2018 Market Survey Report for (Non-financial) Application of Blockchain in China
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2
Survey Background

As a distributed ledger that can settle the concerns on trust, Blockchain technology has attracted more and more attention.

At the beginning of 2017, Blockchain technology was listed on the “13th Five-Year Plan” as one of strategic cutting-edge technologies. It is regarded as a revolutionary technology, which will usher in a new round of technology revolution and industrial reform in the future.

As indicated in the *China Blockchain Technology and Application Development White Paper* published in April 2017, China embraced the world’s second largest number of Blockchain-based enterprises after the United States.

In 2018, the China Economic Weekly published a full-page of 3 articles on the Blockchain-themed special reports, which helped to publicise the knowledge of Blockchain and clarify the development goals.

However, as the application market of Blockchain is at the early stage of development, the public and enterprises still lack enough understanding for Blockchain technology. What are the challenges and opportunities for Blockchain technology development in China, and how well do the public and enterprises understand the technology? What kinds of problems do enterprises expect to solve through applying Blockchain technology? These are the issues we look into and seek for answers through the “2018 Market Survey for (Non-financial) Application of Blockchain in China” (the “Survey”).

The Survey is jointly launched by VeChain and PwC.

- It is the first survey conducted on the application of Blockchain in non-financial areas.
- It is the first time for PwC to cooperate with an enterprise specialised in Blockchain technology on conducting a survey.
- 50% of enterprises surveyed generate annual revenue of more than USD 100 million.
Survey Approaches

2018 Market Survey for (Non-financial) Application of Blockchain in China is a world-wide survey jointly conducted by VeChain and PwC in the forms of online questionnaire and focus group discussion from November to December 2017.

The respondents are mainly VeChain's and PwC's clients. Totally, we received more than 130 questionnaires, and held two focus group discussions engaging more than 40 respondents. Respondents were from nearly 20 industries, involving more than 10 functional departments. As Blockchain technology was at the emerging stage, only a few people really knew about it. Our quantitative research data came from people who had a considerable level of knowledge and research on Blockchain technology.

We designed a set of questionnaire that covered over 40 questions, which focused on three major topics, namely, the understanding of Blockchain, the opinions on the application of Blockchain, and the opportunities and challenges faced by Blockchain technology.

Meanwhile, with a view to further explore in depth, we not only made quantitative research through online questionnaire, but also held two high-level qualitative focus group discussions participated by technical experts and executives of related enterprises in Shanghai and Singapore to fully understand the status quo of Blockchain in non-financial areas.
The Survey covers both high-tech industries and traditional industries.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT or high-tech industry</td>
<td>28%</td>
</tr>
<tr>
<td>Service industry</td>
<td>15%</td>
</tr>
<tr>
<td>Manufacturing industry</td>
<td>11%</td>
</tr>
<tr>
<td>Blockchain industry</td>
<td>11%</td>
</tr>
<tr>
<td>Media</td>
<td>9%</td>
</tr>
<tr>
<td>Educational or scientific institution</td>
<td>6%</td>
</tr>
<tr>
<td>Retail industry</td>
<td>4%</td>
</tr>
<tr>
<td>Other industries</td>
<td>16%</td>
</tr>
</tbody>
</table>
The Survey engages respondents from different departments in enterprises.

- IT and information department: 38%
- Marketing and sales department: 16%
- Entrepreneurs/founders: 11%
- Educators and science researchers: 8%
- Media: 11%
- Other departments: 16%
Understanding of Blockchain Technology
85.7% of respondents believe that the core feature of Blockchain technology is tamper-resistant.

More than half of respondents believe that Blockchain technology will have a significant impact on the business community.

Respondents believe that Blockchain technology is most useful in supply chain management.
Information authenticity is the respondents’ primary impression of Blockchain technology.

- We explore in depth respondents’ understanding of Blockchain technology through two focus group discussions held in Shanghai and Singapore. The result is as follows:

  **Multi-party cooperation**

  **Sharing platform**

  **Tamper-resistant**

  **Efficiency improvement**  **Cost saving**  **ICO**

  **Security and trust**

  **Hard to understand**  **Enabling innovation in unknown areas**

  **Decentralization**

  **Hard to quantify**

  **Improvement on the level of security**

  **Complex**

Keywords regarding of “what is Blockchain” and “the value of Blockchain”
It is commonly understood that Blockchain technology is featured by tamper-resistance.

• Respondents believe, the features of tamper-resistance (85.71%) and distributed system (83.46%) lay the foundation for Blockchain. At the meantime, these two features are inherently interconnected. It is by adopting the distributed ledger that Blockchain technology can realise the real-time synchronisation and update of all the transaction information generated by each node of the network. Each node has an independent ledger that contains all information of the network, which in turn ensures the information on the Blockchain network is tamper-resistant.

• In addition, 58.65% of respondents believe that smart contract also is the core feature of Blockchain technology. At present, smart contract is not widely recognised, possibly due to the lack of public understanding of Blockchain technology.

Understanding of Blockchain technology by its features

A5: In your opinion, what are the core features of Blockchain technology? (Multi-choice)
More than half of respondents are optimistic about Blockchain technology.

- 52.8% of respondents expect that Blockchain technology will have a significant impact on the business community. It is worth mentioning that, in our survey, most of respondents who have experience of applying Blockchain technology affirm its function, which shows a positive signal for such emerging technology.

P8: In your opinion, what kind of impact will Blockchain technology have on the business community?
(A) Significant impact  (B) Some impact  (C) Hard to tell  (D) No impact
People’s understanding of Blockchain has a great impact on their attitude towards Blockchain technology.

- According to our survey, it is noted that as more is learned about Blockchain, more respondents are optimistic towards the technology.
- 48.4% of respondents who have ‘Basic understanding’ hold optimistic attitude; 84.2% of respondents who are ‘Working in the industry’ have optimistic attitude; while 85.7% of respondents ‘With experience of applying Blockchain technology’ are optimistic.
- The above implies that improvement on people's understanding of Blockchain technology will facilitate the promotion of its application in an effective way.

A3: Do you know about Blockchain?
P8: In your opinion, what kind of impact will Blockchain technology have on the business community?
   (A) Significant impact  (B) Some impact  (C) Hard to tell  (D) No impact
100% of respondents believe Blockchain is very helpful for supply chain management.

- The cross-tab analysis of the fields of application and the usefulness of Blockchain technology on respondents’ work provides an overview for fields where Blockchain technology can produce the most significant and duly outcomes. The results on different applications is listed as follows:

- It is notable that, for major applications engaged in our survey, no respondent who have the experience of applying Blockchain technology thinks the application is useless. Most respondents who have applied the Blockchain technology believe it is useful.

<table>
<thead>
<tr>
<th>Field of Application</th>
<th>Useful</th>
<th>Not Clear</th>
<th>Useless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security traceability</td>
<td>66.7%</td>
<td>33.3%</td>
<td>0%</td>
</tr>
<tr>
<td>Supply chain management</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Distributed data storage</td>
<td>87.5%</td>
<td>12.5%</td>
<td>0%</td>
</tr>
<tr>
<td>Identity authentication</td>
<td>85.7%</td>
<td>14.3%</td>
<td>0%</td>
</tr>
<tr>
<td>Deposit certificate</td>
<td>75.0%</td>
<td>25.0%</td>
<td>0%</td>
</tr>
<tr>
<td>Shared data &amp; application</td>
<td>83.0%</td>
<td>17.0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Traditional industries are more optimistic about Blockchain than new technology industries.

- The result of sequencing the industries by the percentage of respondents who choose ‘significant impact’ and are optimistic about the Blockchain technology shows: retail industry 100%, education and scientific industry 66.7%, manufacturing industry 60.0%, service industry 47.1%, IT or high-tech industry 45.5% and media 41.7%.

### Attitude towards Blockchain technology from different industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>Significant impact</th>
<th>Some impact</th>
<th>No impact</th>
<th>Hard to tell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Education and scientific research</td>
<td>66.7%</td>
<td>33.3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>60.0%</td>
<td>40.0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Service</td>
<td>47.1%</td>
<td>41.2%</td>
<td>0%</td>
<td>11.7%</td>
</tr>
<tr>
<td>IT or high-tech</td>
<td>45.5%</td>
<td>51.5%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Media</td>
<td>42.0%</td>
<td>50%</td>
<td>0%</td>
<td>8%</td>
</tr>
</tbody>
</table>

G1: What industry are you engaged in? (Only these industries with comparatively big number of respondents are listed)
P8: In your opinion, what kind of impact will Blockchain technology have on the business community?
(A) Significant impact (B) Some impact (C) Hard to tell (D) No impact
Entrepreneurs and founders are more enthusiastic about Blockchain technology.

- Ranking the result of the respondents who have optimistic attitude towards Blockchain technology by department, shows: entrepreneurs/founders 93.3%, marketing and sales department 68.4%, educational and scientific department 66.7%, media 42.9% and IT & high-tech department 41.9%.

- According to different attitudes from different departments, middle office departments (e.g. media, IT and information department) tend to be more conservative towards Blockchain technology due to considerations on technical support.

- Therefore, the application needs to be promoted by entrepreneurs/founders, as the decision-makers, in a top-down manner.

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G2: What is your position? (Not all factors are listed)
P8: In your opinion, what kind of impact will Blockchain technology have on business community?
   (A) Significant impact   (B) Some impact   (C) Hard to tell   (D) No impact
Innovative Applications of Blockchain Technology
logistics, government and medical industries can mostly benefit from Blockchain technology.

The application that can best embody features of Blockchain technology is security traceability.

Respondents from all industries believe that Blockchain technology is helpful to address the pain points in their business.
Blockchain has a wide range of cross-industry applications, among which logistics, governments and medical projects are of most value.

- According to the survey, the top 3 application fields with most promising future are logistics, government and medical industry.
- As the most naturally related and leading industry for Blockchain technology applications, logistics wins votes from both ordinary users and professionals.
- It is generally believed that Blockchain technology can give full play of its functions in government. Meanwhile, as government has strong effect of demonstration and credit enhancement, it can greatly improve people’s fast understanding of Blockchain technology.
- The demand in medical field for verifying information authenticity is far greater than other fields. The expectation for Blockchain technology application in medical field is mainly driven by the need of authenticity verification on personal information, medical information and drug information.

### Fields where Blockchain technology can create most value

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics</td>
<td>63.3%</td>
</tr>
<tr>
<td>Government</td>
<td>47.0%</td>
</tr>
<tr>
<td>Medical field</td>
<td>44.4%</td>
</tr>
<tr>
<td>Laws and regulations</td>
<td>37.6%</td>
</tr>
<tr>
<td>Food &amp; beverage</td>
<td>23.1%</td>
</tr>
<tr>
<td>Energy</td>
<td>19.7%</td>
</tr>
<tr>
<td>Transportation</td>
<td>12.0%</td>
</tr>
<tr>
<td>Entertainment</td>
<td>10.3%</td>
</tr>
<tr>
<td>Others</td>
<td>8.6%</td>
</tr>
</tbody>
</table>
**Security traceability outshines other Blockchain implementation fields.**

- We further explore the respondents whose companies have already implemented Blockchain technology, and the result is shown in the chart on the right. Among these companies, 50% chose the field of **security traceability**, standing out from other fields of application.

- In addition to security traceability, other fields with more than 20% proportion are distributed data storage, identity authentication, shared data & application and supply chain management.

<table>
<thead>
<tr>
<th>Fields of Blockchain implementation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security traceability</td>
<td>50.0%</td>
</tr>
<tr>
<td>Distributed data storage</td>
<td>26.7%</td>
</tr>
<tr>
<td>Identity authentication</td>
<td>23.3%</td>
</tr>
<tr>
<td>Shared data &amp; application</td>
<td>20.0%</td>
</tr>
<tr>
<td>Supply chain management</td>
<td>20.0%</td>
</tr>
<tr>
<td>Others</td>
<td>16.7%</td>
</tr>
<tr>
<td>Deposit certificate</td>
<td>13.3%</td>
</tr>
<tr>
<td>Distributed energy</td>
<td>10.0%</td>
</tr>
<tr>
<td>Regulatory compliance audit</td>
<td>6.7%</td>
</tr>
<tr>
<td>Market forecasting</td>
<td>6.7%</td>
</tr>
<tr>
<td>Copyright management</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

F13: Have your company applied Blockchain technology?  
F14: What do your company do with Blockchain technology? (Multi-choice)
Respondents believe security traceability is the most valuable Blockchain application.

- So far, **security traceability** has been the most recognised application of Blockchain technology, with a high cognitive rate of 85.71%. As mentioned above, most respondents believe the core features of Blockchain technology are tamper-resistance and distributed system. Obviously, security traceability becomes one of the fields most demonstrating the features of Blockchain technology.

- The second-tier most recognised fields are **distributed data storage and identity authentication**, winning votes of 68.4% and 63.9% respectively, but still lags behind the security traceability to some extent. It is roughly indicated by the votes that, the applications with higher trust requirement and better embodiment of tamper-resistant, win more votes.

**Application that best embodies the value of Blockchain technology**

- Security traceability: 85.70%
- Distributed data storage: 68.40%
- Identity authentication: 63.90%
- Supply chain management: 57.90%
- Shared data & application: 54.10%
- Regulatory compliance audit: 41.40%
- Deposit certificate: 40.60%
- Copyright management: 38.40%
- Distributed energy: 36.80%
- Market forecasting: 15.80%

**A6: Which of the following Blockchain applications have you heard of? (Multi-choice)**
In-house R&D team is the mainstream.

- Among those enterprises that have already implemented Blockchain technology, **53.3% have set up in-house Blockchain technology R&D teams**, outweighing other three approaches.

- Such fact may be related to the possibility that the implementation of Blockchain technology can affect enterprise underlying business model. When it comes to technologies that have impact on the underlying architecture of the business model, an enterprise usually prefers to build a R&D team of its own. On the one hand, in-house R&D team can facilitate system maintenance, information security and cost reduction. On the other hand, enterprises prefer to keep the underlying architecture of the business model under their control.

## Approaches adopted by enterprises for the application of Blockchain technology

<table>
<thead>
<tr>
<th>Approach</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invest in or acquire external blockchain start-ups</td>
<td>3.3%</td>
</tr>
<tr>
<td>Cooperate with well-known large companies</td>
<td>13.3%</td>
</tr>
<tr>
<td>Cooperate with blockchain start-ups</td>
<td>30.0%</td>
</tr>
<tr>
<td>Set up in-house R&amp;D teams</td>
<td>53.3%</td>
</tr>
</tbody>
</table>
Improvement on the level of intelligence and security is the most desirable function to be realised by Blockchain technology.

In IT and high-tech industries, the application of Blockchain technology to **improve intelligence level** is most valued by practitioners. Votes for other benefits such as reducing costs, improving the level of security and facilitating future industrial strategic layout are more or less similar.

Respondents from retail industry have highly consistent views on the benefits of Blockchain technology, that 75% regard **security level improvement** as the primary purpose of Blockchain.

Manufacturing industry pays more attention to the function of Blockchain technology on **improving the intelligence level**.

Most people in media industry expect Blockchain technology to **enhance security level and to take a dominant position in the future strategic layout**.

While in education & scientific and service industries, **industry intelligence level improvement** is most valued.

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G1: What industry are you engaged in? (Not all factors are listed)
P10: What is the greatest value you expect to be generated by Blockchain technology for your industry?
Opportunities and Challenges for Blockchain development in China
The key point for Blockchain development currently is **policy normalisation**.

**Management decision** has the greatest impact on Blockchain implementation, while **input cost** has the slightest impact.
Management plays an essential role in driving Blockchain technology into maturity.

- The feedback from those companies which have not applied Blockchain technology shows, the biggest challenge is the management has not yet decided to make layout in the field of Blockchain, followed by the lack of corresponding industry standards.

- According to the following chart, the number of respondents who choose ‘No talents’ is equal to those who choose ‘No understanding’, which demonstrates these factors at technical level have basically identical impacts on whether to apply Blockchain technology.

- Notably, only 10.1% of respondents indicate that ‘No budget’ is the dominated reason why their companies have not yet adopted Blockchain technology, which suggests that most companies do not regard financial issues as the factors influencing their decisions on applying Blockchain technology.

F17: Why do you not consider applying Blockchain technology?
(Due to rounding, the percentage sum of this question does not equal to 100%)
Input cost is not the key factor that impedes Blockchain technology development.

Concerns for Blockchain technology development

- Policy normalisation: 61.5%
- Talents: 59.0%
- Industry standards: 52.1%
- Market readiness: 50.4%
- Technique: 47.9%
- Policy support: 39.3%
- Lack of understanding: 36.8%
- Input cost: 18.8%

• The survey shows that input cost is not the dominant factor people take into account for adopting Blockchain technology. People would love to invest in Blockchain technology if there already existed any successful Blockchain use cases.

• It suggests, once policy normalisation is established at all levels, there will be a huge number of enterprises and industries taking chances on Blockchain technology. Those enterprises that have already applied Blockchain technology will gain great benefits.
Policy normalisation is the most concerned challenge for Blockchain technology development.

- According to the results from more than 10 industries, it is founded that although concerns of different industries are not exactly the same, policy normalisation is on the top 3 list among all the industries.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT or high-tech industry</td>
<td>Talents 72.7%</td>
</tr>
<tr>
<td></td>
<td>Policy normalisation 69.7%</td>
</tr>
<tr>
<td></td>
<td>Industry standards 63.6%</td>
</tr>
<tr>
<td>Retail industry</td>
<td>Lack of understanding 75.0%</td>
</tr>
<tr>
<td></td>
<td>Policy normalisation 50.0%</td>
</tr>
<tr>
<td></td>
<td>Techniques 50.0%</td>
</tr>
<tr>
<td>Manufacturing industry</td>
<td>Market readiness 60.0%</td>
</tr>
<tr>
<td></td>
<td>Policy support 53.3%</td>
</tr>
<tr>
<td></td>
<td>Policy normalisation 40.0%</td>
</tr>
<tr>
<td>Media</td>
<td>Policy normalisation 66.7%</td>
</tr>
<tr>
<td></td>
<td>Market readiness 66.7%</td>
</tr>
<tr>
<td></td>
<td>Talents 75.0%</td>
</tr>
<tr>
<td>Service industry</td>
<td>Industry standards 64.7%</td>
</tr>
<tr>
<td></td>
<td>Market readiness 58.8%</td>
</tr>
<tr>
<td></td>
<td>Policy normalisation 58.8%</td>
</tr>
<tr>
<td>Educational or scientific industry</td>
<td>Policy normalisation 83.3%</td>
</tr>
<tr>
<td></td>
<td>Industry standards 66.7%</td>
</tr>
<tr>
<td></td>
<td>Market readiness 50.0%</td>
</tr>
</tbody>
</table>

G1: What industry are you engaged in? (Not all factors are listed)
P11: In your opinion, what are the challenges for Blockchain technology development? (Multi-choice)
G1: What industry are you engaged in?
G2: What is your position?
A4: What channels do you learn about Blockchain technology from?

Industry distribution of respondents

- Blockchain industry: 30.1%
- IT or high-tech industry: 9.0%
- Retail industry: 13.5%
- Manufacturing: 12.0%
- Service industry: 14.3%
- Agriculture: 4.5%
- Educational or scientific institution: 9.0%
- Media: 1.5%
- Government: 1.5%
- Others: 11.3%

Department distribution of respondents

- Entrepreneurs/founders: 38.3%
- Innovation and strategic dept.: 11.3%
- IT and information dept.: 3.0%
- Purchasing dept.: 10.5%
- Marketing and sales dept.: 9.0%
- HR dept.: 15.8%
- Educators and science researchers: 8.3%
- Government officials: 1.5%
- Media: 1.5%
- Others: 0.8%

Channels that respondents learn about Blockchain technology

- Website: 64.7%
- WeChat: 52.6%
- Forum: 43.6%
- Traditional media: 30.1%
- Academic research: 37.6%
- Salon: 26.3%
- Weibo: 23.3%
- Others: 22.6%
Contact us

Chun Yin Cheung
PricewaterhouseCoopers Business Consulting (Shanghai) Co., Ltd.
Risk Assurance Partner
Email: chun.yin.cheung@cn.pwc.com

Kevin Feng
Shanghai Weilian Information Technology Co., Ltd.
Chief Operating Officer
Email: kevin.feng@vechain.com

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