

Research on Big Data Adoption in Hong Kong Retail Sector



Hong Kong Productivity Council

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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 Data¹

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 (SMEs²), 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

² 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.

https://www.success.tid.gov.hk/english/aboutus/sme/service_detail_6863.html

- 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.

Aspect	Comments	Insights in additional to survey
Current Big Data Project	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<p>The reasons of no current Big Data Project includes:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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

Aspect	Comments	Insights in addition to survey
Interested Data to Analyze	<p>They are interested to perform analysis mainly in following areas:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
Expected Benefits	<p>They expect the above data can benefit:</p> <ul style="list-style-type: none"> • Customer Relationship Management • Target Marketing • Marketing Campaign Design • Website Design • Operational & Business Decision • Reaction to Competitor • Facilitate Strength, Weakness, Opportunity, Threat (SWOT) Analysis 	<ul style="list-style-type: none"> • 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

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.
- **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

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

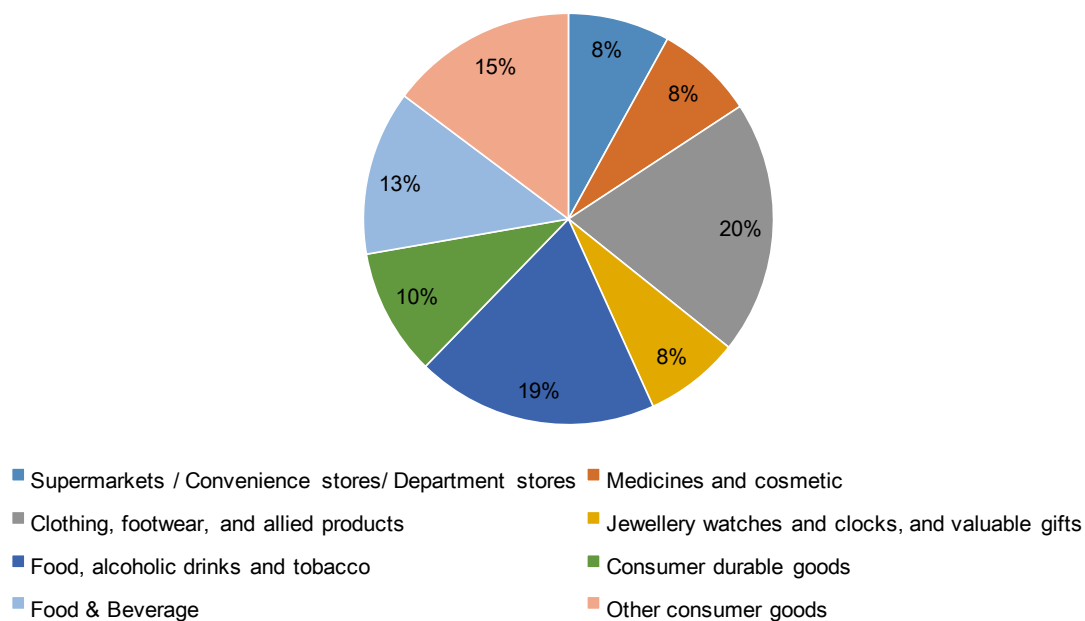
- Business Sector;
- Employee Numbers;
- Overall Level of Data Management and Analysis Comparing to the Peers;
- Spending on Information Technology Annually Comparing to Total Annual Expense; and
- Range of Annual Revenue.

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%).

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

Business Nature



3.1.2. Employee Numbers

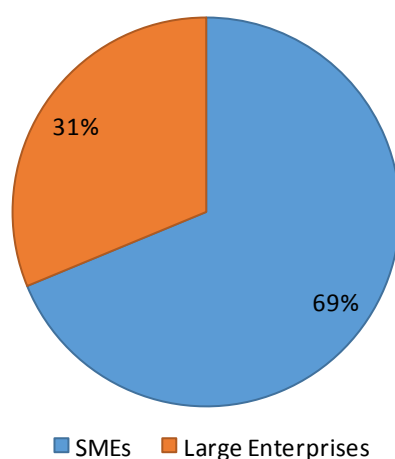
In this study, it is strategically aim at company with employee numbers greater than 5 people since it is believe that for micro-sized company, Big Data Technology will be in lower priority of their business development.

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%).

	Number of Staff	Number of Response	%
SMEs ³	1-5	0	0%
	6-20	203	51%
	21-50	72	18%
	Sub-total	275	69%
Large Enterprises	51-100	46	12%
	101-500	63	16%
	>500	16	4%
	Sub-total	125	31%
	Total	400	100%

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.

https://www.success.tid.gov.hk/english/aboutus/sme/service_detail_6863.html

3.1.3. Overall level of data management and analysis comparing to the peersFor 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

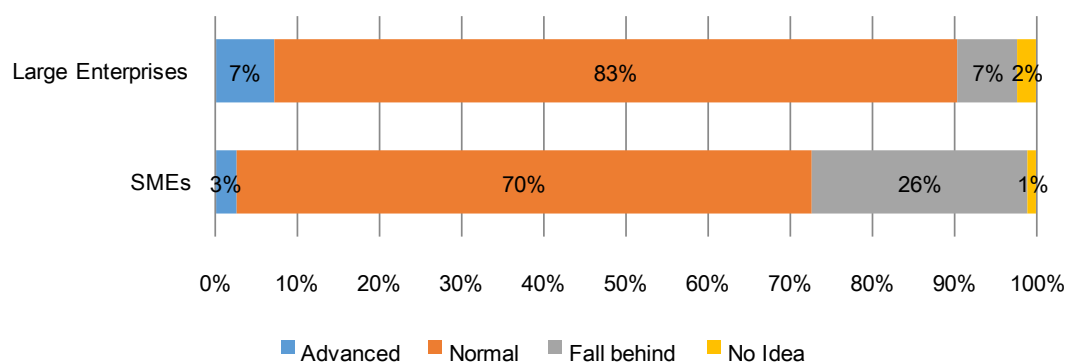
In term of overall level of data management and analysis comparing to the peers, among the 125 large enterprise respondents, most of them value themselves as "Normal" (104, 83%), with equal amount of them rated "Fall Behind" (9, 7%) and Advanced (9, 7%).

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.

	SMEs		Large Enterprises	
	#	%	#	%
Advanced	7	3%	9	7%
Normal	193	70%	104	83%
Fall behind	72	26%	9	7%
No Idea	3	1%	3	2%
Total	275	100%	125	100%

Overall level of data management and analysis comparing to the peers



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%".

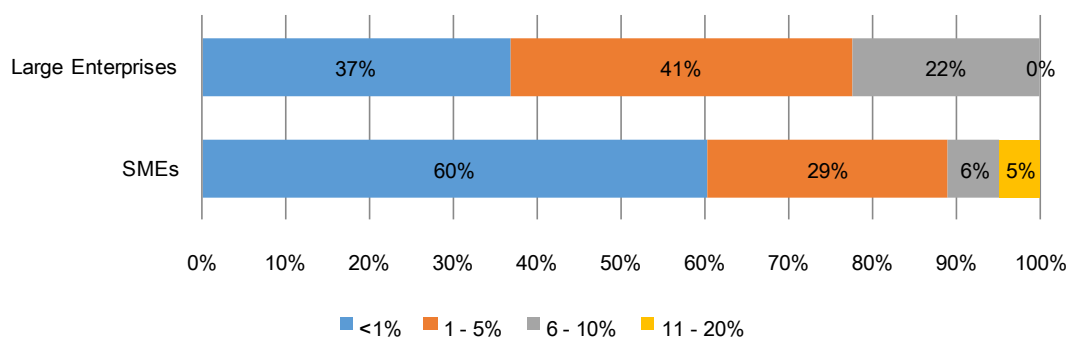
Comparison

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.

	SMEs		Large Enterprises	
	#	%	#	%
<1%	166	60%	46	37%
1 - 5%	79	29%	51	41%
6 - 10%	17	6%	28	22%
11 - 20%	13	5%	0	0%
>20%	0	0%	0	0%
Total	275	100%	125	100%

Spending on information technology annually comparing to total annual expense



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

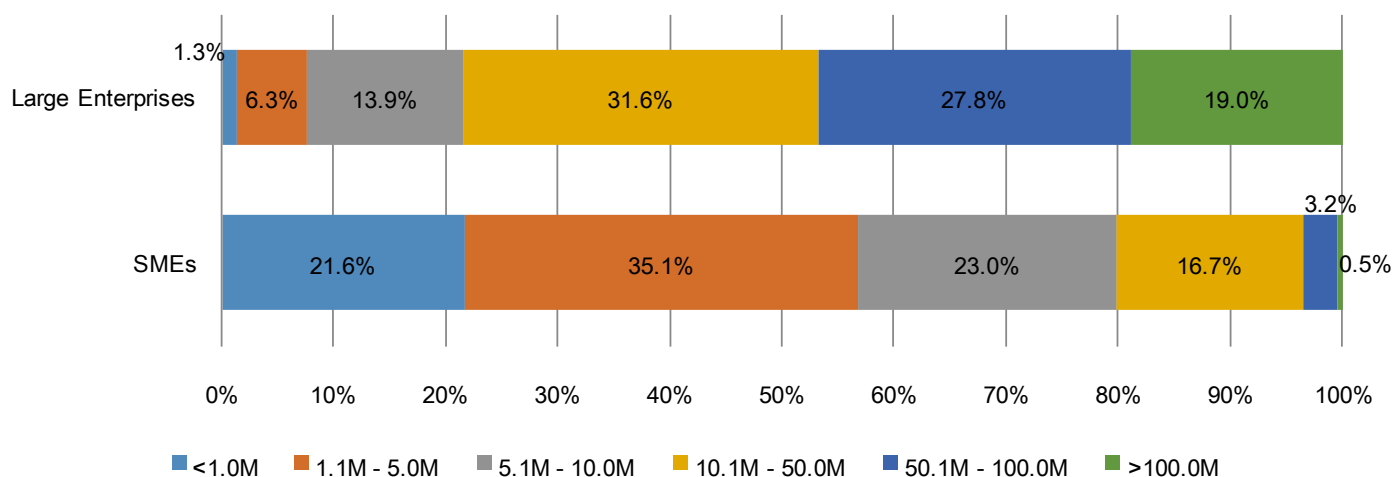
Among the 125 large enterprise respondents, only 79 of them disclose their information regarding the annual revenue. Among the 79 respondents, around 31.6% are having revenue of "10.1M-50.0M" (25, 31.6%), following by "50.1M-100.0M" (22, 27.8%), ">100.0M" (15, 19.0%) and "5.1-10.0M" (11, 13.9%). Only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

	SMEs		Large Enterprises	
	#	%	#	%
<1.0M	48	21.6%	1	1.3%
1.1M - 5.0M	78	35.1%	5	6.3%
5.1M - 10.0M	51	23.0%	11	13.9%
10.1M - 50.0M	37	16.7%	25	31.6%
50.1M - 100.0M	7	3.2%	22	27.8%
>100.0M	1	0.5%	15	19.0%
Responded	222	100.0%	79	100.0%
Undisclosed	53		46	
Total	275		125	

Range of annual revenue



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

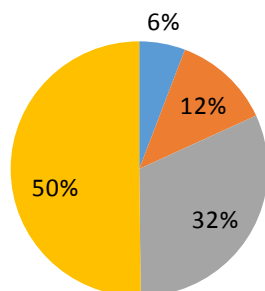
For Large Enterprises

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%).

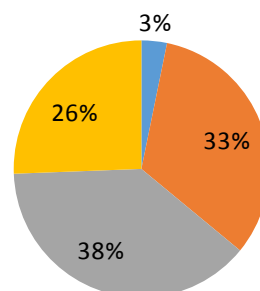
Comparison

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.

	SMEs		Large Enterprises	
	#	%	#	%
Very familiar	16	6%	4	3%
Familiar	34	12%	41	33%
Not quite familiar	87	32%	48	38%
Never heard about it	138	50%	32	26%
Total	275	100%	125	100%

SMEs

■ Very familiar ■ Familiar
■ Not quite familiar ■ Never heard about it

Large Enterprises

■ Very familiar ■ Familiar
■ Not quite familiar ■ Never heard about it

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

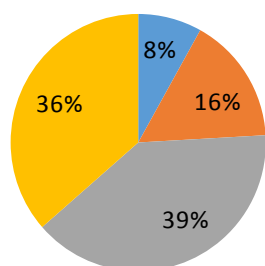
For Large Enterprises

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%).

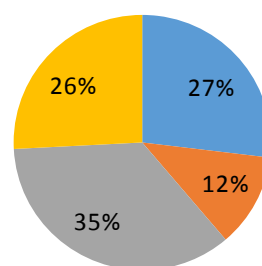
Comparison

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.

	SMEs		Large Enterprises	
	#	%	#	%
Implemented	11	8%	25	27%
Pilot stage	22	16%	11	12%
Learning stage	54	39%	33	35%
No plan	50	36%	24	26%
Responded	137	100%	93	100%
Never heard about Big Data	138		32	
Total	275		125	

SMEs

■ Implemented ■ Pilot stage
■ Learning stage ■ No plan

Large Enterprises

■ Implemented ■ Pilot stage
■ Learning stage ■ No plan

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

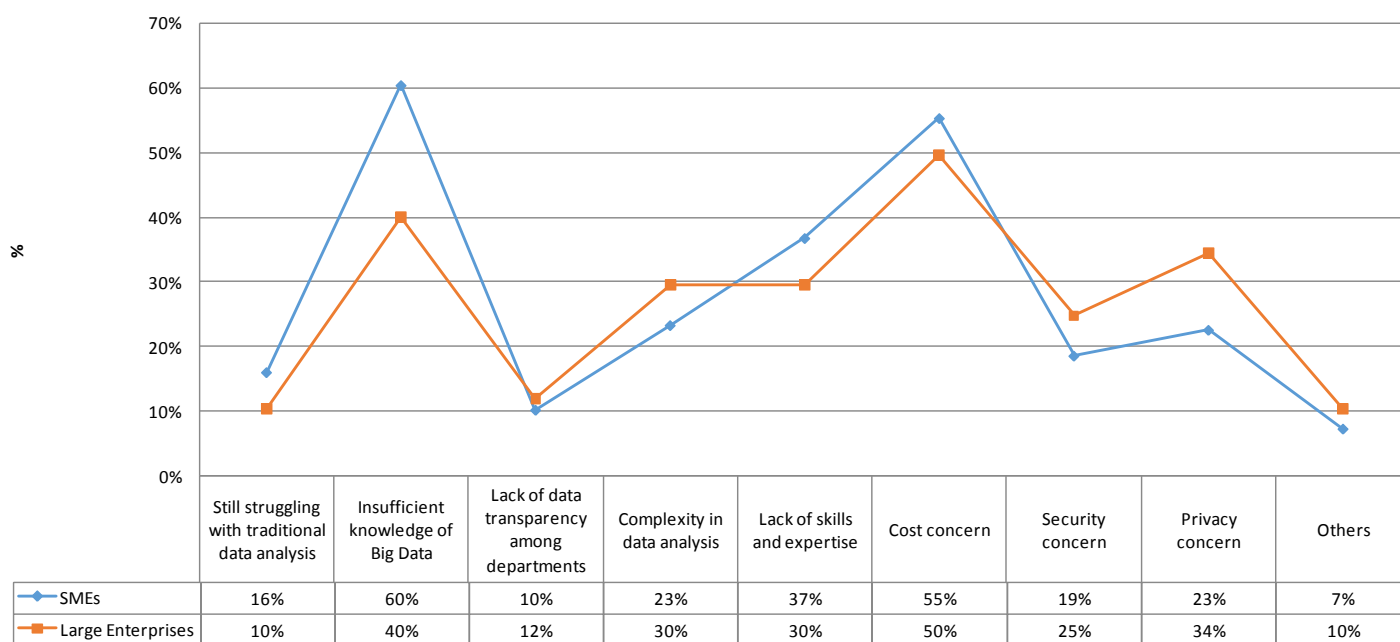
Among the 125 large enterprise respondents, "Cost concern" is the biggest concern to Big Data Adoption (62, 50%), following by "Insufficient knowledge of Big Data" (50, 40%) and "Privacy concern" (43, 34%).

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

	SMEs (A)		Large Enterprises (B)		Difference
	#	%	#	%	(A)-(B)
Still struggling with traditional data analysis	44	16%	13	10%	6%
Insufficient knowledge of Big Data	166	60%	50	40%	20%
Lack of data transparency among departments	28	10%	15	12%	-2%
Complexity in data analysis	64	23%	37	30%	-6%
Lack of skills and expertise	101	37%	37	30%	7%
Cost concern	152	55%	62	50%	6%
Security concern	51	19%	31	25%	-6%
Privacy concern	62	23%	43	34%	-12%
Others	20	7%	13	10%	-3%
Total	275		125		

Concerns on Big Data Adoption



3.3.2. Expected Challenges for Big Data Adoption

For SMEs

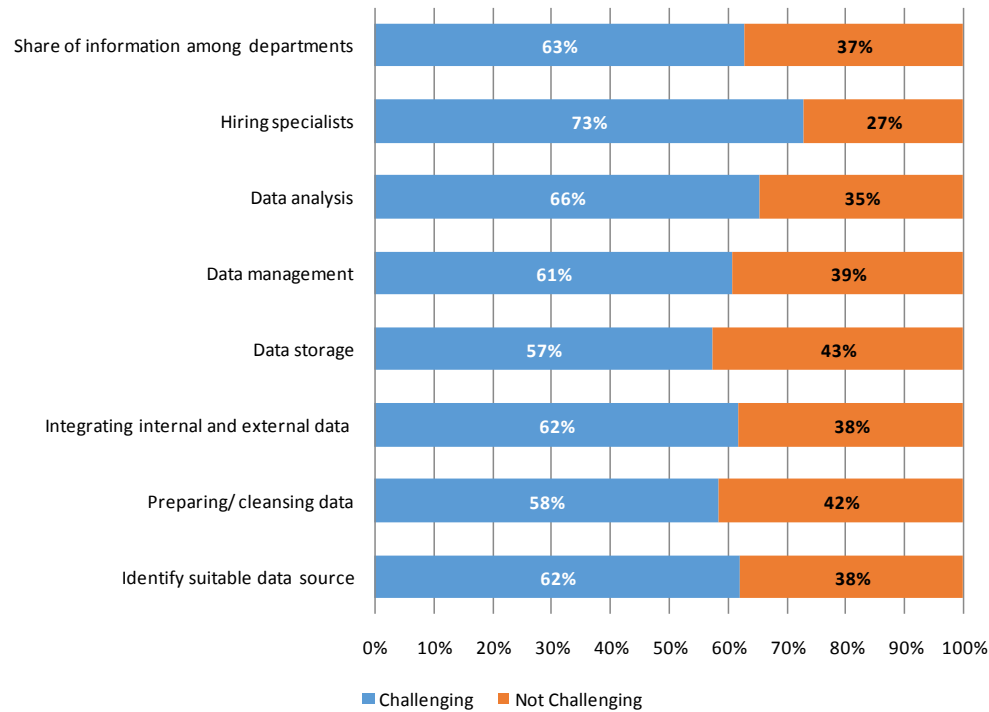
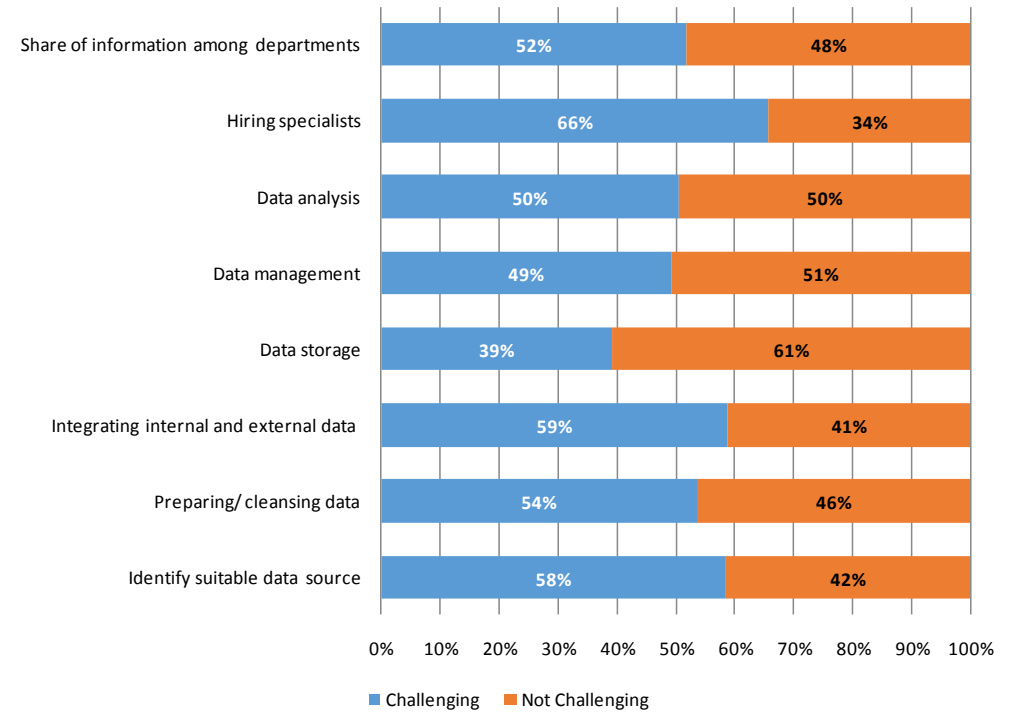
In term of Expected Challenges for Big Data Adoption, among the 275 SME respondents, all issues are expected to be challenging (>50%). Among the issues, the most challenging issue is "Hiring specialists" (73%), following by "Data Analysis" (66%) and "Share of information among departments" (63%).

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**Challenges for Big Data Adoption - Large Enterprises**

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%).

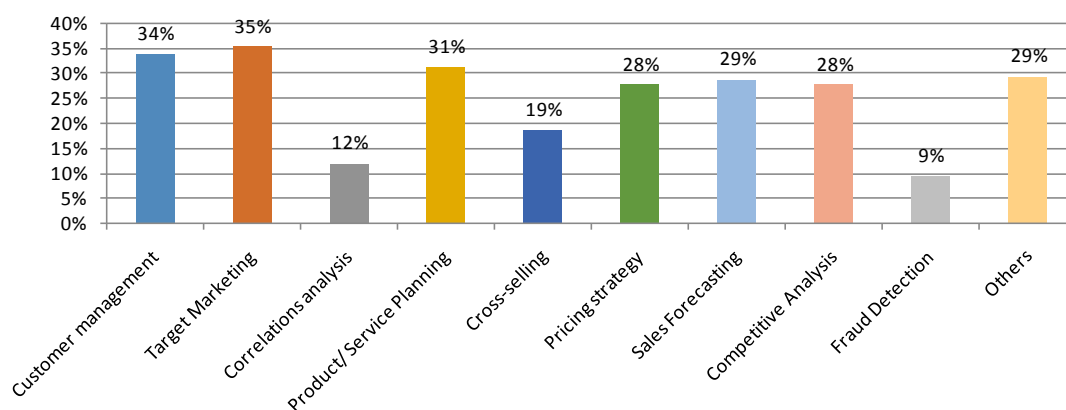
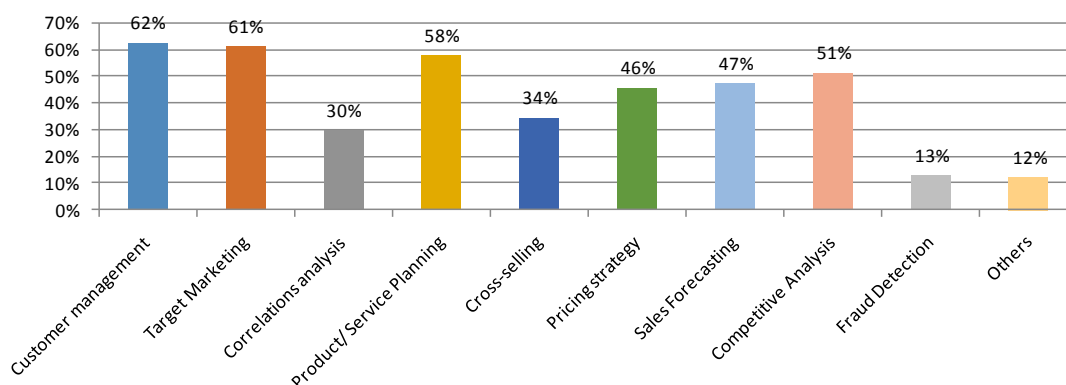
For Large Enterprises

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.

	SMEs (A)		Large Enterprises (B)		Difference (A)-(B)
	#	%	#	%	
Customer Management	93	34%	78	62%	-29%
Target Marketing	97	35%	76	61%	-26%
Correlations Analysis	33	12%	37	30%	-18%
Product/ Service Planning	86	31%	72	58%	-26%
Cross-selling	51	19%	43	34%	-16%
Pricing Strategy	76	28%	57	46%	-18%
Sales Forecasting	79	29%	59	47%	-18%
Competitive Analysis	76	28%	64	51%	-24%
Fraud Detection	26	9%	16	13%	-3%
Others	81	29%	15	12%	17%
Total	275		125		

Benefits by using Big Data Technologies - SMEs**Benefits by using Big Data Technologies - Large Enterprise**

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

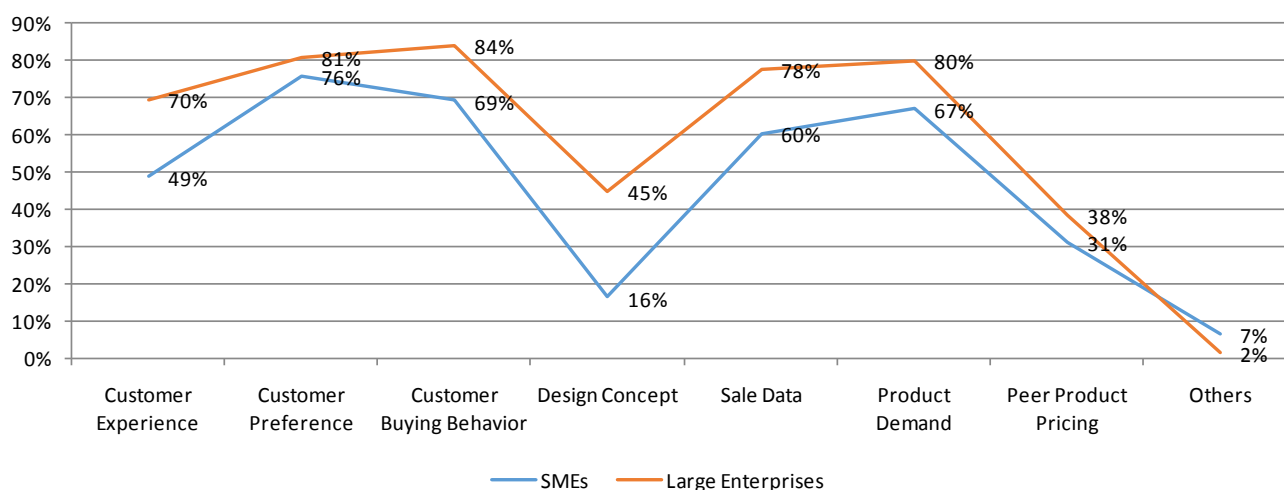
Among the 125 large enterprise respondents, the top three types of data are Customer Buying Behavior (105, 84%), following by Customer Preference (101, 81%) and Product Demand (100, 80%).

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.

	SMEs (A)		Large Enterprises (B)		Difference
	#	%	#	%	(A)-(B)
Customer Experience	134	49%	87	70%	-21%
Customer Preference	208	76%	101	81%	-5%
Customer Buying Behavior	190	69%	105	84%	-15%
Design Concept	45	16%	56	45%	-28%
Sale Data	166	60%	97	78%	-17%
Product Demand	184	67%	100	80%	-13%
Peer Product Pricing	86	31%	48	38%	-7%
Others	18	7%	2	2%	5%
Total	275		125		

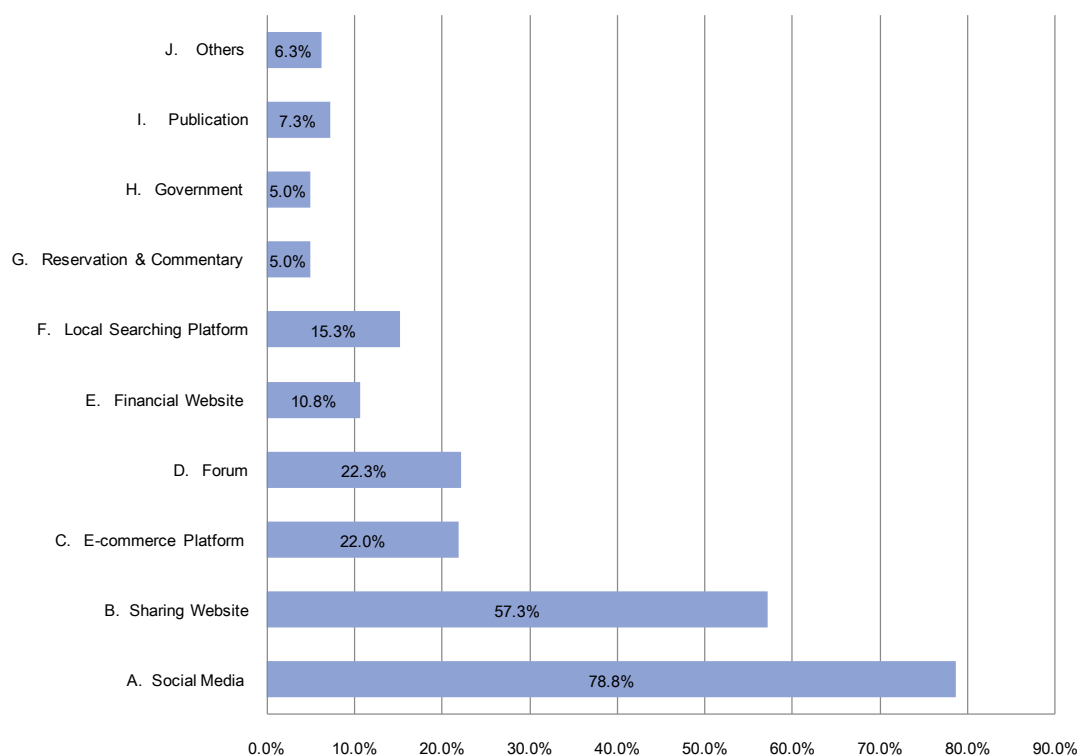
Type of interested data for analysis



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. 社交媒體網站
Social Media (Facebook/Google+/Twitter/QQ)
- C. 電子商務平台
E-commerce Platform (Amazon/ Ebay/ Taobao)
- E. 財經網站
Financial Website (Yahoo!Finance/Google Finance)
- G. 預約及評價網站
Reservation & Commentary (Hotel.com/Trip)
- I. 書籍／刊物 Publication (Google Book/ Newspaper)

- B. 分享網站
Sharing Website (Youtube)
- D. 討論區
Forum (HKDiscuss/ HKGolden)
- F. 本地資訊搜尋平台
Local Searching Platform (Openrice)
- H. 本地／海外政府
Government (Local/Overseas) (Weather/ Demographic/ GDP)
- J. 其他 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

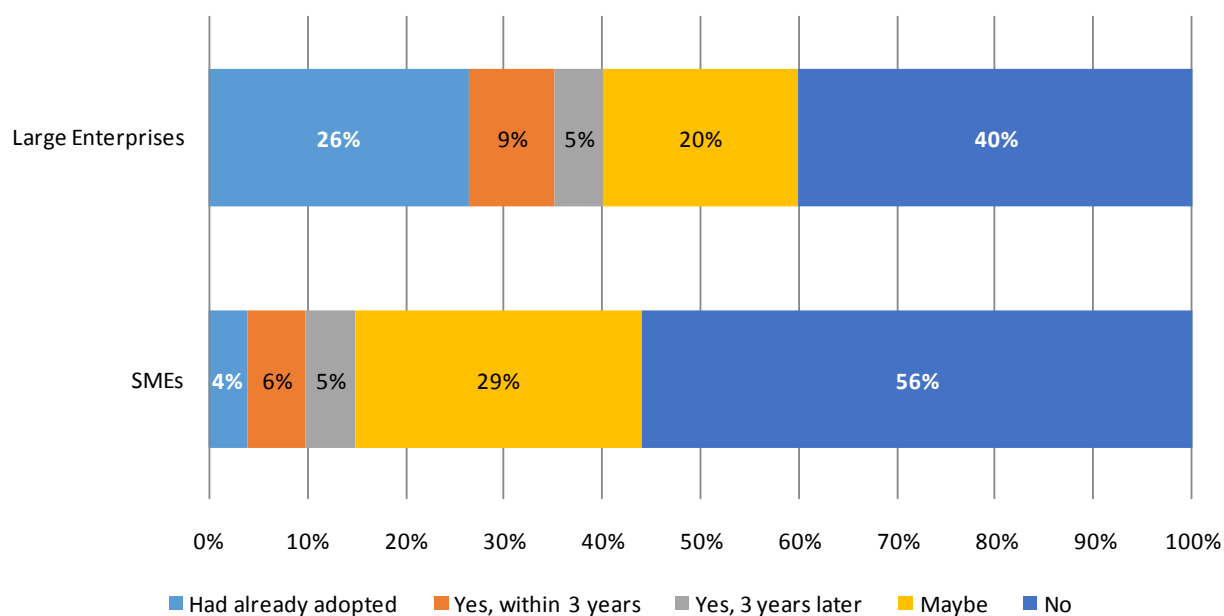
Among the 125 large enterprise respondents, 40% of the respondents do not have any plan, while 20% of them maybe adopt in future, 9% of them will adopt within 3 years and 5% of them will adopt 3 years later.

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.

	SMEs		Large Enterprises	
	#	%	#	%
Had already adopted	11	4%	33	26%
Yes, within 3 years	16	6%	11	9%
Yes, 3 years later	14	5%	6	5%
Maybe	80	29%	25	20%
No	154	56%	50	40%
Total	275	100%	125	100%

Future Big Data Adoption



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

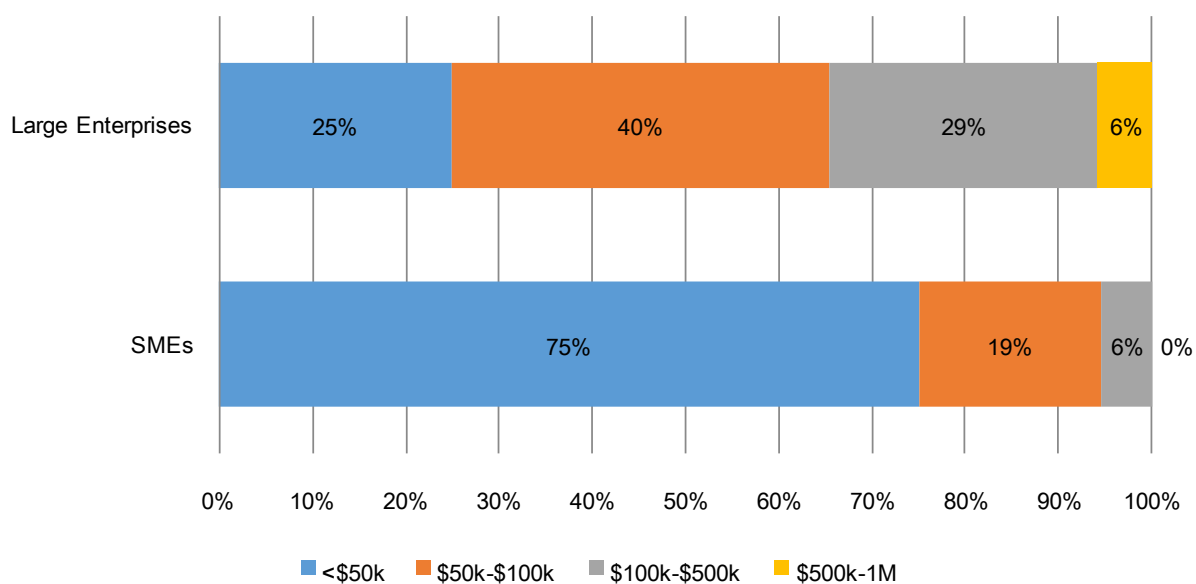
In our survey base, both retail and F&B sector as defined in C&SD are surveyed.

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.

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](#)

	SMEs		Large Enterprises	
	#	%	#	%
<\$50k	81	75%	13	25%
\$50k-\$100k	21	19%	21	40%
\$100k-\$500k	6	6%	15	29%
\$500k-1M	0	0%	3	6%
Responded	108	100%	52	100%
Not using in future	154		50	
Undisclosed	13		23	
Total	275		125	

Expected Spending in Big Data



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

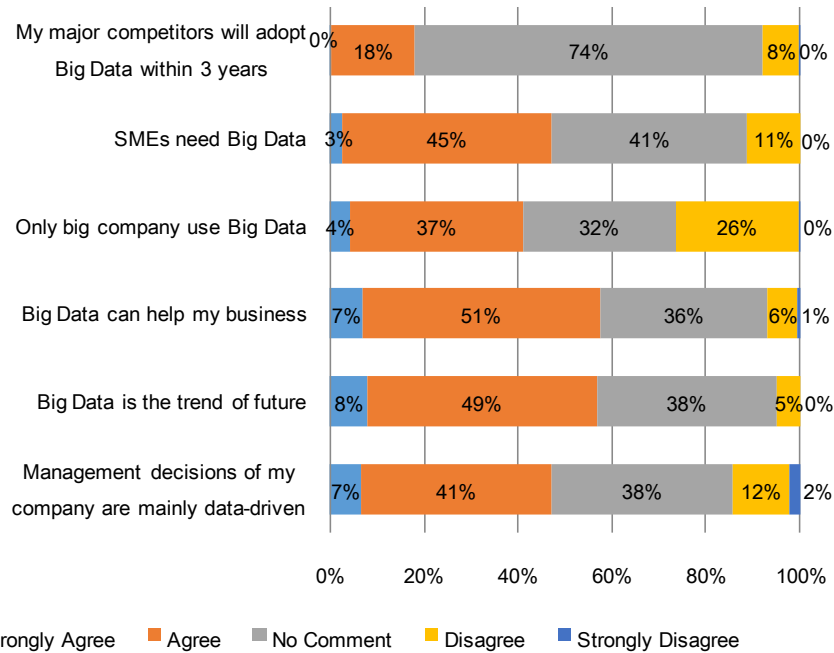
57% of SME respondents and 82% of the Large Enterprise respondents strongly agree or agree "Big Data is the trend of future" respectively. With the huge consensus among Large Enterprise respondents, they see a bright future for Big Data Technologies development. Also, although half of the SME respondents 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

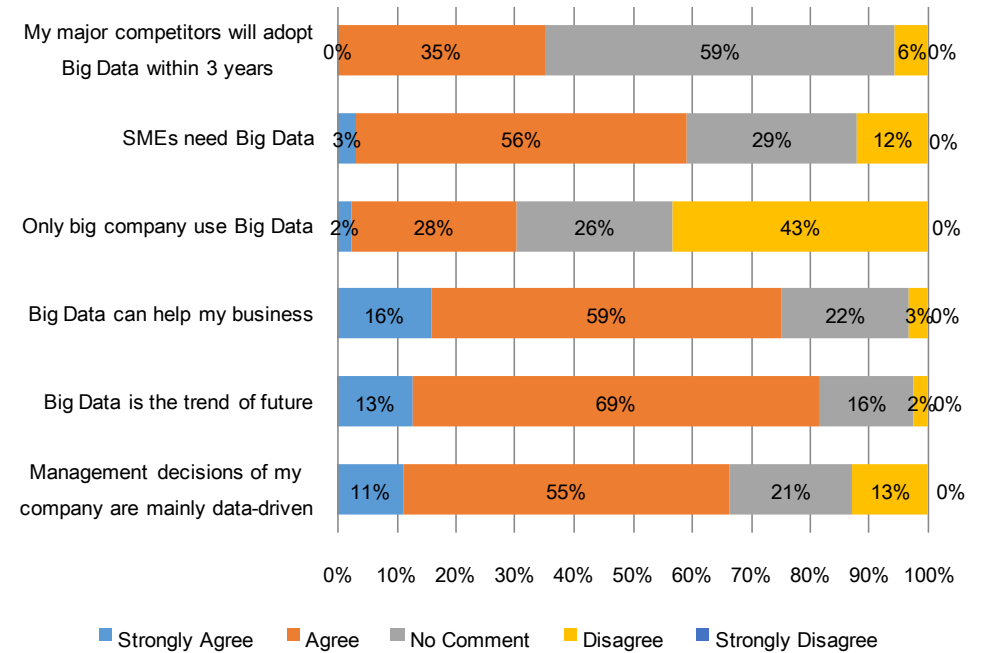
48% of SME respondents and 66% of the Large Enterprise respondents strongly agree or agree "Management decisions of my company are mainly data-driven" respectively. With both of them agree their decisions are mainly data-driven, the volume, variety and quality of data will be crucial to make a difference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

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

Comments from SMEs



Comments from Large Enterprises



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.

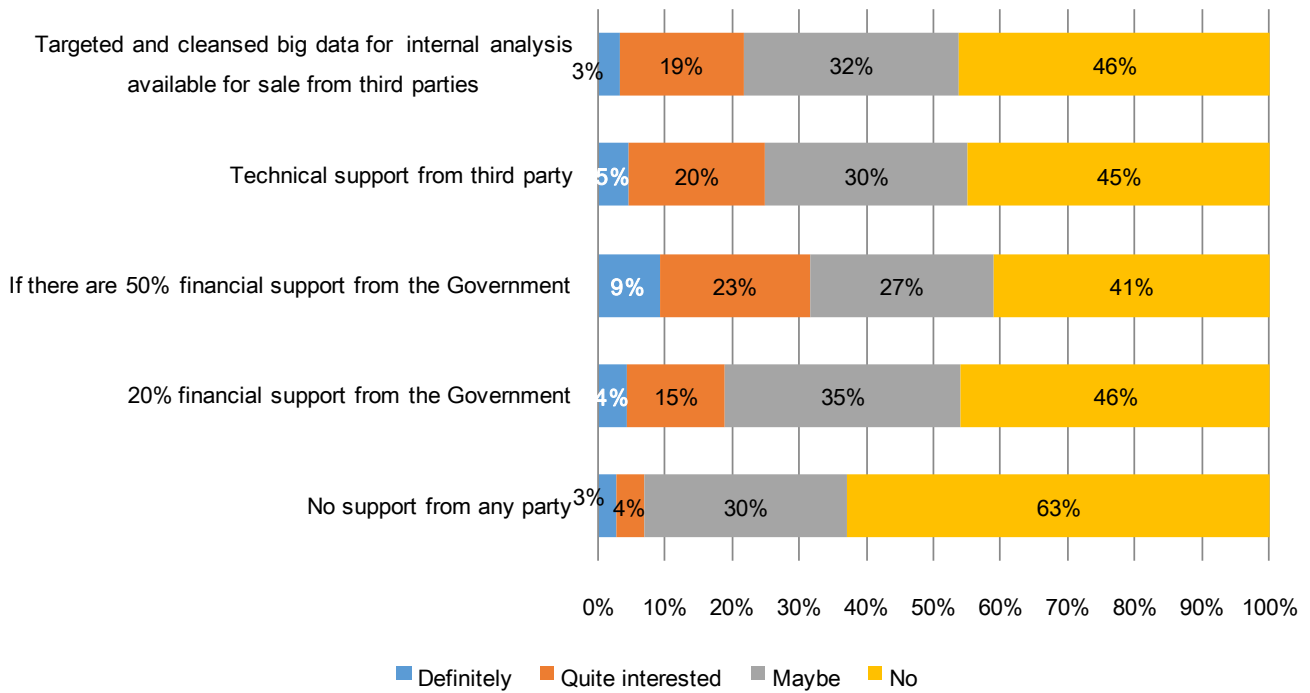
1. No support from any party;
2. 20% financial support from the Government;
3. If there are 50% financial support from the Government;
4. Technical support from third party; and
5. Targeted and cleansed big data for internal analysis available for sale from third parties.

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%).

%	Definitely	Quite interested	Sub-total	Maybe	No	Total
No support from any party	3%	4%	7%	30%	63%	100%
20% financial support from the Government	4%	15%	19%	35%	46%	100%
If there are 50% financial support from the Government	9%	23%	32%	27%	41%	100%
Technical support from third party	5%	20%	25%	30%	45%	100%
Targeted and cleansed big data for internal analysis available for sale from third parties	3%	19%	22%	32%	46%	100%

Interest to adopt 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

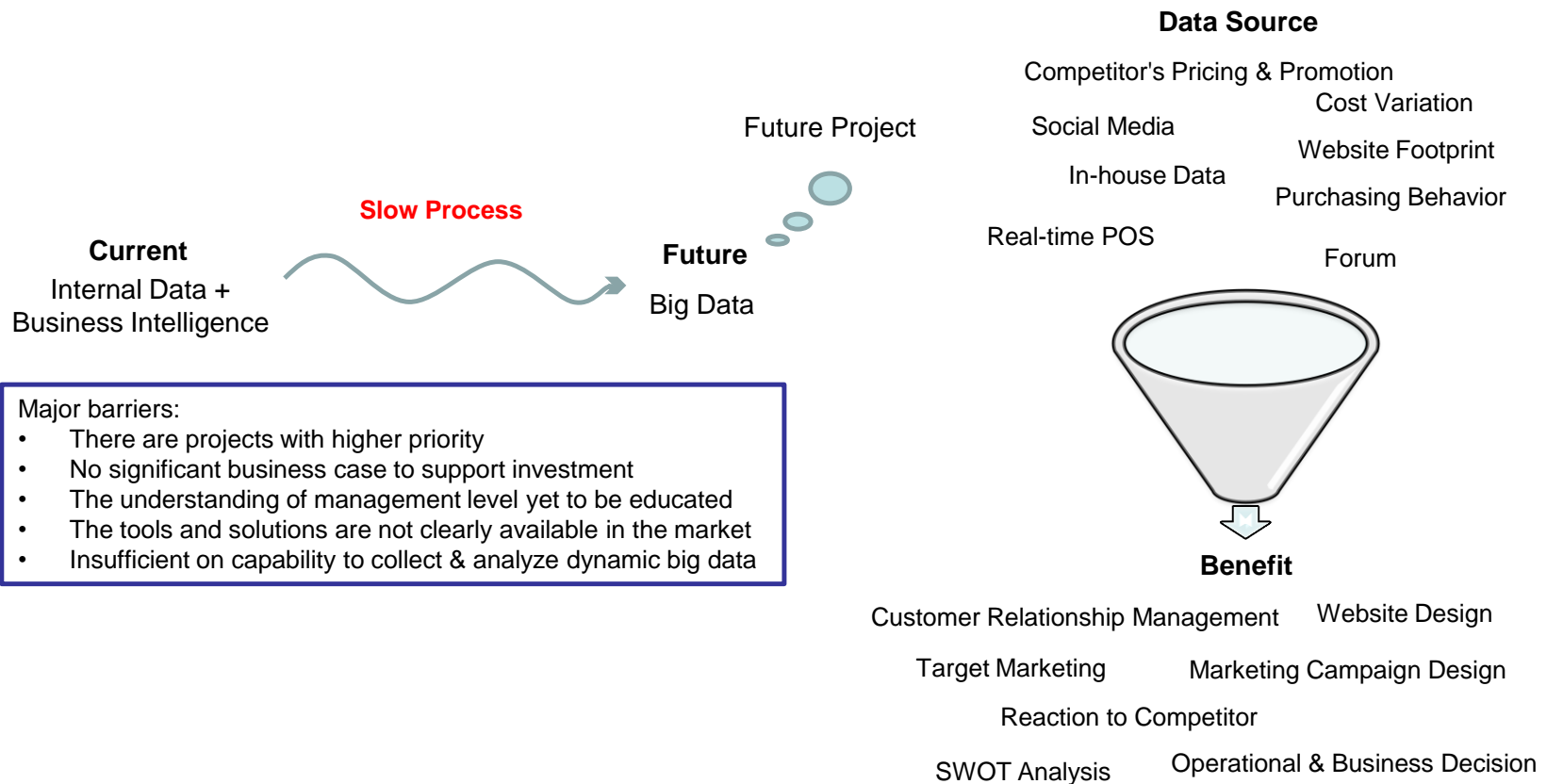
#	Business Sector	Position of Respondent	Rating on the Importance of IT Development (1-Highest, 5-Lowest)
1	<ul style="list-style-type: none"> • Department Store • Clothing, footwear, and allied products 	Executive Director	2
2	<ul style="list-style-type: none"> • Clothing, footwear, and allied products 	IT Director	2
3	<ul style="list-style-type: none"> • Clothing, footwear, and allied products 	IT Director	4
4	<ul style="list-style-type: none"> • Food & Beverage (with catering services) 	Head of IT	2
5	<ul style="list-style-type: none"> • Food & Beverage (with catering services) 	Senior IT Manager	1
6	<ul style="list-style-type: none"> • Digital Marketing Agency for Retailer 	Director	-
7	<ul style="list-style-type: none"> • Supermarket • Department Store • Medicines and cosmetic • Jewellery watches and clocks, and valuable gifts • Food, alcoholic drinks and tobacco • Food & Beverage (with catering services) 	Project Manager	5
8	<ul style="list-style-type: none"> • Supermarket • Other consumer goods 	Business Intelligence Team	2
9	<ul style="list-style-type: none"> • Department Store 	System Analyst	4
10	<ul style="list-style-type: none"> • Other consumer goods 	Quality Assurance Director	3

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



Aspect	Comments	Insights in additional to survey
Current Big Data Project	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<p>The reasons of no current Big Data Project includes:</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<p>They are interested to perform analysis mainly in following areas:</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

Aspect	Comments	Insights in additional to survey
Expected Benefits	<p>They expect the above data can benefit:</p> <ul style="list-style-type: none"> • Customer Relationship Management • Target Marketing • Marketing Campaign Design • Website Design • Operational & Business Decision • Reaction to Competitor • Perform Strength, Weakness, Opportunity, Threat (SWOT) Analysis 	<ul style="list-style-type: none"> • 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

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

Aspect	Comments/ Suggestions
Role of Big Data in Future	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.
Big Data in SMEs	<ul style="list-style-type: none"> • 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	<p>The following four supports are required to boost Big Data Adoption:</p> <ul style="list-style-type: none"> • Technical Support • Financial Support • Knowledge Transfer • Smart Infrastructure (e.g. Free Wifi to support data collection) <p>To achieve the supports, different roles are identified for Government, University and Other Organizations:</p> <ul style="list-style-type: none"> • Government <ul style="list-style-type: none"> ■ 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 <ul style="list-style-type: none"> ■ Incubate data scientists through University courses • Other Organizations <ul style="list-style-type: none"> ■ 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

「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) :		
部門 Department:	1. <input type="checkbox"/> 行政 Administration 2. <input type="checkbox"/> 市場推廣及銷售 Sales and Marketing 3. <input type="checkbox"/> 營運部門 Operation 4. <input type="checkbox"/> 資訊科技 Information Technology 5. <input type="checkbox"/> 其他 Other _____		
聯絡電話 Tel :	電郵 Email :	日期 (Date) :	

此部份由調查員填寫 To be Completed by Interviewer

問卷編號 :	調查員 :	日期 :
公司類別 Type of Company		
1. <input type="checkbox"/> 超級市場 Supermarket	2. <input type="checkbox"/> 便利店 Convenient Store	3. <input type="checkbox"/> 百貨公司 Department Store
4. <input type="checkbox"/> 藥物及化妝品 Medicines and cosmetic	5. <input type="checkbox"/> 衣物、鞋類及有關製品 Clothing, footwear, and allied products	6. <input type="checkbox"/> 珠寶首飾、鐘錶及名貴禮物 Jewellery watches and clocks, and valuable gifts
7. <input type="checkbox"/> 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 & 2)	8. <input type="checkbox"/> 耐用消費品 (汽車、電器等) Consumer durable goods (cars, electrical appliances, etc.)	9. <input type="checkbox"/> 飲食業 Food & Beverage (with catering services)
10. <input type="checkbox"/> 其他消費品 Other consumer goods		

A. 公司資料 Company Profile

1. 請問 貴公司主要從事甚麼業務? What is the major business nature of your company?

2. 請問 貴公司有多少員工? 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

(註: 如受訪公司員工人數少於 6 人, 終止訪問。 If your company engages less than 6 persons, end of questionnaire)

3. 請問 貴公司的主要產品/服務是甚麼? What is/are the major products/services of your company?

a) _____ b) _____ c) _____

4. 請問 貴公司的經營方式是? What is the operation model of your company?

1. ☐ 集團經營 Holding Company 2. ☐ 連鎖式經營 Chain Stores 3. ☐ 家庭式經營 Family Business
4. ☐ 個人經營 Sole Proprietors 5. ☐ 其他 Other _____

5. 請問 貴公司目標客戶群是? (可多選) Which is/ are the target market of your company? (Multiple answers)

1. ☐ 本地 Local 2. ☐ 中國內地 Mainland China 3. ☐ 外地 Overseas

B. 數據管理及分析 Data Management and Analysis

6. 請問 貴公司的數據分析工作主要由前線店舖進行或交到後勤部門集中分析? The data analysis job is conducted within the retail outlets or pass to back office for centralized analysis?

1. ☐ 前線店舖 Outlets 2. ☐ 後勤部門 Back office 3. ☐ 其他 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?

	1.領先 Advanced	2.差不多 Normal	3.落後 Fall behind
i) 數據收集方法 Methodology of Data collection	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>
ii) 分析工具 Analysis tool	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>
iii) 數據主導決定 Data-driven decision	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>
iv) 整體 Overall	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>

8. 請問 貴公司每年投放在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?

1. ☐ <1% 2. ☐ 1 - 5% 3. ☐ 6 - 10% 4. ☐ 11 - 20% 5. ☐ >20%

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)?

1. ☐ <1.0M 2. ☐ 1.1M - 5.0M 3. ☐ 5.1M - 10.0M 4. ☐ 10.1M - 50.0M 5. ☐ 50.1M - 100.0M 6. ☐ >100M

C. 對大數據技術的認知及採用階段 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?

1. ☐ 十分熟悉 2. ☐ 熟悉 3. ☐ 不太熟悉 4. ☐ 從未聽過 (調查員請解釋何謂大數據後跳到 Q12)
 Very familiar Familiar Not quite familiar Never heard about it (interviewer: please explain and then skip to Q12)

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 貴公司在數據技術應用上處於哪個階段？Which stage will you position your company in big data adoption?

1. ☐ 已實行 Implemented 2. ☐ 試驗階段 Pilot stage 3. ☐ 學習階段 Learning stage 4. ☐ 沒有打算應用 No plan

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)?

1. ☐ 客戶管理 Customer management 2. ☐ 目標市場推廣 Target Marketing 3. ☐ 數據關連性分析 Correlations analysis
 4. ☐ 產品/服務計劃 Product/ Service Planning 5. ☐ 交叉銷售 Cross-selling 6. ☐ 定價策略 Pricing strategy
 7. ☐ 銷售預測 Sales Forecasting 8. ☐ 競爭力分析 Competitive Analysis 9. ☐ 欺詐監測 Fraud Detection
 10. ☐ 其他 Others _____

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)?

1. ☐ 顧客體驗 Customer Experience 2. ☐ 顧客喜好 Customer Preference 3. ☐ 顧客消費模式 Customer Buying Behavior
 4. ☐ 產品設計意念 Design Concept 5. ☐ 產品銷售數據 Sale Data 6. ☐ 產品需求 Product Demand
 7. ☐ 同行產品定價 Peer Product Pricing 8. ☐ 其他 Others _____

D. 獲取感興趣數據的公眾渠道 Sources of Interested Data

14. 請提供首三個 您最感興趣取得數據的公眾渠道 (1 為最感興趣) : Please rank your top three preferred public sources of data? (1: most interested, following by 2 and 3)

1. _____ 2. _____ 3. _____

K. 社交媒體網站

Social Media (Facebook/Google+/Twitter/QQ)

M. 電子商務平台

E-commerce Platform (Amazon/ Ebay/ Taobao)

O. 財經網站

Financial Website (Yahoo!Finance/Google Finance)

Q. 預約及評價網站

Reservation & Commentary (Hotel.com/Trip)

S. 書籍／刊物 Publication (Google Book/ Newspaper)

L. 分享網站

Sharing Website (Youtube)

N. 討論區

Forum (HKDiscuss/ HKGolden)

P. 本地資訊搜尋平台

Local Searching Platform (Openrice)

R. 本地／海外政府

Government (Local/Overseas) (Weather/ Demographic/ GDP)

T. 其他 Others _____

15. 請提供 5 個 您最感興趣的網站 : (由受訪者自行講出, 調查員可提供 Q14 的例子) 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. _____

E. 採用大數據技術的障礙及挑戰 Barriers and Challenges on Big Data Adoption

16. 請問 貴公司採用大數據技術的首三個障礙為? (選首三項) What are the top 3 barriers to Big Data Adoption (Top 3 choices)?

1. ☐ 傳統數據分析仍未做好

Still struggling with traditional data analysis

2. ☐ 對大數據知識不足

Insufficient knowledge of Big Data

3. ☐ 部門間數據不流通

Lack of data transparency among departments

4. ☐ 數據分析複雜化

Complexity in data analysis

5. ☐ 缺乏專才

Lack of skills and expertise

6. ☐ 成本考慮

Cost concern

7. ☐ 安全性考慮

Security concern

8. ☐ 私隱考慮

Privacy concern

9. ☐ 其他 Others _____

17. 您認為以下是應用大數據技術會遇到的挑戰嗎? Do you agree that the followings are challenges for Big Data Adoption?

	1. 十分具挑戰性 Very challenging	2. 具挑戰性 Challenging	3. 稍為具挑戰性 Somewhat challenging	4. 沒有挑戰性 Not Challenging	0. 不知道 Don't know
1. 尋找合適的數據源 Identify suitable data source	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
2. 數據預備／整理 Preparing/ cleansing data	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
3. 融合內部及外部數據 Integrating internal and external data	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
4. 數據儲存 Data storage	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
5. 數據管理 Data management	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
6. 數據分析 Data analysis	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
7. 專才招聘 Hiring specialists	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
8. 部門間分享數據 Share of information among departments	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
9. 其他 Others _____	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

F. 對大數據技術的意見 Attitude Towards Big Data Adoption**18. 您認同以下陳述嗎？ Do you agree with the following statement?**

	1. 十分同意 Strongly Agree	2. 同意 Agree	3. 沒有意見 No Comment	4. 不同意 Disagree	5. 十分不同意 Strongly Disagree
1. 公司管理決定大多是數據主導的 Management decisions of my company are mainly data-driven	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
2. 大數據是未來趨勢 Big Data is the trend of future	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
3. 大數據能幫助公司業務 Big Data can help my business	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
4. 只有大公司使用大數據 Only big company use Big Data	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
5. 中小企需要大數據 SMEs need Big Data	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
6. 公司主要對手已經應用大數據 My major competitors are using Big Data	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
7. 公司主要對手將在 3 年內應用大數據 My major competitors will adopt Big Data within 3 years	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

19. 您認為 貴公司會在未來應用大數據技術嗎？ Will your company adopt Big Data in the future?

1. ☐ 已採用 Had already adopted 2. ☐ 會，3 年內 Yes, within 3 years 3. ☐ 會，3 年後 Yes, 3 years later
 4. ☐ 可能會 Maybe 5. ☐ 不會，原因為：_____ (跳到 Q21)
 No, why: _____ (Jump to Q21)

20. 您認為 貴公司將會在大數據投入多少資金？ How much do you expect the spending on Big Data?

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

21. 假若有以下支援，貴公司有多大興趣應用大數據技術？ Are you interested to adopt Big Data under the following circumstance?

	1. 一定會 Definitely	2. 很大興趣 Quite interested	3. 可能會 Maybe	4. 不會，原因為： No, why:
1. 沒有任何援助 No support from any party	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/> ，_____
2. 政府提供 20% 財務支援 20% financial support from the Government	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/> ，_____
3. 政府提供 50% 財務支援 If there are 50% financial support from the Government	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/> ，_____
4. 第三者提供技術支援 Technical support from third party	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/> ，_____
5. 第三者售賣預先處理的目標數據作 貴公司內部分析用途 Targeted and cleansed big data for internal analysis available for sale from third parties	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/> ，_____

22. 您是否有興趣受邀作更深入的調查 Are you willing to participate in in-depth Interviews?

1. ☐ 有 Yes 2. ☐ 沒有 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**) : _____

公司類別 Type of Company

- | | | |
|---|---|---|
| 10. <input type="checkbox"/> 超級市場 Supermarket | 11. <input type="checkbox"/> 便利店 Convenient Store | 12. <input type="checkbox"/> 百貨公司 Department Store |
| 13. <input type="checkbox"/> 藥物及化妝品
Medicines and cosmetic | 14. <input type="checkbox"/> 衣物、鞋類及有關製品
Clothing, footwear, and allied products | 15. <input type="checkbox"/> 珠寶首飾、鐘錶及名貴禮物
Jewellery watches and clocks, and valuable gifts |
| 16. <input type="checkbox"/> 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 & 2) | 17. <input type="checkbox"/> 耐用消費品 (汽車、電器等)
Consumer durable goods (cars, electrical appliances, etc.) | 18. <input type="checkbox"/> 飲食業 Food & Beverage (with catering services) |
| 10. <input type="checkbox"/> 其他消費品 Other consumer goods | | |

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-