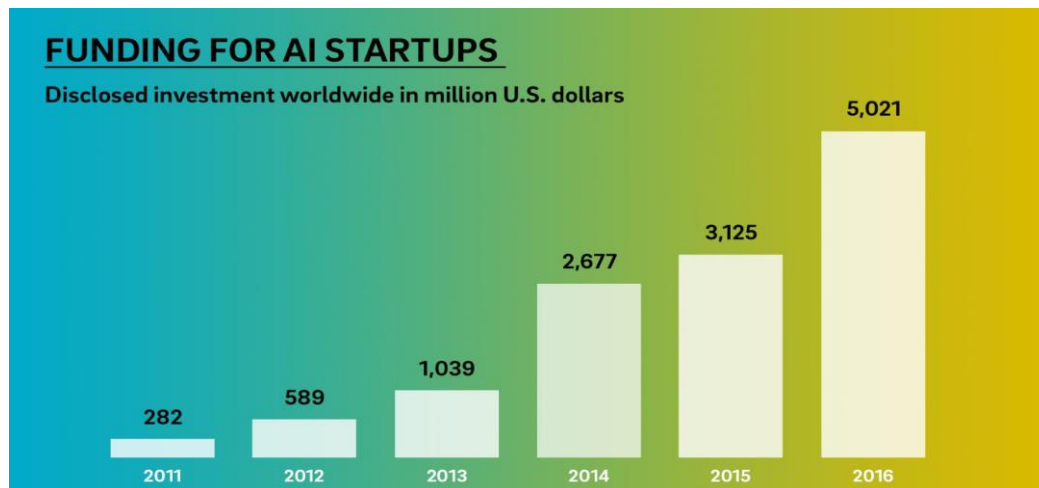


Fig 2. Funding for AI Startups

What's AI?

First of all, AI is short for Artificial Intelligence. The most basic concept of AI is typically defined as the ability of a machine to perform cognitive functions associated with human minds (such as perceiving, reasoning, learning, and problem solving), includes a range of capabilities that enable AI to solve business problems. It's normally regarded as a branch of computer science.

Artificial intelligence research and development are highly technical and specialized. This concept could be summarized as 3 basic concepts of artificial intelligence, that are: machine learning, deep learning, and neural networks.

All of the innovation is related to these three main aspects. For this thesis, we will not discuss about the deep technical research. What we are going to discuss about is the application of AI. What we need to know is making the machine has the ability to solve different kinds of problems and also act like human being, with the self-learning mechanism to improve itself continuously.

About JD.com



JD.com History

JD.com is the second largest online retailer and overall retailer in China right now, the e-commerce market leader in China is Alibaba, which devotes to provide the best online shopping experience to customers. Since the establishment of the company in 1998, the company experienced a turbulent and an expansionist history.

Funding History

From the establishment in 1998, there have 4 rounds of funding, the total amount funding amount has already reached to 3.5 billion dollars.

In 2011, the funding type was “Serious C”, DST invested 500 million for the first injection.

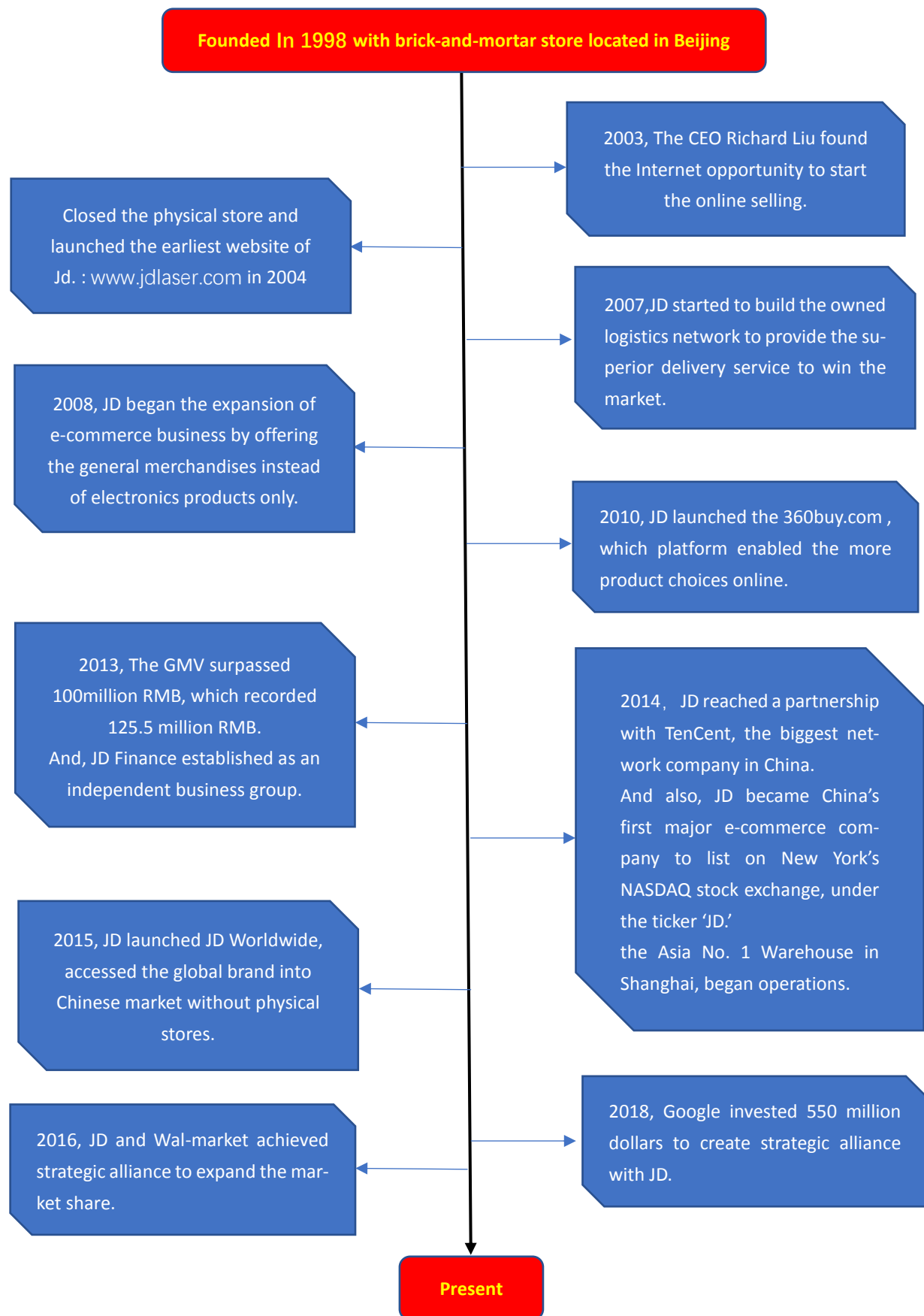
In 2013, the business of JD.com has expanded. The second funding as “Unattributed”, the total amount was 700 million dollars from Ontario Teachers’ Pension Plan.

In the following year, the continuous development of JD.com need more capital, they did the IPO (Initial Public Offerings) and acquired 1.8 billion dollars.

The latest funding happened last year, 2018. Google invested 550 million dollars as “Equity” into JD.com for the strategic cooperation in future.

Development History

Fig 3 The timeline of JD development



The Brand Position and Strategic Level Target

By obtaining the information from the official website, we could have a clue on JD.com strategy analysis. Knowing their long-term business plans.

JD.com sets the standard for online shopping through its commitment to quality, authenticity, and its vast product offering covering everything from fresh food and apparel to electronics and cosmetics. Its unrivalled nationwide fulfillment network provides standard same- and next-day delivery covering a population of more than 1 billion - a level of service and speed that is unmatched globally.

Vision: Become the Most Trusted Company in the World.

Mission: Technology Shapes Our Lives.

Core Value:

- Customer First
- Integrity
- Collaboration
- Gratitude
- All in
- Ownership

Based on the explanation of Gloria Li, JD's Senior VP for Public Relations said, the top priority is to provide the best user experience to customers and always deliver authentic products.

JD.com Business

The above chart briefly shows the main activities during the company history, including funded as a four-square-meter retail unit in Beijing's technology hub of Zhongguancun in 1998, and regarded the crisis of SARS for the whole retailer industry as the opportunity for JD, innovated the company model from the brick-and-mortar stores to online selling by taking the advantages of the internet development. And after that strategic transformation, JD group started the rapid growing of the business scale, and quickly became one of the largest companies in China. Along with the company's quick

development, it became a member of the fortune global 500 just within 20 years. After these years of development, including creation, selling, merger & acquisition, strategic partnership, etc. JD.com became one of the biggest online retailers soon. At present, JD.com have 3 main businesses, which are E-commerce, JD logistics, Technology. (The information comes from JD.com official website)

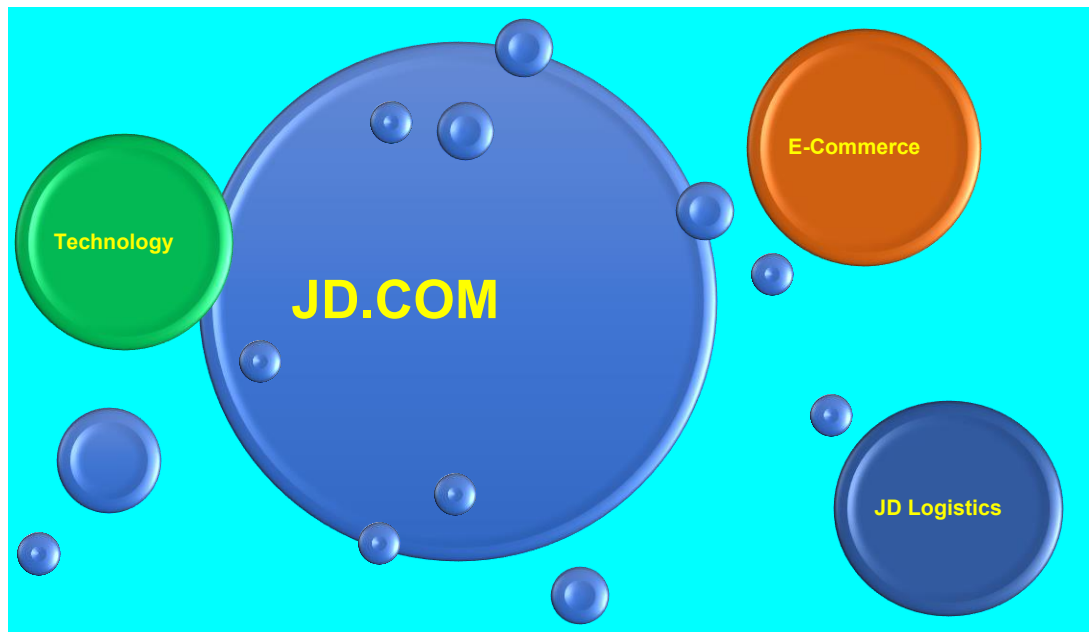


Fig 4. The main businesses of JD.com

The following analysis will start from the annual report established from JD.com with a financial analysis, to have an overview on the development and revenue of JD.com, also get the information which one is the star business, which is the most promising, and the focus of JD.com. Then we will have a detail look of these three main businesses, to analyze the advantages and disadvantages of these businesses within JD group, at the same time, use the Boston Consulting Group matrix tool to do the research. After these analyses, we are trying to understand the strategic choice and the planning of JD.com.

E-Commerce

JD.com is an outstanding one-stop e-commerce platform in China which provide direct access to superior quality products for more than 300 million active customers, striving to become the industrial standard in terms of on-line shopping experience and helping

local and international brands gain access to China's fast-growing e-commerce business market.

1. Vast Selection of Products

JD.com is providing a huge amount and variety of products, including fresh food, electronic products, clothing, and furniture, fast-moving consumer goods, and so on.

2. Extraordinary Delivery Speed

The most competitive advantage for JD.com is the extremely fast delivery speed, which could really realize the one-stop shopping experience in China and create a high barrier for the competitors and potential entrants.

Taking advantages of the nationwide logistics network and advanced data-driven delivery technology, JD.com provides the precisely timing delivery service, you could choose the time period which is suitable for you, the fastest delivery could be realized in the same day, that is service level which almost no rival could compete.

3. Cross-border Platform

The cross-border platform facilitates the business of JD Worldwide, which allow the global brands access into Chinese e-commerce market without physical stores in China, which means consumers could get the qualified products from all over the world by JD.com platform.

JD Logistics

JD Logistics is a commercial group owned by JD.com which established in April of 2017. It provides intelligent supply chain and logistics services by adopting the company's advanced technology and logistics expertise to enterprises all over the whole industries.

1. The largest fulfillment infrastructures

JD.com possesses the largest and most automated smart fulfillment centers which amount up to 20 in Asia, these Asia No. 1 logistics parks make JD.com own the largest fulfillment infrastructures of any e-commerce company all over the world. Meanwhile, JD.com also leverages a network of more than 550 warehouses with a total of approximately 12 million square meters.

JD.com had built a nationwide fulfillment infrastructure that is the largest among all e-commerce companies in China, more also which is quite highly automated.

The Fulfillment Process:

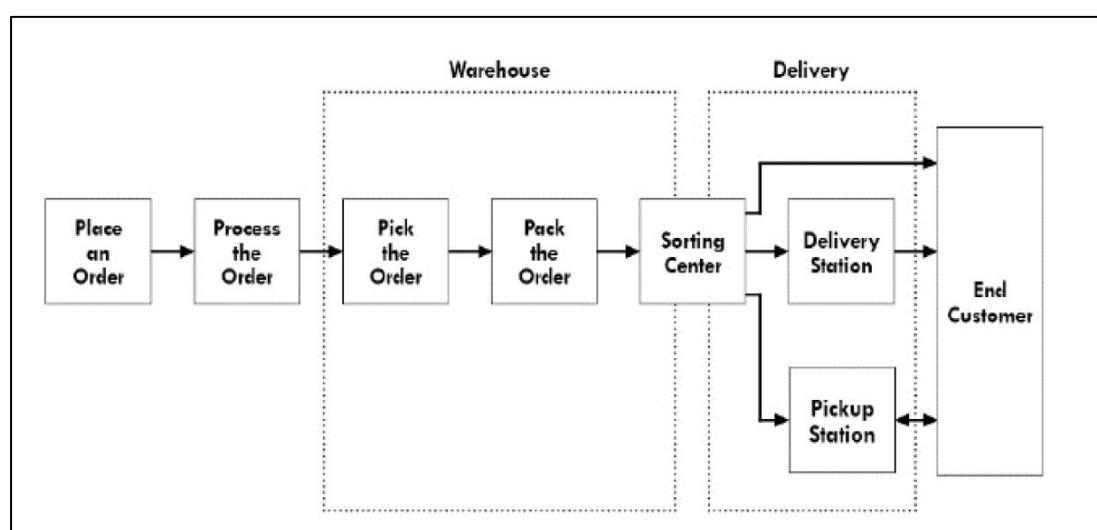


Fig 5 Fulfillment Process

(Source: website)

2. Varieties of Logistics services

JD Logistics is the only e-commerce platform all over the world that provides different level warehousing including small, medium, and oversized. Also, cold chain distribution, cross-border distribution, frozen and refrigerated storage facilities, B2B, and crowdsourcing logistics.

On the other hand, JD logistics doesn't only work for JD.com platform, but also open to other companies which are their partners, help to improve the industry delivery service level.

3.The unrivalled time efficiency

Thanks to the unparalleled nationwide logistics network, JD.com has the ability to deliver more than 90% of the orders the same day or next day, which is the most competitive advantage for JD.com which hardly find another e-commercial competitor at the same company scale level in the world.

4.Technology Development

JD.com believes that intelligent logistics is driven by technological innovation. They focus on developing the most intelligent and efficient logistics systems, leveraging the information systems, big data resources and experience advantages of the Chinese market.

On the other hand, JD.com has established the world's first fully automated warehouse in Shanghai, and they are currently developing self-owned drone delivery and automatic delivery robots.

Technology

Technology could change the industry rules. And JD.com believes the advanced technology could help the company win the competition. These years, JD.com has been continuing to focus on the technology research and development.

Technology is a support business in JD.com, because of every other business are all based on the techniques in JD. For the technology development, the continuous Innovation is an indispensable element.

In every aspect of their business, JD is at the leading edge of industry innovation, developing an incredibly efficient retail supply chain, and innovative new technologies and services that enhance the experience for consumers, and brand and merchant partners.

JD.com set the global standard for e-commerce logistics, with same- and next-day delivery available for almost any product to almost anywhere in China. They are at the forefront of robotics and automation, being the first company in the world to make

commercial deliveries by drone, and have developed unmanned delivery vehicles, warehouses and stores. And with their platform generating an astounding 31 petabytes of data every day, they are building powerful AI and machine learning tools that provide unrivalled insight into consumer behavior in China.

Global Research Hub: The JD Silicon Valley R&D Center

The global R&D efforts are headquartered at the Silicon Valley R&D Center in Santa Clara, CA. The Silicon Valley R&D Center brings together leading talent in sectors such as machine learning, cloud computing, big data and AI, to develop cutting-edge innovations that enhance the retail experience for their more than 300 million active customers and the hundreds of thousands of brand partners.

Innovation at JD.COM

The research and development programs focus on a number of key areas that have a meaningful impact on the business, consumers, and their partners.

JD Logistics which also target as Smart Logistics sets the global standard in the e-commerce industry for speed and quality of service. The vast majority of orders placed on JD can be delivered right to the customer's doorstep on the same day, or the day after, the order is placed – a level of service that no other company globally comes close to matching.

Underpinning this is JD's highly advanced logistics network – and they are constantly researching new innovations to enhance the experience for consumers. Smart logistics research at JD.com is led by JD-X, the logistics and automation lab. JD-X focuses on innovating the next generation of smart logistics technologies, with a particular focus on automated fulfillment capabilities including drones, autonomous delivery vehicles and automated warehouse technologies.

All the above businesses are the basic businesses of JD.com. For the latest technology adoption especially AI application within the basic businesses, we will talk them de-tailly in another chapter which is “AI application in JD.com”.

The 2018 Annual Report Analysis

The latest established annual report shows that JD.com has a continuous revenue increasing since JD.com was listed on Nasdaq in the United States in May 2014.

For the convenience of reading in Italy, I exchanged the currency from RMB to Euro.

The exchange rate has declared in the below of the chart.

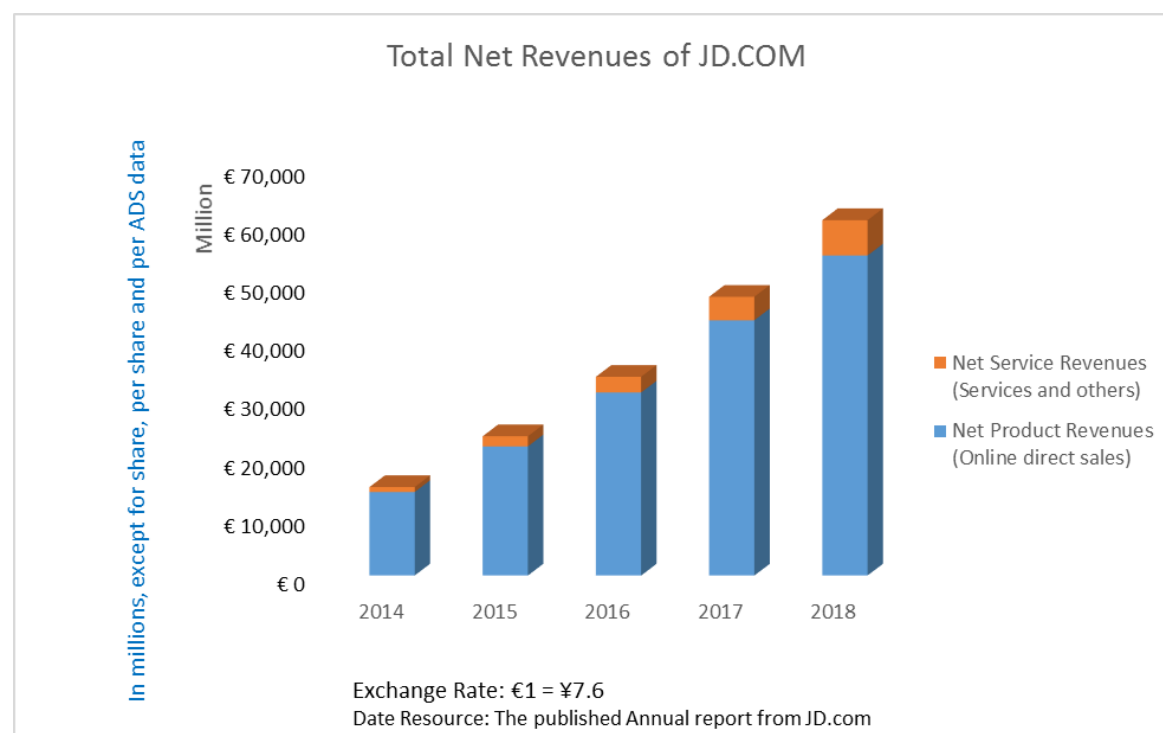


Fig 6. Total Net Revenues of JD.com

In the fourth quarter of 2018, JD.com reported net income of 134.8 billion yuan (\$19.6 billion), up 22.4% from the same period in 2017. Net product revenue increased 20.1 percent, while net service revenue increased 45.7 percent compared to the fourth quarter of 2017 and the fourth quarter of 2018. The much-increased revenue on service implies the business of logistic has started to play its important role in JD group.

This overview of the JD.com from the annual report just shows the total revenues of the company, which is superficial. For the detailed information of the business analysis, we need to do further research and look deeper of the financial report.

"JD.com continued to outperform the industry in our key product categories in 2018," said Richard Liu, chairman and chief executive officer of JD.com. "Our investment in technology enhances the customer experience and improves operational efficiency. As JD drives the growth of its retail business, we are committed to optimizing our business resources and creating long-term value for our shareholders."

The investment on Technology

Extracting the expenses of each items from JD.com annual report, we could draw the below pie chart to show the expense growth ratio from 2017 to 2018 in JD.com. Although the total investment number of other items may higher than technology and content, that's because of the other business, representative example, direct sales business is the cash cow for JD. Now we are trying to have an idea that how JD will layout the businesses in the future by seeing which item they invest more than before, find out the biggest expense growth ratio during these years.

It's significantly that the technology and content expenses increased by 82.6% from RMB6,652 million in 2017 to RMB12,144 million (Euro 1,597 million) in 2018. We could have a direct viewing impression that JD is focusing on the technology research and development.

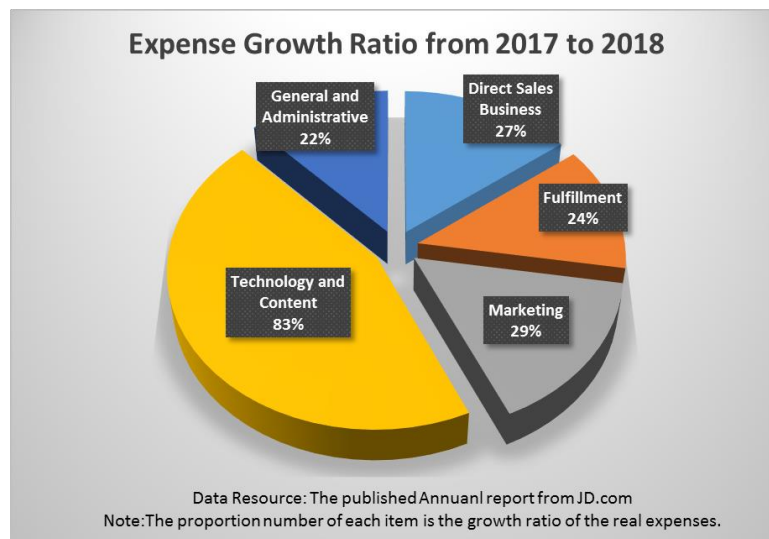


Fig 7. Expense Growth Ratio From 2017 to 2018

How JD.com compete in AI area

"Overall, we saw healthy revenue and earnings performance in the fourth quarter, reflecting our balanced approach to financial discipline and investments in the future," said Sidney Huang, chief financial officer of JD.com. "In particular, our core JD Mall business continues to grow and improve margins. We focus on developing industry-leading technological innovation and infrastructure to improve future efficiency and economies of scale. "

As the implication we've got from the previous annual report analysis, we know one of the key business plan of JD.com is the technology research and development.

When it comes to AI, researchers believe the technology will become an important driver of business strategy. Its potential to reduce costs (and therefore prices) of products and services, as well as increase customer focus, means that AI's importance as a driver of business growth and competitive advantages will continue to climb.

There's a common view, that AI revolution isn't even the future at this point, it's happening now and if your business isn't on the bandwagon, it's already falling behind.

Before we get into the analysis of the AI application in JD.com, we could do have an overall view of the AI technology used in the E-commerce industry. After that, we will have a look at the AI application in JD.com. To see what kind of work had done by JD.com, and what they are going to do in terms of AI technology.

The AI in E-commerce industry analysis

Based on Accenture's report of "How AI Boosts Industry Profits and Innovation", the analysis was done by reflecting the annual growth rates in 2035 of gross value added (a close approximation of GDP), comparing baseline growth in 2035 to an artificial intelligence scenario where AI has been absorbed into the economy. Here we could have a view on the economic impact of artificial intelligence in wholesale and retail industry. Before entering an industry, the company must have enough information on the industry, need to do the business market assessment, have a clear recognition on the competitive dynamics of that industry.

Artificial Intelligence is not a new word in these years, actually it occurred for many years. Based on the record about patents related to AI technology, it occurred before 1996. And the growth in patent families usually follows scientific publications, roughly, the rising started from 1996, and the number of scientific publications always higher than the patent families.

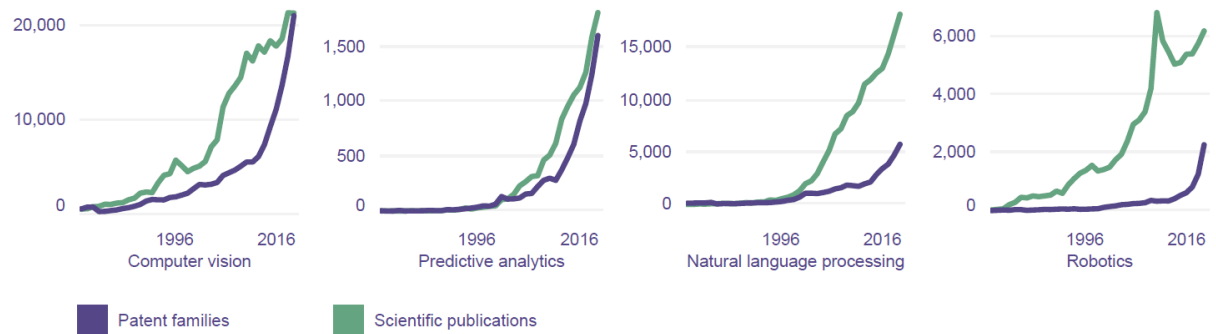


Fig 8. Functional application patent families and scientific publications by earliest priority year and publication year, respectively

(Sourced: WIPO)

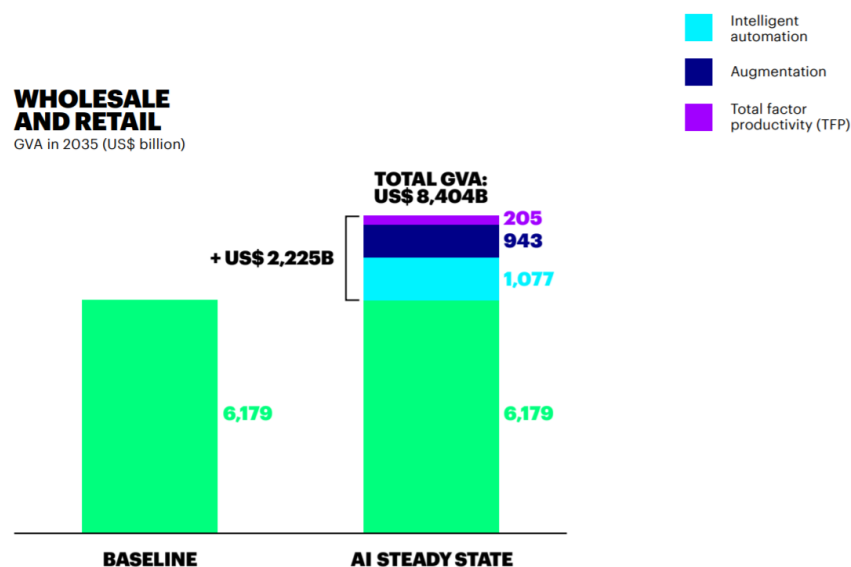


Fig 9. Annual Growth Rates in 2035 of Gross Value Added

(Source: Accenture and Frontier Economics)

To forecast the demand and supply condition of AI Technology in e-commerce industry, consequently, the financial returns from the investment on AI, we are going to do the market assessment which could help us to understand the market conditions.

Industry analysis could help the company get a sense of what is happening in the industry, provide the theory support for the company to make the planning by indicating

the competitive degree of the industry and costs connected with entrance and exit of the industry. By doing the research of the industry analysis, it could contribute to identify the current industry stage, whether the industry will continue to grow or it has already reached to the saturation phase. To help the company make a decision whether it's a good timing to enter the industry.

Since the industry analysis is a subjective method, we are not going to give an absolute and precise summary after the analysis. What the goal we want to achieve is to have a better understanding on the strategic planning of JD.com invest AI technology in e-commerce industry.

Technology – X Department

Team

Zhou Bo Wen , the director of JD AI platform and Research. Before joining in JD.com, he was the director of the AI Foundations laboratory of IBM Research in New York.

Dr. Zhou has decades of experience as a scientist and business leader in natural language technology, machine learning and artificial intelligence. He has published more than 100 papers in top peer-reviewed journals and conference proceedings and has received more than 10 patents. He is a leading researcher in deep natural language understanding and speech translation. Since 2014, he has led a series of researches on natural language processing models and theories based on deep learning. In 2003, he developed the world's first embedded large vocabulary speech-to-speech two-way real-time translation system and won numerous IBM outstanding technology innovation awards for his research work.

Dr. He Xiao Dong is vice general manager of JD AI research institute, head of deep learning, NLP and voice lab, and vice President of technology at JD.com. He is also an associate professor at the university of Washington (Seattle). In addition, Dr. He Xiaodong worked at Microsoft for about 15 years before joining JD.com. He was the principal researcher and research manager of DLTC at Microsoft research in Redmond.

Dr. He Xiao Dong received his bachelor's degree from Tsinghua university in 1996, his master's degree from the Chinese academy of sciences (Beijing) in 1999, and his doctor's degree from the university of Missouri, Columbia in 2003. His research interests are focused on the field of artificial intelligence, including deep learning, natural language, computer vision, speech, information retrieval and knowledge representation. He has published more than 100 papers in ACL, EMNLP, NAACL, CVPR, SIGIR, WWW, CIKM, NIPS, ICLR, ICASSP, Proc and other aspects, and he was officially selected as an IEEE Fellow on November 22, 2018. He is also the co-inventor of DSSM, now widely used in language, vision, IR and knowledge expression tasks. He also led the development of CaptionBot, the world's first image caption cloud service deployed in 2016.

Dr. Mei Tao, vice President of JD AI research institute and director of computer vision and multimedia laboratory.

Before joining JD.com, he served as a senior researcher of Microsoft research Asia. His research team has ranked first in international image and video description, recognition and search competitions for many times, and its research results have been successfully translated into key products and services of Microsoft for more than 20 times.

Dr. Mei Tao has published more than 200 papers in the field of multimedia analysis and computer vision, won the best paper award 11 times, and has more than 50 U.S. and international patents. And on November 22, 2018, he was officially selected as an IEEE Fellow.

There still have lots of talented and excellent stuff in JD AI research department. Such as Pei Jian, a leading big data researcher and professor of computing science at Simon Fraser University in Canada, is the head of the established data platform and product development department of JD.com. He was the leader of the AI product team in the cloud computing department of Huawei technologies co., LTD., the world's largest telecom equipment manufacturer.

Other recent hires include Bo Lifeng, former chief scientist of amazon, and Shen Yan-qing, former technology chairman of Microsoft Asia Pacific.

AI Application in JD.com

The Automatic Warehouse

Welcome to the creeping new age of automation. JD.com, in western world, there have Google, Amazon, Apple, and other scientist companies. At the same time, in China, there have BAT, which are Baidu, Alibaba, Tencent. The development of JD.com is fast, which with a respectable \$58 billion market cap in 2018, is investing aggressively to be added to the pantheon.

Executives in Beijing and Shanghai said its secret ingredient was logistics -- it created China's first east-west, north-south package delivery service that could be purchased almost anywhere (especially the tier 1 & tier 2 cities) in the country that day, as long as it was ordered before 11 am.

With heavy investment in artificial intelligence (AI) and delivery networks including the use of delivery drones and robots, JD.com is undoubtedly realized the unbelievable delivery speed. Based on the latest news that JD Logistics' recent fundraising activities have been valued at about 10 Billion dollars, signaling investor confidence in its global expansion strategy. In fact, JD.com's investment supply chain solutions, such as automated warehousing and cross-border logistics, have attracted investors and partners in southeast Asia, particularly with Japanese delivery company Yamato. This is also an evidence that the market has a strong confident on JD logistics due to the advanced technology used.

In October 2017, JD established the world's first whole-process unmanned sorting center (Amazon realized the unmanned sorting system earlier, published the video in 2014, but that's not the whole-process unmanned sorting center), realizing the automation of the entire process from product entry, storage, packaging and sorting, located in Kunshan city, Jiangsu province. The factory can process 9,000 packages per hour, achieving the same work as 180 human sorting machines, while eliminating human error, saving JD.com millions of dollars a year.



Fig 10. Autonomous bots processing parcels

(Source: JD.com)

Not only the technology is innovated, the management philosophy of logistic is advanced. JD.com uses the IWD which means Warehouse distribution integration to realize the logistic work.

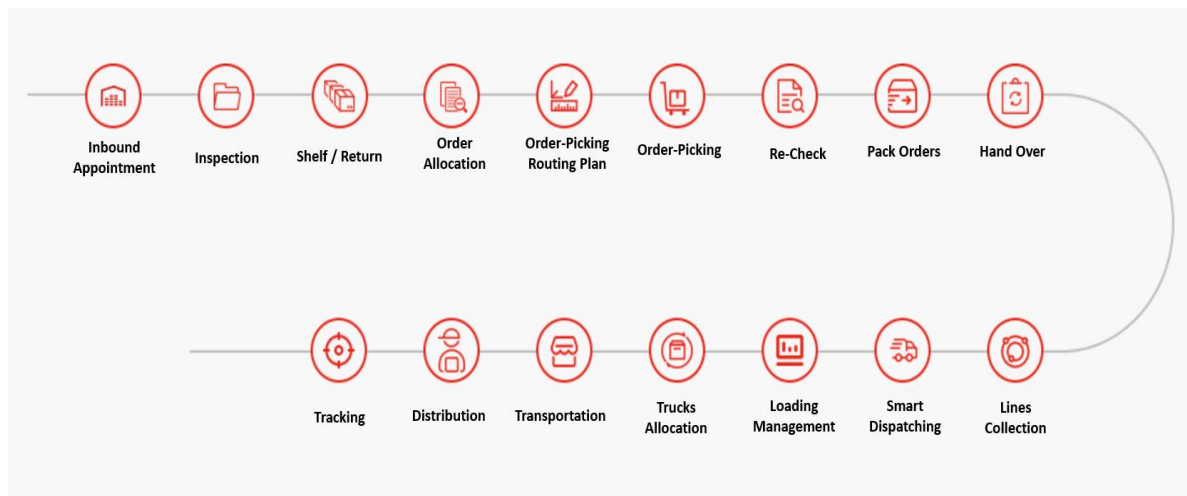


Fig 11. JD.com IWD process

JD.com had set up a large new Shanghai fulfillment center in 2018 that can organize package and ship 200,000 orders a day. It employs just four people -- all of whom work for the robot. From intelligent warehouses that process orders to autonomous truck and drone deliveries.



Fig 12. JD's first ever fully-automated sorting center.

(Source: JD.com)

Delivery Robot

Another innovation is JD's delivery robot. With a maximum range of 20km and up to five packages at a time, the delivery robots are intended to serve smaller communities, such as university campuses. Each delivery robot costs \$7,900 (50,000 yuan) and the estimated delivery cost per package is \$0.25 (1.5 yuan). It is currently undergoing pilot testing on university campuses in Beijing.



Fig 13. A JD delivery bot on the way of delivery and waiting the red light on the road

(Source: Sohu News)

Drone

To cover rural areas of China where access is restricted, JD.com has created seven different types of drones, each with different capabilities. Weighing 1,000kg and travelling 100km, the drones will be the next form of delivery for remote villages, many of whom have yet to benefit from the convenience of e-commerce. These drones eliminate the cost of transporting goods to rural areas by car, allowing better distribution of logistics resources.



Fig 14. A JD drone delivery the package to rural districts

(Source: JD.com)

Unmanned Supermarket

In addition to logistics, Alibaba and JD have moved into other areas, such as cloud solutions, supply chain financing and blockchain. One interesting area with significant investments is unmanned stores, which have become popular across the country in the last few years. Consumer data is collected using technologies such as mobile payments, face and motion recognition to identify preferences and buying habits. The stores are open 24 hours a day, seven days a week, replenishing supplies only when necessary, reducing labor costs.

In this supermarket, there have two normal way to work. The first one is scanning the QR code (which post on the wall when you at the gate of the supermarket, or you can find it online) in the first time, and authorize the payment of WeChat to JD supermarket. Then you can go to any JD supermarket by showing the code which automatic created by your phone to the gatekeeper machine, the door will open immediately,



Fig 15. JD Unmanned Supermarket

and then you can freely shop there, take anything you want, and show the code again when you leave to open the door. Once you get out of the door, the payment will be done automatically and immediately. There's no cashier to scan your product, neither you don't need to scan the product you've selected and pay the order. When you get into the supermarket, the cameras (there's lots of cameras on the ceiling) will follow you, and the detection will record what you selected, and will account the order by WeChat directly.

The second way is more ignorant, that is facial recognition. When you stand at the gate of JD unmanned supermarket, the camera scans your face and confirm your personal data. The door will open and you can take anything you want. Once you finish the shopping, you walk at the exit gate, the door opens automatically. Just leave through the designated route, the camera will scan you again, and confirm your information, in the meantime, the RFID (Radio Frequency Identification Devices) labels on the products you've selected could help the sensors recognize what you buy. When you get out the market, the order will be counted and the payment message will come to your phone. Thanks to the AI technology, everything is unmanned and unconsciously.



Fig 16. Customers are shopping in JD.com supermarket

(Source: Shejipi.com)

NeuHub Platform

Not only the single application of AI like above showing in JD.com. They are also doing the sharing, share their rich resources with public on AI development, for the individuals or the small businesses who don't have the ability to do the research and development by themselves, JD.com is helping them to be bigger by establishing this open platform. This is an open platform for everyone and every organization to start their AI business in this ecosystem.



Fig 17. Open AI platform of JD.com

(Source: JD.com)

According to JD's plan, NeuHub platform will be an inclusive and open platform, where different roles can find suitable scenes, for example, the analysis and evaluation of image quality can be realized with simple code. In terms of business, the platform can support the scientific research personnel, algorithm engineer to design new AI ability to meet user requirements, and the deepening electric business, supply chain, logistics,

finance, advertising, and other fields, explore test health, poverty alleviation, pension, government, education, culture, sports and other multidisciplinary application, focusing in the study of new technology and industry trends, latest landing project incubation industry.

It is worth noting that JD has also announced its own AI accelerator. JD will select global outstanding AI startups to quickly access JD system. According to Zhou Bowen's speaking, JD will not only open up resources, but also make more investments and acquire more AI start-ups in the future.

We can say, JD is quite smart. As mentioned in the part of Competitor analysis, JD is not the leaders in AI area, but they are doing their best to moving fast. The power and influence for the single organization is limited, but if they share the platform to public, lots of users could work on it. It's a win-win situation, one side, JD really help lots of start-ups build their business, provide them benefit. On the other hand, their work raises on the JD's platform, they can't leave JD.com, the start-ups help JD become bigger and stronger. That is to say, JD hopes to establish its own technical camp with the AI open platform NeuHub, and strengthen JD's AI ecology with the acquisition and investment of iso-structured AI accelerator.

In this "Sharing" times, this is a quick way to boost their business and it's a sustainable strategy to develop their AI world.

AI is not perfect

- The security and privacy of AI

Along with the application of artificial intelligence technology becomes more and more extensive, the vulnerability of artificial intelligence is gradually exposed.

As long as the network brings convenience to people's daily life. The personal data is becoming more and more important to do lots of activities. Once there have the personal data, it's quite risky to be stolen and defrauded.

The increasing number of cyber-crimes reminds people that cybersecurity is a serious issue in the modern life.

In the future, when everything is connected -- every container, every truck, even every

manhole cover in a city -- attacks at the virtual level could cause damage to physical space.

In fact, hijacking smart devices has become an important means of cyber-attacks. Cyber security experts say many unmanned systems use artificial intelligence technology, which can pose serious security problems if hijacked. A smart car, for example, can be connected to a factory server and controlled remotely from a mobile phone. Owners need to update their software regularly to ensure the car's driving mode, which could be hijacked by the Internet.

Moreover, image and sound synthesis breed new risks. Experts with the national Internet emergency response center said that with the development of technology, synthetic images and voices are becoming more realistic. If this technology is used for online fraud, to fabricate faces and voices, it is very scary.

The development and applications of AI involve more personal data than before, similar with any new frontier, AI brings a bunch of artifacts, related to the nuances and caveats of them that pose a challenge from a security point view.

There have two diagrams below shows the typical artifacts and stakeholder clusters involved at various stages of an end to end AI workflow.

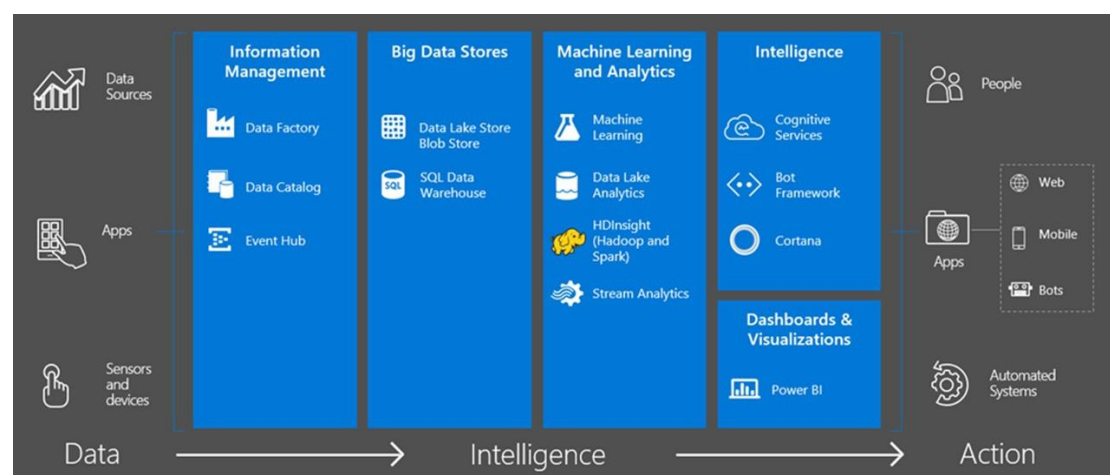


Fig 18. The End to End workflow

(Source: Microsoft)

This diagram comes from the Microsoft Azure Documentation (same with the next diagram) shows lots of systems, data formats, tools, stakeholders, and so on involved during the workflow from data to intelligence end with action.

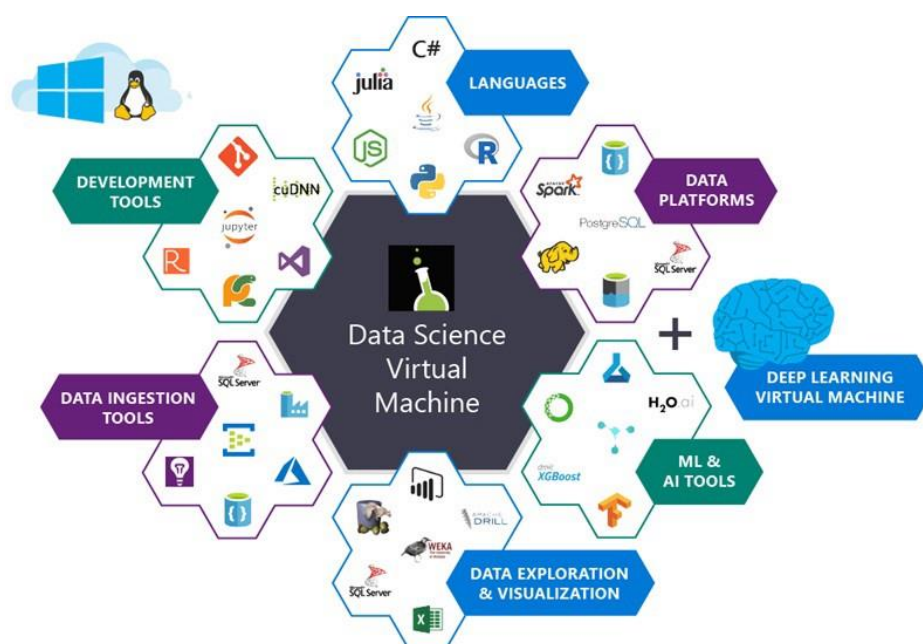


Fig 19. The diaspora of development tools, platforms, frameworks, data handling, etc.

(Source: Microsoft)

The above two diagrams highlight the following characteristics of the nature and types of security challenges:

- There is a huge ecosystem (Both old and new) of tools, languages, frameworks
 - with capabilities from data ingestion, data preprocessing, modeling, model evaluation, integration, visualization, packaging, deployment. and so on.
- From traditional software engineers to machine learning engineers, data scientists and statisticians, multiple stakeholder groups are involved in any project.
- A complete working solution usually involves multiple systems coupled together at various interfaces

From a security perspective, this is a lot of new and unknown things, put aside the details and internals of AI at this moment, even the traditional network security is difficult to do well in such an environment. This is because it often takes time for new tools and frameworks to become "secure enough," and new stakeholder groups may not always have a unified understanding or awareness of security. Furthermore, there had a history of interesting security failures for the solutions involving many systems and interfaces.

Let's look at the 'data security' aspect. The following features of data security challenges

in the context of AI stand out:

- In most solutions, there is huge amounts of business data involved. We're talking about millions, even billions of records. And also, depending on the problem area, these can be of great value (for example, a broker's past dealings) or sensitivity (for example, medical records from a series of hospitals)
- In addition, not only are large amounts of data involved, but all attributes/aspects (dimensions) of the data are considered.
- Unlike traditional software engineering, "virtual data" cannot normally be used in AI and ML (Machine learning) for the test/pre-production phase. (the key point is to learn from the data!) So, in all aspects of the ecosystem, we are talking about various stakeholders and systems that process valuable real data.
- With AI already in business, it works with the hundreds of hitherto obscure data and record formats (and corresponding readers, encoders and decoders). There is a rich history of security vulnerabilities in a few popular coding formats.

It's not difficult to imagine that network attackers control artificial intelligence algorithms through vulnerabilities, realize physical hardware manipulation, implement public opinion guidance, create false images or influence, create information noise, and cause security risks.

On the other side, the risk from AI itself. The movies like <I, robot> will not just a fiction story in the future. Facts show that deep learning of artificial intelligence through algorithms and big data does not exclude the possibility of evolving "self-consciousness", assisting or even replacing human beings to make analysis and decisions, which is prone to counter-cannibalism risk.

In 2017, two artificial intelligence robots in the lab of Facebook, an American social media platform, used machine learning to talk to each other, and constantly upgraded their dialogue strategies, gradually developing a language that can be understood by machines but cannot be understood by humans.

In the era of rapid development of artificial intelligence, security issues are increasingly prominent, we need to strengthen the study and prevention of potential risks, effectively

safeguard the interests of the people and national security, to ensure that artificial intelligence is safe, reliable and controllable.

In network security protection, technical research should be strengthened to establish effective security protection against network attacks.

In order to ensure the construction of the rule of law, macro-legislation should be arranged in time. The development of artificial intelligence is inseparable from an artificial intelligence law reflecting the needs of The Times and a legal and regulatory system composed of supporting regulations.

In the meantime, it's needed to further improve the precise and pragmatic policy support system and build policy clusters. Sun You Hai, the dean of the law school of Tianjin university said, to further upgrade the whole process of the safety prevention and control system, and develop industry safety standards, do emergency preparedness plan, increase the prevention and control of key areas, increase the comprehensive control of code data, algorithm and other key areas, to ensure technical safety, product safety, data safety and application safety.

How JD.com deal with the risk of AI

In the year of 2018, JD. Com security revealed some new research findings in the field of AI security which could be some kind of the security concerns releasing for the users.

- **Black box interpretation technology, makes the AI decision traceable**

In fact, after AI was applied to the field of security, the industry could not avoid a difficult question: is AI a scientific decision or a big gamble? On the one hand, with deep learning, AI seems to be able to approach the truth indefinitely. On the other hand, its decisions are closed, and one cannot judge whether they are justified or not. It's different with other fields, the irreversibility of security makes people more cautious about the application of AI.

Taking e-commerce as an example, "we cannot freeze an account because of a simple machine decision, nor can we determine that a software contains malicious code because of a machine's decision. "JingDong security technology experts said. In view of

this, JingDong security lab and professor Xinyu Xing's team at Penn state university jointly launched a black box interpretation technology based on the gaussian mixture model. With the approximation and interpretation ability of gaussian model, it can provide accurate interpretation no matter which deep learning model is used by AI system. It ensures that the AI system is reasonable in fighting against black production, and minimizes the "accidental injury" to users' normal behaviors. In addition, the solution can also help ai-driven security system to automatically patch, and achieve self-repair of AI security system, using AI to strengthen the AI.

- **Deep learning techniques deal with program crashes, bringing AI into the realm of traditional security**

Every day, large and small servers may produce hundreds of program crashes, which greatly affects the normal business of an enterprise. If not handled properly, these crashing programs can even jeopardize the customer experience. Worldwide, the cost of debugging software has risen to \$312 billion a year, and developers spend 50 percent of their programming time finding and fixing bugs, identifying the root causes of software crashes, analyzing crash dumps, and identifying the execution paths that led to the crashes.

In this regard, JingDong security put forward the deep learning technology to properly deal with the program crash. According to security experts at jd.com, the computer system automatically generates a core dump report when the program crashes. The report covers the state of memory when the program crashes and the computer instructions that were executed. JingDong security USES deep learning technology to analyze the memory state and every instruction in the report and force the program to execute in reverse, thus depicting every state of the program before the crash with AI technology. Through such operations, the AI system will automatically find the root cause of the program crash and direct security researchers to react quickly and complete the quick repair of the software system.

With the help of this technology, JingDong security minimizes the labor and time costs required to respond to program crashes, and minimizes the degradation of user

experience caused by attacks.

- AI fight with AI, E-commerce offensive and defensive war continues to escalate

At present, there are millions of criminals directly or indirectly involved in cybercrime in China. Under the "power" of AI technology, the criminal behaviors of cybercrime organizations show highly organized, large-scale and intelligent characteristics. At a security summit, JingDong security introduced in detail the methods of AI attack and defense confrontation and program fault behavior analysis with the black industry, providing valuable experience for the security industry.

According to the security technology expert introduction, JingDong, in tackling the scalpers JingDong safety adopted "forcing", such as using the crawler technology to intercept black spiders, monitor the activities of the black production, obtain relevant information, such as the production tools, platform to intercept in advance, and through the study of the production tool of key nodes for reinforcement.

In the process of machine registration, JingDong security adopts a three-track approach of black production intelligence, unsupervised learning + supervised learning and man-machine identification, through which tools, technologies and scenarios of actual attacks are understood. Use the combination of unsupervised and supervised learning to reduce the rate of misjudgment and ensure the experience of real users; Based on the man-machine recognition of JingDong multiple scenes, the behavioral characteristics of machine registration are identified and marked.

In the picture verification code confrontation, JingDong security actively use AI counterattack. The first step of the counterattack is to extract the model, because the black production platform will use the AI model for image verification. Based on this insight, jd.com security USES as few queries as possible to provide the black production system with some image verification codes for identification. Through these marking, the weakness of the black production model is automatically found, the approximate model is obtained, and then the antagonistic samples are produced. The newly generated image

captcha will not cause confusion in the identification of real people, but the AI platform will misjudge the code when it is forced, thus defeating machine learning of black AI.

- AI Open source sharing, build a borderless doctor organization of security circle

With the increasing prevalence of cyber hacking, more and more people realize that no one can be immune from the threat of global cyber security. In the era of great security supported by AI technology, open source sharing of security technology and building a new network security ecology may be the only way to deal with black production.

Not all enterprises can have massive user data and rich application scenarios like JD.COM. Many small and medium-sized enterprises have been under the "safety poverty line" for a long time due to their inability to afford security research funds. Therefore, the importance and urgency of open source sharing can be seen.

While some AI security tools are currently open source, the overall number is still small. With the reporter's interview, JingDong safety chief scientist Tony Lee said: "more and more white hat hackers spirit strong push freely shared return, we hope it like the spirit thrives as the Olympic flame, the mobilization of the entire community to share the spirit to each other, constantly open up more security ideas, methods, tools, etc., establish a safety strap medicines sans frontiers, thereby to win completely safe out of the poverty situation to be completed.

Competitors Analysis

Considering the situation that up to now, the main arena of JD.com is in China, the main competitors come from the local companies. Of course, they are doing the business to expand overseas, especially the Southern Asia. Since we are not doing the analysis of business expansion, this chapter we will focus on the local market competitors instead of global scope to see the position of JD.com on the 3 main areas, E-commerce platforms, Logistic systems and AI technology research and development.

E-commerce platforms

As long as the E-commerce is more and more popular in Chinese modern life, the market potential and profit of this industry is huge, more and more platforms come into this area. And thus, the competition becomes more and more fierce.

In the area of E-commerce platform in China, JD.com has lots of competitors. Taobao, Tmall, Pinduoduo, Suning, NetEase Kaola, Mogujie, etc.

Based on the data published in 2018, without accident, Taobao is still the top 1 E-commerce platform in China with 540.27 Million average MAU (Monthly Active Users) and 58.2% by sales share.

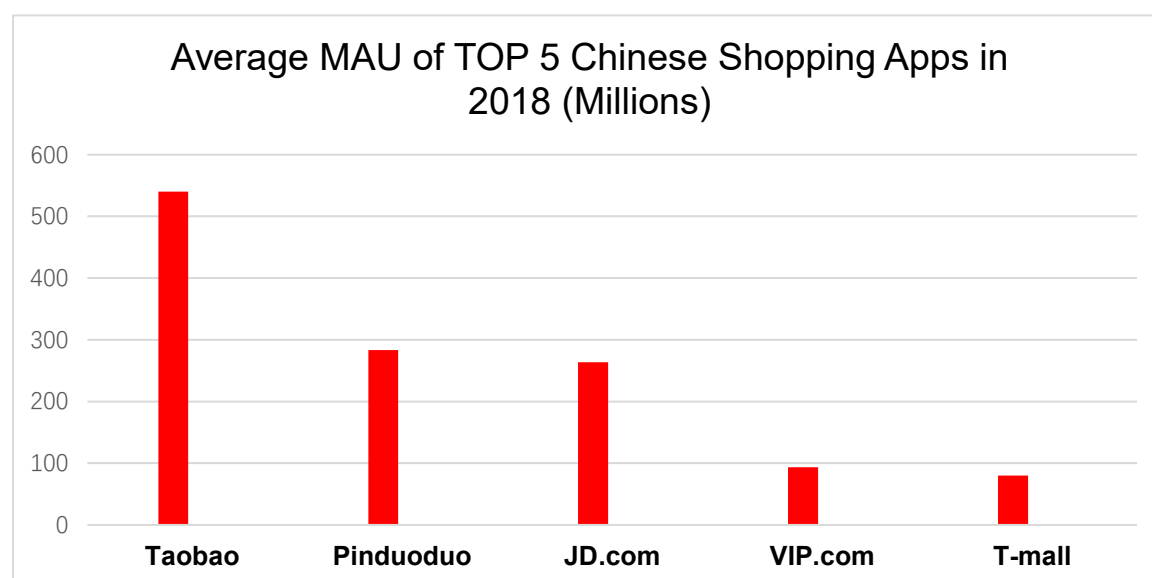


Fig 20. Average MAU of TOP 5 Chinese Shopping Apps in 2018

(Data Source: China Internet Watch)



Fig 21. The main E-commerce retailers in China

(Source: Statista)

- Low-middle Class

For the customer segment is the low-middle class. Both Taobao and Pinduoduo are strong competitors.

The business of Taobao is C2C, that makes Taobao has more active users than other platform from the working mechanism. As a symbolic of E-commerce in China, Taobao has the highest shares in the market as a matter of course. But the fast rising of Pinduoduo is worth to take more attention which also invested by Tencent like JD. Pinduoduo is a newly-rising platform, the biggest highlight is incredible low price. The turning point for Pinduoduo is the integration of social components into the traditional online shopping process, which the company calls the "team purchase" (Tuan Gou in Chinese) model.

By sharing Pinduoduo's product information through the social networks like QQ and WeChat, users can invite their friends to form a shopping team to get a lower purchase price. This mechanism keeps users motivated and better attracts users to have a more interactive and dynamic shopping experience. Combined with other incentives such as

cash, coupons, lotteries and free products, Pinduoduo manages to acquire users at a fraction of the cost. Pinduoduo soon became a viral sensation in China. The price on that platform is extremely low, the discount would be up to 10%. Thanks to the company's bulk sales model, it's easy for sellers to place large orders and leave more room for them to cut prices. Meanwhile, the difference between Taobao and Pinduoduo is that: Taobao's interface is search-based and centered on multiple product displays, while Pinduoduo is more akin to a news feed, so more exposure to single products, making it easy to create 'hot style' [Bao Kuan in Chinese]. Taobao has more products on the market, but Pinduoduo focuses on bestsellers that attract more buyers. The biggest highlight of Pinduoduo is also the biggest weakness for it. The incredible low price comes with the low quality of the product. It's not saying all the products on Pinduoduo are of low quality, and not deserve to be bought. Just comparing with other platforms, Pinduoduo gives the public image like the product with low level, low quality and the customers more like low income cluster.

As long as China's middle class is rising, the customers care more about quality and brand instead of price, right now, JD.com is more appropriate for the trend. Of course, Alibaba knows this information, their business Tmall has already stepped into the middle-high class segment to share the market cake.

- Middle-high Class

For the middle-high class segment, the biggest competitor for JD.com is Tmall which is owned by Alibaba, same with Taobao. While the business model of Tmall is B2C, it's just a platform, while JD.com is more like an agency to earn the intermediate spread. The product quality of JD.com is more reliable. On the other hand, JD.com also provides the service to brand owners, allows them to open flagship stores on their platform, same with Tmall as a B2C platform. While all of these brand owners are validated by JD.com to guarantee the quality. And Tmall products are more clothes and food, most of them are small items. While if someone wants to buy some bigger things, especially electronic products, JD.com would have higher priority than Tmall.

for consumers. As everyone's business is growing, the categories for both platform are much richer than before, the competition in every category will be more stiff.

- 3C Area

The competitor in 3C area is Suning, and the competitor of oversea brand products is NetEase Kaola, both of these platform are invested by Alibaba, while the scale of those two platform are not as large as JD.com and the brand reputation is lower. Eventhough JD.com has its own target customer segment for the middle-high class right now, in the wake of business expanding, the product category is larger than before, the edge of customer segment is becoming blurry. And we can see, no matter in which area, the biggest competitor is Alibaba. And JD.com is invested by Tencent. Furthermore we can say, Alibaba and Tencent are the biggest rival in every area. One more complementary, in terms of payment, Alibaba has Alipay, Tencent has WeChat Pay.

Logistic System

For JD.com, one of their jokers is logistic system. As we know, Logistic is the main part of E-commerce. Alibaba built their logistic system too which called "Cai Niao Guo Guo", and also they used AI technology into logistic system to improve the delivery efficient. As Jack Ma said at the global intelligent logistics summit in hangzhou, their logistics subsidiary Cai Niao will eventually ensure one-day domestic delivery and three-day delivery around the world. Alibaba is investing billions of dollars in logistics to cut delivery times in China and around the world to less than three days. Honestly speaking, this is a bomb to JD.com. Alibaba fight with JD.com on their key competitiveness.

Shunfeng Logistic, the second largest logistic company in China which is famous for the high-quality service and stepped into the E-commerce these years. Shunfeng has a very good reputation in Logistic industry. For the future development, JD.com has to face the challenge from Shunfeng.

Logistic	Efficiency	Reliable	Popular	Price	Service	Safety	Coverage
JD	1	1			1	1	1
Cai Niao(Alibaba)			1	1			1
Shun Feng		1			1	1	

Fig 22. Grades for three main logistics

In this table, there have two things need to be declared. The first one, I just evaluate the logistic service within the E-commerce area. For the efficiency of personal package to deliver, the efficient of Shunfen would be the number one. The second one, I just make a comparison between these 3 logistics, it's not saying that there only have 3 logistics in the market. It just lists out the 3 logistics we are doing the analysis here. There still have lots of big logistics such as "Yuan Tong" "EMS" "Shen Tong" "Zhong Tong" "Bai Shi Hui Tong" "Yun Da", etc. Both of them occupy a large share of the market.

AI technology

It's not only JD doing the research on AI, but almost every technology company. Alibaba, Tencent, Baidu, Huawei, etc. inside of China. Amazon, Google, Apple, etc globally. Everyone fights to occupy the commanding height. The competition is fierce. And the threats come from all directions.

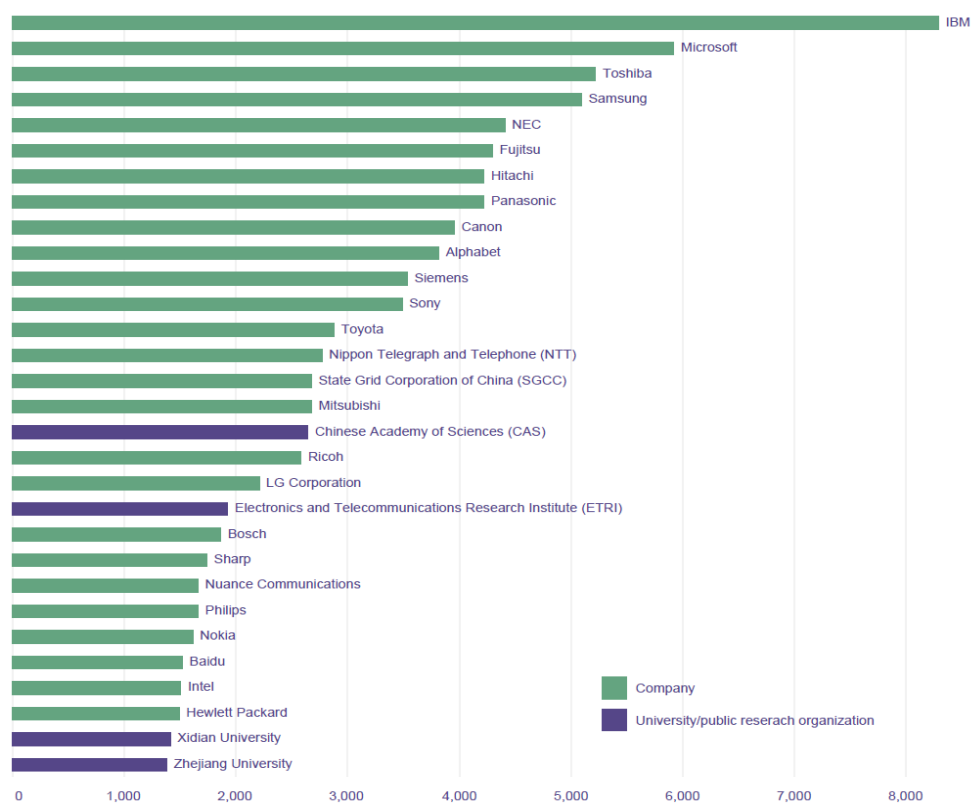
To be honesty, JD.com is just in the early stage of AI technology compared with other scientific companies, the owned patent number is not ranked in the top list yet.

Here's the picture comes from WIPO to show the main companies with most of AI technology Intellectual Patents globally.

From the picture of top 30 patents applicants, it looks that there's not much Chinese companies on it. But it doesn't mean there don't have lots competitors for JD.com in AI area within China.

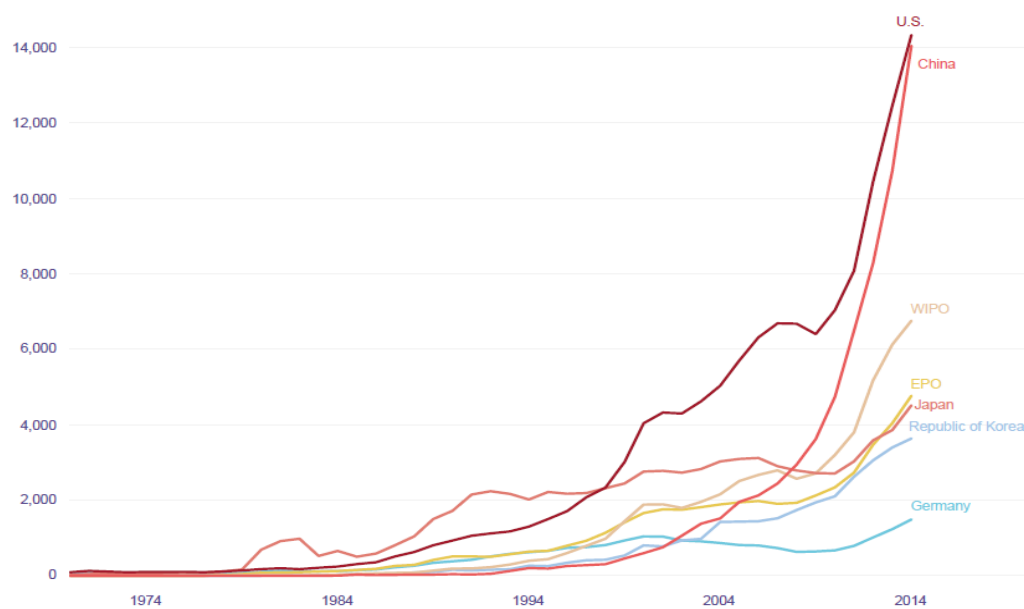
Let's come to another picture of patents application which shows China had already caught up American to be the first one. Combine with the previous chart which implies even the single company application is not very much but there have lots of companies to apply the AI patents, means the AI competition in China is fierce.

Companies represent 26 of the top 30 AI patent applicants worldwide



Note: Fujitsu includes PFU; Panasonic includes Sanyo; Alphabet includes Google, Deepmind Technologies, Waymo and X Development; Toyota includes Denso; and Nokia includes Alcatel

Fig 23. Top 30 patent applicants by number of patent families
(Source: WIPO)



Note: EPO is the European Patent Office. WIPO refers to PCT applications.

Fig 24. Number of patent applications for different offices by earliest priority date
(Source: WIPO)

The SWOT analysis of JD.com

Strengths

Brand Reputation

The biggest competitor of JD.com is Alibaba, which is the biggest e-commerce platform in China. There have two big sub-brands of Alibaba, Taobao and Tmall. The business model of Taobao is different with JD.com, Taobao is just a C2C platform, the product prices are normally lower. It's very easy to boost the business since the procedure to open an online store on Taobao is easy, the database flow is quite big. While there has a problem, that the provided product quality can't be guaranteed. Tmall has a similar business model with JD.com, this is a B2C platform, the online store is licensed, they are online brand store. But it focuses on food, clothing more than JD.com. JD.com focuses on 3C products more. And Tmall started late than JD.com. And what the difference is that Tmall is still just a platform without control the product directly, but JD.com has the self-run model, not only provide the platform and leave the other responsibilities away. That means JD.com select and corporate with OEMs, and takes the role of quality control management, they buy the product and store them in their warehouses. Comparing with Alibaba's business model, people believe the quality of JD.com is better.

On the other hand, in contrast with Alibaba, JD.com contributed lots of effort on overseas brand cooperation, which competitor of this area in China is NetEase Kaola, which acquired by Alibaba with 2 Billion Dollars in 2019.

JD.com's brands have higher trust in many foreign platforms, and these brands may choose to cooperate with JD.com's self-run model in priority. Self-run enterprise is very important for category management and team selection ability. JD.com has such ability, because they have been self-run for 16 years.

Annual active customer accounts

Based on the data of Annual report, JD.com has a huge use base, increased to more than 300 million within twelve months at the end of December 31, 2018 from the number of 292.5 million on December 31, 2017.

On the other hand, the fourth quarter and the third quarter active customer accounts of 2018, respectively increased by 20% and 22%, compared to the same periods in 2017.

More and more Cooperation

"In the next 5-10 years, we hope to build the Global Smart Supply Chain basic network (GSSC) with all sectors of society to promote the intelligent development of the global supply chain, promote the transformation and upgrading of social business forms, reduce social costs and improve circulation efficiency. Wang Zhen Hui, CEO of JD logistics, said at the 2018 global smart logistics summit on oct 18.



Fig 25. The Mission of JD GSSC

(Source: JD.com)

JD logistics supply chain is to GSSC, and their vision is focusing on a global scale to procurement, production, design, optimizing the whole chain of logistics, the model is based on technology and innovation, business flow, logistics, cash flow, information flow, etc., hand in hand with more partners to improve the efficiency of the supply chain of the whole society, saving the cost of supply chain, the social logistics cost down to less than 5%.

"Our goal is to build a dual 48-hour channel across the globe to reach the whole world in 48 hours for China, and to improve the local logistics efficiency of other countries in the world, to achieve local 48-hour delivery, and to help Chinese made products to go global and global goods to enter China." Mr. Wang said. At present, it has gradually led the global timeliness and service landing in Indonesia, Thailand, Malaysia, the

United States, such as has opened 211 limited time service in Bangkok, local consumers can also enjoy the "morning order, afternoon delivery".

Bangkok - JD.com has teamed up with leading Thai retailer central group to launch a digital wallet platform to promote cashless payments in southeast Asian countries, partners announced on Tuesday.

Approved by Thailand's central bank, the Dolfin wallet will be online in two to three months. The platform, which makes payments by reading QR codes on smartphones and other devices, will be operated by Central JD Money, a subsidiary of Central group, and JD Fintech holdings, a joint venture of JD.

JD.com, is looking to develop southeast Asian markets and provide basic systems technology. For its part, for Thailand side, they hope to strengthen its digital operations by leveraging the expertise of the Beijing group.

Bangkok Bank and Kasikornbank will work with Dolfin. The service will connect to Prompt Pay, the Thai government's interbank mobile payment system.

By the end of the year 2019, the service will introduce facial recognition to authenticate users in place of passwords.

Technology

The one of the main long-term strategic targets for JD.com is transferring to a technology-driven company. The latest E-commerce platform need to marketing from the huge data chain, obtain useful information for consumer demand, and help the upstream manufacturers to make products more suitable for consumer demand through data analysis, so as to help break through the offline scene and empower the real economy through online data. Also, the big data analysis used in other business.

The advanced technology used in every business units is big highlight of JD's image. Using the advanced technology to continuously improve the work performance and increase customer's experience when they using JD's service is one of the most competitive advantages for JD.com.

For the detailed information, it has already stated in the name of “Technology -X department” under the chapter “how JD.com compete in AI area”. There’s no need to repeat the same thing.

Product

The biggest competitor of JD.com in China is the sub-brand of Alibaba, Taobao and Tmall.

In terms of products, there is no need to mention the richness of Taobao’s categories. From clothing, home appliances, 3C, home furnishers, general merchandise to automobiles, "omnipotent Taobao" can meet all requirements. This is mainly because Alibaba does not deal with the products directly, and all SKU (Stock Keeping Unit) are provided by sellers on the platform. Sellers will naturally take the market demand as the orientation, so finally formed a category prosperity of the market; Comparatively speaking, JD.com and Tmall, which have similar modes, set higher requirements on the quality and brand of commodities, with higher threshold and fewer categories. JingDong in particular is self-run, category expansion costs are very high. Therefore, from the perspective of category richness, JD.com does not have an advantage.

However, in terms of product quality, JingDong has stronger control over products. JingDong has long been to "quality goods trading positions", especially in the 3C, household appliances, such as standard, although it is sometimes get caught up in events such as fake, refurbished goods, at the same time, the third-party platform has also revealed the existence of supply fake businesses, but compared to Taobao fake gray, fake and real product both present situation of coexistence of phony. JingDong on "quality goods" image clearly has more advantages.

When e-commerce started in China, the price is everything, and Taobao’s rapid rise was due to the grassroots quality of low price. But as competition among merchants intensifies and costs soar, past low prices no longer have a price advantage. In addition, the domestic consumption potential is being released, and the pursuit of products with brands and guaranteed quality is the mainstream consumption demand in the future. Therefore, from the perspective of commodity quality alone, JingDong model

has certain advantages. Of course, realizing that B2C is the future of Alibaba, Alibaba has spared no effort to develop Tmall in recent years. However, according to the current situation, Tmall is better at clothing and other categories. For 3C, home appliances, the strength of JingDong is stronger.

Consumers in the U.S. or Europe may take the authenticity and safety of the products they buy for granted, but being able to order food and children's products from the smartphones of companies that guarantee these quality problems has huge appeal in China. Our strategy of delivering super-fast standards is faster than you get in other markets - and reliable quality is paying off in the form of breakthrough growth.

Currently, JD.com has adopted AI technology to detect the fake product online.

By using artificial intelligence technology to solve the problem of online counterfeiting and piracy. To identify counterfeit goods, it uses fake product identification modeling, image recognition technology, semantic recognition algorithm, product information database, real-time interception system and data collaboration platform. Using these advanced technologies, the most of forged goods are removed immediately.

This is mostly used for the function of B2C products. For the self-run products, JD.com validates the qualification before selling the product.

JD.com has a strict zero-tolerance policy toward counterfeit goods. They source products directly from world-leading global brands, and work tirelessly to eliminate counterfeits.

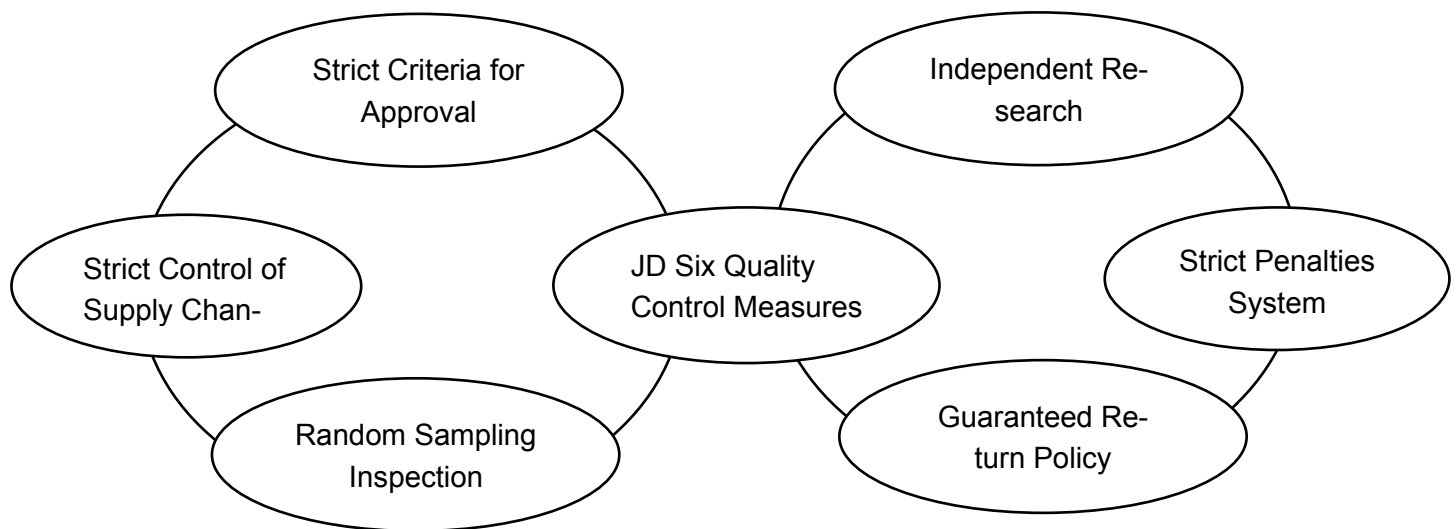


Fig 26. The quality control mechanism of JD.com

Highly Efficient logistics

There's an experiment on YouTube by a blogger, to compare Amazon and JD.com online shopping. He and his friend in China buy a phone charge cable both at 5:00pm of local time. And to see the duration of the product delivery.

On Amazon, if the customer wants to receive the product as soon as possible, the service called "Amazon Prime" is necessary, which cost 99 dollars per year. The normal delivery service of JD.com is free.

The experiment result:

The duration of Amazon delivery is 24 hours and 23mins, by paying the Amazon Prime service fee, and customer need to go to the delivery spot (a supermarket acquired by Amazon in America), and picking it by himself.

The duration of JD.com delivery is 20 hours and 32 min, without extra fee. And receive the product home, the deliveryman comes to your apartment.

Online shopping experience is based on 2 major aspects, the first one is of course, the product itself, including price and quality. The second one is timeliness. No one like to wait more than 1 week to buy something online. There are few logistic programs of JD.com to provide the best online shopping experience to customers.

211 Program

Jindong's self-run delivery service also offers the highest level of service. The most famous and impactive service is speedy "211 program," also called "211 limited time delivery"(211 Xian Shi Da) , this service refers to the fast delivery service at 2-11 o'clock per day, detailly speaking of that it provides same day delivery for orders submitted prior to 11AM and next day delivery (before 3PM) for orders submitted before 11PM, setting a new standard in China's B2C e-commerce sector.

For example, Wang is located in one of tier 1 or tier 2 cities in China, like Shanghai. And he buys something on JD.COM, this order is confirmed (means he pays the order online) on 9:30am (before 11am) in 2019-08-20, he will receive the product in the same day (2019-08-20). On the other hand, if he pays the order in the afternoon or

night, such as 10:00 pm (before 11pm), he will receive the product next day before 3:00 pm.

Right now, this service has covered the majority of biggest cities in China. Tier 1 and Tier 2. For the rural cities, this service cannot be promised.

For the weight is higher than 15kg and the volume is larger than $0.12m^3$. This service may not be enjoyed by the customers since this kind of product need more specific transportation standard.

Fixed Time Delivery

For the particular areas, normally same with 211 service area, the tier 1 and tier 2 cities, there have more advanced service called “Ding Shi Da”, the customer can enjoy the appointment distribution of three time periods within 7 days.

09:00 -- 15:00; 15:00 -- 19:00; 19:00 -- 22:00;

and you can enjoy the appointment distribution of electronic goods within 10 days.

This service is quite attractive for the customers who work outside or have special requirements on the specific receiving time.

For example, Wang has a meeting with his friend in 2019-08-21, he needs to leave home on 5:00 pm to attend the party. He buys a gift for his friend on JD.com in 2019-8-20 morning, he could choose the product delivery time as 09:00 -- 15:00. He doesn't need to worry anything, just prepare for the meeting on the other issues and receive the gift in the morning before he leaves.

Another example, Zhang is an office staff who has a nine-to-five work, it's not possible for her to receive the orders in the day. Normally the deliveryman has the similar work time with nine-to-five work, for the other e-commerce platform to solve this kind of problem by setting the specific place to leave the packages there. But there has risk to lose the product by mistaking or some unexpected destroy of product in that delivery pot. Due to this kind of situation, she wants to receive the product directly. So, she'd like to buy product on JD.com since she could select the delivery time as 19:00 -- 22:00.

For the product delivered during 19:00 -- 22:00, this service is also called Night Delivery.

This service is provided for the areas with better security situation for guaranteeing the safety of deliveryman and product when providing the more added value service.

Top speed Delivery

Top speed Delivery service (Ji Su Da) is to provide customers with a personalized pay value-added services, if customer choose Top speed Delivery services, to be successful in full payment by way of "online payment" or "pay on delivery" successfully and submit orders, then check the Top speed Delivery service, JD.com will be finish the service in time, the deliver goods to customer for what customer had provided the address of a service in 2 hours.

Remark:

- The above-mentioned services are provided for the products which controlled by JD.com
- All the above logistic service cannot be promised if there's natural disasters or other events cannot be expected, such as Traffic control, heavy rain and snow, flood, ice disaster, earthquake, holidays, 618 anniversary celebration, power failure and other factors.
- For the service districts may be adjusted based on the real situation.

The expansion to overseas

830 Theme

JD.com is stepping up efforts to build a 30-hub global supply chain within two to three years, in what analysts call "building for the future".

Huang xing, vice President of JD group, talked at the 4th Eastern Economic Forum in Vladivostok, Russia, that the company hopes to establish a global network of logistics centers in this timeframe, Russian news website sputnikns.cn reported on Tuesday.

Russia, Thailand, Vietnam, Indonesia are important market for JD, all the strategic plan and the marketing exploration procedures are ongoing.

JDThai

For implementing the global smart supply chain, the company announced the completion of its first logistics center of its kind in Thailand. On November 2, 2017. Jing-Dong group and ShangTai group formally established a joint venture company. The two sides announced that they would like to promote new retail platforms in Thailand and throughout southeast Asia. The platform operates under the "JD Central" brand and uses "jd.co.th" as its domain name. With the help of this platform, JD.com could enter all other southeast Asian countries, taking advantage of Thailand's natural resources and advantageous position. Fast paced, China's best products have the ability to be exported in bulk to the rest of southeast Asia. Fruits and other agricultural products from southeast Asia could soon arrive in China.

The ShangTai group was reported to have complete offline retail networks in Thailand, Vietnam and Europe. It has 12 million "The 1 Card" members. On this basis, it will assist JD.com in logistics, big data analysis, supply chain management, online operations and other technical aspects. All these will lead to an ecological retail system with core competitiveness. This also marks the ShangTai group into the era of online shopping.

Under the theme of "830", the company hopes that 30 such centers around the world can work together with 8 such centers in China, the textile e-commerce network, which the company says can ship goods from China to all parts of the world within 48 hours to complete local market transactions within 48 hours.

In Bangkok, customers now enjoy the same "211 service" JD offers in China - orders placed before 11am can be shipped on the same day, or the next day if they are placed before 11pm.

In addition to the practicality of such a time frame, the news shows the urgency of the company's top leaders to play a leading role in building such a global network. It's about building the future, because China's demographic dividend has peaked. The number of Internet users in China reached 802 million at the end of June, but growth slowed to single digits, the China Internet network information center said in August, 2018.

Given this situation, overseas expansion, especially in southeast Asia, where the population is young and getting richer, is crucial for Chinese e-commerce giants like JD and its larger rival Alibaba group.

In addition, the companies' global plans are fully in line with China's "One Belt and One Road" initiative (BRI), which aims to promote greater social and economic links between China and its trading partners along the route.

A company like JD will face an uphill battle if it decides to enter a mature and saturated market, but it will do well in the vast emerging markets along the BRI route.

They will also enjoy the benefits of the broader trend and also realize the initiative as a non-state sector company.

WHA-JD Alliance Co

WHA, the group's listed company, is partnering with JD Future Explore to form a joint venture to run logistics centers and support the e-commerce boom in Thailand and the region.

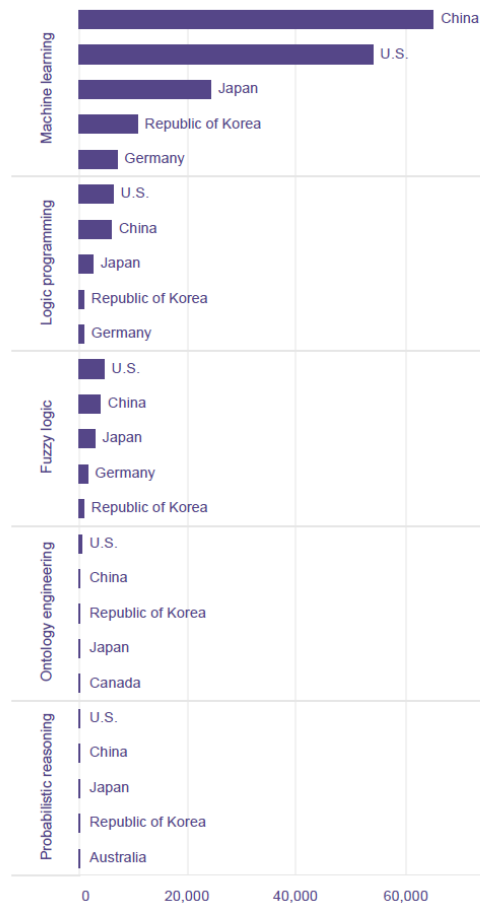
The new company, WHA-JD Alliance Co, is expected to have a registered capital of 50 million baht. WHA holds a 51 per cent stake, while JD Future is a subsidiary of Chinese Internet giant JD.

WHA-JD Alliance Co will build a custom distribution center, a warehouse building for a specific tenant.

Intellectual and Patent

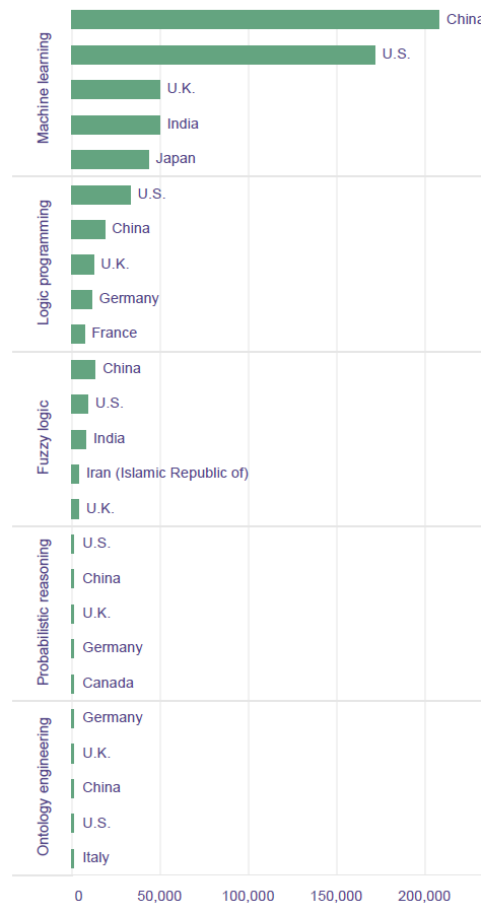
Firstly, I'd like to post a chart from WIPO (World Intellectual Property Organization), Showing the latest AI patent situation by countries. Even though it's not the owned effort for the company, but this states the overall AI technology level of the country. As we know that from porter's diamond model theory, the local resource could help the company works very well in that area no matter from the human resource or the network effect. By checking the report of WIPO, named as "Technology trends 2019: Artificial Intelligence", I paste this picture to show that AI technology research in China has already left American behind, showing the AI market in China is in the stage of becoming maturity.

China, followed by the U.S. The number of filings in logic programming is close to parity in these two offices, while there are slightly more filings in fuzzy logic in the U.S. than in China



Note: A patent may refer to more than one category

While it does not appear among the top offices for patent filing, India ranks third in fuzzy logic and fourth in machine learning scientific publications



Note: A scientific publication may refer to more than one category

Fig 27. AI situations of China compared with other countries

(source: WIPO)

Right now, the AI patents of JD.com is not as much as other companies no matter globally or just in China. As we said before, the AI technology strategy is a new strategy for JD.com, they are trying their best to catch up the market trend, and thanks to their company large scale, they are doing a very well work on AI devotion.

In the 2019 national science and technology week, JD.com digital technology disclosed the block chain patent application number for the first time. Data shows that it has applied for nearly 200 blockchain patents. Blockchain technology has been implemented in such scenarios as quality traceability, digital storage, credit network and value innovation.

Opportunities

The Urbanization of China

“Human resources are first resources”, comes from the previous Chairman of China, Jiang Zemin’s theory, which is the inheritance and development of Marxist theory of talent resources. He has consistently held that technological advancements, economic boom and social development depend on improving the quality of workers.

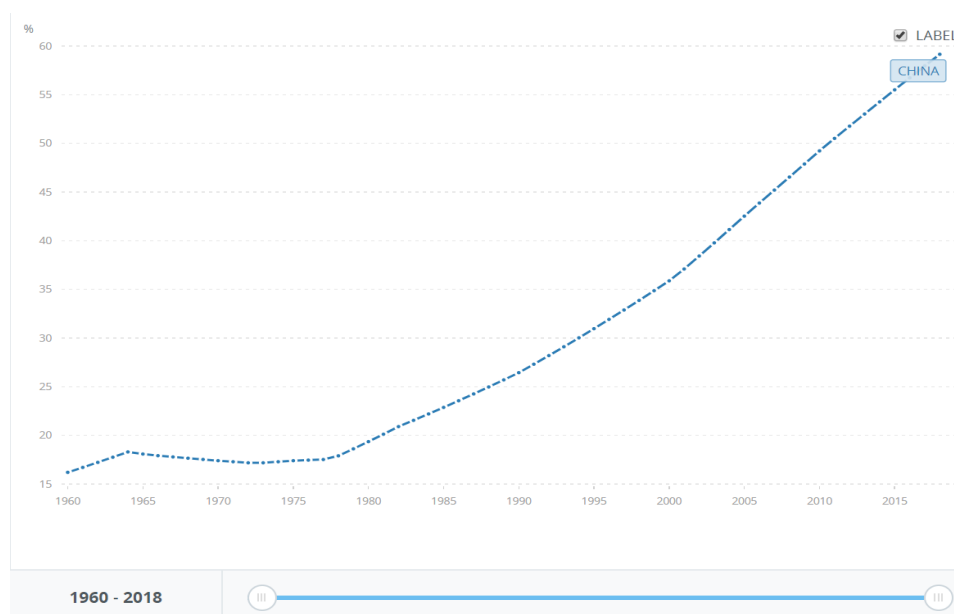


Fig 28. China’s Urban population (% of total population)

(Source: United Nations Population Division. World Urbanization Prospects: 2018 Revision)

Talking about the urbanization, we have to mention the GDP of the big cities which could be a proof to show that lots of people move to big cities. And the economics of China boost a lot in the past years.

Increasing GDP

China's economic miracle of rapid GDP growth is most evident in the explosive growth of its cities - in terms of population, but also in terms of GDP per city, as the chart shows.

Shanghai and Beijing, the southern cities of Shenzhen and Guangzhou, the central Chinese stronghold of Chongqing and its neighboring city of Chengdu, and the satellite cities of Suzhou and Hangzhou of Shanghai were among China's largest cities in terms of GDP in 2018.

Their growth reflects China's rapid economic rise. While the GDP of Shanghai was only 27.3 billion yuan in 1978, and 3.3 Trillion yuan in 2018, up 12,000 percent increase. But the biggest Cinderella story is Shenzhen. This southern Chinese city, located between two other major cities, Hong Kong and Guangzhou. The city is a leading global technology hub, dubbed by media as the next Silicon Valley and China's Silicon Valley. Shenzhen had a GDP of less than 200 million yuan in 1978 and increased to 2.4 trillion yen by 2018 thanks to the establishment of China's first special economic zone by Paramount leader Deng Xiaoping in 1980. On its way to becoming China's third largest city in 2018, Shenzhen's GDP grew by a staggering 1.2 million yuan.

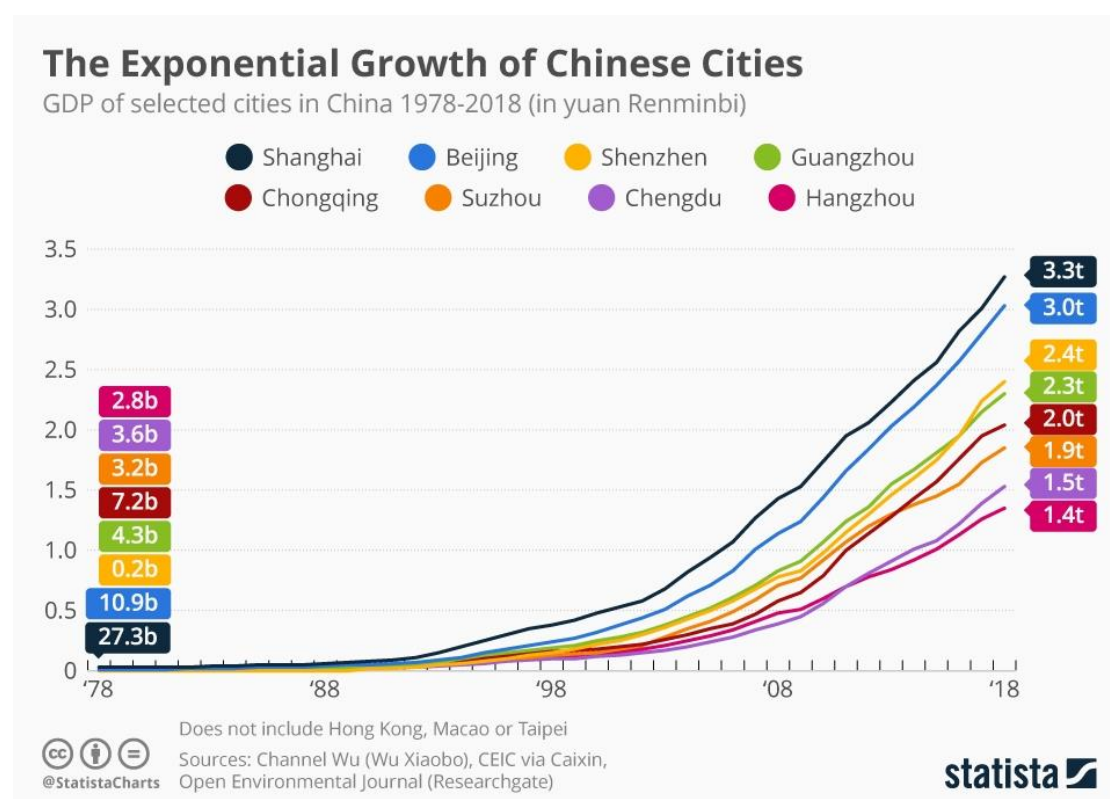


Fig 29. The exponential growth of selected Chinese cities GDP

(Source: Statista)

Let's compare the Top 10 GDP Countries worldwide to see the economics of China. The ranking is based on projection by the international monetary fund's October 2018 outlook for 2019 and 2023.

Rank ▲	Country/Economy ▼	GDP (Nominal) (billions of \$)					Growth (%) ▼	GDP per capita (Nominal) (\$)		Continent ▼
		2019 ▼	% Share ▼	diff ▼	2023 ▼	Rank ▼		2019 ▼	Rank ▼	
1	United States	21,482.41	24.4	-	24,671	1	2.54	65,062	8	North America
2	China	14,172.20	16.1	7310	19,581	2	6.18	10,099	72	Asia
3	Japan	5,220.57	5.93	8952	5,908	3	0.94	41,418	26	Asia
4	Germany	4,117.07	4.67	1104	4,937	4	1.86	49,692	18	Europe
5	India	2,957.72	3.36	1159	4,330	5	7.44	2,188	145	Asia
6	France	2,844.70	3.23	113	3,364	6	1.62	43,500	21	Europe
7	United Kingdom	2,809.91	3.19	34.8	3,257	7	1.49	42,036	23	Europe
8	Italy	2,112.80	2.40	697	2,396	8	1.03	34,784	28	Europe
9	Brazil	1,929.71	2.19	183	2,351	9	2.37	9,160	75	South America
10	Canada	1,820.36	2.07	109	2,322	10	2.05	48,601	19	North America

Fig 30. GDP (Nominal) Ranking 2019

(Source: statisticstimes.com)

China's economy has been developing steadily with strategic growth, with an average growth rate of 9.52% from 1989 to 2019.

Worker efficiency is the driving force of China's economic growth, as it has been since 1978, when the country implemented a drastic economic reform program. From 1979 to 1994, worker productivity growth accounted for more than 42 percent of China's economic growth.

China's 1978 economic reform plan emphasized the creation of private and rural enterprises, state regulation of prices, and investment in labor education and industrial output. By most measures, the plan was a resounding success, with average economic growth rising from about 6 per cent before the reforms to 9 per cent after.

PPP

Another GDP index we need to mention is PPP, although China is the second largest economy, it is the largest in the world in terms of nominal GDP using purchasing power parity.

Rank ▲	Country/Economy ▼	GDP (PPP) (billions of Int. \$)					Growth (%) ▼	GDP per capita (PPP) (Int. \$)		Continent ▼
		2019 ▼	% Share ▼	diff ▼	2023 ▼	Rank ▼		2019 ▼	Rank ▼	
1	China	27,449.05	19.2	-	37,198	1	6.18	19,559	75	Asia
2	United States	21,482.41	15.0	5967	24,671	2	2.54	65,062	12	North America
3	India	11,412.97	7.98	10069	16,575	3	7.44	8,443	126	Asia
4	Japan	5,806.72	4.06	5606	6,380	4	0.94	46,069	31	Asia
5	Germany	4,555.47	3.18	1251	5,184	5	1.86	54,984	18	Europe
6	Russia	4,345.36	3.04	210	4,966	7	1.80	30,198	56	Europe
7	Indonesia	3,753.20	2.62	592	4,969	6	5.12	13,969	101	Asia
8	Brazil	3,524.06	2.46	229	4,149	8	2.37	16,727	86	South America
9	United Kingdom	3,144.55	2.20	380	3,609	9	1.49	47,042	30	Europe
10	France	3,081.00	2.15	63.6	3,541	10	1.62	47,113	28	Europe

Fig 31. GDP (PPP) Ranking 2019

(Source: statisticstimes.com)

Both of the two approaches, the US and China will take the top two spots. The US will be the world's largest economy in nominal terms, while China will be the largest on a PPP basis. In 2019, the U.S. is ahead of China by \$731 billion. China surpassed US on a PPP basis in 2014. China will remain the world's largest economy for decades to come, as the second-ranked US grows slowly and third-ranked India lags behind.

From this point of view, there's one indication for the company. Let's back to JD.com, this Chinese Company. Even though JD.com is doing the expansion to overseas, their main business is still in China. As long as the internal purchasing power of China is huge and growing steadily, the company can correspondingly rise.

Considering the recent Trade Confliction between America and China, (the GDP growth rate will lower than before. It's obviously that the Trade Confliction makes both countries' economic worse than before. But the influence of Tariff in China is not expected by American politician. If we look at American side, the PMI (Purchasing Managers' Indexes are economic indicators derived from monthly surveys of private sector companies.) of American has continuous decreased to 49.1 (lower than 50 means the economic is not good). Here we can refer the Financial crisis in 2008, why china could out of that financial maelstrom. One reason is because of the system of China,

government steer the market to move forward. Once there's something wrong, government will deal the problem in the first of beginning, drag the derailed development back to the track, which is different with American capital market, free development, after the issues happen, the government involve to solve it in the late stage. Another reason is China's economic is more relied on the domestic demand.

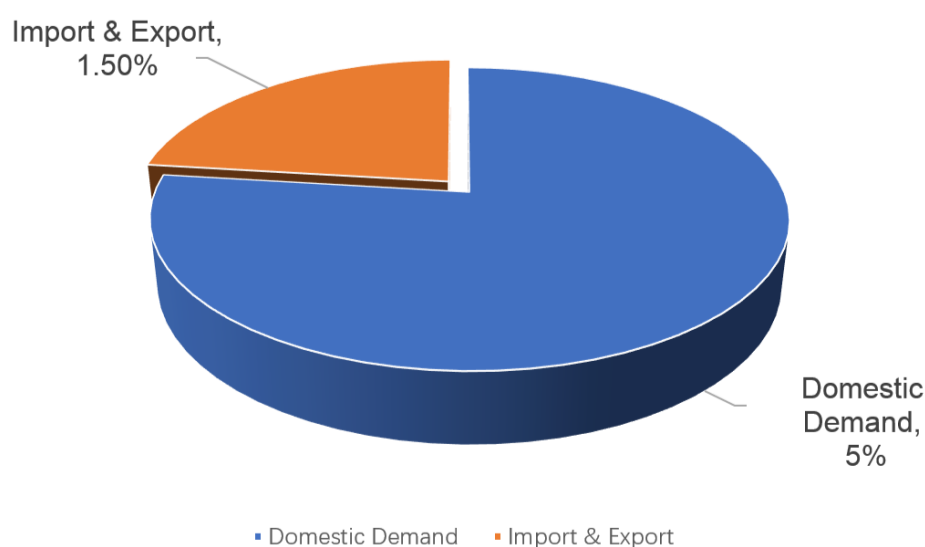


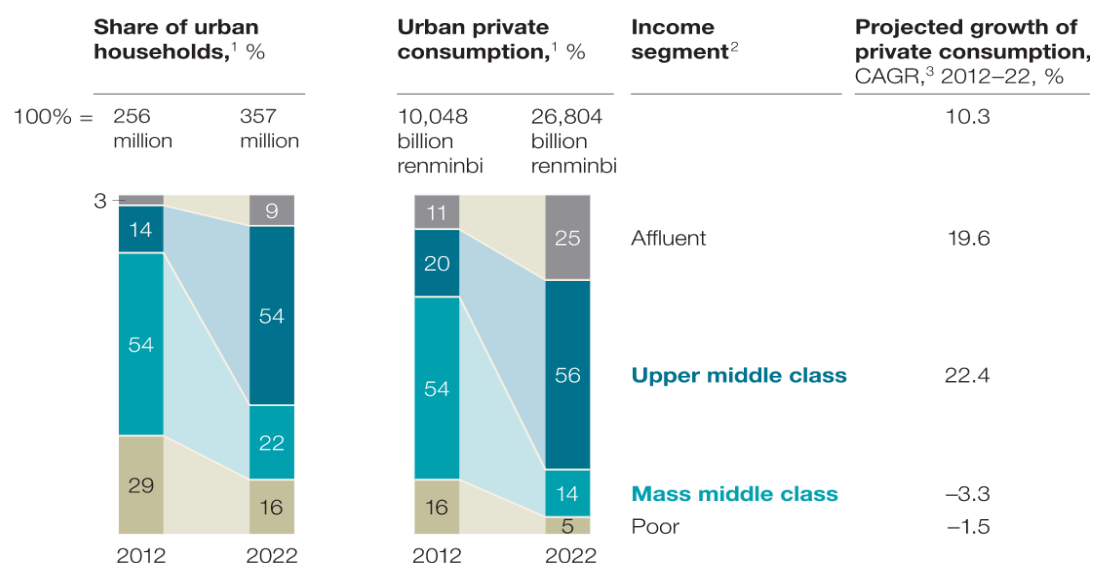
Fig 32. The composition of China's GDP growth (6.5%) in 2018

(Data Source: iNEWS)

China's Middle-class Rising

Speaking of China's rising domestic demand, we can have a look at of China's middle-class rising. They are young, rich and with large population base.

For the sake of simplicity, McKinney's research calls the consumers' household income between 106,000 and 229,000 yuan in the upper middle class. In 2012, this segment accounted for only 14% of urban households, dwarfed by the mass middle class, with household incomes ranging from 60,000 yuan to 106,000 yuan. By 2022, McKinsey estimate, the middle class will account for 54% of urban households and 56% of urban private consumption. The mass middle will be cut to 22% of urban households.



¹Figures may not sum to 100%, because of rounding; data for 2022 are projected.

²Defined by annual disposable income per urban household, in 2010 real terms; affluent, >229,000 renminbi (equivalent to >\$34,000); upper middle class, 106,000 to 229,000 renminbi (equivalent to \$16,000 to \$34,000); mass middle class, 60,000 to 106,000 renminbi (equivalent to \$9,000 to \$16,000); poor, <60,000 renminbi (equivalent to <\$9,000).

³Compound annual growth rate.

Fig 33. The magnitude of China's middle-class growth

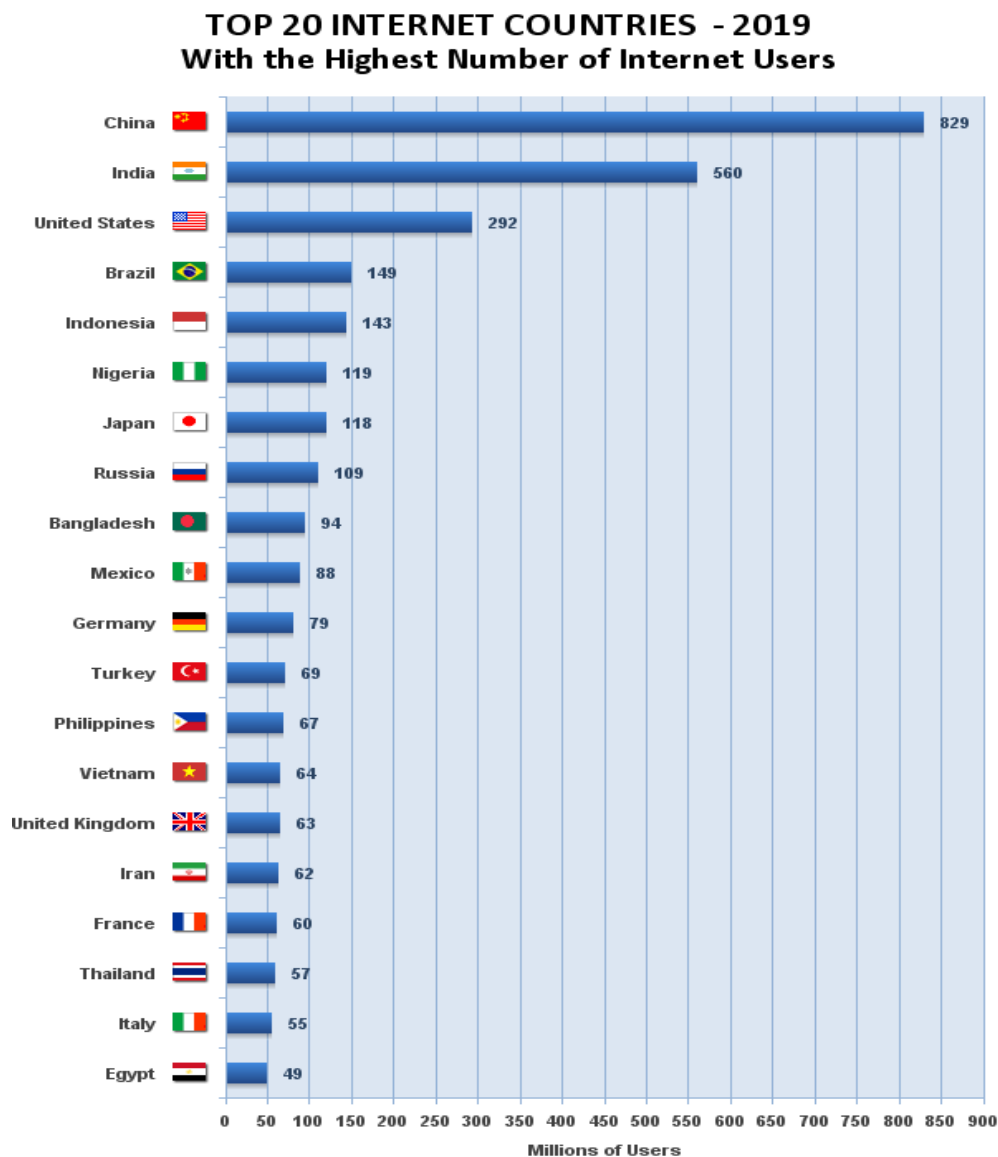
(Source: McKinsey)

China's new middle class is also divided into different generations, most notably group is G2, G2 consumers are typically teenagers and people from the early 20s, born after the mid-1980s and brought up in a period of relative abundance. In 2012, it included nearly 200 million consumers, accounting for 15 percent of urban spending. In a decade, their share of urban consumer demand should more than double to 35%.

Another indication is China's increasing affluent middle class, is shifting consumer preferences from low price to high quality. This is an opportunity for JD.com since the product of JD.com with higher price than Alibaba, the product quality is higher than Taobao, and the brands on JD.com platform are more globally. That is total match the future consumer trend.

The Internet users in China

The Chinese internet users' proportion (of 1.4 Billion total population) 58.4% is not quite high compared with 89% (of 329 Million total population) American internet users, there still have a large gap to develop. But since the huge population base, China has already been the largest country of internet users with 829 Million almost triple of American internet users based on the latest research. There has a large new technology market attraction in China.



Source: Internet World Stats - www.internetworldstats.com/top20.htm
3,131,087,014 Internet users in the Top 20 countries in June 30, 2019
Copyright © 2019, Miniwatts Marketing Group

Fig 34. Top 20 countries with highest number of internet users

(Source: Internet World Stats)

For the trend review, it's not enough only seeing the single year's number. We look back to the previous year data, and we found that the number is increasing every year. Thus, we could see the online shopping market potential is huge and profitable as the consumer demands continuously grow. It deserves to invest more in this area.

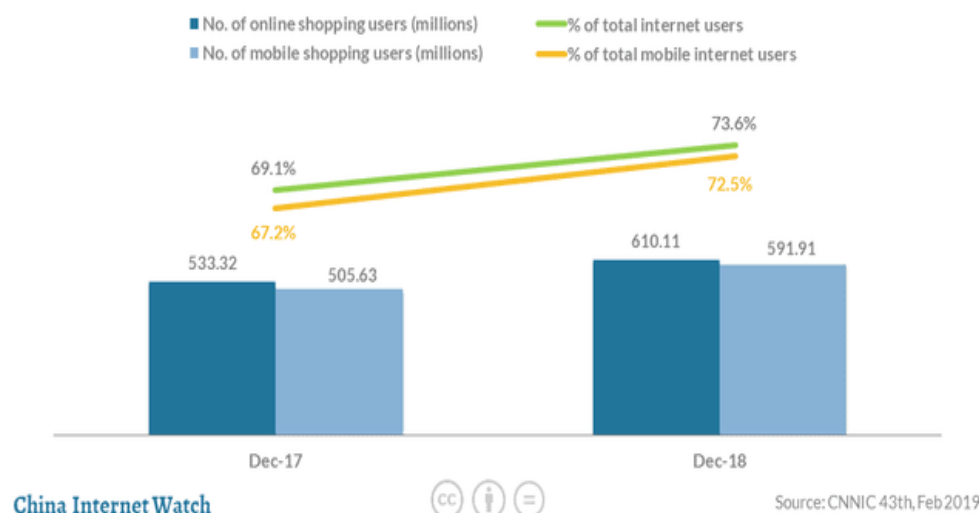


Fig 35. China online shopping users

(Source: CIW)

As the chart shows, every item is increasing. No matter the number of online shopping users or the mobile shopping users. And the number will continuously increase.

Among the total internet users in China, youth and middle-age are the main stream, the age from 10 to 40 years old occupied 67.8% shares. These people are younger and richer than before, they focus on the product brand, quality shopping experience instead of simply price. There's an opportunity for JD.com to adopt to the new technology, by analyzing the big data of consumers' behavior, JD.com could provide right product to consumers. Thus, to implement the mission of JD.com to make shopping a simple and pleasant experience.

The Government Support

For Chinese government and companies, there's one fact has to be accepted that American technology level of AI is still in the leading position. And in the past, due to the scientific research environment issues, the problem of brain drain is serious. China's top AI researchers currently reside 73.7 percent outside China and 26.3 percent at homeland.

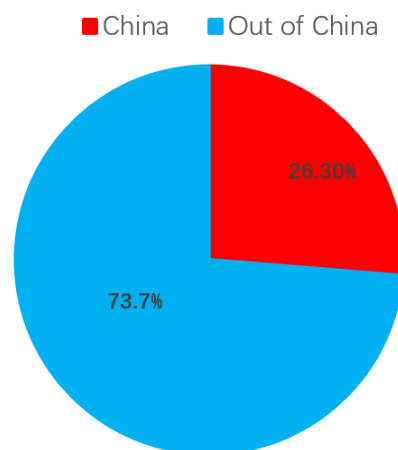


Fig 36. China's top AI researchers' residence

(Data Source: Marco Polo think tank)

Marco Polo think tank believes that the reason most AI talents do not stay in China is that the government focuses on cultivating talents, but does not devote enough energy to creating incentives and research environments for them.

The truth is not only AI but also other areas talents stay in US instead of China.

Made in China 2025

China realized those issues. And Chinese believes the future is technology, for a better competitive advantage in the future, Chinese government published the next strategy target called "Made in China 2025" on 8th of May, 2015. And a serious plan for transferring the made in China as innovation in China. The plans take innovation-driven, quality-oriented, green development, structural optimization, and talent as basic guidelines. In order to improve the national manufacturing industry innovation ability, promote the informatization and industrialization depth fusion, strengthen industrial base ability, strengthening the construction of quality brand, fully implementing green

manufacturing, the development of key areas breakthrough, further advanced manufacturing industry structure adjustment and actively developing a service-oriented manufacturing and producer services, improve the level of manufacturing internationalization as the mission and priorities, and to provide support and guarantee for eight.

Under this big blueprint, in the early of year 2017, Chinese government announced national development plans, including the creation of a competitive artificial intelligence industry that will reach 1 trillion yuan (\$154 billion) by 2030.

Since the government published the strategic plans, the development of AI in China increased a lot. Here have some data to show the development result.

First of all, the academic have opened more majors and courses on AI. The academic research and development environment on AI is much better than before.

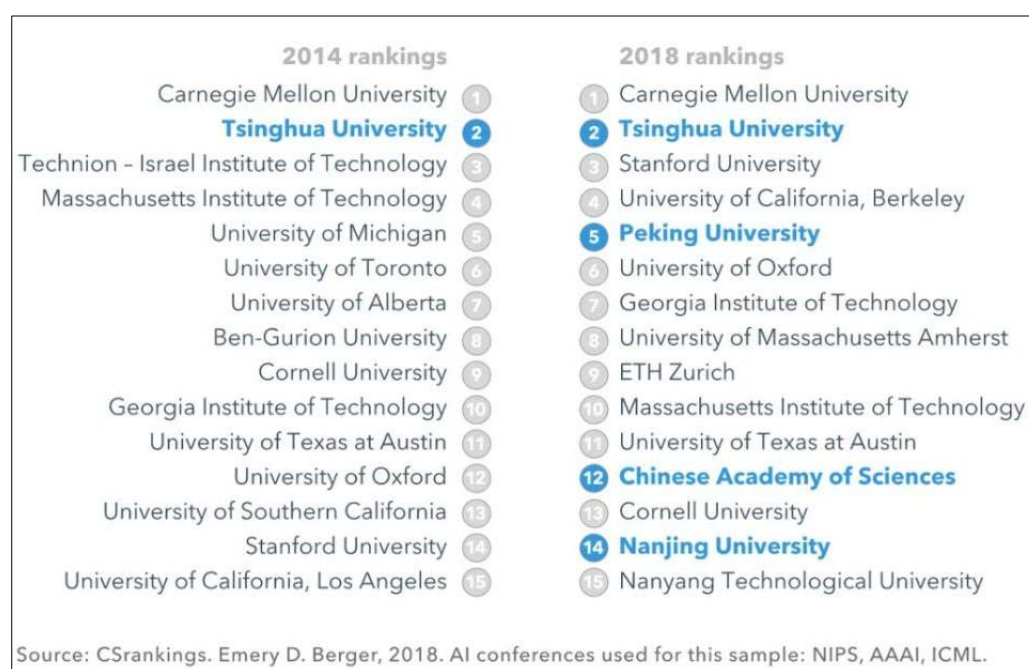


Fig 37. Universities ranked by published papers in Top AI conferences (2014 vs 2018)

(Source: CS rankings)

It's not enough to invest in AI just from academic to establish itself as a leader in the field. The Chinese government has recognized the problem and in its 2017 national AI strategy highlighted incentives such as high salaries to attract top scientists come back to China. This could be checked by the lots of Chinese companies did in the past year, such as Alibaba, Tencent, Baidu, Huawei, also JD, they hired the top talents with

incredible salaries to boost the AI technology.

Every company wants to win in this technology war. The game rule is just the technology, and the technology is based on talents.

Joy Dantong Ma, deputy director of the Marco Polo think tank, analysed the number of NeurIPS authors who received papers in the past decade in which they studied in China as undergraduates increased nearly tenfold. In 2018, nearly 1,000 Chinese authors, 25 percent of the total, compared with about 100, 14 percent, in 2009.

In the past 10 years, 15,616 AI scientists have become conference paper authors, of whom nearly 2,800 (about 18%) are Chinese.

Here's another chart to show that the Chinese researchers number in AI has increased a lot especially in recent years after the strategic plan published, meanwhile, the weight of the global researchers increased too.

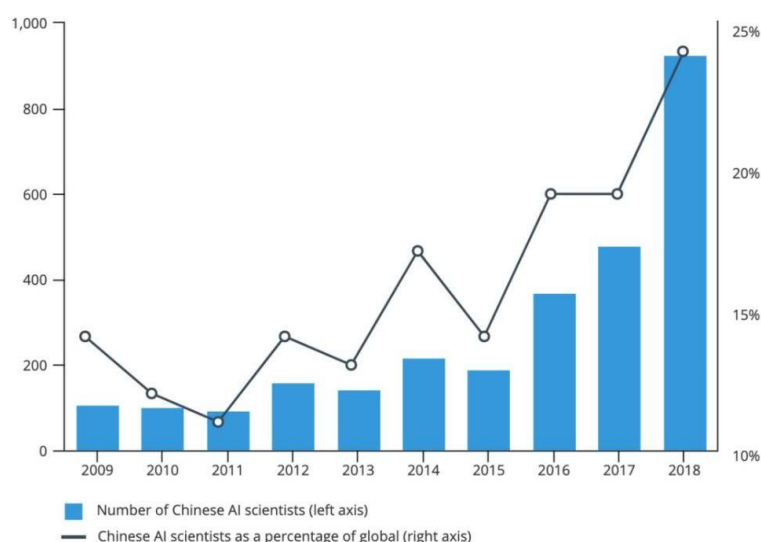


Fig 38. The Chinese researchers' number in NeurIPS

(Data Source: Marco Polo think tank)

The large number of scientific publications by the top 20 universities and public research organizations contrasts sharply with the small number of universities and public research organizations among top patent applicants. China again topped the list, with 10 of the top 20 public research institutions being Chinese and the Chinese academy of sciences (CAS) topping the list.

10 of the top 20 organizations in AI scientific publications are in China, six in the U.S., two in Singapore and one each in Japan and France

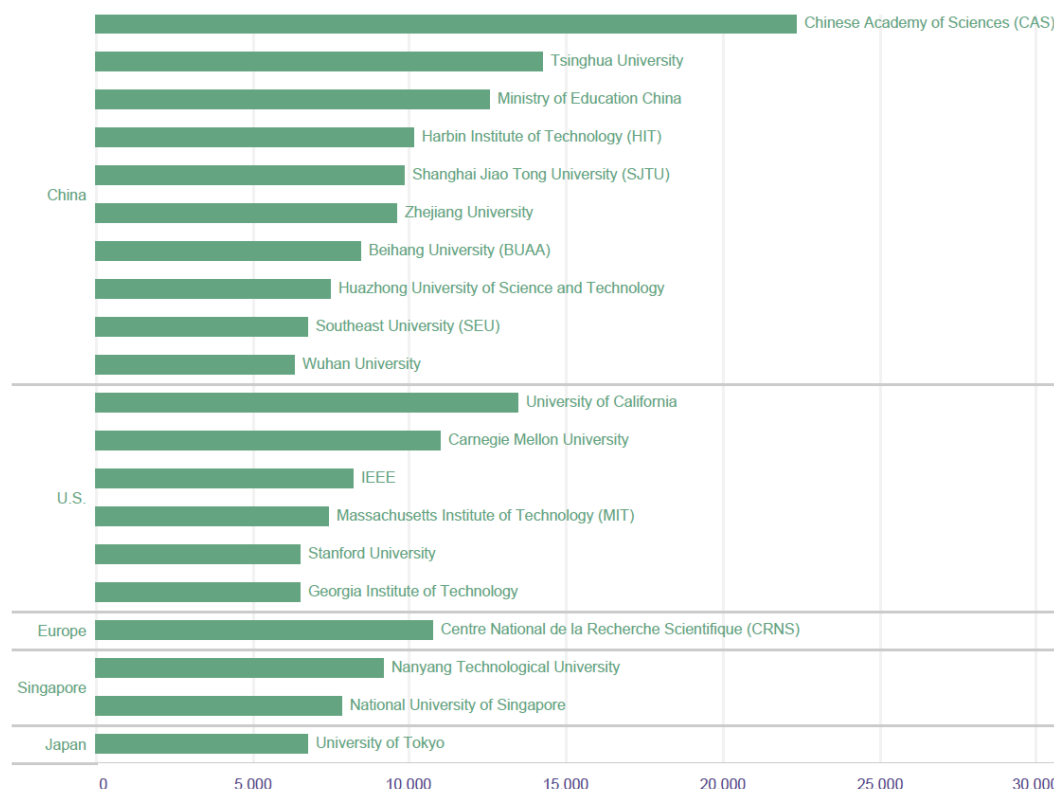


Fig 39. Top 20 universities public research organization producing AI scientific publications by number of articles

(Source: WIPO: World Intellectual Property Organization)

Weakness

The brand image links with CEO too close

Different with the other companies, the brand reputation of JD.com is closely bounded with the reputation of Richard Liu, the CEO of JD.com. In the first of begininig, JD.com was building the image that CEO is super close to the stuff, it was easy to see the news that Richard Liu rides the light vehicle to deliver the package with the bottom level stuff. By showing this kind of news to create a nice image to him, that the company cares the front-line stuff. Thus, the brand JD.com is quite closely linked with CEO ,Richard Liu, which leads to any image changes of CEO would influence the company stock price. That's quite risky since no one is perfect, no one would promise he or she won't make any mistake in any area. Moreover, they are doing business, there have lots of links with different benefits. The traps, intrigues are everywhere. Any bad

news would hit the stock price and wipe off a mount of market value of that company. In 2018, the sex scandal of Richard Liu in USA had a huge impact both in society and business area. Although that event doesn't have a final exact statement, the impression of Richard Liu to the society has already dropped a lot based on the online comments of the news.

The market opened 4.1% lower on Tuesday and fell further in the first deal since founder and CEO Richard Liu was detained in US on charges of sexual misconduct.

The stock closed down 7% at \$29.19 in the first 10 minutes of trading on Wall Street, compared with its close of \$31.30 on Friday before the scandal broke.

The influence continues until the end of the year 2018. Of course, the stock price decrease is not just because of this vague event, it also be affected by the expanding of the businesses.



Fig 40. JD.com Year-to-Date Stock Performance in 2018

(Source: MarketScreener.com)

The reasons of the stock price decreasing are lots of. But the sex scandal was the most obviously one in last year. In the future, on one would promise there won't happen any bad news to CEO, Richard Liu. What if then? That's why I think the closed linkage between company brand reputation and CEO personal image is quite risky.

Financial issues

As we know, technology innovation is a series of long-term activities including planning, concept design, system-level design, detailed design, prototyping and testing, process design, product launch, and other main activities.

The increased investment in the company's infrastructure to build the super business empire including logistic and fulfillment network, the expanded businesses including the AI development in an all-around way, and also the expansion of the warehouses from 405 to 550 over the past year. All of these investments made the company with a huge capital expense.

Let's back to see the reasons behind the previous stock performance in 2018, it is not only because of CEO's sexual scandal, but also the slowing profit growth. Since the huge investment, the dividends of the stock thus not good as before.

Considering the AI technology is still in the early stage of earning money, and the investment is huge and continuous, JD.com still need lots of money in the future. How to satisfy the shareholders, stabilize the stock market by showing a good profit growth in the next year, may be the next task for JD.com. Otherwise, the investors withdraw their money or shareholders sell out their shares makes the stock worthless, it would be a great blow for JD.com.

Threats

Competitor and Technology

As we mentioned in the competitor analysis chapter, we have already did the analysis of the main competitor of JD.com from the perspectives of E-commerce Platforms, Logistic Systems, and also AI technology.

All of those E-commerce platforms not only replace traditional retail transactions, but also stimulate consumption that would not otherwise occur. The threats which not happened still need to be prevented in advanced.

Also the problems of AI itself, there have the technical risk also mentioned before.

The threats from competitors and the AI technology risk from all kinds of ways both mentioned in above paragraph are all in the respect of players in that market. There still have some threats not just the organizations who also doing the similar work. But their influence is huge and maybe a disaster for a company.

International Situation

The international relationship within different governments. The impact of it would serious wound the the business even destory it, especially for the overseas business. Looking at the Trade War between America and China, there are lots of businesses have already influenced. The most famous one is HuaWei. We could get some thoughts from this event to other companies not only JD.com. What if the relationship between your company country with the local government become worse, and the policy for foreign companies changed? How much of your businesses will be influenced? What should you do to meet this kind of unexpected situation?

JD.com has expanding their overseas business for years. The most greatest regional achievement is Southeast Asia market. The Thailand market has already opened by cooperation with local companies, this has described before. Right now, the relationship between China and Thailand is good, it's not difficult to open that market, what if the government won't like Chinese company and tax a lot in someday?

Although this kind of situation has already out of company control, company should consider it and prepare some protection and backups in advanced.

Conclusion

At this page, we have almost finished the analysis of JD.com from different aspects. From my opinion, the conclusion is that the Artificial Intelligence strategy is suitable and necessary to meet the latest customer requirement in this rapid development of science and technology period. Today, the business war is not only competing in the area of management but also a war of technology. And another opinion, JD.com is worthy to invest. Even though the operation cost is high right now, it will lower as long as the logistic infrastructures get into operation, the profit will come with it too.

The first reason is the key competitiveness of JD.com, the self-run logistics. The highly efficient, the precise delivery, the best experience provided to customers will be a strong and powerful competitive advantage than competitors. The tangible resources are quite valuable and not easy to be imitated. The nationwide owned-unmanned warehouses build an enormous logistic network, equipped with the advanced AI technology, the work efficient will be higher than before. And the large scale will lower the marginal cost to bring more profit in the future.

As an important part of enterprise supply chain, logistics network is the basis of supply chain operation and management, it must be the primary task of enterprise strategic planning. I believe that who owns the right of logistic control will grasp the lifeline of E-commerce in the future.

The second reason, the further strategic cooperation with Walmart and Google. As we know, Tencent, the world most valuable technology company which operate the largest social software of WeChat in China, is the largest corporate stakeholder of JD.com, Walmart, the world largest company by revenue, is the second corporate stakeholder. Furthermore, Walmart invest 319 million dollars, and JD.com invest 181 million dollars to finish a new round financing to start the business of “Dada-JD.Daojia”, focusing on the “last mile” delivery, the online-to-offline service to provide the better service to customers. The customer data intergation among the

biggest social platform WeChat , the giant offline retailer Walmart and the second largest online retailer JD.com to create a huge customer network, by sharing the resources between those companies to build a retailer empire. The profit of this cooperation is significant. In the first half of 2018, sales increased by 500% year-on-year; Walmart's official flagship store on JD.com has more than 1.3 million followers, ranking the first in the fast retailing category on the day of June 18, 2018. On JD.com's home platform, Walmart's sales were 3.5 times that of the same period in 2017, also ranking first on the platform.

Currently, there are 10 projects under construction of cloud warehouse, which cooperated between Walmart and JD.com. Different from the previous formats, cloud warehouses serve online orders 100%, which makes up for the lack of store density in some areas of Walmart.

For JD, the other partner in the cooperation, Walmart not only provides the support of mature supply chain resources, but also complements its lack of offline channels, which will help JD further improve its logistics system be more efficient.

In 2018, Google, which is considered one of the Big Four technology companies, alongside Amazon, Apple and Facebook, invested 550 million dollars to have a strategic cooperation with JD. The cooperation includes joint development of retail solutions around the world, including in southeast Asia, the United States and Europe. By applying JD's supply chain and logistics expertise and Google's technical expertise, the two companies aim to explore the creation of next-generation retail infrastructure solutions with the goal of providing a useful, personalized and frictionless shopping experience.

The third reason is that the AI technology used in JD.com everywhere. The products of JD X department include the Unmanned Warehouse, Drones, Unmanned Ground Vehicle, Unmanned Supermarket, Unmanned Container. JD.com is not just providing the AI technology into separate part, they are going to build a smart life by providing a smart city circle.

With the continuous deepening of JD's unmanned technology strategy, JD's intelligent logistics will be able to meet or even create richer application scenarios, meet the complex and changeable user needs, and realize the improvement of operation efficiency and user experience, becoming an important part of JD's intelligent business.

Without any doubt, in this technology is everything period, the company who gives up technology research and development will die sooner or later. And it's proved that the AI strategy application increased the competitiveness of JD.com. The development of AI technology in JD.com will provide the sustainable competitiveness in future.

Curently, most of companies are working on AI technology. Everyone wants to obtain the first mover advantage, and acquire more customer as soon as possible to come into being of lock-in effect. Thus, to become the winner and have the lion market share.

The competition is fierce, the effort of capital and other resources will be the key to success. In this new era, the opportunities come with threats. Every company needs to build a right value, adopt the appropriate strategy management skill, keep on improving their scientific and technological innovation capacity, make good use of different resouces, to stand out of the competition.

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