Research on Big Data Adoption in Hong Kong Retail Sector
Context

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Executive Summary

A. Background

Big Data is one of the hottest new technology trends globally. According to a 2015 forecast from International Data Corporation (IDC), the Big Data technology and services market will grow at a 23.1% compound annual growth rate to $48.6 billion through 2019.

Considering the customer experience and expectation is changing with the development of technology and also retail sector is one of the major engines of Hong Kong Economy, this research is conducted to deeply understand the view from retail industry towards Big Data Technology, including their concerns/challenges, potential usage and willingness, to facilitate the design of subsequent big data related services.

B. Big Data Technology

Big data is a broad term for data sets so large or complex that traditional data processing applications are inadequate, e.g. customers' comments on your company or related products in social media/discussion forum.

Big data technology is the ability to quickly obtain valuable information from various types and volume of data. In Big Data Technology, there are 4 important concepts, namely the 4Vs:

- **Variety** - Extends beyond structured data and includes semi-structure or unstructured data of all varieties, such as text, audio, video, click streams, log files, and more.
- **Volume** - Comes in one size: large. Organizations are awash with data, easily amassing hundreds of terabytes and petabytes of information.
- **Velocity** - Sometimes must be analyzed in real time as it is streamed to an organization to maximize the data's business value.
- **Veracity** - Uncertainty of Data

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1 White Paper - Introduction to Big Data: Infrastructure and Networking Considerations, Juniper Networks, Inc.
C. Methodology

In this Study, telephone interviews were conducted to 400 respondents by a random selection process early 2016. The respondents were classified with the following eight business sectors:

1. Supermarkets / Convenience stores/ Department stores;
2. Medicines and cosmetic;
3. Clothing, footwear, and allied products;
4. Jewellery watches and clocks, and valuable gifts;
5. Food, alcoholic drinks and tobacco;
6. Consumer durable goods;
7. Food & Beverage; and
8. Other consumer goods.

D. Summary of Analysis Statistics

The survey findings and data analysis of Hong Kong retailers is divided into seven sub-sections. The topics covered are as follows:

1. Profiles of Respondents (Section 3.1);
2. Understanding on Big Data (Section 3.2);
3. Concerns and Expected Challenges to Adopt Big Data (Section 3.3);
4. Expected Benefit by Adopting Big Data (Section 3.4);
5. Big Data to Analyze (Section 3.5);
6. Future Big Data Adoption (Section 3.6); and
7. Interest in Potential Big Data Support (Section 3.7).

1. Profiles of Respondents

- At least 30 number of responses are collected for each business sector.
- Around 69% of the respondents (275 out of 400) are Small and Medium Enterprises (SMEs), while 31% are Large Enterprises (125 out of 400).
- 26% of SMEs rated themselves fall behind their peer while 7% of Large Enterprises rated themselves fall behind.
- SMEs are generally in low commitment to information technology (60% investing <1% of annual expenditure).

2. Understanding on Big Data

Manufacturing enterprises with fewer than 100 employees and non-manufacturing enterprises with fewer than 50 employees are regarded as small and medium enterprises (SMEs) in Hong Kong.

Research on Big Data Adoption in Hong Kong Retail Sector

- 50% of the SMEs and 26% of Large Enterprises never heard about Big Data
- For who heard about Big Data, both of SMEs and Large Enterprises are mainly in learning stage, with 39% and 35% respectively

3. Concerns and Expected Challenges to Adopt Big Data
   **Concerns**
   - For SMEs: "Insufficient knowledge of Big Data" is the biggest concern to Big Data Adoption (166, 60%), following by "Cost concern" (152, 55%) and "Complexity in data analysis" (64, 23%).
   - For Large Enterprise: "Cost concern" is the biggest concern to Big Data Adoption (62, 50%), following by "Insufficient knowledge of Big Data" (50, 40%) and "Privacy concern" (43, 34%).

   **Expected Challenges**
   - For SMEs: All issues are expected to be challenging (>50%), with the most challenging issue is "Hiring specialists" (73%), following by "Data Analysis" (66%) and "Share of information among departments" (63%).
   - For Large Enterprises: "Data storage" and "Data management" are the least challenges, with 61% and 51% are thinking these issues are not challenging respectively. Among the issues, the most challenging issue is "Hiring specialists" (66%), following by "Integrating internal and external data" (59%) and "Identify suitable data source" (58%).

4. Expected Benefit by Adopting Big Data
   - For SMEs: The top three benefits are Target Marketing (97, 35%), following by Customer Management (93, 34%) and Product/Service Planning (86, 31%).
   - For Large Enterprises: The top three benefits are Customer Management (78, 62%), following by Target Marketing (76, 61%) and Product/Service Planning (72, 58%).

5. Big Data to Analyze
   - For SMEs: The top three types of data are Customer Preference (208, 76%), following by Customer Buying Behavior (190, 69%) and Product Demand (184, 67%).
   - For Large Enterprises: The top three types of data are Customer Buying Behavior (105, 84%), following by Customer Preference (101, 81%) and Product Demand (100, 80%).
   - Majority of the respondents would like to get the data from Social Media (78.5%), following by Sharing Website (67.3%), Forum (22.3%) and E-commerce Platform (22.0%).

6. Future Big Data Adoption
For SMEs: Over half of the SMEs (56%) do not have any plan regarding Big Data in the future. Among the 108 SME respondents who are interested to adopt Big Data in future, around 75% of the respondents expect to spend <$50k, while 19% of them may spend $50k-100k and 6% of them will spend $100k-$500k.

For Large Enterprises: 40% of the Large Enterprises do not have any plan regarding Big Data in the future. Among the 52 large enterprise respondents who are interested to adopt Big Data in future, 40% of the respondents expect to spend $50k-$100k, 29% of them may spend $100k-$500k, 25% of them may spend <$50k and 6% of them may spend $500k-$1M.

The potential Big Data market in SME retailers is estimated at $3.12B while for Large Enterprises in retail sector, the potential Big Data market is estimated at $166.3M.

7. **Interest in Potential Big Data Support**

*Comments from SMEs and Large Enterprises*

- 18% of SME respondents and 35% of the Large Enterprise respondents agree their major competitors will adopt Big Data within 3 years respectively.
- 48% of SME respondents and 59% of the Large Enterprise respondents strongly agree or agree "SMEs need Big Data" respectively.
- 41% of SME respondents and 30% of the Large Enterprise respondents strongly agree or agree "Only big company use Big Data" respectively.
- 58% of SME respondents and 75% of the Large Enterprise respondents strongly agree or agree "Big Data can help my business" respectively.
- 57% of SME respondents and 82% of the Large Enterprise respondents strongly agree or agree "Big Data is the trend of future" respectively.
- 48% of SME respondents and 66% of the Large Enterprise respondents strongly agree or agree "Management decisions of my company are mainly data-driven" respectively.

*Interest to Adopt Big Data under Different Circumstances*

The following circumstances were reviewed by the 400 retailer respondents to illustrate the change of their willingness to adopt Big Data.

1. No support from any party
2. 20% financial support from the Government
3. If there are 50% financial support from the Government
4. Technical support from third party
5. Targeted and cleansed big data for internal analysis available for sale from third parties

- It is noticed that, in the basic situation that no support from any party, around 63% of the
respondents are not interested to adopt Big Data. However, with some supports, no matter in what format, their interests are significantly improved, the difference ranging from 17%-22%.

- 50% financial support from the Government is the most preferred to encourage them “definitely” or “quite interested” to adopt Big Data (32%), following by "Technical support from third party" (25%) and "Targeted and cleansed big data for internal analysis available for sale from third parties" (22%)

E. Comments from In-depth Interviews

Ten in-depth interviews were conducted in May-October 2016 to sizable companies that are interested in the topic of Big Data Technology in order to capture the views of market leaders to supplement the survey result by open-ended questions.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Comments</th>
<th>Insights in additional to survey</th>
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</table>
| **Current Big Data Project** | • Most of them are either no current big data project or implementing pilot project with internal data only  
• For some marketing campaign, “big data technology” will be deployed as a tools to support the campaign  
• Although no big data project, they will continue to evolve internal Business Intelligence system | • The current Big Data Project mainly reply on internal data only  
• Marketing is the major area to start with  
• Most of the market leader take enhancement of BI as the first step to Big Data |
| **Major Barriers to Big Data** | The reasons of no current Big Data Project includes:  
• There are other projects with higher priority  
• No significant business case to support investment  
• The understanding of management level yet to be educated  
• The tools and solutions are not clearly available in the market  
• Insufficient on capability to collect & analyze dynamic big data | • Although it is understood Big Data is the future trend, market leaders do not see the urgency to adopt immediately  
• How to get management buy-in is the common barrier to Big Data in large enterprises  
• Internal analysis experience is insufficient even in market leaders  
• External specialists are relied to launch big data project |
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<tr>
<th>Aspect</th>
<th>Comments</th>
<th>Insights in additional to survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interested Data to Analyze</strong></td>
<td>They are interested to perform analysis mainly in following areas:</td>
<td>• Besides external data, internal data is also seen as importance due to the large scale of market leaders</td>
</tr>
<tr>
<td></td>
<td>• In-house Data</td>
<td>• As most market leaders developed their own websites for e-commerce, the footprint information from the website cannot be neglected</td>
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<tr>
<td></td>
<td>• Competitor's Pricing &amp; Promotion</td>
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<td></td>
<td>• Purchasing Behavior</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sentiment from Social Media</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sentiment from Forum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Real-time Point-Of-Sale Data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cost Variation of Raw Material</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Website Footprint</td>
<td></td>
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<tr>
<td><strong>Expected Benefits</strong></td>
<td>They expect the above data can benefit:</td>
<td>• Besides sale-driven benefits, market leaders also focus on internal sustainable development to provide better services to their customer and remain competitiveness in the market</td>
</tr>
<tr>
<td></td>
<td>• Customer Relationship Management</td>
<td></td>
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<td></td>
<td>• Target Marketing</td>
<td></td>
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<tr>
<td></td>
<td>• Marketing Campaign Design</td>
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<td></td>
<td>• Website Design</td>
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<tr>
<td></td>
<td>• Operational &amp; Business Decision</td>
<td></td>
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<tr>
<td></td>
<td>• Reaction to Competitor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Facilitate Strength, Weakness, Opportunity, Threat (SWOT) Analysis</td>
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</table>
F. Conclusion

In considering the current situation found in this research, the following recommendations are suggested in order to enhance the big data adoption in Hong Kong retail sector:

For SMEs
1. Upgrade IT infrastructure in order to increase the readiness to adopt Big Data Technologies, for example migrating to cloud services
2. Attend relevant seminars, forums or workshops hosted by relevant organizations to keep on-track on the latest Big Data development
3. Actively consider applying relevant supportive schemes/programmes to facilitate the adoption, e.g. Retail Technology Adoption Assistance Scheme for Manpower Demand Management (ReTAAS) or Technology Voucher Programme, etc.

For Large Enterprises
4. Increase the process from learning stage to pilot stage in Big Data related project in order to remain competitiveness
5. Seek independent consultants to conduct security and privacy assessment to reduce the privacy concern from your company and clients

For Public Organizations/ the Government
6. Enhance the promotion and education of Big Data Technology among the industry, including the basic idea and potential benefits
7. Act as a lead on data sharing and big data adoption to transfer the experience with the Industry
8. Enhance the training for Big Data Analyst as a major career path in future
9. Besides financial support, other supports such as consultation service and a subscription platform are also welcome by the Industry

-End of Executive Summary-
1. Introduction

1.1. Background

Big Data is one of the hottest new technology trends globally. According to a recent forecast from International Data Corporation (IDC), the Big Data technology and services market will grow at a 26.4% compound annual growth rate to $41.5 billion through 2018, or about six times the growth rate of the overall information technology market.

In Hong Kong, the awareness on Big Data Technology is also raising, with various parties are transferring the knowledge to Hong Kong companies through conference, summit or symposium (e.g. Big Data & Analytics Innovation Summit 2015, Hong Kong Big Data Symposium 2015 and Big Data and Digital Innovation 2015).

Considering the customer experience and expectation is changing with the development of technology and also retail sector is one of the major engines of Hong Kong Economy, this research is conducted to deeply understand the view from retail industry towards Big Data Technology, including their concerns/challenges, potential usage and willingness, to facilitate the design of subsequent big data related services.

1.2. Big Data Technology

Big data is a broad term for data sets so large or complex that traditional data processing applications are inadequate, e.g. customers’ comments on your company or related products in social media/discussion forum.

Big data technology is the ability to quickly obtain valuable information from various types and volume of data. In Big Data Technology, there are 4 important concepts, namely the 4Vs:

- **Variety** - Extends beyond structured data and includes semi-structure or unstructured data of all varieties, such as text, audio, video, click streams, log files, and more.
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- **Velocity** - Sometimes must be analyzed in real time as it is streamed to an organization to maximize the data's business value.
- **Veracity** - Uncertainty of Data
1.3. Objective

The objectives of this research are:

1. Understand the latest development of market
2. Understand the adoption status of Big Data Technology among Hong Kong retailers
3. Provide insights to the service/product designers
4. Provide insights to end-users

1.4. Structure of Report

This report sets out our approach and methodology in conducting the research, provides the survey findings and presents the results of data analysis of Hong Kong retailers.

Following this introductory chapter, the rest of this document is structured as follows:

• Chapter 2 describes in detail the methodology adopted to carry out the research;
• Chapter 3 presents the survey results, data analysis and major findings;
• Chapter 4 presents the major findings from in-depth interviews; and
• Chapter 5 sets out our conclusions and recommendations.
2. Methodology

For robust understanding of the views of Hong Kong retailers towards Big Data Technology, both telephone interviews and in-depth interviews are applied in order to facilitate quantitative analysis and qualitative analysis respectively.

2.1. Telephone Interviews

1.1.1 Questionnaire Design
To facilitate the interview process and enhance record management, a designated questionnaire was developed with reference to similar research in other countries. Please refer to Appendix I for the questionnaire.

The information to be collected is illustrated as follows:
- Company Profile
- Big Data Adoption Situation
- Difficulties
- Interested Data
- Future Big Data Adoption
- Interest on Big Data Service

1.1.2 Sample Size

In this Study, 400 responses were successfully collected early 2016, with the following eight business sectors:
1. Supermarkets / Convenience stores/ Department stores
2. Medicines and cosmetic
3. Clothing, footwear, and allied products
4. Jewellery watches and clocks, and valuable gifts
5. Food, alcoholic drinks and tobacco
6. Consumer durable goods
7. Food & Beverage
8. Other consumer goods

The ratio is determined based on Census and Statistics Department latest number of establishments in corresponding business sector.
2.2. In-depth Interviews

2.2.1 Questionnaire Design

The interviews are structured with a designated questionnaire. Please refer to Appendix II for the details.

2.2.2 Sample Size

Ten in-depth interviews were conducted in May-October 2016 to sizable companies that are interested in the topic of Big Data Technology in order to capture the views of market leaders to supplement the survey result by open-ended questions.
3. Survey Statistics

This chapter presents the survey findings and data analysis of Hong Kong retailers for the Study and is divided into seven sub-sections. The topics covered are as follows:

1. Profiles of Respondents (Section 3.1);
2. Understanding on Big Data (Section 3.2);
3. Concerns and Expected Challenges to Adopt Big Data (Section 3.3);
4. Expected Benefit by Adopting Big Data (Section 3.4);
5. Big Data to Analyze (Section 3.5);
6. Future Big Data Adoption (Section 3.6); and
7. Interest in Potential Big Data Support (Section 3.7).

400 respondents have been successfully interviewed in this Study.

3.1. Profile of respondents

This sub-section discusses the profiles of the 400 surveyed retailers, including

• Business Sector;
• Employee Numbers;
• Overall Level of Data Management and Analysis Comparing to the Peers;
• Spending on Information Technology Annually Comparing to Total Annual Expense; and
• Range of Annual Revenue.
3.1.1. Business Sector

As shown in below table and figure, at least 30 number of responses are collected for each business sector. Among the 400 respondents, the top business sector is "Clothing, footwear, and allied products" (80, 20%), following by "Food, alcoholic drinks and tobacco" (76, 19%) and "Other consumer goods" (59, 15%).

<table>
<thead>
<tr>
<th>Business Sector</th>
<th>Number of Response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Supermarkets / Convenience stores/ Department stores</td>
<td>32</td>
<td>8%</td>
</tr>
<tr>
<td>2. Medicines and cosmetic</td>
<td>31</td>
<td>8%</td>
</tr>
<tr>
<td>3. Clothing, footwear, and allied products</td>
<td>80</td>
<td>20%</td>
</tr>
<tr>
<td>4. Jewellery watches and clocks, and valuable gifts</td>
<td>30</td>
<td>8%</td>
</tr>
<tr>
<td>5. Food, alcoholic drinks and tobacco</td>
<td>76</td>
<td>19%</td>
</tr>
<tr>
<td>6. Consumer durable goods</td>
<td>40</td>
<td>10%</td>
</tr>
<tr>
<td>7. Food &amp; Beverage</td>
<td>52</td>
<td>13%</td>
</tr>
<tr>
<td>8. Other consumer goods</td>
<td>59</td>
<td>15%</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100%</td>
</tr>
</tbody>
</table>

Business Nature

- Supermarkets / Convenience stores/ Department stores (8%)
- Medicines and cosmetic (8%)
- Clothing, footwear, and allied products (20%)
- Jewellery watches and clocks, and valuable gifts (8%)
- Food, alcoholic drinks and tobacco (19%)
- Consumer durable goods (10%)
- Food & Beverage (13%)
- Other consumer goods (15%)
3.1.2. Employee Numbers

In this study, it is strategically aim at company with employee numbers greater than 5 people since it is believe that for micro-sized company, Big Data Technology will be in lower priority of their business development.

It can be seen from below table and figure that around 69% of the respondents (275 out of 400) are Small and Medium Enterprises (SMEs), while 31% are Large Enterprises (125 out of 400).

Most of the companies fall in the category "Number of staff 6-20" (203, 51%), following by "21-50" (72, 18%), "101-500" (63, 16%), "51-100" (46, 12%) and ">500" (16, 4%).

<table>
<thead>
<tr>
<th>Number of Staff</th>
<th>Number of Response</th>
<th>%</th>
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<tbody>
<tr>
<td>SMEs(^3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>6-20</td>
<td>203</td>
<td>51%</td>
</tr>
<tr>
<td>21-50</td>
<td>72</td>
<td>18%</td>
</tr>
<tr>
<td>Sub-total</td>
<td>275</td>
<td>69%</td>
</tr>
<tr>
<td>Large Enterprises</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-100</td>
<td>46</td>
<td>12%</td>
</tr>
<tr>
<td>101-500</td>
<td>63</td>
<td>16%</td>
</tr>
<tr>
<td>&gt;500</td>
<td>16</td>
<td>4%</td>
</tr>
<tr>
<td>Sub-total</td>
<td>125</td>
<td>31%</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100%</td>
</tr>
</tbody>
</table>

SMEs vs Large Enterprises

\(^3\) Manufacturing enterprises with fewer than 100 employees and non-manufacturing enterprises with fewer than 50 employees are regarded as small and medium enterprises (SMEs) in Hong Kong.
3.1.3. Overall level of data management and analysis comparing to the peers

For SMEs
In term of overall level of data management and analysis comparing to the peers, among the 275 SME respondents, most of them value themselves as "Normal" (193, 70%), following by "Fall Behind" (72, 26%) and Advanced (7, 3%).

For Large Enterprises
In term of overall level of data management and analysis comparing to the peers, among the 125 large enterprise respondents, most of them value themselves as "Normal" (104, 83%), with equal amount of them rated "Fall Behind" (9, 7%) and Advanced (9, 7%).

Comparison
In comparing SMEs and Large Enterprises, over one-quarter of SMEs rated themselves fall behind their peer, which is 19% more than Large Enterprises, while Large Enterprises are generally believe they are doing normal practice with their peer.

<table>
<thead>
<tr>
<th></th>
<th>SMEs</th>
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<th></th>
<th>Large Enterprises</th>
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<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td></td>
<td>#</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Advanced</td>
<td>7</td>
<td>3%</td>
<td></td>
<td>9</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>193</td>
<td>70%</td>
<td></td>
<td>104</td>
<td>83%</td>
<td></td>
</tr>
<tr>
<td>Fall behind</td>
<td>72</td>
<td>26%</td>
<td></td>
<td>9</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>No Idea</td>
<td>3</td>
<td>1%</td>
<td></td>
<td>3</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>275</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td><strong>125</strong></td>
<td><strong>100%</strong></td>
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</table>

Overall level of data management and analysis comparing to the peers

<table>
<thead>
<tr>
<th></th>
<th>Large Enterprises</th>
<th></th>
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<th>SMEs</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Advanced</td>
<td>%</td>
<td></td>
<td>Normal</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>7%</td>
<td></td>
<td></td>
<td>83%</td>
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</table>
3.1.4. Spending on information technology annually comparing to total annual expense

*For SMEs*
In term of annual spending ratio, among the 275 SME respondents, most of them are spending less than 1% of their total expense (166, 60%), following by "1-5%" (79, 29%), "6-10%" (17, 6%) and "11-20%" (13, 5%) while no one are spending ">20%".

*For Large Enterprises*
In term of annual spending ratio, among the 275 large enterprise respondents, most of them are spending 1-5% of their total expense (51, 41%), following by "<1%" (46, 37%), "6-10%" (28, 22%) while no one are spending "11-20%" or ">20%".

*Comparison*
In comparing SMEs and Large Enterprises, SMEs are generally in low commitment to information technology with most of them spending <1% total expense on it, which may be one of the reasons of falling behind their peer as shown in 3.1.3.

While 37% large enterprises are spending <1%, it is not necessary mean the commitment to information technology is as low as in SMEs since their operation scale are much larger. However, with the larger scale, 41% of them are spending "1-5%", even larger than "<1%" means large enterprises generally recognize the importance of information technology in their business.

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<thead>
<tr>
<th></th>
<th>SMEs</th>
<th>Large Enterprises</th>
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<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>&lt;1%</td>
<td>166</td>
<td>60%</td>
</tr>
<tr>
<td>1 - 5%</td>
<td>79</td>
<td>29%</td>
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<tr>
<td>6 - 10%</td>
<td>17</td>
<td>6%</td>
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<tr>
<td>11 - 20%</td>
<td>13</td>
<td>5%</td>
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<tr>
<td>&gt;20%</td>
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<td>0%</td>
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<tr>
<td>Total</td>
<td>275</td>
<td>100%</td>
</tr>
</tbody>
</table>
3.1.5. Range of annual revenue

For SMEs
In term of annual revenue, among the 275 SME respondents, only 222 of them disclose their information regarding the annual revenue. Among the 222 respondents, around one-third of them are having revenue of "1.1M-5.0M" (78, 35.1%), following by "5.1M-10.0M" (51, 23.0%), "<1.0M" (48, 21.6%) and "10.1-50.0M" (37, 16.7%). Only 3.2% and 0.5% are having revenue of "50.1M-100.0M" and ">100M" respectively.

For Large Enterprises
Among the 125 large enterprise respondents, only 79 of them disclose their information regarding the annual revenue. Among the 79 respondents, around 31.6% are having revenue of "10.1M-50.0M" (25, 31.6%), following by "50.1M-100.0M" (22, 27.8%), ">100.0M" (15, 19.0%) and "5.1-10.0M" (11, 13.9%). Only 6.3% and 1.3% are having revenue of "1.1M-5.0M" and "<1.0M" respectively.

Comparison
In comparing SMEs and Large Enterprises, it is noticed that the scale of SMEs and Large Enterprises are in huge difference, which support the statement in Section 3.1.4.
### Research on Big Data Adoption in Hong Kong Retail Sector

#### SMEs vs Large Enterprises

<table>
<thead>
<tr>
<th>Range of Annual Revenue</th>
<th>SMEs</th>
<th>Large Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.0M</td>
<td>48</td>
<td>1</td>
</tr>
<tr>
<td>1.1M - 5.0M</td>
<td>78</td>
<td>5</td>
</tr>
<tr>
<td>5.1M - 10.0M</td>
<td>51</td>
<td>11</td>
</tr>
<tr>
<td>10.1M - 50.0M</td>
<td>37</td>
<td>25</td>
</tr>
<tr>
<td>50.1M - 100.0M</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>&gt;100.0M</td>
<td>1</td>
<td>15</td>
</tr>
</tbody>
</table>

**Responded**: 222 SMEs, 79 Large Enterprises

**Undisclosed**: 53 SMEs, 46 Large Enterprises

**Total**: 275 SMEs, 125 Large Enterprises
3.2. Understanding on Big Data

This sub-section discusses the understanding on Big Data of the 400 surveyed retailers, including:

- Familiarity to Big Data Technology
- Status in Big Data

3.2.1. Familiarity to Big Data Technology

**For SMEs**

In term of Familiarity to Big Data Technology, among the 275 SME respondents, half of the respondents admit that they had never heard about it (138, 50%), following by "Not quite familiar" (87, 32.0%). Only 12% and 6% are "Familiar" and "Very familiar" respectively.

**For Large Enterprises**

Among the 125 large enterprise respondents, around 38% are "Not quite familiar" (48), following by "Familiar (41, 33%), "Never heard about it" (32, 26%) and "Very familiar" (4, 3%).

**Comparison**

In comparing SMEs and Large Enterprises, Large Enterprises are in general putting much more awareness to Big Data Technology, with 24% more than SMEs that had heard about Big Data Technology or even familiar with it. However, in term of "Very familiar", SMEs are 3% higher than Large Enterprises, which may reflect that SMEs would like to apply Big Data to make them closer with Large Enterprises.

<table>
<thead>
<tr>
<th></th>
<th>SMEs</th>
<th></th>
<th>Large Enterprises</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Very familiar</td>
<td>16</td>
<td>6%</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Familiar</td>
<td>34</td>
<td>12%</td>
<td>41</td>
<td>33%</td>
</tr>
<tr>
<td>Not quite familiar</td>
<td>87</td>
<td>32%</td>
<td>48</td>
<td>38%</td>
</tr>
<tr>
<td>Never heard about it</td>
<td>138</td>
<td>50%</td>
<td>32</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>275</strong></td>
<td><strong>100%</strong></td>
<td><strong>125</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
3.2.2. Status in Big Data

For SMEs
In term of Status in Big Data, among the 137 SME respondents who had heard about Big Data Technology, 39% of them are in "Learning stage" (54), following by "No plan" (50, 36.0%). Only 16% and 8% are in "Pilot stage" and "Implemented" respectively.

For Large Enterprises
Among the 93 large enterprise respondents who had heard about Big Data Technology, around 35% are in "Learning stage" (33), following by "Implemented" (25, 27%), "No plan" (24, 26%) and "Pilot stage" (11, 12%).

Comparison
In comparing SMEs and Large Enterprises, both of them are learning this new technology, with large enterprises adopted earlier than SMEs that around one-quarter of who understand Big Data Technology had implemented Big Data project.
<table>
<thead>
<tr>
<th></th>
<th>SMEs</th>
<th>Large Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td></td>
</tr>
<tr>
<td>Implemented</td>
<td>11</td>
<td>8%</td>
</tr>
<tr>
<td>Pilot stage</td>
<td>22</td>
<td>16%</td>
</tr>
<tr>
<td>Learning stage</td>
<td>54</td>
<td>39%</td>
</tr>
<tr>
<td>No plan</td>
<td>50</td>
<td>36%</td>
</tr>
<tr>
<td>Responded</td>
<td>137</td>
<td>100%</td>
</tr>
<tr>
<td>Never heard about</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>Big Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>275</td>
<td></td>
</tr>
</tbody>
</table>

**SMEs**

- Implemented: 11 (8%)
- Pilot stage: 22 (16%)
- Learning stage: 54 (39%)
- No plan: 50 (36%)
- Responded: 137 (100%)
- Never heard about Big Data: 138

**Large Enterprises**

- Implemented: 25 (27%)
- Pilot stage: 11 (12%)
- Learning stage: 33 (35%)
- No plan: 24 (26%)
- Responded: 93 (100%)
- Never heard about Big Data: 32
3.3. **Concerns and Expected Challenges to Adopt Big Data**

This sub-section discusses the difficulties to adopt Big Data of the 400 surveyed retailers, including:

- Concerns on Big Data Adoption
- Expected Challenges for Big Data Adoption

### 3.3.1. Concerns on Big Data Adoption

*For SMEs*

In term of concerns on Big Data Adoption, among the 275 SME respondents, "Insufficient knowledge of Big Data" is the biggest concern to Big Data Adoption (166, 60%), following by "Cost concern" (152, 55%) and "Complexity in data analysis" (64, 23%).

*For Large Enterprises*

Among the 125 large enterprise respondents, "Cost concern" is the biggest concern to Big Data Adoption (62, 50%), following by "Insufficient knowledge of Big Data" (50, 40%) and "Privacy concern" (43, 34%).

*Comparison*

In comparing SMEs and Large Enterprises, the largest difference is on the view of "Insufficient knowledge of Big Data", with 20% more SMEs agree this is the concern to them. Also, Large Enterprises are more concern about data privacy than SMEs, while both of them agree Cost is one of top 3 concerns.
## Concerns on Big Data Adoption

<table>
<thead>
<tr>
<th>Concerns</th>
<th>SMEs (A)</th>
<th>Large Enterprises (B)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Still struggling with traditional data analysis</td>
<td>44</td>
<td>16%</td>
<td>13</td>
</tr>
<tr>
<td>Insufficient knowledge of Big Data</td>
<td>166</td>
<td>60%</td>
<td>50</td>
</tr>
<tr>
<td>Lack of data transparency among departments</td>
<td>28</td>
<td>10%</td>
<td>15</td>
</tr>
<tr>
<td>Complexity in data analysis</td>
<td>64</td>
<td>23%</td>
<td>37</td>
</tr>
<tr>
<td>Lack of skills and expertise</td>
<td>101</td>
<td>37%</td>
<td>37</td>
</tr>
<tr>
<td>Cost concern</td>
<td>152</td>
<td>55%</td>
<td>62</td>
</tr>
<tr>
<td>Security concern</td>
<td>51</td>
<td>19%</td>
<td>31</td>
</tr>
<tr>
<td>Privacy concern</td>
<td>62</td>
<td>23%</td>
<td>43</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
<td>7%</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>275</td>
<td></td>
<td>125</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concerns</th>
<th>SMEs (%)</th>
<th>Large Enterprises (%)</th>
<th>Difference</th>
</tr>
</thead>
</table>

- **Still struggling with traditional data analysis**: SMEs 16%, Large Enterprises 10%
- **Insufficient knowledge of Big Data**: SMEs 60%, Large Enterprises 40%
- **Lack of data transparency among departments**: SMEs 10%, Large Enterprises 12%
- **Complexity in data analysis**: SMEs 23%, Large Enterprises 30%
- **Lack of skills and expertise**: SMEs 37%, Large Enterprises 30%
- **Cost concern**: SMEs 55%, Large Enterprises 50%
- **Security concern**: SMEs 19%, Large Enterprises 25%
- **Privacy concern**: SMEs 23%, Large Enterprises 34%
- **Others**: SMEs 7%
3.3.2. Expected Challenges for Big Data Adoption

For SMEs
In term of Expected Challenges for Big Data Adoption, among the 275 SME respondents, all issues are expected to be challenging (>50%). Among the issues, the most challenging issue is "Hiring specialists" (73%), following by "Data Analysis" (66%) and "Share of information among departments" (63%).

For Large Enterprises
Among the 125 large enterprise respondents, "Data storage" and "Data management" are the least challenges, with 61% and 51% are thinking these issues are not challenging respectively. Among the issues, the most challenging issue is "Hiring specialists" (66%), following by "Integrating internal and external data" (59%) and "Identify suitable data source" (58%).

Comparison
In comparing SMEs and Large Enterprises, SMEs are generally concerning about the technical ability of themselves towards to this new technology, also their departments may not have a consistent standard and procedure to share their data; while Large Enterprises have already set up good infrastructure and hence Data storage, Data management and Data analysis will be the least challenges. Both of them require specialists to conduct big data analysis, which reflect the related job opportunities will be in great demand.
Challenges for Big Data Adoption - SMEs

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Challenging</th>
<th>Not Challenging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of information among departments</td>
<td>63%</td>
<td>37%</td>
</tr>
<tr>
<td>Hiring specialists</td>
<td>73%</td>
<td>27%</td>
</tr>
<tr>
<td>Data analysis</td>
<td>66%</td>
<td>35%</td>
</tr>
<tr>
<td>Data management</td>
<td>61%</td>
<td>39%</td>
</tr>
<tr>
<td>Data storage</td>
<td>57%</td>
<td>43%</td>
</tr>
<tr>
<td>Integrating internal and external data</td>
<td>62%</td>
<td>38%</td>
</tr>
<tr>
<td>Preparing/cleansing data</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>Identify suitable data source</td>
<td>62%</td>
<td>38%</td>
</tr>
</tbody>
</table>

Challenges for Big Data Adoption - Large Enterprises

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Challenging</th>
<th>Not Challenging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of information among departments</td>
<td>52%</td>
<td>48%</td>
</tr>
<tr>
<td>Hiring specialists</td>
<td>66%</td>
<td>34%</td>
</tr>
<tr>
<td>Data analysis</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Data management</td>
<td>49%</td>
<td>51%</td>
</tr>
<tr>
<td>Data storage</td>
<td>39%</td>
<td>61%</td>
</tr>
<tr>
<td>Integrating internal and external data</td>
<td>59%</td>
<td>41%</td>
</tr>
<tr>
<td>Preparing/cleansing data</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>Identify suitable data source</td>
<td>58%</td>
<td>42%</td>
</tr>
</tbody>
</table>
3.4. Expected Benefit by Adopting Big Data

For SMEs
In term of benefits by using Big Data Technologies, among the 275 SME respondents, the top three benefits are Target Marketing (97, 35%), following by Customer Management (93, 34%) and Product/Service Planning (86, 31%).

For Large Enterprises
Among the 125 large enterprise respondents, the top three benefits are Customer Management (78, 62%), following by Target Marketing (76, 61%) and Product/Service Planning (72, 58%).

Comparison
In comparing SMEs and Large Enterprises, both of them agree Target Marketing, Customer Management and Product/Service Planning are the major benefits by using Big Data Technologies in similar order. However, it is noticed that the % difference of the understanding of benefits between SMEs and Large Enterprises is quite high, ranging from 3% to 29%, which suggest that SMEs may not clearly understand what Big Data can offer to them in order to facilitate their business.
Research on Big Data Adoption in Hong Kong Retail Sector

<table>
<thead>
<tr>
<th></th>
<th>SMEs (A)</th>
<th>Large Enterprises (B)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Customer Management</td>
<td>93</td>
<td>34%</td>
<td>78</td>
</tr>
<tr>
<td>Target Marketing</td>
<td>97</td>
<td>35%</td>
<td>76</td>
</tr>
<tr>
<td>Correlations Analysis</td>
<td>33</td>
<td>12%</td>
<td>37</td>
</tr>
<tr>
<td>Product/ Service Planning</td>
<td>86</td>
<td>31%</td>
<td>72</td>
</tr>
<tr>
<td>Cross-selling</td>
<td>51</td>
<td>19%</td>
<td>43</td>
</tr>
<tr>
<td>Pricing Strategy</td>
<td>76</td>
<td>28%</td>
<td>57</td>
</tr>
<tr>
<td>Sales Forecasting</td>
<td>79</td>
<td>29%</td>
<td>59</td>
</tr>
<tr>
<td>Competitive Analysis</td>
<td>76</td>
<td>28%</td>
<td>64</td>
</tr>
<tr>
<td>Fraud Detection</td>
<td>26</td>
<td>9%</td>
<td>16</td>
</tr>
<tr>
<td>Others</td>
<td>81</td>
<td>29%</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>275</td>
<td></td>
<td>125</td>
</tr>
</tbody>
</table>

Benefits by using Big Data Technologies - SMEs

Benefits by using Big Data Technologies - Large Entreprise
3.5. Big Data to Analyze

This sub-section discusses the interested type and source of Big Data of the 400 surveyed retailers, including

- Type of interested data for analysis
- Preferred Public Sources of Data

3.5.1. Type of interested data for analysis

For SMEs
In term of type of data, among the 275 SME respondents, the top three types of data are Customer Preference (208, 76%), following by Customer Buying Behavior (190, 69%) and Product Demand (184, 67%).

For Large Enterprises
Among the 125 large enterprise respondents, the top three types of data are Customer Buying Behavior (105, 84%), following by Customer Preference (101, 81%) and Product Demand (100, 80%).

Comparison
In comparing SMEs and Large Enterprises, both of them agree Customer Preference, Customer Buying Behavior and Product Demand are the major types of data to analyze in similar order. SMEs are less focus on Design Concept and Customer Experience, with 28% and 21% lower than Large Enterprises respectively, which suggest SMEs are not design originated and also customer experience is not their primary aim as they are less famous and hence the discussion of their products/companies in forum or social media is too few to conduct valid analysis.
## Type of interested data for analysis

<table>
<thead>
<tr>
<th>Type of interested data for analysis</th>
<th>SMEs (A)</th>
<th>Large Enterprises (B)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Customer Experience</td>
<td>134</td>
<td>49%</td>
<td>87</td>
</tr>
<tr>
<td>Customer Preference</td>
<td>208</td>
<td>76%</td>
<td>101</td>
</tr>
<tr>
<td>Customer Buying Behavior</td>
<td>190</td>
<td>69%</td>
<td>105</td>
</tr>
<tr>
<td>Design Concept</td>
<td>45</td>
<td>16%</td>
<td>56</td>
</tr>
<tr>
<td>Sale Data</td>
<td>166</td>
<td>60%</td>
<td>97</td>
</tr>
<tr>
<td>Product Demand</td>
<td>184</td>
<td>67%</td>
<td>100</td>
</tr>
<tr>
<td>Peer Product Pricing</td>
<td>86</td>
<td>31%</td>
<td>48</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
<td>7%</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>275</td>
<td>125</td>
<td></td>
</tr>
</tbody>
</table>
3.5.2. Preferred Public Sources of Data

In terms of preferred public sources, majority of them would like to get the data from Social Media (78.5%), following by Sharing Website (67.3%), Forum (22.3%) and E-commerce Platform (22.0%).

---

**Preferred Public Sources of Data**

- **A. Social Media** (Facebook/Google+/Twitter/QQ)
- **B. Sharing Website** (Youtube)
- **C. E-commerce Platform** (Amazon/ Ebay/ Taobao)
- **D. Forum** (HKDiscuss/ HKGolden)
- **E. Financial Website** (Yahoo!Finance/Google Finance)
- **F. Local Searching Platform** (Openrice)
- **G. Reservation & Commentary** (Hotel.com/Trip)
- **H. Government** (Local/Overseas) (Weather/ Demographic/ GDP)
- **I. Publication** (Google Book/ Newspaper)
- **J. Others**
3.6. Future Big Data Adoption

This sub-section discusses the future Big Data Adoption of the 400 surveyed retailers, including

- Future Plan
- Expected Spending in Big Data

3.6.1. Future Plan

For SMEs
In term of future plan, among the 275 SME respondents, over half of the respondents (56%) do not have any plan regarding Big Data in the future, while 29% of them maybe adopt Big Data in future, 6% of them will adopt within 3 years and 5% of them will adopt 3 years later.

For Large Enterprises
Among the 125 large enterprise respondents, 40% of the respondents do not have any plan, while 20% of them maybe adopt in future, 9% of them will adopt within 3 years and 5% of them will adopt 3 years later.

Comparison
In comparing SMEs and Large Enterprises, SMEs are more reluctant to adopt this new technology, this may due to their understanding on Big Data is not enough and also they do not know what they can be benefit from using Big Data as suggested by Section 3.2.1 that around half of them did not hear about Big Data before and also Section 3.4 that their expected benefits is far lower than Large Enterprises.
### Research on Big Data Adoption in Hong Kong Retail Sector

#### SMEs and Large Enterprises

<table>
<thead>
<tr>
<th></th>
<th>SMEs</th>
<th></th>
<th></th>
<th></th>
<th>Large Enterprises</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td></td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Had already adopted</td>
<td>11</td>
<td>4%</td>
<td>33</td>
<td>26%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, within 3 years</td>
<td>16</td>
<td>6%</td>
<td>11</td>
<td>9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, 3 years later</td>
<td>14</td>
<td>5%</td>
<td>6</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maybe</td>
<td>80</td>
<td>29%</td>
<td>25</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>154</td>
<td>56%</td>
<td>50</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>275</td>
<td>100%</td>
<td>125</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Future Big Data Adoption

- **SMEs**
  - Had already adopted: 4%
  - Yes, within 3 years: 6%
  - Yes, 3 years later: 5%
  - Maybe: 29%
  - No: 56%
  - Total: 100%

- **Large Enterprises**
  - Had already adopted: 26%
  - Yes, within 3 years: 9%
  - Yes, 3 years later: 5%
  - Maybe: 20%
  - No: 40%
  - Total: 100%
3.6.2. Expected Spending in Big Data

For SMEs
In term of expected spending in Big Data, among the 108 SME respondents who are interested to adopt Big Data in future, around 75% of the respondents expect to spend <$50k, while 19% of them may spend $50k-100k and 6% of them will spend $100k-$500k.

For Large Enterprises
Among the 52 large enterprise respondents who are interested to adopt Big Data in future, 40% of the respondents expect to spend $50k-$100k, 29% of them may spend $100k-$500k, 25% of them may spend <$50k and 6% of them may spend $500k-$1M.

Comparison
According to Census and Statistics Department, there were 49,500 establishments in retail sector, with 49,100 of them engaged less than 50 persons, which is classified as SME, and 400 of them were Large Enterprises. While for F&B sector, there were 13,900 establishments, with 13,300 of them were SMEs and 600 of them were Large Enterprises.4

In our survey base, both retail and F&B sector as defined in C&SD are surveyed.

When considering Section 3.6.1 and Section 3.6.2, 44% of SMEs may adopt Big Data in future while for Large Enterprises, the number is 60%, together with the finding in Section 3.6.2, the potential Big Data market in SME retailers is estimated at $3.12B while for Large Enterprises in retail sector, the potential Big Data market is estimated at $166.3M.

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4 Key Statistics on Business Performance and Operating Characteristics of the Import/Export, Wholesale and Retail Trades, and Accommodation and Food Services Sectors in 2014, C&SD Dec 2015
Research on Big Data Adoption in Hong Kong Retail Sector

<table>
<thead>
<tr>
<th></th>
<th>SMEs</th>
<th></th>
<th></th>
<th></th>
<th>Large Enterprises</th>
<th></th>
<th></th>
<th></th>
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<tr>
<td></td>
<td>#</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$50k</td>
<td>81</td>
<td>75%</td>
<td>13</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50k-$100k</td>
<td>21</td>
<td>19%</td>
<td>21</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$100k-$500k</td>
<td>6</td>
<td>6%</td>
<td>15</td>
<td>29%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$500k-1M</td>
<td>0</td>
<td>0%</td>
<td>3</td>
<td>6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responded</td>
<td>108</td>
<td>100%</td>
<td>52</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not using in future</td>
<td>154</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undisclosed</td>
<td>13</td>
<td></td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>275</td>
<td></td>
<td>125</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Expected Spending in Big Data**

- **SMEs**:
  - <$50k: 75%
  - $50k-$100k: 19%
  - $100k-$500k: 6%
  - $500k-$1M: 0%

- **Large Enterprises**:
  - <$50k: 25%
  - $50k-$100k: 40%
  - $100k-$500k: 29%
  - $500k-$1M: 6%
3.7. Interest in Potential Big Data Support

This sub-section discusses the view and comment of the 400 surveyed retailers, including

- Comments from SMEs and Large Enterprises
- Interest to Adopt Big Data under Different Circumstances

3.7.1. Comments from SMEs and Large Enterprises

The following statements were commented by the 400 retailer respondents, with 275 of them are classified as SMEs and 125 of them are Large Enterprises.

1. My major competitors will adopt Big Data within 3 years
2. SMEs need Big Data
3. Only big company use Big Data
4. Big Data can help my business
5. Big Data is the trend of future
6. Management decisions of my company are mainly data-driven

My major competitors will adopt Big Data within 3 years
18% of SME respondents and 35% of the Large Enterprise respondents agree their major competitors will adopt Big Data within 3 years respectively. This can see that the urge to adopt Big Data among Large Enterprises is larger in order to remain competitiveness.

SMEs need Big Data
48% of SME respondents and 59% of the Large Enterprise respondents strongly agree or agree "SMEs need Big Data" respectively. It is suggested that, both SMEs and Large Enterprises think that despite the urge of Large Enterprises is larger, SMEs should not out-of-track in this business trend.

Only big company use Big Data
41% of SME respondents and 30% of the Large Enterprise respondents strongly agree or agree "Only big company use Big Data" respectively. It is suggested that, despite they agree SMEs need Big Data, some of them think that only big company can adopt Big Data in practical consideration.
Big Data can help my business
58% of SME respondents and 75% of the Large Enterprise respondents strongly agree or agree "Big Data can help my business" respectively. It can see that, with the understanding of Big Data among Large Enterprises is higher, they realize Big Data can help their business.

Big Data is the trend of future
57% of SME respondents and 82% of the Large Enterprise respondents strongly agree or agree "Big Data is the trend of future" respectively. With the huge consensus among Large Enterprise respondents, they see a bright future for Big Data Technologies development. Also, although half of the SME respondents did not hear the term "Big Data" before as suggested in Section 3.2.1, over half of them agree Big Data is the trend of future.

Management decisions of my company are mainly data-driven
48% of SME respondents and 66% of the Large Enterprise respondents strongly agree or agree "Management decisions of my company are mainly data-driven" respectively. With both of them agree their decisions are mainly data-driven, the volume, variety and quality of data will be crucial to make a difference in order to make the best decision.

<table>
<thead>
<tr>
<th></th>
<th>SMEs</th>
<th>Large Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>My major competitors will adopt Big Data within 3 years</td>
<td>Strongly Agree 0%</td>
<td>Strongly Agree 0%</td>
</tr>
<tr>
<td></td>
<td>Agree 18%</td>
<td>Agree 35%</td>
</tr>
<tr>
<td></td>
<td>No Comment 74%</td>
<td>No Comment 59%</td>
</tr>
<tr>
<td></td>
<td>Disagree 8%</td>
<td>Disagree 6%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 0%</td>
<td>Strongly Disagree 0%</td>
</tr>
<tr>
<td>My major competitors are using Big Data</td>
<td>Strongly Agree 1%</td>
<td>Strongly Agree 1%</td>
</tr>
<tr>
<td></td>
<td>Agree 20%</td>
<td>Agree 33%</td>
</tr>
<tr>
<td></td>
<td>No Comment 67%</td>
<td>No Comment 58%</td>
</tr>
<tr>
<td></td>
<td>Disagree 13%</td>
<td>Disagree 9%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 0%</td>
<td>Strongly Disagree 0%</td>
</tr>
<tr>
<td>SMEs need Big Data</td>
<td>Strongly Agree 3%</td>
<td>Strongly Agree 3%</td>
</tr>
<tr>
<td></td>
<td>Agree 45%</td>
<td>Agree 56%</td>
</tr>
<tr>
<td></td>
<td>No Comment 41%</td>
<td>No Comment 29%</td>
</tr>
<tr>
<td></td>
<td>Disagree 11%</td>
<td>Disagree 12%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 0%</td>
<td>Strongly Disagree 0%</td>
</tr>
<tr>
<td>Only big company use Big Data</td>
<td>Strongly Agree 4%</td>
<td>Strongly Agree 2%</td>
</tr>
<tr>
<td></td>
<td>Agree 37%</td>
<td>Agree 28%</td>
</tr>
<tr>
<td></td>
<td>No Comment 32%</td>
<td>No Comment 26%</td>
</tr>
<tr>
<td></td>
<td>Disagree 26%</td>
<td>Disagree 43%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 0%</td>
<td>Strongly Disagree 0%</td>
</tr>
<tr>
<td>Big Data can help my business</td>
<td>Strongly Agree 7%</td>
<td>Strongly Agree 16%</td>
</tr>
<tr>
<td></td>
<td>Agree 51%</td>
<td>Agree 59%</td>
</tr>
<tr>
<td></td>
<td>No Comment 36%</td>
<td>No Comment 22%</td>
</tr>
<tr>
<td></td>
<td>Disagree 6%</td>
<td>Disagree 3%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 1%</td>
<td>Strongly Disagree 0%</td>
</tr>
<tr>
<td>Big Data is the trend of future</td>
<td>Strongly Agree 8%</td>
<td>Strongly Agree 13%</td>
</tr>
<tr>
<td></td>
<td>Agree 49%</td>
<td>Agree 69%</td>
</tr>
<tr>
<td></td>
<td>No Comment 38%</td>
<td>No Comment 16%</td>
</tr>
<tr>
<td></td>
<td>Disagree 5%</td>
<td>Disagree 2%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 1%</td>
<td>Strongly Disagree 0%</td>
</tr>
<tr>
<td>Management decisions of my company are mainly data-driven</td>
<td>Strongly Agree 7%</td>
<td>Strongly Agree 11%</td>
</tr>
<tr>
<td></td>
<td>Agree 41%</td>
<td>Agree 55%</td>
</tr>
<tr>
<td></td>
<td>No Comment 38%</td>
<td>No Comment 21%</td>
</tr>
<tr>
<td></td>
<td>Disagree 12%</td>
<td>Disagree 13%</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree 2%</td>
<td>Strongly Disagree 0%</td>
</tr>
</tbody>
</table>
**Comments from SMEs**

- **My major competitors will adopt Big Data within 3 years**: 18% Strongly Agree, 74% Agree, 8% No Comment, 0% Disagree, 0% Strongly Disagree.
- **SMEs need Big Data**: 3% Strongly Agree, 45% Agree, 41% No Comment, 11% Disagree, 0% Strongly Disagree.
- **Only big company use Big Data**: 4% Strongly Agree, 37% Agree, 32% No Comment, 26% Disagree, 0% Strongly Disagree.
- **Big Data can help my business**: 7% Strongly Agree, 51% Agree, 36% No Comment, 6% Disagree, 1% Strongly Disagree.
- **Big Data is the trend of future**: 8% Strongly Agree, 49% Agree, 38% No Comment, 5% Disagree, 0% Strongly Disagree.
- **Management decisions of my company are mainly data-driven**: 7% Strongly Agree, 41% Agree, 38% No Comment, 12% Disagree, 2% Strongly Disagree.

**Comments from Large Enterprises**

- **My major competitors will adopt Big Data within 3 years**: 0% Strongly Agree, 35% Agree, 59% No Comment, 6% Disagree, 0% Strongly Disagree.
- **SMEs need Big Data**: 3% Strongly Agree, 56% Agree, 29% No Comment, 12% Disagree, 0% Strongly Disagree.
- **Only big company use Big Data**: 2% Strongly Agree, 28% Agree, 26% No Comment, 43% Disagree, 0% Strongly Disagree.
- **Big Data can help my business**: 16% Strongly Agree, 59% Agree, 22% No Comment, 2% Disagree, 3% Strongly Disagree.
- **Big Data is the trend of future**: 13% Strongly Agree, 69% Agree, 16% No Comment, 2% Disagree, 0% Strongly Disagree.
- **Management decisions of my company are mainly data-driven**: 11% Strongly Agree, 55% Agree, 21% No Comment, 13% Disagree, 0% Strongly Disagree.
3.7.2. **Interest to Adopt Big Data under Different Circumstances**

The following circumstances were reviewed by the 400 retailer respondents to demonstrate the change of their willingness to adopt Big Data.

1. No support from any party;
2. 20% financial support from the Government;
3. If there are 50% financial support from the Government;
4. Technical support from third party; and
5. Targeted and cleansed big data for internal analysis available for sale from third parties.

It is noticed that, in the basic situation that no support from any party, around 63% of the respondents are not interested to adopt Big Data. However, with some supports, no matter in what format, their interests are significantly improved, the difference ranging from 17%-22%.

Among all the support, 50% financial support from the Government is the most preferred to encourage them "definitely" or "quite interested" to adopt Big Data (32%), following by "Technical support from third party" (25%) and "Targeted and cleansed big data for internal analysis available for sale from third parties" (22%).

<table>
<thead>
<tr>
<th>%</th>
<th>Definitely</th>
<th>Quite interested</th>
<th>Sub-total</th>
<th>Maybe</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No support from any party</td>
<td>3%</td>
<td>4%</td>
<td>7%</td>
<td>30%</td>
<td>63%</td>
<td>100%</td>
</tr>
<tr>
<td>20% financial support from the Government</td>
<td>4%</td>
<td>15%</td>
<td>19%</td>
<td>35%</td>
<td>46%</td>
<td>100%</td>
</tr>
<tr>
<td>If there are 50% financial support from the Government</td>
<td>9%</td>
<td>23%</td>
<td>32%</td>
<td>27%</td>
<td>41%</td>
<td>100%</td>
</tr>
<tr>
<td>Technical support from third party</td>
<td>5%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
<td>45%</td>
<td>100%</td>
</tr>
<tr>
<td>Targeted and cleansed big data for internal analysis available for sale from third parties</td>
<td>3%</td>
<td>19%</td>
<td>22%</td>
<td>32%</td>
<td>46%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Interest to adopt Big Data under different circumstances

- Targeted and cleansed big data for internal analysis available for sale from third parties:
  - Definitely: 3%
  - Quite interested: 19%
  - Maybe: 32%
  - No: 46%

- Technical support from third party:
  - Definitely: 5%
  - Quite interested: 20%
  - Maybe: 30%
  - No: 45%

- If there are 50% financial support from the Government:
  - Definitely: 9%
  - Quite interested: 23%
  - Maybe: 27%
  - No: 41%

- 20% financial support from the Government:
  - Definitely: 4%
  - Quite interested: 15%
  - Maybe: 35%
  - No: 46%

- No support from any party:
  - Definitely: 4%
  - Quite interested: 30%
  - Maybe: 63%

The chart shows the percentage of respondents interested in adopting Big Data under different circumstances.
4. Findings from In-depth Interviews

This chapter presents the findings from the 10 in-depth interviews with the sizable companies in Hong Kong, with the following structure:

1. Profiles of Respondents (Section 4.1);
2. Findings (Section 4.2);

4.1. Profiles of Respondents

<table>
<thead>
<tr>
<th>#</th>
<th>Business Sector</th>
<th>Position of Respondent</th>
<th>Rating on the Importance of IT Development (1-Highest, 5-Lowest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Department Store</td>
<td>Executive Director</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>• Clothing, footwear, and allied products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>• Clothing, footwear, and allied products</td>
<td>IT Director</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>• Clothing, footwear, and allied products</td>
<td>IT Director</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>• Food &amp; Beverage (with catering services)</td>
<td>Head of IT</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>• Food &amp; Beverage (with catering services)</td>
<td>Senior IT Manager</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>• Digital Marketing Agency for Retailer</td>
<td>Director</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>• Supermarket</td>
<td>Project Manager</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>• Department Store</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Medicines and cosmetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Jewellery watches and clocks, and valuable gifts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Food, alcoholic drinks and tobacco</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Food &amp; Beverage (with catering services)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>• Supermarket</td>
<td>Business Intelligence Team</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>• Other consumer goods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>• Department Store</td>
<td>System Analyst</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>• Other consumer goods</td>
<td>Quality Assurance Director</td>
<td>3</td>
</tr>
</tbody>
</table>

The 10 in-depth interviews comprises companies in various business sector and aimed at the person responsible for relevant project and decision making.
4.2. Findings

From In-depth Interview:
Observation: Big Data is currently not common among market leaders

Current
Internal Data + Business Intelligence

Future
Big Data

Slow Process

Future Project

Major barriers:
- There are projects with higher priority
- No significant business case to support investment
- The understanding of management level yet to be educated
- The tools and solutions are not clearly available in the market
- Insufficient on capability to collect & analyze dynamic big data

Data Source
- Competitor's Pricing & Promotion
- Social Media
- Cost Variation
- Website Footprint
- Purchasing Behavior
- In-house Data
- Real-time POS
- Forum

Benefit
- Customer Relationship Management
- Website Design
- Target Marketing
- Marketing Campaign Design
- Reaction to Competitor
- Operational & Business Decision
- SWOT Analysis
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Comments</th>
<th>Insights in additional to survey</th>
</tr>
</thead>
</table>
| **Current Big Data Project**  | • It is observed that the process to Big Data is slow among the market leaders  
• Despite the slow adoption to big data, they will continue to evolve internal Business Intelligence system  
• For some marketing campaign, “big data technology” will be deployed as a tools to support the campaign | • The current Big Data Project mainly reply on internal data only  
• Marketing is the major area to start with  
• Most of the market leader take enhancement of BI as the first step to Big Data |
| **Major Barriers to Big Data** | The reasons of no current Big Data Project includes:  
• There are projects with higher priority  
• No significant business case to support investment  
• The understanding of management level yet to be educated  
• The tools and solutions are not clearly available in the market  
• Insufficient on capability to collect & analyze dynamic big data | • Although it is understood Big Data is the future trend, market leaders do not see the urgency to adopt immediately  
• How to get management buy-in is the common barrier to Big Data in large enterprises  
• Internal analysis experience is insufficient even in market leaders  
• External specialists are relied to launch big data project |
| **Interested Data to Analyze** | They are interested to perform analysis mainly in following areas:  
• In-house Data  
• Competitor’s Pricing & Promotion  
• Purchasing Behavior  
• Sentiment from Social Media  
• Sentiment from Forum  
• Real-time Point-Of-Sale Data  
• Cost Variation of Raw Material  
• Website Footprint | • Besides external data, internal data is also seen as importance due to the large scale of market leaders  
• As most market leaders developed their own websites for e-commerce, the footprint information from the website cannot be neglected |
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Comments</th>
<th>Insights in additional to survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected Benefits</td>
<td>They expect the above data can benefit:</td>
<td>• Besides sale-driven benefits, market leaders also focus on internal sustainable development to provide better services to their customer and remain competitiveness in the market</td>
</tr>
<tr>
<td></td>
<td>• Customer Relationship Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Target Marketing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Marketing Campaign Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Website Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Operational &amp; Business Decision</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reaction to Competitor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Perform Strength, Weakness, Opportunity, Threat (SWOT) Analysis</td>
<td></td>
</tr>
</tbody>
</table>

Besides the big data plan of the market leaders, their suggestions to boost big data adoption among the industry are also gauged.

**From In-depth Interview:**

**Suggestion from market leaders**

- **SMEs need Big Data**
  - In smaller scale
  - Shall first start with analysis on their own data

- **Suggestion to boost Big Data Adoption**
  - Government to take lead and set the reference cases
  - Knowledge transfer and promotion to the industry
  - University courses to educate data analyst
  - Set up funding to encourage SME develop Big Data Project
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Comments/ Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of Big Data in Future</td>
<td>All of them agree Big Data is the essential element in the future. With the social media usage, live stream data and the IOT infrastructure, Big Data has very high potential to better analyze performance and provides actionable insights based on new data sources.</td>
</tr>
</tbody>
</table>
| Big Data in SMEs               | • From view of sizable retailers, it is believed that SMEs also need Big Data however it maybe in smaller scale. Nevertheless, SMEs shall start consider adopt to Big Data  
• Since “Big Data” itself do not mean anything, but the analysis and follow-up prediction are the values. At the end SMEs will need “Big Data Analysis”  
• SMEs shall first start with analysis on their own data since some SMEs may even do not have internal database |
| Supports to Boost Big Data Adoption | The following four supports are required to boost Big Data Adoption:  
• Technical Support  
• Financial Support  
• Knowledge Transfer  
• Smart Infrastructure (e.g. Free Wifi to support data collection)  
To achieve the supports, different roles are identified for Government, University and Other Organizations:  
• Government  
  ■ Government shall take lead to demonstrate how to make use of Big Data  
  ■ Government may initiate funding scheme to encourage SMEs to develop Big Data Project  
  ■ A platform, certified by Hong Kong Government, may be developed to provide the capacity for SMEs to store their data for further analysis  
• University  
  ■ Incubate data scientists through University courses  
• Other Organizations  
  ■ Provide platform to SMEs to gain more exposure of use cases from other countries  
  ■ Enhance promotion and training to enterprises |
5. Conclusion

5.1. Summary on Current Situation in Hong Kong Retail Sector

With this robust research on big data adoption in Hong Kong retail sector, it is noticed that:

Current Big Data Adoption
The understanding on big data technology among Hong Kong retail sector is low, with half of the SMEs and one-quarter of Large Enterprises never heard about the term of "Big Data".

For who heard about Big Data, majority of SMEs and Large Enterprises are either in learning stage or no plan on Big Data Project.

Concerns
"Insufficient knowledge of Big Data" is the biggest concern to SMEs while "Cost" is the biggest concern to Large Enterprises. Also, Large Enterprises are more concern about data privacy than SMEs while SMEs worry about the complexity in data analysis.

Expected Challenges
SMEs are generally concerning about the technical ability of themselves towards to this new technology, also their departments may not have a consistent standard and procedure to share their data; while Large Enterprises have already set up good infrastructure and hence Data storage, Data management and Data analysis will be the least challenges. Both of them require specialists to conduct big data analysis, which reflect the related job opportunities will be in great demand.

Expected Benefits
Both of SMEs and Large Enterprises agree "Target Marketing", "Customer Management" and "Product/ Service Planning" are the top 3 benefits by using Big Data Technologies.

Interested Data
Both of SMEs and Large Enterprises agree "Customer Preference", "Customer Buying Behavior" and "Product Demand" are the major types of data to analyze in similar order. Beside this, "Customer Browsing Behavior" is also pointed out as a crucial element to facilitate marketing campaign design.
Also, majority of them would like to get the data from Social Media, following by Sharing Website, Forum and E-commerce Platform. From the in-depth interview, “Website footprint” is added as a major source to capture those potential customer who visited their website. While these external data are interested, the internal data from operation or sales transaction cannot be neglected. The combination of internal and external data will be the challenges.

Future Plan on Big Data Adoption
SMEs are more reluctant to adopt this new technology, this may due to their understanding on Big Data is not enough and also they do not know what they can be benefit from using Big Data.

The potential Big Data market in SME retailers is estimated at $3.12B while for Large Enterprises in retail sector, the potential Big Data market is estimated at $166.3M.

Views from Retailers on Big Data
It is noticed that the urge to adopt Big Data among Large Enterprises is larger in order to remain competitiveness.

Despite the urge of Large Enterprises is larger, both SMEs and Large Enterprises think that SMEs should not out-of-track in this business trend.

Despite they agree SMEs need Big Data, some of them think that only big company can adopt Big Data in practical consideration.

It can see that, with the understanding of Big Data among Large Enterprises is higher, they realize Big Data can help their business.

With the huge consensus among Large Enterprises, they see a bright future for Big Data Technologies development. Also, although half of the SMEs did not hear the term "Big Data" before, over half of them agree Big Data is the trend of future.

With both of them agree their decisions are mainly data-driven, the volume, variety and quality of data will be crucial to make a difference in order to make the best decision.

Need of Support from Third Party
It is noticed that, in the basic situation that no support from any party, around 63% of the respondents are not interested to adopt Big Data. However, with some supports, no matter in what format, their interests are significantly improved, the difference ranging from 17%-22%.
5.2. Recommendations

In considering the current situation found in this research, the following recommendations are suggested in order to enhance the big data adoption in Hong Kong retail sector:

For SMEs
1. Upgrade IT infrastructure in order to increase the readiness to adopt Big Data Technologies, for example migrating to cloud services
2. Attend relevant seminars, forums or workshops hosted by relevant organizations to keep on-track on the latest Big Data development
3. Actively consider applying relevant supportive schemes/programmes to facilitate the adoption, e.g. Retail Technology Adoption Assistance Scheme for Manpower Demand Management (ReTAAS) or Technology Voucher Programme, etc.

For Large Enterprises
4. Increase the process from learning stage to pilot stage in Big Data related project in order to remain competitiveness
5. Seek independent consultants to conduct security and privacy assessment to reduce the privacy concern from your company and clients

For Public Organizations/ the Government
6. Enhance the promotion and education of Big Data Technology among the industry, including the basic idea and potential benefits
7. Act as a lead on data sharing and big data adoption to transfer the experience with the Industry
8. Enhance the training and certification for Big Data Analyst as a major career path in future
9. Besides financial support, other supports such as consultation service and a subscription platform are also welcome by the Industry

-End of Report-
Appendix I: Questionnaire of Telephone Interviews

Survey on Big Data Adoption

**Company Name (Chinese):**

**Company Name (English):**

**Interviewee:**

**Position:**

**Department:**


**Contact Telephone Tel:**

**Email:**

**Date (Date):**

This section to be completed by interviewer.

**Type of Company**

1. □ Supermarket
2. □ Convenience Store
3. □ Department Store
4. □ Medicines and Cosmetics
5. □ Clothing, footwear, and allied products
6. □ Jewellery, watches, and clocks, and valuable gifts
7. □ Food, alcoholic drinks and tobacco (other than items 1 & 2)
8. □ Consumer durable goods (cars, electrical appliances, etc.)
9. □ Food & Beverage (with catering services)
10. □ Other consumer goods

**Company Profile**

1. What is the major business nature of your company?

2. What is the number of employees in your company?

   1. □ 1-5  2. □ 6-20  3. □ 21-50  4. □ 51-100  5. □ 101-500  6. □ >500

   (Note: If your company engages less than 6 persons, end of questionnaire.)

3. What are the major products/services of your company?

   a) 
   b) 
   c) 

4. What is the operation model of your company?


5. Which is/are the target market of your company? (Multiple answers)

   1. □ Local  2. □ Mainland China  3. □ Overseas

**Data Management and Analysis**

6. The data analysis job is conducted within the retail outlets or pass to back office for centralized analysis?

   1. □ Outlets  2. □ Back office  3. □ Other
7. 您認為貴公司在數據管理及分析上比您的主要對手是？What will you rate your company's level of data management and analysis comparing to the peers in your industry?

<table>
<thead>
<tr>
<th>領域</th>
<th>1. 領先 Advanced</th>
<th>2. 差不多 Normal</th>
<th>3. 落後 Fall behind</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) 數據收集方法 Methodology of Data collection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii) 分析工具 Analysis tool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii) 數據主導決策 Data-driven decision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv) 整體 Overall</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. 請問貴公司每年投放於資訊科技的資金比例為每年總支出的多少？How much does your company spend on information technology annually comparing to total annual expense?

<table>
<thead>
<tr>
<th>比例</th>
<th>1. &lt;1% 2. 1 - 5% 3. 6 - 10% 4. 11 - 20% 5. &gt;20%</th>
</tr>
</thead>
</table>

9. 請問貴公司年均收入大概多少（港幣百萬元）？What is the range of annual revenue of your company (HK$ M)?

<table>
<thead>
<tr>
<th>頸界</th>
<th>1. &lt;1.0M 2. 1.1M - 5.0M 3. 5.1M - 10.0M 4. 10.1M - 50.0M 5. 50.1M - 100.0M 6. &gt;100M</th>
</tr>
</thead>
</table>

C. 對數據技術的認知及應用階段 Knowledge on Big Data Technology and Stage of Adoption

10. 請問您對「大數據」熟悉嗎？Are you familiar with Big Data Technology?

<table>
<thead>
<tr>
<th>準確度</th>
<th>1. 非常熟悉 Very familiar 2. 熟悉 Familiar 3. 不太熟悉 Not quite familiar 4. 從未聽過（調查員請解釋何謂大數據後跳到Q12）Never heard about it (interviewer: please explain and then skip to Q12)</th>
</tr>
</thead>
</table>

何謂大數據 What is Big Data？

- 資料量龐大或複雜到傳統數據分析不能解讀的資訊，稱為大數據，例如顧客在社交媒體/討論區對你公司/相關產品的喜好意見。Big data is a broad term for data sets so large or complex that traditional data processing applications are inadequate, e.g. customers' comments on your company or related products in social media/discussion forum.
- 大數據技術，是指從各種各樣類型的海量數據中，快速獲得有價值信息的能力。Big data technology is the ability to quickly obtain valuable information from various types and volume of data.

11. 請問貴公司在大數據技術應用上處於哪個階段？Which stage will you position your company in big data adoption?

<table>
<thead>
<tr>
<th>頭段</th>
<th>1. 已生效 Implemented 2. 試驗階段 Pilot stage 3. 學習階段 Learning stage 4. 沒有打算應用 No plan</th>
</tr>
</thead>
</table>

12. 請問您認為應用大數據技術能否幫助貴公司在以下各項的表現？（可多選）In which area do you see the opportunities for improving your company's operation by using Big Data Technologies (Multiple answers)?

|------|----------------------------------------------------------------------------------------------|

13. 請問您有興趣分析哪種數據？（可多選）What types of data do you wish to analyze (Multiple answers)?

|------|-----------------------------------------------------------------------------------------------|
14. Please rank your top three preferred public sources of data? (1: most interested, following by 2 and 3)

1. ___________________________  2. ___________________________  3. ___________________________

K. Social Media (Facebook/Google+/Twitter/QQ)
L. Sharing Website (Youtube)
M. E-commerce Platform (Amazon/ Ebay/ Taobao)
N. Forum (HKDiscuss/ HKGolden)
O. Financial Website (Yahoo!Finance/Google Finance)
P. Local Searching Platform (Openrice)
Q. Reservation & Commentary (Hotel.com/Trip)
R. Government (Local/Overseas) (Weather/ Demographic/ GDP)
S. Publication (Google Book/ Newspaper)
T. Others ___________________________

15. Please provide 5 websites which you are most interested in: (to be named by the respondent, the interviewer can also give examples as given in Q14)

1. ___________________________  2. ___________________________
3. ___________________________  4. ___________________________
5. ___________________________

16. What are the top 3 barriers to Big Data Adoption (Top 3 choices)?

1. □Still struggling with traditional data analysis
2. □Insufficient knowledge of Big Data
3. □Lack of data transparency among departments
4. □Complexity in data analysis
5. □Lack of skills and expertise
6. □Cost concern
7. □Security concern
8. □Privacy concern
9. □Others ___________________________

17. Do you agree that the followings are challenges for Big Data Adoption?

<table>
<thead>
<tr>
<th>1. 尋找合適的數據源</th>
<th>2. 具挑戰性</th>
<th>3. 稍為具挑戰性</th>
<th>4. 沒有挑戰性</th>
<th>5. 不知道</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify suitable data source</td>
<td>Very challenging</td>
<td>Challenging</td>
<td>Somewhat challenging</td>
<td>Not Challenging</td>
</tr>
<tr>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
<td>5. □</td>
</tr>
<tr>
<td>2. 數據預備／整合</td>
<td>Preparing/ cleansing data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrating internal and external data</td>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
</tr>
<tr>
<td>Data storage</td>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
</tr>
<tr>
<td>Data management</td>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
</tr>
<tr>
<td>Data analysis</td>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
</tr>
<tr>
<td>7. 專才招聘</td>
<td>Hiring specialists</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of information among departments</td>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
</tr>
<tr>
<td>9. Others</td>
<td>1. □</td>
<td>2. □</td>
<td>3. □</td>
<td>4. □</td>
</tr>
</tbody>
</table>
### F. Attitude Towards Big Data Adoption

#### 18. Do you agree with the following statement?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Comment</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Company management decisions are data-driven.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. Big Data is the trend of future.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. Big Data can help my business.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. Major competitors are using Big Data.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. Small businesses need Big Data.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. My company will adopt Big Data within 3 years.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

#### 19. Will your company adopt Big Data in the future?

1. □ Yes, had already adopted 2. □ Yes, within 3 years 3. □ Yes, 3 years later
4. □ Maybe 5. □ No, why: ________________________________ (Jump to Q21)

#### 20. How much do you expect the spending on Big Data?

1. □ < $50k 2. □ $50k-$100k 3. □ $100k-$500k 4. □ $500k-1M 5. □ > $1M

#### 21. Are you interested to adopt Big Data under the following circumstance?

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Definitely</th>
<th>Quite interested</th>
<th>Maybe</th>
<th>No, why:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No support from any party</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. Government provides 20% financial support from the Government</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. Government provides 50% financial support from the Government</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. Technical support from third party</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. Targeted and cleansed big data for internal analysis available for sale from third parties</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

#### 22. Are you willing to participate in in-depth interviews?

1. □ Yes 2. □ No

---

問卷完結，多謝合作！End of Questionnaire, Thank You for Your Support and Cooperation!
如有查詢，請聯絡亞洲城市研究社楊小姐或張小姐。For enquiry, please contact Ms. Yeung or Ms. Cheung of ACRC
電話 Tel: 3743 0582 / 2739 3291；傳真 Fax: 3743 0583；電郵 Email: yeungmeiching@acrc.hk
Appendix II: Questionnaire of In-depth Interviews

「大數據」技術應用調查 Survey on Big Data Adoption

公司名稱 Company (中文 Chinese): ________________________________
(英文 English): ________________________________

被訪者姓名 (Interviewee): ________________________________ 職稱 (Position): ________________________________
電郵 Email: ________________________________ 日期 (Date): ________________________________

<table>
<thead>
<tr>
<th>公司類別 Type of Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. □超級市場 Supermarket</td>
</tr>
<tr>
<td>11. □便利店 Convenient Store</td>
</tr>
<tr>
<td>12. □百貨公司 Department Store</td>
</tr>
<tr>
<td>13. □藥物及化妝品 Medicines and cosmetic</td>
</tr>
<tr>
<td>14. □衣物、鞋類及有關製品 Clothing, footwear, and allied products</td>
</tr>
<tr>
<td>15. □珠寶首飾、鐘錶及名貴禮物 Jewellery watches and clocks, and valuable gifts</td>
</tr>
<tr>
<td>16. □食品、酒類飲品及煙草（超級市場及便利店除外） Food, alcoholic drinks and tobacco other than items 1 &amp; 2</td>
</tr>
<tr>
<td>17. □耐用消費品 (汽車、電器)等 Consumer durable goods (cars, electrical appliances, etc.)</td>
</tr>
<tr>
<td>18. □飲食業 Food &amp; Beverage (with catering services)</td>
</tr>
</tbody>
</table>

1. 你認為由 1－5 評分(1 為最重要)，資訊科技發展對於貴公司屬於哪個級別？每年投放資金約多少？

2. 請以第一感覺簡述「大數據」是甚麼。

3. 貴公司現時有否大數據相關項目？
   如沒有，為甚麼沒有相關項目？有甚麼障礙？貴公司未來會否有相關計劃？

4. 請問可否介紹一下現時／未來大數據相關項目？

5. 為甚麼會開始大數據相關項目？如何說服管理層開展項目？

4. 貴公司期望大數據帶來甚麼好處？（如客戶管理／目標市場推廣／數據關連性分析等）

5. 貴公司對哪方面較有興趣進行分析？（如顧客體驗／顧客消費模式／同行產品定價等）

6. 貴公司大數據的數據來源是甚麼？
6. 貴公司進行大數據相關發展／項目遇到甚麼困難？當中最大困難是甚麼？

7. 貴公司如何克服／解決那些困難？

8. 貴公司有否開設大數據相關職位？相關員工大多是由外面聘請或進行內部培訓？

9. 貴公司未來預算投資多少於發展大數據項目？

10. 貴公司是否願意與市場分享在大數據的經驗？

11. 請問你認為大數據是否未來發展趨勢？

12. 請問你認為中小企是否需要大數據？

13. 請問你認為政府／市場需要為企業應用大數據提供甚麼幫助？

14. 請問你對提高香港企業大數據應用有甚麼建議？（如：推廣／培訓）

15. 現時有機構打算收集坊間大數據再以 Subscribe 模式給予中小企下載合適數據再作內部分析，請問你認為這概念是否可行？對此有甚麼建議？

-完-