

An Exploration of Big Data Practices in Retail Sector – Supplementary Materials

Emel Aktas ^{1,*} and Yuwei Meng ²

¹ Cranfield University, Cranfield School of Management, College Road, Cranfield, MK43 0AL, UK

² Apple Computer Trading (Shanghai) No. 391 Yuanshen Road, Pudong, Shanghai, 200135, China; yuwaymong@gmail.com

* Correspondence: emel.aktas@cranfield.ac.uk; Tel.: +44-123-475-1122

A.1 Interview 1

Respondent 1 - Senior Director, Supply Chain Finance – Company A

Respondent 2 - Global Supply Chain Management Information Systems and Business Intelligence – Company A

(...)

Ok, so, how... what data are you using at the moment in supply chain?

R2. So R1 and I would kind of take it as conversation, and we have a lot of different data. We have data form a multitude of different sources across the global enterprise. **We have probably 30+ different systems that we have in use on a daily basis [IIE1].**

Oh that's a lot.

Oh yeah, that's a lot. A lot of system. So we have, you know, **host data, so data like ERP data, customer order data , vendor purchase order data, things like that, we have financial**, like R1's team analysis. We have **transport management system** as well both on the in-bound and out-bound side. So really, **a full spectrum from vendor order, inbound transport, the distribution process within the facilities, and then out bound transport as well**. Across that the corresponding financial on top of that. Em, you know there is both internal data, so you know, data internal to Company A, as well as **(logistics services) provider data**, so the Company B, Company C, companies like that were **integrated with us as well [IIE2].**

Ah, ok, so you mention the distribution system, is that kind of integrated with the provider, Company C, data or it is a separate... what it is about?

Yea, so that's our warehouse management system.

...Some of vendor actually have their own.

So in terms of the distribution centre... if the vendor have their own, do you also use data from them or you have your own system?

No, we do. We integrated with the vendor or our system integrated with the vendor as well. Or other providers.

So from the distribution system, the data would mainly about the inventory and stock?

Stock, WIP, outbound shipment, in-bound vendor PO [IIE3], has kind of copy of everything. But primary the WMS is primarily concerns about the activities that happen within the four wall of our facility.

So, how are you going to use these data?

For the distribution we use it for, you know, on hand **inventory [IIE4]**. And, our current WIP, how many unit we have shipped, how many we received in various process within the distribution centre.

So, what kind of decision you use (for), is it basically about the transportation or..?

Is the... inventory decision, inventory level and understanding where inventory is help us make... understanding of space, **space needs, the other data that R2 mention also help us to plan our labour [IIE4]**.

So the space and labour, is it within the warehouse or you also consider within the stores?

No, we don't... we completely focus on the warehouse.

And how about the vendor order and customer order?

We do, so outside the WMS, we do use them for, you know, **planning purpose on the inbound and outbound side [IIE5]**. Understanding how the predict, **the volume that we seen relates to our forecast and what the latest projections are [IIE6]**.

That would also help us with the transportation planning.

So, you mention the transportation planning, it is the scheduling?

Yes, the **routing [IIE7]**, we both have to schedule transportation for shipment for our stores as well as work with our whole sales customer on, when they come and pick up their own goods.

You know, I think even take it a step further in the inbound side route planning, you know to distribution centre as well.

So in terms of the inbound logistics planning, you also has the information from supplier then?

Correct.

Ok, and what would that be?

Ah, ...(merchandise information)...

Ok, so all SKUs, you have their information in terms of orders and arrange transport in terms of inbound and outbound then?

Yes.

Do you think it is very difficult to handle such amount of data?

Yes, I mean it is definitely challenging, **you need good team you need very skilled resources [IIE8]**. Just **put together 30+ different system [IIE1]** to do any one given function can be joining up three or four different system together. Things like that, so, you know, we have done a very very good job on it, and **we do it fairly easily now, but to do it is very complicated [IIE9]**.

Ok, so could you tell me more about how you integrated these 30+ system?

Yes, so we get data from our provider, we land it on a service data base where we have all the data and put business intelligent in query on top of that data base.

So, do you have an interface that you can access all the data just use it or different functions have different right to manipulate different data? How does it works?

I think you can said we built customed interfaces, customed tools sit on top of the data to provide the views.

It is pretty much, you know, **we have a BI team and they create can report where all the user don't have to worry in data managing and creating view of things, they just use pre-defined dashboards, and query of information [IIE10]**.

So can you maybe tell me more about the BI team, what are you doing, in more detail?

Basically we are **building tools that support the main functions [IIE11]** in the supply chain, so inbound transportation, DC operations, outbound transport, supply chain finance, customer operation. We have a **stander set of KPI that we take a look at [IIE11]**. You know, things like, what are the inventory level and how fast we are turning our product. Then we have a **general flow reports [IIE11]**, what are the projected inbound receipts or projected supplement, how do those relates to forecast, plan and there is **operational tools that we are continuously building for specific business need [IIE11]** within anyone of those function. To support any area of supply chain based upon the current business need. Customed tools we build for our internal user group. It is customised toolkits that we are building.

Ok, so when you have the report from these data, how are they going to be used? In a daily basis or monthly?

It depends, so we have multiple time for their report, we have daily report, we weekly report, we have monthly report, we have quarterly report.

On demand.

Yep on demand report, and, you know, they are delivered in various different format. From Excel, doing online BI tool that they can create.

So, in terms of analysing or using data, is it also you doing it or is the specific function they are doing it?

We rely on specific function, we do do some of it. But the way we develop, or we will develop the tool, will partner with the group, we get it, test it, roll out and analyse. At that point we turn it over to the operation, whatever function that is. **They use that tool and it is up to them to create and analyse it and go for business [IIE12].**

Ok, how these tools are design. It is also required by the function or...?

We work together.

Yes, there have to be a business need obviously. Now where that business... **the business need rarely originated within BI team [IIE13]**, to be honest with you. The business need will either originate from, you know, the executive leadership team or within the functional team themselves. And they will come to us with the request and say 'hey we need this to be built.' And **we analyse it and see how it fit in with other priority [IIE14]**, and... there is a prioritisation process and then (we will) work with them under requirement, what it needs to look like, what data element and what functionalities. (and what development.)

Ok, so how long, how much effort actually do you put into building these tools for the analyse?

How much effort (put) into building the tools?

Yes, maybe in terms of how much time you need to do it, finish the project?

A simple tool can be built in under a day, complex tool can be built in couples of weeks.

Ok, so what would be the most complex tool you have ever built until now?

I think... I am gonna said transport management tool are most complex.

Yeah, and the most... advance.

So they integrated with the most system and they provide both executive level of **flow report, KPI report, and reception report [IIE15]**, that's use to manage transport flows, you know we have a global deployment of those as well.

So, could you also give me some idea on retail planning?

You have any...?

Yes for example assortment, are they also using the tools you develop at the moment?

They don't use our tools [IIE16].

Ok.

We unfortunately, we don't... we could not speak knowledgeably about any of that.

Ok. Do you have plan in place to develop further quantitative analysis?

We are constantly building and reporting to give operational, the operation better decision-making tools, no matter it is quantitative, or it is just small...it is information.

We are... data kind of... as enabler for other area.

So, could you maybe give me an example in terms of what is the problem tools designing to solve?

It's all about data sources, we got so many it is getting all the great data sources, put together and crunched, that's probably the biggest single barrier we face when we try to build these tools [IIE17].

Most of them... it is fair to said that a lot of them are sectional recording.

Sectional reporting flow, you know, so we can do staffing plan and managing inbound flow, em, understanding event and milestones across the board. How many unit are we shipping, what is the cost of shipping something air versus the sea, you know, how can we... how can we have all those information where we can make better decisions... 'cause we don't know that we are shipping, for example 50% air in or not, we can never improve it. So we are enabling our process for... to allow (cost) reduction.

Ok, so basically you are doing more about how to reporting the data in terms of... in the format they... the function... they required.

Yes, we are providing they information in the format they required, that allows them to manage their business in an efficient manner.

Ok, do they change their requirement very often or not that often?

All the time. Everyday [IIE18].

So could you maybe, give me an example?

Yeah... I mean it is a **further level of granular details at the end of the day [IIE19].** So you know, they've been looking at it in... the way it shows six fields, and tomorrow they need two more fields for a new process and we need to go back in and do it. Or, you know,

get (ad-hoc) we have to query... something that has not presented to them and things like that and... so it's continual moving target.

But these granular data, is it not available at the moment or it is not reported in that way?

It is not reported, it is in the base database [IIE20], and we don't give everybody access to every table and every field in the base database cause they are not technical, they are business user. That we... we take 30 systems, 10 tables per system, so there is 300 tables and... you know 15 fields in a table and we don't give them access to that, we boil that down to a review that they need to run their business.

So now that they require a more granular data, is it very challenging for you to, go back to do all the programming or is it ok?

Something are fairly easy something require more time.

So why is the differences, why some of them are fairly easy?

Just depend on the request, depend on the calculations that is needed, you know we get... like a field of description we can add it in a matter of seconds of minutes, you know if it is adding a completely new route calculation it is couple of days to work out.

Ok, so what would you think would be the biggest, say challenging in doing this, is it about the technology or it is about the people or whatever...?

Em, I think the challenges are always **making sure you have the right data to support the process**, and you are **able to report on it in an efficient and accurate way [IIE21]**. Once we have the data, then we can build the tool, **the people training is fairly easy [IIE22]**.

So is data collecting part of your responsibility or is it by other function?

Yes, the data collection is our responsibility. Now other people, for example the transport team own the interface, they own the related area, but we land the data in our server and we own the data for the functional team.

So, at the moment, do you think sometime the requirement they demanding is... even not capable of doing it cause you do not have enough data?

Yeah, yeah, we do run into that case and then **we need to go back into the provider and integrated new fields, and new functionality. From time to time it happens [IIE23]**.

So is some data you get is already aggregated so you are not able to break it down?

Yeah, we **will get aggregated data from providers [IIE23]**.

Ok, so now do you have any plan of going to collect more data or how are you going to do that, as sometime you are not able to get the things you needed. Is it also the case that you need to collect completely new type of data?

Yeah, absolutely. So we are doing that across two regions right now, Asia transport side we are doing it, Korean logistics side we are doing it, so as we expand function, **we are gonna be expose to new data [IIE24]**.

In terms of the logistics, I heard that there is also a trend now to include the GPS data the fleet you have, have you thought about that?

I don't have integration of GPS data but some provider system are... you know, software and services tools have that data and we have access to that associate down to their sites and things like that, I am immature now to explore on GPS tracking at all.

So do you think now you has some data you are collecting but are not used, or not reported?

Yeah.

So, for example?

Well, you never know.

So do you think now the system is getting bigger and bigger... and for how long would you store the data?

Currently we don't have our archival strategy, we have **enough space for not being constrained**. So I think you know at the minimum, we **store the granular level of detail for up to three years [IIE25]**, and after every three years we will need to take a look at how our archived the transactional level of detail. But keep... store... keep a full history and you know, roll that out to a level at no the SKU case level. But we don't have a constrain as far as (data)base right now.

So your constrain is it in terms of equipment or is it in terms of the capacity of storage?

Yeah I mean at a certain time storing massive amount of transactional data is a space hard and is a resource hard that will slow you down but **we have not reach that point yet [IIE25]**.

Ok, do you foresee any bottleneck in this?

No.

Maybe go back to the development of the tools a little bit further... So you have the programmer that would work with the function, and discuss together.

Yeah I have broken between the **data team and the programing team**. Our **data team is administer of the database and the server, programming team is responsible for**

development of application and reports, and then the data team they provide can-used reporting and enable them to better report faster and also **keep the programmer working with the business, not with the data [IIE26]**. It works well.

Ok, then so it more of less the questions I would like to ask you. Thank you very much for taking part in this, and I would sent you the an executive summary maybe at the end of July, something like that.

That would be fantastic we are able to see it.

Ok, so thank you very much again, and goodbye.

Bye.

-End-

A.2 Interview 2

Respondent 3 - IT Development Manager – Company D

(...)

Before that, what's the..., you are representing general merchandising...

That's correct.

What would be the category you are... you are doing, is that clothing or...?

Yeah, and no, so general merchandise is not clothing and it's not grocery. So anything you can't eat or wear, em, is tend to be classified as general merchandise. So televisions are general merchandise, em, small domestic appliances like foods mixers, personal grooming like electric razors and things like that. And on the home side, you got textile, dining, cook shop. So, basically, and toys that is in sports, so anything you can't eat or wear, is likely to be general merchandise.

OK, Thank you. What planning are you responsible for?

What Planning I responsible for?

Yeah.

Em, well across the division, we are entirely responsible for planning both **sales and marketing activities, logistics activities for general merchandising [I2E1]** in the division, (number of) stores.

OK. So that's a very wide range of activity.

Absolutely.

So, what data are you collecting?

So broadly speaking, we collect data **pre and post sales**, so we look at, we are collecting... data in, **stocks in terms of availability through the supply chain [I2E2]. From suppliers**, like though our supply chain, and then **into stores**, and then we look at **sale information** so (we are) looking at daily sales, and also weekly sales, we are looking at that **at store and line level**. So **store and line level analysis, (on) sales**, and then we have an area of the business unit who are **looking at long term sales activities [I2E3]. So analysing market information from different geographic area in which we operate**, so that's looking at analysis of **costumer habits, trends [I2E4]**. We also looked at the **commodity market** to understand **how the changing commodity market impacts, on gross prices of products [I2E5]**.

OK. So you mentioned the availability, is that related to the stock level on the...(unclear)..

Sorry, say again?

The availability. Can you explain it a bit more in detail?

The availability is one of the key measure for any retail organization. So you are looking at, if you are our customer, you going to our stores, what's the key measure is what's the probability that you will find the product that you are looking for that we ranged. So **one of the key measures that we measures ourselves by is the percentage of availability of any line in our stores any one time [I2E6]**, and we have a high target to achieve.

So how would you measure it, is it the inventory level on the **shelf or maybe in the back of the store?**

So **both**, so looking at the **stock on hand level [I2E6]** for a line in a store. You are **comparing that continuously with sales and the replenishment cycle [I2E7]**. So if you got sales... and you are going to the stores and is expecting your availability. You are looking at the replenishment cycle to ensure that the availability level are maintained.

OK. Are you also doing the online shopping?

So, yes and no, we have an online offer available ..., and yes, we do have an online offer for customers.

OK, so I know that some online order fulfilment method are picking in the store, so is that the same story in for you?

Yes, there's a grocery home shopping and offer, but that's grocery, and we do some general merchandise and we have a **limited range of product available** through the grocery home shopping chain. So stuffs you do **associate with the grocery [I2E8]**, so for instance we might, sale bottle opener online, which would be generalized products but that would be available on line alongside the grocery product range. We don't currently have a full online internet offer.

OK, for this part of online offer, so you find it very difficult to ...(unclear)?

Do you do what sorry?

Do you find it is, you always face stock out situation?

Well, as I said... we don't ... currently offer a full online business and **the availability is always a challenge with online offers [I2E9]**. But the **shopping experience for customers in any website** whether it is ours or anywhere else, the **availability is a different measure**, because you could be **inform with the customers in terms of what availability you got any one line any moment in time. But you count your board range [I2E10]**, so the customers are looking to buy a television and the availability on one particularly unit is not good, and

you can illustrate that to customers very up front, but you can also say that you know, alternative, is good availability on Brand A television rather than Brand B television for instance. [I2E10]

So how would you decide which product to go to online offer and which are not?

Well, that's not a question that I can answer, that's a **commercial decision**. Obviously that's driven by **market and trends and movements and the selection of range is integrate process that involved a numbers of factors [I2E11]** which obvious for us is especially complicated by the facts we have... we operating in different consumer markets.

OK, so, in terms of the sales, you also mentioned the long term sales and customer habit. How long would you define as a long term?

Well. Our models will be looking at **24 months in ahead [I2E12]**, so you are planning at least one or two seasons ahead anyway, so at least 12 months in terms your planning process. So planning for Christmas is already well on the way on any retailers. So we will be thinking about spring, summer, (20)15 within the next few months, so our market analysis for our customer trends and so on would project beyond that. ...bit like whether forecasting, **the further you get the more affected you can be**. You know, **the trends in the market for certain styles and designs are relatively easy to plot and we would build these to our marketing and range forecast for the coming seasons**, so... you are **fairly accurate on the next season and the season after that**. **But beyond that, you are into the speculation on the forecasting [I2E13]**.

So, you mentioned, talking about the very complicated forecasting model, so what kind of factors will you ...(unclear)...?

Sorry, say it again, what sort of what?

What sort of factors or elements.

Well, what the marketing guys will be doing is looking at **trend analysis for products that we are selling to our existing chain**, also looking at what **other retailer is selling and what time, what is moving to the stores**. And then we looking at **population trends**, so looking at the revolution of tablet technology into one geographic area may move faster than it does in other areas, for instance, and that kind of the analysis that we are doing. We are looking at **how customer's shopping habit is changed or changing over the next 12 or 20 months [I2E14]**.

OK, So let's back to availabilities, so do you find it very challenged or how, at the moment how are you ensuring the high level of the availabilities?

So, Company D as a whole and my division has a well-established supply chain operation with **very high quality business partners** and the net result of that is the end chain supply chain, which is driven by availability. The end **chain supply chain is very well geared up; very responsive to moving stock into stores and, it is an, continuous, replenishment allocation cycle that response to fast sales [I2E15].**

So, do you think there is anything you can improving the current practices?

There is always room for improvement in any business, obviously from our point of view **getting accurate and timely data from our stores is the key thing [I2E16].** It's a very dynamic environment, the store environment, and there's many factors that can change consumer habits and consuming purchasing patterns and on weekly or daily bases. The challenge for us on retailer is able to **spot those trends**, and spot those changes, **and respond accordingly [I2E17].** The obvious one is always the weather. So, if the weather turns warmer, then customer would start to buy seasonal product, but that can happen on a daily basis. So, as you are more towards the weekend, then BBQ equipment may spikes for that particular weekend. And then the consumer science people here in Company D spend a lot of time, try to understand **how the things like the weather or other event taking place in a local environment can affect customer habit. And we respond accordingly with the supply chain and moving product around accordingly [I2E18].** So you have a **public holiday**, that can have **influences on the spending habit [I2E18]** on the, one of that public habit. But it is the detail that we have to try to get right 'cause you have to get right product into right stores at the right time.

Ok, so in terms of the data from the stores, are you looking at the sales date or are you also looking into other?

Well sales data is the primary driver. But from the whole store perspective of view you also looking at **footwork, at which customer spend by which basket size**, you look at the information **for impulse purchasing [I2E19]**, so the variety of different metrics come together to create the overall picture. But as I said, **it is like forecasting the weather, it is very... it is very multi-facticity model and very difficult to get right every time [I2E20].**

Why do think the data would get inaccurate when you get it?

Why it became in accurate?

Yep.

Em.. well I am not sure it does. You know it... the sale information is accurate, **inaccuracy is not necessarily our biggest challenges [I2E21].** Our biggest challenge is... em ...

timeliness of the data, getting it in a format that we can use quickly and promptly and respond accordingly [I2E22].

So is it because you have different information system, so you get problem on integrating it?

Em, yeah... we do have some challenges with integration between system... Em, Company D is an organisation is growing organically over many years. And **we have some many sophisticate systems, and as many organisation, linking these together can be... can be interesting.** And, obviously when you are handling data between systems you have to ensure data integrity is maintained. **And, we are good at that, we have a good understanding of the data flow...[I2E23]** but obviously there is always room for improvement. Making the **data flow faster, I think, would be the biggest improvement [I2E24]** we can make.

Do you have any plan in place in solving this problem?

Yeah, we... as I said it is kind of a continuous improvement process. And, there are numbers of initiative that we will over time **improve the speed that which we get data and the granularity that data will improve.** So, as we **change our in-store system and our central enterprise resource system [I2E24].** As those evolve and improve then inevitably the speed and granularity of the data that will be able to crunch here at the centre will improve.

Obviously (we are) talking about very large data set from across the estate. **We have a large number of store and (who are) selling a large number of product. So the ability to... analysis that data quickly and efficiently is gonna be increasingly important [I2E24].** And there are some strategic solutions in the pipe flying around: **improve data management and data handling,** all of which, all of which will inevitably lead to improve decision-making and improve analysis of trends and... you know, **almost real-time trend analysis would be possible. But we are not there yet [I2E24].**

Most of initiatives would about how you report the data and transfer the data rather than to collect new data?

Yes. The data we collected, you know there only... **there is a limit the amount of information you can collect.** At the end of the day we are selling product to people and you can collect a limit amount of information about those product. You can... you know...it is... **there is element in diminishing [I2E25].** We turn in job for a while on the amount of information you collect on any one particular sale. But putting that aside, yes as we move forward, our ability to **get more information quickly would be a key to our ability to respond to market variation [I2E26]** even better than we do now.

So, in terms of analysing data, what sort of insight or outcome would you get to support your decisions?

So, the analysis that we do is on a... it kind of goes into... We do a lot of work **on analysing stock movement [I2E27]**. So through the supply and through our store and to our customer. We also spend a lot of time looking at **sales analysis, so looking at what selling with what [I2E27]**. And that data analysis is ongoing and is support the decision-making for **ranging our stock in the future both in the short and long term [I2E27]**. So, as a retailer we spend a lot of time looking **what our customer are buying [I2E28]**, we spend a lot time looking at **how we can move those products through the supply chain in an even more efficient and time-efficient manner [I2E28]**. We (are) also very cautious about the **impact on the environment** of our supply chain and our customer base. So we are very cautious about the ecologic impact that we have. So this is the, probably emerging, **increasingly emerging degree of analysis will be to held**: how we can improve the supply chain and customer experiences so that... we can only do that with **good quality and quantity data around our sale [I2E29]**.

So, you also mention the sale date to (analyse) what is going to sale with what, so how would you use sale analysis in business?

So the data is received in a fairly cool format you can imagine, from our stores. What we will be doing is **providing to the commercial team various report, most of which we can report... which give them their sale and trend analysis and... daily sales in terms of volume and value of sales. And they would be making their merchandising decision on the back of that, back of that information [I2E30]**.

So these report, in which level are they reported? Is it in the whole (business unit)...

No we go down to... we do report on whole (business unit), we report on the whole group but we go down to **store and line level**. So we can report **sale in individual product level by store [I2E31]**.

Ok, so do you have any concerns over this practise? Do you think it is effective?

Do I have any concerns?

Yes.

Em... the size of the data set... you talking about **a very large volume of data** and you know, **time to make decision on the basis of large volume of data can be difficult [I2E32]**. But it is important that we and my team here in the... analysis team **provide the data at the level of which is appropriate for the decision making to take place [I2E33]**. So obviously they are... buyer and merchandiser they are interested in their products but the higher you got through the organisation obviously the analysis become more... rolled up. So **we are looking at sales by section or by class or by department rather than necessarily by product. But**

we also do the same by store [I2E33], so looking at product sale through the store as well as just by product and sales. So which product is selling well or badly in which store, and that would help us with merchandising decision for moving forward to another sales. So it is a process of continuous improvement.

So in term of deciding which product to go into which store you are doing (it) in store level?

Yes. Sorry, so we plan at store-line level.

Ok, would you also consider layout inside the store?

Pardon, say again?

Layout, would you also consider that?

Oh, absolutely, yes. A big part of planning process is around store layout panoramic. That's a key part of retail process obviously. So, in terms of **heat map for which product sale well, and which is slow moving, you would planogram those accordingly on a shelf or within... at the macro space in the store itself [I2E34]**. So ultimately we making decisions fairly continuously about **which product should go to which store base on their sales and then with that, which product go where with each store [I2E35]** and that's a... let's said that's a... almost a continuous process.

I hear that there is some practice using camera data within the store to optimise layout. Are you also using that?

We don't for this division, but Company D as a whole does use... em camera technology for identifying customer flow. Em.. but again as a well-established retail organisation we got a very good idea on how to optimise the layout in our store to attract customer. Given that, as I said already, it is a continuous learning process, and there is **trends and... fashion trends**, then it is right that **we reflect that in our store layout and store design, and awful lot of energy and works goes into ensuring that our stores are attractive to customer both in terms of the range that they offer but how they look and feel [I2E36]**.

Would you mind to share a bit of insight in terms of how you do this?

How we do it?

Yes.

So we... I don't know the detail, **that's not the area that I work in**. But I know that... you know we spend time with **appropriate marketing organisation to understand what works well for customer**. We use **focus group, so we get regular customer feedback [I2E37]** from our customer. We look at, so we look... we also look at **what our competitors are doing well [I2E38]**, and what is not working so well and we will reflect that in our stores.

We also try to built a unique brand, and making it a destination store for customer. Things... I think it is fair to said that things are going well there. So it a... an area we are getting better at. So making our the latest generation of our stores one of the destination for our customer is a primary target for us and we are investing a lot of energy into getting that right.

So how would you decide which layout, which design is effective or ineffective?

Well ultimately it comes down to **piloting into stores [I2E39]**, so if you have a design concept, that's been signed off, ultimately you deploy that into a store, and you analyse what works well what doesn't work so well, so you build on that. Then you draw out the improve model into it... that couple of store and again, **take the learnings, until you reach the point you said that this is the best format for the store [I2E40]**. And then you roll out... roll that out according to size and product range.

So, are you also doing the pricing...?

Sorry said it again if we are doing what?

Pricing.

Pricing? How do you mean?

I mean, do you consider maybe promotions, certain price comparison, how to plan offers...?

Oh yes of course. I mean... obviously price, we haven't talk about that have we. Price is a fundamental corner stone of any retail operation, absolutely right. What company D is good at is we are a... we are **competitive retailer, but we also add value, so our pricing reflect that accordingly [I2E41]**. We might not always be the cheapest but we are competitive. And we like to offer our customer good customer services and that is part of the overall customer experience. So yep, pricing is a very important part of our strategy, and again we **spend a lot of time analysing our own pricing, how successful it is in terms of our... em.. sale through [I2E42]**. And we also look at how our competitors are pricing same **product [I2E43]**.

So how often would you review your pricing decision?

Em... so, pricing is a bit like sales really. It is one of the continuously moving... components. We... we would picture our pricing competitively, and **if for some reason the product is not selling through the we anticipated, obviously the merchandising would be reviewing that pricing and making changes accordingly [I2E43]**. So, in (area which the respondents responsible for), there is an awful lot of sales (are) driven by promotions activities, so we would anticipate having a fairly large amount of our product are on promotion at any one time. And, again that's kind of a **customer... as customer expectation**

[I2E45], they do an awful lot of works... em sorry the customer have that... have a high expectation of having product on promotions not just with Company D but with all retailers.

Ok, so, the time is almost there and thank you very much for answering my questions.

That' pleasure.

Ok, thank you very much for your time.

Thank you.

-End-

A.3 Interview 3

*Respondent 4 – Chief Executive – Company E; Visiting Fellow - Academic Institute B;
Chairman – Professional Organisation A; Former Operation Development Director –
Company D*

Thank you very much for taking part in the interview, so first, please introduce yourself very briefly about your experiences.

Ok, so, (cough) excuse me. I am current Chief Executive of Company E, I am also the chairmen of A Supply Chain Organisation, former operation development director of Company D... and have a career in retail and retail logistics for over 30 years.

Ok, while you are in the operation development in Company D, what would be your main responsibilities?

Responsibilities there was really developing the online business from operational perspective, so setting up the home delivery operation for Company D, the non-food online business and building the marketplace for developing the customers and services propositions and contributing towards the development of the grocery international expansion. So, we took Company D the grocery home delivery services into wider geographic area while I was there. It is now even wider.

So, about the online shopping platform, did you design the platform or ...?

Em, it was different from grocery and for general merchandise, for non-food. So, grocery was very much the in-house design web platform that was created original back in the late 1990s and was further developed over the years through to a significant rewrite of the grocery web platform in around 2007, 2008. The non-food was written from scratch in 2006, we develop the web platform for non-food in Company D in about six months and **as soon as we launch, we realise we... into completely the wrong way, so we spend the next five years rebuilding it [I3E1]**. So we build the Company D non-food business back onto a new distributing platform, with a number of other solutions that we integrated to create an extensive platform. There are 26 different IT solutions that we were combined to create what it is now, including building market place so there are other retailers could sell their product through the Company D site.

So, do you mind if you talk about... more about these IT solutions you finally have?

I can try (smile). IT is not my area of expertise, but...yeah, essentially what we trying to create is a call system that will actually **manage the interface with customer for those, emm, a web journey**. But **then we build all the solution around it, so CRM solutions, a delivery option solution, a content management solution, a MBM solutions, so master**

data capability, and various sort of [I3E2]. And then around that we build an integration lab, which essentially wouldn't be in the all of these 26 solutions, should be an effectively problem play, and it would be easier for us to build the platform out in the future, because the way in which we architected it. Emm, as it turn out it was a quite complex thing to do. Now two years on, a lot of these problems have been nailed down and the platform work correctly but that... is a very very complex piece of advance architecture.

I can imagine that. So, as it is so complicated, must be a lot data you are collecting.

Yeah, em...as we see we emm... the situation Company D is wonder... **we collected quite a lot of data, well not quite a lot, A LOT of data about customer behaviour when they are shopping online [I3E3].** So, you know, we could **understand what customer would doing, so where they came from,** if you are coming from somewhere else to the website, **what they did on our website, what they did when they left, and where they went to [I3E3].** And we could understand quite a lot around their behaviour. We also have **the richness of the Company D's loyalty scheme data as well. So we are able to link, customer's online and off-line behaviour and we understood, (cough) excuse me, quite a lot about their life style [I3E4].** So, Company D operate in **not just the grocery or the online retail market, it operates in banking, it operates in insurance, it operates in insurance in pet products, you know, you can actually build up quite a lifestyle picture of a consumers from all of the data,** that is managed by... em... Company F. They manage all the data, and there is a **vast amount of data points sits within Company D, around each individual customer. The common thread being used is loyalty scheme [I3E5].** What we do when we... when launch Company D online shopping platform is we recognise that the platform would probably bring some new customer into the business that haven't shop with Company D before. So what we did, quite...cunningly I suppose, is anybody who join the business who didn't join the loyalty scheme, we gave them an account. By doing that, we didn't tell them we gave them an account, but we assign one so we could then start monitoring their behaviour, through the loyalty scheme data, and we can actually feed that, their personal activities into the richness what we already have there. And we would then tell the customer they have the opportunities to set up an account. As they were purchasing, yeah, they were actually accruing what we called 'ghost loyalty scheme points'. So they didn't know they have an account, we are actually allocating their points to these ghost accounts. And when they finally signed up for loyalty scheme, we gave them all the point they accrued, so they though, that we are giving them something for nothing, whereas actually, er... frankly, but they though, we gave bonus that actually had a monetary value so... yeah, **loyalty scheme is very very central to the way in which Company D operate [I3E6].** And, it is really really important in terms of understanding customer's lifestyle, so you know, from, with **Company**

D loyalty scheme you can understand a lot about people's lifestyle . So for example, if you... filled up your car with petrol every weeks, at Company D, from the size of the, from the amount of petrol you put into the car, Company D can deduce how far you travel every week. So they got an idea of your lifestyle in terms of your movement. And, it's... this sort of deduction they can draw from what you are doing in terms of fuel purchase or buying online or buying offline and your insurance... can create quite a rich picture of your lifestyle, and there is consequent about it, Company D can then start to positively market you in an increasingly personalised way [I3E7]. So if you go back to the early 2000, Company D is in a position where, when it sent out loyalty scheme statements to its customers, the offers that are in the statements, were largely unrelated to what customer is buying. And the reason for that is **the UK consumer were quite nerves about people having lots of insights about their lifestyle, and are were quite resistant to any kind of indication [I3E8]** that somebody knew what is going on in their lives. In about 2007, 2008, **if customer wasn't getting personalised recommendations and offers, they got upset [I3E9]**. So customers have shifted within about 5- or 6- year time period. So position where they **recognise there is value exchange happening, but they will actually providing Company D with insights into their lifestyle. And they expected something back for it [I3E10]**. And they wanting something back for it, for that data, that is relevant to them. They wanted relevant deals, and if Company D gives them something that is irrelevant they started to complain. So the move has shifted, shifted rather within, within a comparably short period of time. And Company D, like other retailers are **now getting more and more sophisticated about the way in which they, they used that data in the way in which they interpret that data [I3E11]**. Because in the very early days, customer went on the web site, and stared to look at a particular item, and then abandon the website Company D would sent them a message saying, 10% off a product, **now we now know, emm, as e-commerce has mature, that customer actually make purchases over a significantly lengthen period of time [I3E11]**. So you don't went to a website and decide to buy that little black dress straight away. It might take a few days, **so you might go on and... and explore, you might try to find out what a particular brand got available, you might want discuss with your friend, you might put something on social media to say, you know, 'what you think of this?' [I3E11]**. You then might take a look at **peer recommendations**, you might actually pop into the store and touch and feel it, try on, and then you might make the purchase 5 days later on. So it is not immediate things, so all organisation has **become far more refine and less clumsy about the way in which they interact with customer, and don't actually try discount the item straight away, they recognise there is a journey that customers is gonna go on [I3E11]**. And it is all about psychology nowadays, it is all about, there is more of a nuance science approach towards it. So rather than actually says 'here is a big selections

hammer of discounts’, here is a little note that says, ‘we saw you disappear from the sight, anything we can help you’. Not necessarily just trying to say, to trade in the old mentality where is always about money off coupons or whatever it might be. And actually more into psychology and **getting the consumer to interact in different kinds of ways [I3E12]**, so that they can understand the through concept. So organisations like Company D are quite advance in that, other organisations are quite sophisticate, there are organisations like Company G, who just sale their own user experience in their offer and speed. Then how the position works, **they probably run about 30 or 40 tests, at any one time on their website [I3E13]**, and they are hoping to get to a position next year, where they can run about 15,000 test, at any one time, so **AB testing and trying different things with different group of customer [I3E13]**. And, but you... the fundamental principle is you **need a lot of customer to be able to do it [I3E14]**. If you end up with small number of customer, to actually AB test or multi-area test with all those kind of customer is very difficult. When you got millions of people visiting your website on a weekly basis, you can actually segregate them and try different things and see what works and that, that **sort of test and learn mentality is increasing coming into the bigger retailers in the UK now [I3E15]**.

Ok, looks like very complicated model starting by Company D.

Em.. well, yes I think Company D was very much pioneer with customer data and the Company D is... Company D is actually been... been very generous for these insights. **So over the number of years, you know, Company F is become more and more of a... probably less a Company D business and more of an independent force in the... in the data analyse base [I3E16]**. So organisation like Company H, have been clients of Company F for many years. And, you know, Company I, an organisation in the state, are big client of Company F. And so Company F actually help a lot of retailers, to understand their data, based upon, the learning that they parties with Company D to begin with.

But the data, the Company F services, wouldn’t involve the data they collect for Company D.

No, er... Not specifically, what they would do is... they obviously have access to huge data bank, so they can... they **can pull out some generic customer trend form that [I3E17]**. That they may used to guide the retailers, but, you know, as far as I am aware Company D didn’t sell its own data in anyway.

Not even to the suppliers?

Em... it makes data available to the suppliers, yes. And... that... is in a whole host of different way, whether it is... you don't, you don't let supplier have, you know individual customer data. Because, you know, that's protected, but, you know, **customer activities around particular items or particular manufacture’s brand, yes, that, all that kind of**

data is available...through... actually through a portal of the a... the vendor can get access [I3E18]. And, and frankly from my experience is that Company D relatively few did. **Not that many vendors who were actually interest in data around what actually happened with their own item. They tended in many ways to be governed by very old, traditional buyer-seller relationship [I3E19].** Where Company D would said, you know, ‘we sold 100, we want to reorder another hundred’, rather than says, ‘actually, what actually happen was this is the demand pattern, and we miss sales here and we think we might have... em, undersold here because of, you know, out of stock of the shelf’, those kind of things. **Em, that kind of... em, insight really wasn’t prompt by many suppliers. It was a limited number of suppliers and largely in grocery and then non-food area it was em... random sloppily lightly touched by the vendors [I3E19].**

So, em.. do you think because some supplier they don’t actually really want these insights, would that...

No... **I don’t think... is that they don't want it, I think they are not sophisticated enough yet [I3E20],** so you get the large... **very large sort of global reta... manufacturers like Company J or Company K, em... they are very very interest in those kinds of things [I3E20].** But you get... you know, a small business who might just produce... I don't know, er, regional jams or something like that, and they just don't have the scale sophistication to be able to utilise the data. So that’s very much in the... in the buy... traditional buyer-seller relationship. **So what, what’s more and more retail organisation doing is they tiered they suppliers [I3E21].** So these guys would be partner suppliers, these guys be gold, silver or bronze, whatever tiering structure they used. And for the partner suppliers, they will then **engage the detail data exchange.** And quite often on a, on a commercial basis, **so retailer would monetised that relationship in charge, but some other in data, some would be free, but some would be charged for [I3E21].**

So, how these data... to what extent does it affect your planning process in the operation side?

Em... from a... an **online perspective,** emm, the data that we were emm... the data that we were working with, we did a lot of f... analytics.

Sorry? F..?

Footload, so foot analytics would be, if a... on a certain time period 100 people visited your website, your conversion rate, or typical conversion rate in web retailing is probably around 2% to 3%. So it is comparably low, **what foot analytics does is it says, for a hundred percent of people who come into the shop, why do they leave? [I3E22]** So you can actually see where they leave the website, so some would bound out straight away, that...

arrive at your homepage and just disappear, some would actually go to a...em, department page, or might land on a... a specific landing page, they might have go to a product page, they might have look at the product detail, they might have view reviews and leave then, they might have... **so you know, as they go through the journey, they get narrower and narrower, people drop out at every... at every step, and that guided a lot of what we did: trying to understand how we actually get more customer to convert. [I3E23]** And, from an operational perspective, where we were getting to was, the really interesting things is, the number of customer who once they actually decided to put something into their basket, and potential make the purchase, it was then how many actually went through the... em, delivery option selection, payment, and full checkout. So, we were looking at, **how many customers drop out of the basket at delivery option stage, so, the question there is, 'are we providing the right delivery option to a consumer to suit their lifestyle?' [I3E23]** Emm, and **in the non-food side of things it was quite unsophisticated**, we had... you know, a next day delivery standard, we 2-5 days delivery option, we had a collect in store delivery option. You could, at one stage actually have your non-food items delivered with the grocery home delivery vehicle. You know, with large items you could have a time delivery **on a day of your choice and came with the full, you know, the full installation services**, those kinds of things. So, we analyse... some element so we could see what customer doing because we have, emm **tracking monitor on the website you could actually see where the customers were going. We actually brought people into user experience lab and did eyeline monitoring, so we could actually see what they are looking at the website while they are doing these things, so we can understand, which bit of the website a were configured in the right way and which one works. So it lead us to, you know, introduce new options for delivery. [I3E24]** Emm, with... with grocery it was rather different, because with grocery you are actually buying... you know a basket of grocery for typically on a weekly or four night basis. The delivery side of thing was really driven around a one-hour or two-hour time slot. So, typically they will from 7 in the morning to 11 at night. And **we have some quite sophisticated algorithm running in the background, that optimise the delivery charge [I3E25]**, so the delivery charges that you will pay Company D of... say on average £5, certain time is cheaper than that and certain is more expensive than that, depending on customer demand. So we have a quite sophisticated algorithm running in the background, that was optimising and changing the delivery charge on a, not on a... a continuous basis, but we would understand what demand was like on certain slots, **and we will run the algorithm say well, what if we try this, what if we try that, will be yield form the delivery, from the delivery that is actually working, more to our advantages. [I3E26]** Emm, so it was far more sophisticated in the grocery world than it was in the non-food world, but a lot of it was **driven by customer activities and then how we respond to, you know, putting more**

vehicle on a certain time in a day, or starting the picking activities earlier so we got more early slots, so whatever it might be. [I3E27]

Ok, so I heard that for online, especially for grocery, the availability is always an issue, so is that...?

Em, 'always an issue'. Yes it is really, I guess it is. The really interesting things is when home delivery started... you know, Company D started home delivery 1995, 1996. So it is been around for a long time and originally was a telephone service. Em... it was originally aim at serve disable people or older people who...er, stuck in the home so couldn't actually go to the grocery store, was its origin. The internet came along and helps it, and made it what it is today. But **in the early days Company D believed, as most grocery believed, that, their in-store availability was very high [I3E28]**, and therefore, you know, the problem is about what offer the customer buys. Whereas in reality, **the product may have been in the store but it wasn't necessarily on the shelf [I3E29]**. And so the late 1990s there was a big theme and a big trend within supply chain cycle, around what was called 'the last 50 yards', of **how you actually makes sure that the product there... the have been delivered into the store is actually been filled into shelves. [I3E30]** And **Company D believe, it was pretty good at that, until it started to pick delivery for home... [I3E31]** pick order for home delivery. Because what we came very... apparent very quickly is that the guys who were pick home delivery orders would behaving like the customer would. And they will walk in round the store and picking things off shelves. And **what Company D found very quickly was its on-shelf availability was in the low 90% [I3E31]**.

But still is very good?

Em... well, if you are in a position where your food basket that you are looking to buy every week, you know, one in ten item is missing, it not that good, **particularly when Company D believed that it have 97, 98 percent of those item on the store. [I3E31]** And something was failing in terms of its replenishment processes, to make sure that the product was there when the customer walks past. And in this case, the customer was being... was being deputised for, by a Company D employee who was actually picking the order. **So it was a big focus in the business in Company D, and in other grocers, around the on-shelf availability and the process is about receive the product in the back, in the back door and how they would move on to the shelf [I3E32]**. So (there) was quite a lot of work came about...em, in terms of **retail running packaging or transit packaging, so making sure that the process are getting proper from the back door to the shelves was eased. And then... the amount of labour, the effort required was minimised. [I3E32]** And all of that was driven from online retail. So online retail was exposing Company D to its real customer

performance, so it was **quite a shocking time for Company D [I3E31]** and the measure of availability in Company D became the dot-com picking measure. So Company D believes it have 97% availability, but when it actually pick grocery from the shelves, it, sometimes it wasn't there. So what overtime that... that actually the best measurement we got on the business, for what our customer see as the availability is the dot-come grocery picking metric. And that, **that change Company D's behaviour**. Emm... **it is try and drive more products to the shelf. [I3E32]** Over the time, yeah, the availability as good first time, so... **the item the customers have actually ordered, went up about 97%. In reality what the customer what being, then delivered was higher than that [I3E33]**, because with grocery, if you order... I don't know, red apple and there aren't any red apple, the customer would often take green one as an acceptable substitute. And so **Company D would substitute items you know, where it was out of stock on the shelf [I3E33]**, the item that customer original ordered. So once they ordered a hundreds things, yeah, there are 97 of those things available **they would typically get delivered one or two extract things that could be reasonably substituted. [I3E34]** And what Company D did originally, is it allows the grocery pickers, you know, to select the item, and the mind-set of a grocery picker isn't necessarily the same as the customer. So the grocery picker in the store would go around the... **would quite often substitute something that was similar and quite often with lower value. [I3E35]** And so the customer found that they were getting short changes by the fact that there was adjustment to the invoice, the customer found them were getting short change, so in two thousands and... where we have been about 2009, we change our approach. And **we draw most of the substitution through an algorithm [I3E36]**, so we actually says, here is the rules, the rules are if a particular item is out of stock, yeah, **there would be a number of items that we have identified that are adequate or acceptable substitution [I3E36]**. So **it must be from one of those. And we will always substitute a higher value product [I3E37]**, so we will never ever send a cheaper product to the customers. But if we were sending a higher value product, customer only wanted to pay... say 10p, they don't wanted to pay 20p, so **we would give then the 20p item for 10p [I3E37]**. So, because we didn't have the right availability in the business, the customer shouldn't be penalised for it, and **they will only get a upward substitution [I3E37]**. Now, the original calculation said that could be quite damaging to the business in terms of profitability. Em, **what actually happen was as we implemented it, it have the exactly the opposite impact, because customer have more confident, and so their basket size grown. [I3E38]** So they started to order more items, from which we can actually make a greater cash margin. And you know, it became a very well-received action by the consumer. Emm... you know, quite a difficult things to implement.

Yes I can... it was quite surprising how you gone a long way from this to that. So the algorithm you mentioned for the substitute it also comes from the... analysing data form the past to see how customer...?

Yes, so, what we had, emm... from the data perspective, is we knew that if we have substituted one item from another, and when we actually delivered the alternative item, those alternative items will also segregated them from the delivery. So when the driver got to the customer's home, he would say, he will point out to the delivery note, 'here is your delivery paperwork, your substitution are at the top of the paper'. So they would be identified and... 'We didn't have Brand C baked beans so delivered a Brand D Baked beans'. And they would on a separate bag, **so we say to the customer, there is your substitutions are you happy with them.** And, we would then know, from a... **from all of that data, whether the customer found the substitution is acceptable or not. So did they accept it, did they returned it, we have all that data so it told us, what the quality of the proposed substitution is likely to be, and we could work out what the rejection rate is likely to be for a particular item in particular order [I3E39].** And what then did, it may... it got us to actually give the customer more latitude in **telling us what kinds of substitution that they wanted, or how they would like us to pick it. [I3E39]** So for example, you know, the vast majority of grocery basket got banana in them, and people like their banana different, yeah, in different way, so some people like them very green, some people like them very yellow, some people like them speckled. So the customer will be able to tell us, what kind of banana they want it. **So I like my banana green, then picker will go and try pick green bananas, and if no green bananas there, he would substitute yellow ones, so it came as an alternative [I3E39],** but it was highlighted to the customer when we went... delivery over to the customer. And again that was data being used to drive a substitution logic within the system. So, also about the data, would that be... you kind of have a better forecast in terms of what is going to be picked, what is going to be sold in the store?

Yeah... so... em... Company D operated a... what was called '**continuous replenishment methodology [I3E40].** Em, so, you know, going back to the 1980s and the 1990s, the way in which grocer replenish their stores was very much on the basic. So, 'this is what I sold last week', so I might have sold, 100 tins of rice pudding, therefore I will replenish 100 tins of rice pudding. And it was, **what they didn't know is how many sales they lost. [I3E41]** They have no ideas of lost sales within the overall equation. And they also have **no idea of how much of that 100 tins of demand was being created by other things being out of stock. So how much of it is driven by forced substitution , and how much of it, was under... being underpaid because of lost sales [I3E42].** So where organisations got to was a position where **starting to measure very regularly they, the gap they have on shelf,**

which told them whether or not they are replenishing the shelf in the right way [I3E43], so what sort of product are available to the customer. And therefore, could they maximise sales. And they actually trying to **match those, measurement sequences in line with the customer demand pattern [I3E44]**. So, typically in a grocery store, you will get a relatively low level of activities among the Tuesday and Wednesday, it'll get busier as you head towards the weekend. Friday is busy, Saturday is busy and Sunday reasonably busy as well, so there is a chop and pick shape pattern across the week. Within the day there is also a similar pattern, so quite a few of people go into shopping first things in the morning but it die off during the day, and then it start to ramp up in about 4 o'clock in the afternoon, in the early evening peaked and then it die off from the evening. **So what we are trying to do was understand what the demand pattern in the day looks like as well as demand pattern within the week. [I3E45]** So from that data, and **actually measuring, very regularly, by walking round the store, which items were out of stock, they can see whether there were particular demand pattern on items during the day, whether they were actually leading to lost sales, in theory [I3E46]**. And that, as a consequent drove some of the **replenishment algorithm [I3E47]**. Company D works on this continuous replenishment model, which essentially says, **if we are going to deliver a vehicle into a store at 7 o'clock in the following morning, then that vehicle needs to have left the distribution centre, let's says at 5 in the morning, and it needs to be loaded by, you know, it needs to be loaded by 4.30 in the morning, and, if an average order for that store is 2000 cases of goods, that would take us so many hours to pick it. Therefore, we need the order from the store at... let's say 10 o'clock the previous night [I3E47]**, let's say something like that. **In the old world, every store would be told at about 6 or 7 o'clock in the evening, and that would create a mass order for every store. [I3E48]** Whereas, if you actually link it to the delivery sequence into the store, and therefore to the store's trading pattern, if something sold at, you know, 9 o'clock at night, and only have sold in the evening for whatever reasons, bottle of wine, for example, great to sell in the evening. Then you can actually pick up that demand pattern. So what Company D was doing is, it was taking readings from the stores, very very regularly. And says, **actually based upon its current sales and our expectations of what's gonna sell for the rest of the day [I3E49]**, we need to replenish one of these items. And the next time it actually told the store is: sold this one, **we have to replenish two, and then three, four, five, six, seven, whatever it might be, until the point where, they actually need the order to start the picking routing, but continuous replenishment will build up the order. And if you got something that was looking like a vehicle load, it will actually call that order off and sent it from the distribution centre. [I3E50]** And start an another one, so that there what you actually got was the **transportation being optimised around the customer demand pattern.[I3E50]** And Company D moved to that kind of

solution in the early 2000, and it is still the way in which they operate now. So it is really taking demand at the very last moment and **replenishing from real customer demand rather than a forecast [I3E50]** what might have... trying to take what was actually happening on the ground.

So it is much effective than just to predicting the demand.

Yeah, and the outcomes was positive, so it, you know, that is along with the gap analysis and **the monitoring what is actually happening through the dot-com grocery pickers [I3E51]**, was all part of Company D's improvement in on-shelf availability, across a very... You know, at the same time, across the range that is widening. So typical Company D store would now carry 30, 40 thousands items, something like that.

So how this is... is this decided according to the loyalty scheme demand?

Loyalty scheme demand is useful, but loyalty scheme demand won't be necessarily drive the in-store replenishment or the activities. That's really done from the sales data.

Ok, from the POS or?

Well, **from what is actually going through the till [I3E52]**.

Ok.

And it is really interesting that what Company D has, and a lot of retailer has it now, **they now have alerts**. Because they think, **they believe that they got good level of predictability of what actually happen on a item by item basis. [I3E53]** So they know that the, background pattern of demand on bananas would look, you know, would be shape in a certain way across day and across week. And, I don't know, dry mint or something like that would operate a different, against a different pattern, **they actually got those pattern for every single item in the store. So they then can monitor, the actual sales against those expected pattern. And if there is a significant varies that actual off taking sales, to be predicted of taking sales, they can send alerts. [I3E53]** So Company D knows, that if, the main back check out don't scan bananas, I think it is something like, 3 or 4 minutes, they know they are out of stock on the shelf. Which is a cool way of doing it. **So what that does, it send an alerts to the manager's hand held devices, [I3E53]** and says, 'check your bananas'. So they got that happening all the time, and one of the reason why Company D has this, **this mind-set are always minding the check outs [I3E54]**, so is a measure Company D called 'one in front', which says that, if somebody in front of you in a queue, yeah, that's ok, if it is two people in front of you, you need to open another check out. **So what they do is actually trying to manage the flow of customer's in and out of the store, so that the pattern of sales can match these pattern of forecast. So that when they get the**

variances, isn't down to the fact that the queue that were slowing down the check out, it does down to true missed demand, [I3E54] so that they can react to that. So Company D is using data in a quite sophisticated way, to make sure its, you know, **minute by minute replenishment of the shelf edge, is as accurate as it possibly can be, and therefore maximise sales.** [I3E55] And it is not just Company D are doing it, **a number of... most of the grocers are doing those kind of things now** [I3E56]. Company D is certainly pioneering in the use of... really seeking to gain insight to, what was actually happening in store, and how they can manage the in-store process. Company D is a very, **quite a heavy engineered business.** [I3E57] You know there is, a very **well-defined operating model in Company D that says 'this is how our business works'.** It's very... **documented in a great details** [I3E57], and if everything works in the same way then Company D get some best output. So it is almost like, you know, it's almost an engineering business like Company L. So Company L is an engineering business because it can control everything within, you know within in the wither environment. Where if people involve is a little bit harder. But you have **a standardised operating process** [I3E57], you get closer to the... and that's where Company D got...

Having data driven in every process.

Yeah. [I3E58]

So, would Company D... since Company D has such sophisticated data, online and offline, so is that maybe, would affect your selection of goods in terms of which one should be placed in which store?

Yes, very much. So **ranging is very much done from... done from data** [I3E59]. Em, although... I don't think Company D's... **Company D 's probably is not as good in this area as someone like, er, Company M or Company N, who are very very rigours around the way in which they manage ranging.** [I3E60] So Company D would... will **review its ranging on a cyclical basis anyway** [I3E61], and says look at the, can grocery rang once a year, and they will look at the confection rang once a year. You know, and they will **make wholesale changes based upon data provided by the manufactures, their own sales data, expected marketing activities, and those kinds of things** [I3E62]. And they may make **significant rang changes and change the layout of the store and quite markedly** [I3E63]. Whereas, if you look at the Company M model, they carrying a very **fix number of items** [I3E64], if they change, if they want to change an item, and put a new item in, they will take one out. So **very much one in one out. They don't actually grow they range significantly, and therefore they are very very stable. It is a very predictable model, and it means they will gain true cost advantage** [I3E64] in the way in which they manage their

operations. **Organisation like Company D carry a hung range of SKU, and that range varies from time to time [I3E65]**, by departments and departments will flex, some will grow and some will reduce, depending on the season. Yea, it is, **but much much harder to achieve that true cost advantage. In that, Company D dose it through scale, and developing, you know, buying power through scale [I3E66]**. Company M, Company N, actually do it through control, and through being a very very stable and very consistent model. Two different of doing it. **But both using data in the same way that... you know... if a buyer at Company N comes along as ‘I want to list this new item’, it would be able to demonstrated that that is going to sell more than the one that is already on the range. And if it doesn’t, it doesn’t worth the range [I3E64]**. Whereas as Company D is **bit of a more... a bit more an experimentation [I3E65]**. And could be judged by the marketing for the (unclear). Emm, so you have different model, but certainly it drives the way in which they would merchandise the store. **Certainly on grocery, probably a little bit less on non-food, ‘cause non-food is far more subjective. It is subjective fashion trend [I3E67]**, so, this year people might be decorating their lounges in purple while last year they did it in brown. You know, **changing ranging got to understand the way in which they, the dynamic on customer tastes move as well [I3E67]** and so it is rather more subjective than... you know, this year’s hot toy might be a tiny little things next year it might be huge. So it takes more space on shelf for that. **And that the ranging would compromised by the size of the popular items. [I3E68]**

So, the ranging, for grocery is that more like a sale-driven... or would you also consider some promotions, marketing activities.

Er... it’s both. So it is not, you know, **ranging isn’t done solely form data statistics. [I3E69]** It is done form... You know **if a manufacture is launching new product into market and they are going to put several million pounds with advertising behind the item, yeah, the grocer would be foolish probably not to range that. Because the manufacture would be putting marketing money behind it in terms of ‘we will paid you a listing fee if you range the product on there.’ [I3E69]** Then there is more money available. So, you know grocers respond to that kind of things. So things would go in a range that are... **there is no data to back it up but in comparative terms, you would expected this items with this marketing budget behind it as kind of a launch activities to sell at this kind of rate. And on that basis you might actually say, ‘well we will take that item out of the range because that, the sales on that item will consequently drop as this one is coming into this kind of ...’ [I3E70]** Well, this is... there is **still an element of art to it [I3E70]**. You know, it is more and more a science but there is still some art in there as well I’m afraid.

So, do you think if you can collect data from suppliers, as an exchange, about their marketing budget for certain product, and this can be more scientific?

Yes, if you know... **so the question is ‘do you trust the suppliers?’ [I3E71]** Do you believe the suppliers is going to put that marketing spend behind it and do you believe that the customer off take is going to be in line with the manufacture predictions. That’s a question of judgment. You know, **a grocer will have its own analytics and its own models that will either validate or counter... challenge manufacture’s model [I3E72].** And, you know, **collaborative range development is all about the two coming together and agreed what the forecast really is for that particular store in that particular town, ‘cause it will vary by locations as well. [I3E73]** Em... whilst **organisations trying to work on standard, shelf display model, you know, stores are all in different sizes. [I3E74]** Company D has a, em, 8 different superstore models, that would range from the biggest hypermarket, the extract stores, down to a super store and convenient and metro below that. Em, you know, so they are probably working with 10 different stores layout models that will have to vary departmentally depending upon on the assortment. **So it is quite a sophisticated things, to actually says, ‘I am going to list this item’, what you then gonna says is which category of store are going to list it in. [I3E75]** And that category might be based on the size or **might be based on the demographic of the area. [I3E76]** So if a supplier will list something that is, you know, pink carve in yard or something like that, it is only gonna work in a higher demographic area. So, you know, **how many space you actually going to give it and how much turnover you gonna expected to get form it [I3E77]** is going to be comparably small. It’s only in a small group of store you can sell something as ridiculous design...

So this would link to the store, in-store layout design.

Yep.

Is that also highly related to the sales or you consider... because you mention some of the grocer are picking in the store.

Yep.

I suppose there would be some contradiction between how you optimise it in terms of facing the customer and to fulfil the online orders.

The online picking side of things doesn’t influence the way in which space is manage. So **space is manage purely from the data perspective. [I3E78]** And **Company D has a series of model, that will optimise the space based upon the forecast sales data is given. [I3E78]** So it knows the **cubic characteristics, weight and dimension of every item, and it can then**

model rate of sales based upon certain shelves depth. And you working to different shelf depth, and different items to create the ability to support demand [I3E78] and then you know, you need to talk to the manufacture about what is the pack size is going to coming in. [I3E79] Is it going to come in single, is it going to come in six, is it going to come in 12. Because, you actually only want what a, in ideal you want one-touch-replenishment. [I3E80] So if it comes in six, you want to get all six on shelf, you don't want to be taking bit and pieces back to the store. So Company D has a model in terms of shelf replenishment, that will only trigger replenishment of an item when the shelf content get lower to certain level. Some retailer called it 'minimum credible display'. ... It will accept a smaller number of items on shelf, but is credible in terms of, you can face the item forward and make the display look good, and still get a full case of product behind it when the new items comes in. [I3E80] So there will always more than a minimum replenishment value available on the shelf. So those kinds of things sit within the algorithm that determine space. Plus the sales, which determine how many facing you'll get and how many item you get within a particular space and exactly in which level the item will sit at. [I3E81] Because if something at bottom shelf level that would sell far lower than something at, eye-level or what Company D calls 'by-level' (one level lower). So eye-level item, by-level items and then things sits around. And there are quite sophisticated tools to actually model what the shelf will look like. [I3E82] And you can actually... Company D has a demon store, trail store, [I3E83] on their head-office. Where you can actually layout new fixtures with all the new items and see what it looks like. You can actually do it 3D as well. [I3E84] So they actually have a 3D graphical model where they can actually create a store, at whatever sizes or shape and actually be able to walk through with all these new space and layout and see what it will actually looks like, from a technology angle.

So I heard that Company D and other retailers are using the camera data to analyse how people walk inside and how they pick, so would that be heavily used in the trail store?

Yes, so Company D always have camera in its stores. Initially it was... they were position over the check outs, they were positioned over the check out to make sure the check out will be maned in the... these 'one in front' approach was being managed correctly [I3E85] in the store to make sure the customer could actually get through the check out so that we then study flow of purchase in that... So that the data would be collected correctly. What we then able to do, knowing what an average customer did when they were in the store, is you put camera at the entrance, they would then know, if a certain number of customer came through the entrance in a certain time scale. [I3E86] They know how long an average shopping trip takes [I3E86], they can then man the check out in the right

way so they can pre-empt the demand in check out. [I3E86] What they can then do, once they know the customer coming into the store, they can actually **heat-map them around the store** [I3E87], and see where they are wandering and where they are moving faster and those kind of things. So they understood... they start to understand **where the hot-spots are on the store.** [I3E87] And, **overtime with the use of iBeacon, they will be able to, you know, if a customer has the right apps on their mobile phone, they will be able to track the customer around the store and actually market to them in specific locations.** [I3E88] So the iBeacon you can know that when they standing in front of a particular shelf. That you can say to them, 'just for you, Mr. Jones, today, we will do... that item you are looking at... in terms of discount for you.' Whatever it might be or more significantly, **it won't discount that offer something else, trying to build a basket rather than discount a basket.** [I3E88] So yeah, tracking technology is a... becoming more and more expert.

But for Company D that's more like to ensure the demand pattern is maintained rather to...

It is also to understand customer behaviour, so and start to personalised experience. [I3E89] So, if Mrs. Jones walks into the store, and they know what she normally buys, so they can identify either through eye recognition, with finger prints, through her mobile phone, whatever technique they chose to use. **If they know she is coming to the store, they know what demand is likely to be in the store for her that day.** [I3E90] And, if they know that, then when she standing in front of a particular hair care product, they'll says, 'actually we know that you normally buy that hair care product, but this one is a new one it seems what you normally buy.' So it is a consistent product, but it might actually have some different characteristics, it might actually show that to your new mobile devices, 'how about this one instead?' **So they actually use it as a marketing tool, and to personalised experience as well as to manage availability** [I3E91] and to understand the... you know, today she's brought green bananas instead of yellow bananas or she brought pears instead of apple or whatever it might be. So starting to **monitor those variances and that actually give them insights in terms of what's going to be required from the replenishment perspective** [I3E92], you know. And it know what's being picked up as all of that get check out. So it is increasing the opportunity for **personalisation, feeding all insight into the replenishment algorithm** [I3E92].

So the store design, do you think it can benefit somehow from analysing the traffic in the store?

Ok yeah, absolutely. So **within a store there is always hot and cold spots. And if you can move certain items around the frequent purchases you would draw customer into colder area in the store.** [I3E93] So... yeah, absolutely.

So that's more towards the... increase the exposure of goods to customer and let them walk more...

Yeah but it is... You know, there is a famous story in Company D that they said, I think it is a bit off the earth really, but they said that if you put beer next to the nappies you sell more beer. Because, young father are often buy some more nappies... and buy some more beer at the same time. **Whether it is true it doesn't really matters, that insight came from loyalty scheme data. Those kind of insights get from loyalty scheme data whether they can see, you know, regular repeated pattern of things being put into basket. [I3E94]** So those kind of layout insights are really quite key. Whether that would be true or not, I don't know. It is often quoted in the media, whether that's actually true I don't know, but, **those are kinds of things that loyalty scheme data can actually tell you about the way in which a store could be layout, optimise sales. [I3E94]**

So actually the loyalty scheme data is still very essential in the business.

Absolutely, and more and more so. You know, I would guess that Company D **can probably mine the unmined 5% of the data and probably know more than that. [I3E95]** It got such a huge amount of insight into individual's behaviour and the **challenges really is, is more about develop the capability of data scientists rather than data analysts. [I3E96]** So rather than just taking the data and trying to analyse it, it is actually going and **really examining it and look for insights, in some ways, foresights as to how we can influence the shopping trip in the future, rather than just analysing the historical data which is what has happening for a number of years. [I3E96]** Data scientist is very much a... hot new things among retailers. And more and more retailers are investing quite heavily in people who got real, really strong insight capability when it comes to data. Not just straight analytical, so you know, ...(unclear) giving a pipe of data and asked a few questions about it and he will come back with the answers. I couldn't give him a set of data and he will come over the questions and the answers themselves.

So it would be more like not about analytical tools but about telling the story of how I am going to use it.

Exactly, **it is about it prophesises, about what might be happening, and then says, well how could we change that. Somebody who can actually work with data in a very integrity way, so really understand what are the patterns, what are the implication of those pattern and then to hypothesise how could we actually mend it and or optimise it. [I3E96]** That's not traditional data analysis. That's data science, and that's completely different field, you know. Guys who can do those kinds of things are quite expensive (smile).

So these experienced people, how would you find these people?

That's a very good questions. Em, **with difficulties at the moment [I3E97]**, you know they... those kind of people come under premium in the market, premium in terms of salary. So good data scientist will cost you a hundred thousand pounds a year, at least. So, you know, building up a bank of what I would called 'per pallet heads', you know, **people who are really really motivated and get switched on by data they are really hard to find and they are very expensive. [I3E98]** You got a group of **them it would be big cost on the business but the opportunity is huge. [I3E99]** I was talking to somebody in the retailing yesterday, who had made a change in their organisation that the changes cost them something about £150,000. Because of the change they made and they knew what they were doing from the analytics they put on their website, so they done some AB testing. They got the investment back within a week. Because, **they really have done the homework and understood what the different options were and what the customer preferences might be. [I3E99]** So when they change the whole website onto it, it cost them a lot of money, they got the money back in created sales within a week.

Do you think this kind of improvement, the benefits can be expected or is very...em, you can't really say how much we can improve, just have to trail and errors.

You could estimate, so **what you find in the more advance retailer now is what being called a 'fast fail' culture. [I3E100]** So the... and if something when we set up Company D online shopping platform we were quite keen on which was we have a phase that was 'fail fast, fail early, fail cheaply', which was **let's go and try something, if we get it wrong, get out from it quickly, so don't labour on your mistake. [I3E100]** 'cause mistakes cost you money. But, the thing is you get right, so those one in ten opportunities, you get right you can make a lot from it. So it was about, **test and learn as a culture and mind-set, which doesn't tend to sit well in traditional retailers [I3E101]**, they tend to be engineering businesses and they tend to be fairly straight around the process and operating model. So people come along and says, 'we are gonna spend a few thousand pound and we might waste it.' Tend not to be abet to, but it's real. But **that's the way more and more retailers start to work, that's 'fail fast' mind-set is very much coming into, is the culture of a numbers of retailers. [I3E102]** And it is all based around data analytics. So whether, you know a red button that encourage somebody to buy something rather than a yellow button or green button. It is hugely important and it varies by customer mind-set. So if they are in brown as mind-set then the yellow button works better than red button, whether it is true or not I don't know. And **eyewink analysis those kind of things, are only nearly import the way people works. [I3E103]** And... but you got to try things, you got to have a little bit of a...

Adventurous.

Yeah, a bit of adventurous style and a bit of a bravado in some ways, you got to try some of these things. And if it doesn't work, switch off quickly.

Ok, so do you think... I think most people now aware of what Company D is using the data, and analyse their life so to speak, do you think the data would be...em... someone might want to trick the system.

They have to be very clever, and they also have to buy a lot of things they didn't really want. So, you know, **you are what you are, the life style you lived, you chose to lived, all what Company D is doing is just monitoring what you do. So if you want to trick Company D, you would have to change your lifestyle, I can't see people doing that. [I3E104]**

So you think the data quality is not a big problem.

Em... **I don't think there are people out there who are trying to game the data in any way. [I3E104]** So I think, that's stand for itself. The quality of data, **I thinks there is always an errors to it, but you know, I think that most retailer now have got so many data that the quality of it pretty robust. [I3E104]** There will be some errors in it, but you can smooth those errors out through analysis and... I would said what Company D have on you and what Company O have on you and what Company L have on you is pretty accurate. And it is you... they know more about you than you know about yourself, which is quite scary (smile).

It is very creepy to know that.

Well it is, but the flip side to it is, **if it is used to my advantages, then why not. If it is true value exchange in this [I3E105]**, where, I am willingly handing over my data, my shopping habit and my social media behaviours all the rest of this to these retailers, and **if they are going to give me something in return, that makes my life better**, then why not. But I think **that value exchange is going to be there, it is not you handing over your data without any recovery. [I3E105]** That isn't a fair exchange, the way you getting something back and it is very specific, so you then... you know, it makes you says, 'wow, didn't expected them to do that', then it is pretty good. And there is a time when some of the retailers just do that and you'll think 'that is great'. So, I was looking at a website the other evening, and there is a retailer out there who was basically saying, 'don't put in your size, Mrs. Jones, we now you are a 10.' So, 'we will only present product to you in a 10, we will only present product to you in the colour scheme you asked for or you search before', so we know you have a tendency to search blues and greens rather than reds and yellows. So we will only present to you... so on top of these search, is size 10 in blues and greens, we know that you like skirts, in a pencil cut rather than a flare cut, whatever it might be, so it all present those, we know you like these brands. So it is actually doing a lot of search and filtering for you, and you

would actually think, 'well that's good. Alright I have change my mind I actually prefer this and this and you can change your filters and they'll learn from that, and that kind of things I think it is quite helpful.'

It more about **consumer experience**.

Yeah, and you know, it's **mass personalisation but it is actually getting down to the preference of the individual [I3E106]** and I think that **the more you getting that kind of things back and the... the shopping experience seamless and smoother [I3E106]**, then, I am all for that. I think it is a good things.

So in terms of the people walk into the store, if they don't have a loyalty scheme, actually you have no method to track them.

No.

You think that's a very small portion of people?

Company D got, I don't... I mean **loyalty scheme got millions in circulation, something like that, so, there is a lot of them out there. [I3E107]** And, Company D still got the... the camera base activities mapping in the store. **So even if you haven't got a loyalty scheme account you can still be, you know, as an individual. [I3E107]** They don't who you are, but they know that this group of people in this store on this day, they are out here, moving quickly through this area, so **they know what the average person is doing [I3E107]** as well. They are not able to classify it down to you.

The time, the time you spend on the store, is that linked to the order you check out at the end?

Emm, **they know when you enter the car park, they know when are into the store, they know from their algorithm how long your shopping trip is going to take. [I3E107]** So when you are likely to check out, can they link them together? Precisely? No. But **they can draw an awful lot of conclusion from what they do know from the millions loyalty scheme holders add on the generic customer they don't know personally. [I3E107]**

To make inference.

Yes that's absolutely right. They can infer what other people do in this circumstances. **And what the other might be doing might have the bearing on the loyalty scheme holding as well, so it can work both ways. [I3E107]**

Ok, I think that's more or less the questions I would like to ask you, thank you.

-End -

A.4 Interview 4

Respondent 5 – Senior Merchandiser - Company P

Thank you very much for taking part in my research, this interview is designed to last around half an hour, so first, please introduce yourself about your responsibility in your current job, please.

Ok, my name is Respondent 5, I am a senior merchandiser in Company P.

So, what would be the major responsibility for your title?

My main responsibility is to analyses **historical data, trend to support buyer to develop the right range, product range for the company.**[I4E1]

Ok, so, what data are you collecting?

Well, we collect **sale data, stock data**... what else do we do... we do stock, we do sale and **that's about it, really. We do not have a loyal scheme, so we do not... we are not collecting customer data [I4E2]**, although we have an online service, called 'Meet Company P', which **allows us to ask customer online about the product. So we will put the product online, and before it is launched, to find, get responses to it. [I4E3]**

You mention the stock data, what is that (to be more precise)?

Right, it is **basically what we buy, how much are in stock [I4E4]**, and... So first of all, we will have initial buys, repeat buys, and then also... **at the end of the period, season or quarter, how much we have left, how much discontinuous line, how much discounted product, and then complete closing stock. [I4E4]** Details is to plan future buy and to manage our stock better.

Ok, so **how would you combine these two data to make the analyse?**

Well, at the moment **this is one of the project that I am trying to get support for in Company P. At the moment the two data is not connected, not in the same system. [I4E5]** So, you have **two different department using the data for different things. So, the data that I used most is the historical sales data, to look at trends, sales trend historically [I4E6]**, in order to plan ahead, and then to use trends, analytically website, such as Awebsite, to identified future trend.

So... how long is your planning cycle? You are planning a year ahead, a season ahead, or...?

Well, it is plan a year ahead.

Ok, and the result of your planning, you would feed that data to the buyer, and let them do the purchasing, or?

Yes. So **once the data have been analysed**, we would... the **merchandiser would come to an conclusion, or we take lesson-learnt out of data and share it to the buyers.** [I4E7]

Once the data is analysed, we will be able to come up with **the pattern, the trend, to says ‘this is our best sellers’, what is working, this is not working.** [I4E8] So that in the future, we can capitalised in what is working and come up with product that is not working with the business and then used the trend in the past on Awebsite or any other platform, to also **decide what we are going to... which new area or segment we are going to go into it.** [I4E9]

Ok, so basically that’s more about the volume about the product sold or you also consider the price?

We also do that. So we look at price, we are able to ... **these information allow us to analyse the price structure.** [I4E10] And to look at, to be able to identify **which price band (works) best for us.** And also... not just the platform, **which price combination work best for us. What is the best threshold for each category or each department.** [I4E10] And us for us to be able to **decide going forward, which tier, do we want to grow, maximise, and which one we want to decline.** [I4E10] And what we found out is that this usually different **from one place to the other, internationally.** [I4E11]

Ok, so the price structure, is it about the margin you have, or is about the price...?

It about the price product to be sold. **Margin is just... usually a target** [I4E12], where we know what the **finance would have come up and said ‘this is your overhead, this is how much money we want to make, and this is how much sales we need to generate.’** [I4E13] And then is **the job of merchandiser to interpret that.** [I4E13] ‘ok in order for me to make this amount of money, profit. What product do I need, to have in the range to generate that money.’

Ok, how would you use historical sales data to make the price decision?

So for instance, you would analyse your group of product. And, for the company **you would have an agreed price-tier** [I4E14]. So you could say ‘product below £5 is our value product, entry price product. Product between £5 and £15 are our medium priced product, and then product above £15 are our ...(unclear)... Price product.’ And then what you do is, you analyse the data, historical sales data use that, (to get) **the productivity of the product in each group** [I4E15]. Selection of product in each group, what is their productivity. Are we generating... as average productivity for each product group, and then compare each of the price tier, what is the best productivity. **So most product is price tiered.** [I4E16] So you buy product, redeem your margin target that would allow you to try products in that group, say if it is productive.

Ok, when you say 'productive', you mean does it sells well?

Er, productivity basically means... **so I have three products, and all together these three products generate £450,000. So the productivity for (each of) these product is £150,000.** [I4E17] I am not talking about profitability, I am talking about productivity. So I would then say, **if I put in the range, another product with similar attribute, similar characteristics** [I4E17] to these three products. **I am likely to get on average £150,000 for that new product.** [I4E17] So which allows me to estimate how much I am going to make if I introduce one product. If I introduce two more and I get £350,000 extract next year to what I already has in the pot. Sometimes, you introduce product that you know is gonna switch your sales. So, **if I have three different products last year, but this year I add two more product for the... it is same product but in different colour, so it is very likely that would not generate £150,000 on each product** [I4E17], likely to make £80,000 on the basic product, and then another £70,000 on the fashionable fancy product. So together I get £150,000 by switching the product into two colour, or, what most company will wants is that you have two product, each give you £150k, but they could give you £400k. So they could give you £150k each, instead of £150k (in total). What does that means is **you make more money than you could if you have three products. But (one product) is not that productive unless you have three products. What happen there is what we saying that the sales has been cannibalised.** [I4E17] I don't know if you are familiar with that word.

Yeah, I heard of that. So you would also consider the buying cost as well to inform the buyer, or not really?

Oh yes. If... because merchandiser are consultant of data. If I look at the data and says, 'ok, our margin target is 50%', and **I look at the buying cost versus the retail price that we agreed, and I work out the margin and it is not meeting the target, and I would say to my buyer, 'you need to negotiate your cost', in order for us to achieve our margin target.** [I4E18]

So, for these merchandising decisions, you are going down to each item level?

Yes. **You go to item level. So you do budget top-down, and then you roll up your range bottom up.** [I4E19]

Ok. So I know Company P is direct sales, but in terms of distribution, would you assign the merchandise to ... 'this goes to Scotland and this goes to England'?

Yes. So the way Company P work is, even though it is direct sale, we work (in) **different business units.** [I4E20] So like I said as we met, I cover a unit called EMEA, that is Europe, Middle East and Africa. So that unit has three different distribution centres, distribution hubs.

So depending on the geographical location of each country in these units, they would have their distribution from one of these hubs. So each hubs, country allocated to them would get goods from that hub. [I4E20] That's how we work.

So you would assign products into hubs?

It wouldn't be my job as merchandiser to assign it. So we have a different department, the supply chain department, and they would be the one who done the analysis to assign hubs to country, the most cost effective hub for each country.

But you would say 'this product may sell more in this country', would you inform that to the supply chain?

Yes. Because **each country would have allocated units, assigned units to them.** [I4E20]

So we would... from **historical data we have, to tell which product sells, in what volume** [I4E21] and would have what... in order for us to track demand from historical data. So **the supply chain would know the volume allocated to each of the market.** [I4E22]

Ok, these allocation, the volume, is it also in yearly basis?

It depends on the buying cycle. So **in some country you have seasonality** [I4E23], you have winter and summer season, in Company P we plan it in quarterly basis. And each of the buying would be for quarter. And each of the rang planning, and the rang development is also for quarter.

Ok, so you mentioned one of the plan you have now is to combine the historical sales data and stock data...

Yes, this would help us to have a strategy for... first of all, to **maximise the sales, what we already to have in stock, to manage stock so we minimise inventory, and help us in discounting.** [I4E24]

So when you involve the stock data, you would plan more dynamically?

Yes.

Is that the purpose?

It is the purpose, yes. You know, to be **more dynamic in assignment, to minimise cost of stock holding, and also to minimise the cost of obsolete goods.** [I4E25]

So, do you think there is any challenges in your current parties?

Oh definitely. **The biggest challenge is data, correct data.** [I4E26] Garbage in garbage out. **Training people on how to use the system effectively, and also the different system available is not integrated.** [I4E27] Those are the challenges. Now, because Company P

never used to have merchandiser, now that merchandisers are here, one of our main job is **to highlight the business how to integrate the system they have at the moment so that we get the best out of it.** [I4E28]

So why you think the data quality is not good?

Oh, well. Data quality is as good as what we put in the system, so that's garbage in garbage out. So **sometimes it is down to clarity, process that are not clear enough.** [I4E29] And also, because different function specialised in different things, and **now we are trying to consolidate the functions. In doing that, you might lose some expertise along the way, which can only get back by good training.** [I4E30] So all of these has been identified as next step to make sure that the data is better.

So, it is all about how to integrate the function and their system.

Yes.

About the people training, are you referring to people who can use the system or something else?

We have expert on the system, IT expert. It is **the pool of people put together to identify what the problem is.** [I4E31]

How about the online services, how you use it at the moment?

The online. There is a big project in online platform, to make it effective. At the moment the website is not there (not effective).

So the purpose of the online service is to collect customer preference?

Yes. [I4E32]

You would like to have some sort of loyalty scheme to do the planning?

Well, **I am not sure about that.** [I4E33] I am not senior enough to understand what the strategy is for that. But generally **if people order online they will put the detail anyway.** [I4E33] So I am not sure if we need a loyalty scheme for us to do that.

So now do you have any data from the online platform?

I think we have connected but I am not sure, how they work. [I4E34] I do have the opportunity to use the data from there.

So the sales data you used is already aggregated?

Yes. Perhaps the connect (with online platform) would be useful in quality control. **So perhaps sometime they would ask customer to trail the product and get feedback about quality.** [I4E35]

For the sales data you are now working on, down to which level is it provided?

Down to product.

Of each order or..?

Em, well, of each order, yes. **Every single item sold, well down to the lowest level. [I4E36]**

Do you have access to the stock data?

No, I don't. It is not controlled by my department. [I4E37] So that's what I am working on, for department to share the information, to help decision-making for both.

Ok, do you think you transformation plan is supported? How about the company culture?

Oh, yes, **the company definitely needs to change, they need to push things and they are working on it. [I4E38]**

Ok, so when you have access to the stock data, what sort of quantitative analysis are you going to use?. What insights are you hoping to get?

We need to know what our **optimum stock holding** is, what is the **optimum buying quantity**, and also, we will be able to analyse **how long will stock flows, overheads, and will be able to influence our buying for the next season. [I4E39]** Because when we know how much we already holding, then will be able to decide the **optimum buying that we need of new stock that we gonna need**, in addition to what we are holding. And it also allow us to **proactively have a strategy for managing stock. [I4E39]**

So do you think when you have the stock data, the way you work with supplier will change?

Exactly. It will. **We will be able to do some forecast...(in terms of), when we buy that amount of product, how many do we sell at full price before we do discounting, which supplier management strategy going forward, which supplier is important to us in terms of... (supplying) best sellers. So we will prioritised them, and come up with better (supplier management) strategy. [I4E40]**

Do you know how suppliers are manage now?

Yes we do. We have... **we will review supplier and we have deep relationship with them. Some of our suppliers have been there for many years, in partnership with them for many years, they keep quality in that relationship. [I4E41]**

And for the buying, you also place order yearly or?

The ordering would always be quarterly.

Ok, so I think that all the question I would like to ask you. Thank you.

Thank you.

-End-

A.5 Interview 5

Respondent 6 - Supply Chain Distribution Development Director – Company Q

(...)

So first, please introduce yourself very briefly, mainly about your experience and your responsibility at the moment.

Ok, so my job title is supply chain distribution development director, and that basically mean I am implementing a segment of our transformation plan. So, that's about completely transforming our customer proposition and delivery proposition to allow us to win against our competitors in the market. So one of the core element to that is implementing a central stores and local stores network. So having central stores and local stores which will **allows us to do home delivery from central stores, as we move forward (to) from our stores rather than going through carrier.** [I5E1]

So could you maybe introduce a little bit about the background of the transformation? Why Company Q want to do this?

So the business, brought in new manage director, and end up to the big strategic review, which is end-to-end review of the business and has led to the **strategic and transformation plan that we got now.** [I5E2] So that was communicate to the city back in Oct 2012, which put £200m to that pack about **50% of which was in IT.** [I5E2] Because that's the main completely reengineer (of) the system, and get them fit to the future. **The remaining 50% was in supply chain and stores transformation.** [I5E2] So... they can obviously transform the business and we were... the plan was to... we prophesise the city that we grow £0.5b, from a base of £3.8b. So quite unusual that a business like us big, retailer like us will commit numbers to the city, but that's what we gone through, the journey we are on.

Ok, so about the IT, reengineering the system, is that referring to build online shopping platform or...?

Er, yes, as I said, it's tackling all elements to IS. So, we'll **establish a single view of stock.** [I5E3] So **previously, we won't able to see across all channels and across all platforms.** So that's been the **first piece of work to make sure that we got that visibility.** We then **put in, the central stores and local stores delivery functionality, on top of that, so then again we got seamless home delivery capability to customer and route scheduling capability on top of that.** [I5E3] Again as you go online, you can book delivery slot, you got choice of different slot you can see where the stock is. So if that stock is not in the store you can get it from a home delivery centre etc. And so that's kind of the real background that's been done. **And there is an awful lot of development going on to e-commerce to the**

website, and mobile platform [I5E4], so we are completely transforming those so **the customer journey is quicker, and more seamless and joined up with the single view of stock.** [I5E4] Em, and we are also looking things like pre-paid. **So Company Q back in 2000 implement something called ‘check and reserve’ [I5E5],** which is kind of everywhere now, but that was probably the innovation that really drove the Company Q business in the early 2000. **What we never done is have pre-paid on the back of that.** Because we are always, we train our customer to like the fact that they got flexibility around check and reserve. **So, but of course, without that we are moving stock around the business that... you know we only get collection around 48%.** [I5E5] So there is a need now to decide what we do with pre-paid, whether we implement that or not. The other thing we done from an IS perspective is implementing new store, the digital concept store. So a move to get rid of the catalogue, one of legacies from many many years. And put ipad brochures, completely change the digital experience in store, and that would **lead to new store format because of the things there is... a move to much smaller format, we can just use as collection point that tend to be non-stock.** [I5E6] But again require different level of IT and capability.

So is it more purchase now comes from the internet so you want to change your store model?

Well we still take... 80% of our sales take place in store. So I think, I'll argue the journey begin online, and lose the catalogue we will be, I think **some of our early research and trials shows that taking the catalogue out is quite dangerous, is sale damaging.** [I5E7] There is still a lot of reliance on catalogue in certain part of the country. But we absolutely see that leveraging the store as collection point is absolutely key, because of the immediacy. **So we think that where the battleground gonna be is that people will want things more quickly, they don't wanna wait for delivery.** [I5E8] So you can collect it form a convenient collection point that is quick. And we are putting fast track in the stores; where we are gonna get your collection within 60 seconds. It's gonna be quite compelling, **but also by getting that footfall into store, then clearly we can up sell, interact with customer more effectively.** [I5E9] And, you know, the like would that they will continue to buy although look at the product is quite high. But getting people into store is really important to it, we will be giving customer choice with the home delivery and infrastructure, where they can get it today. You can order by 5 o'clock in the morning and get it delivered late morning, order by lunch time the mid-afternoon, order by early afternoon for evening delivery, from a selection of 20,000 SKUs in our central stores. So we think that's gonna be the things that will make a real different. So we will be, you know, we will see some volume migrate to home delivery, but we would expect our customer to really, you know, be more of an online-focus-journey but it'll just cover lots of different options on how they get it, and if you want it right now, then we will turn it round quickly specially if you pre-paid. The other thing we did

that you might have seen we are now we got a partnership with Company R, and that's we be doing a trail for about 12 month, we'll just agreed a new commercial contract for next 12 month, which is really gonna ramp the volumes up. **So we are intent on using our stores as collection point, not just for ourselves but for the partners. [I5E10]**

Ok, how do you think this new business model would transform your operation then, in terms of using data?

It is one of the big challenges and probably something that we missed as part of the transformation plan. But **interpreting all of these new information system, models is becoming increasingly challenging. [I5E11]** So again, Company Q is quite unique in that... we can catch demand differently to most retailers, because **we have stock checker in our stores [I5E12]**, and we... traditionally been able to do that online, a lot of people can do that now. So we have measure to measure lost sales. **So we can capture demand with customers near the stock checker in the store and then not chosen to buy it. [I5E12]** Now we actually do some filtering on that. **But been a reliable source of demand capture. [I5E13]** But, yeah, **data capture across the organisation is becoming incredibly complex. [I5E14]** One of the things that's clear is that **we don't have skill set of people to do that. [I5E15]** So couples of challenges, there is a using the right database and system to capture data, because there are so many different tools out there. **We got plenty of people that can produce data, and complex data, but when it comes to interpreting that data and telling the story, you know, when there is lots of complex and lots of different data involve, is been... it has become one of our biggest challenges. [I5E15]** And as the business transform, you know, things like lost sales as an example, goes down, because they are in trail, **'cause capture demand differently, because the different IS solutions, and that is becoming a bit of a killing tool for us actually. [I5E16]** Because we just can't keep up with the, the level of data that's require... **(we are not) be able to interpreting it agile enough. [I5E16]**

Why you think you can't interpret the data agile enough, is it because no enough people to do it?

I think there are couple of things. We have an approach, the IT challenges of data right, so we just built spreadsheet to review different... you know whether the SQL, Access databases, pivot view... you know **we tried to use different types of system but there is not an automatic approach. So, we have no real expertise, everybody is creating in their own version, data collection, and interpreting it accordingly. [I5E17]** So there is lack of objectivities as well. Because **people are a bit weedy to what they think the data are telling them. [I5E17]** And they obviously **trying to use data to prove what they think,**

rather than be...you know, **'this is what the data showing, let interpret that objectively, and let's turn that into action quickly.'** [I5E17] That's something we are a long way off being able to do.

So you think it is because you can't reach an agreed view on what the story the data is telling so it would slow down your decision-making process, is that?

Absolutely, yes. I mean, **trying to get an answer is big enough job in some of the big questions.** [I5E17] We also have a... this is part of bit of Company Q history, you know. **We wanna get the perfect answer, and we want to prove things beyond the reasonable date [I5E17],** and when you are in that place, you just **spend so much time refining answers and not trusting data that actually there is a danger you don't actually do anythings.** [I5E18]

Ok, so you mentioned, the stock data as one of the big part of your transformation. Beside that, what else data you have access to now?

Er, well, we put new models in. So, for instances, availability we capture it in different ways. So because we put different stocking strategies in where to catch data, **to report or to show availability across different channels, in different ways to ranging stores [I5E19],** and that's where got very complex. 'cause we are **taking range out of stores, and then trying to see how it still performing from a sound margin perspective.** [I5E20] And of course, having a reliable control of those store, again is another matter when your business is changing so rapidly. You obviously got **a consistent control set of stores, so got (to have) something to measure them by.** [I5E21] So there is the on-going for new data and questions but moving to **reliable control set to make sure you got... something to measure it to effectively.** [I5E21]

So far the data we are talking about are on the operation side, how about those on the customer side?

Er, yeah, I mean, **lots of customer research being done by third party really.** [I5E22] We tend to contract that out. Strategically we are looking it as consulting business. But **we tend to just use that partner that we got for customer services, so, that's contracted out.** [I5E22] The data within supply are challenges; the data within commercial is real challenge, so is probably more internal challenges than customer external challenges. 'cause historically business work out are reviewed... suppliers will do that for them.

Ok, so on your next step would you try to combine those two set of data to help you... or are they now use separately in different divisions?

There are very much **collected separately and they do come together.** [I5E23] But there is probably more... I think directionally from customer perspective, that's less open to Company L, says. I think the customer data is easier to get out when you... doing customer interview and feedback from customer. The internal data, when we are doing things that none of the business are doing, the way we are measuring some of the model we are implanting, is extremely difficult because.... The customer data are tried and tested almost, and they are trained to compare with other business, where are some of the things we are doing you could just can't compare it. 'cause the Company Q model is relatively new, unique anyway, and some of the things we are doing is very much leading edge. So you can't put them together, but... **'cause there is not direct link to it.** [I5E23] So are having to make assumptions when you do link it.

So, how would the **stock data, the visibility affect your operation in the store?**

Probably **start with the ranging.** [I5E24] And how the range is stored, because you got so many input into that decision. From **what the commercial team think they gonna sells, to how that line perform over the last 12 weeks to how much stock you got on the store, and how much lost sales, how well we are serving it.** [I5E24] So you start with... **Should we range that product into store, and then if the answer is yes, then is how much stock we put into the store to support sales, and that's where some of the debates really being had.** [I5E25] Because we are such **high proportion of slow moving SKU** [I5E26], the probability that you are going to sell one of those over a, you know, 6 weeks period, or do you actually just take it out all of store all together and just offer online, that's a big challenges for serving the next 6-12 month about what we actually... Especially **the slow moving SKU, do we bother ranging them in store? Because if we get it to customer online, or fulfil home delivery, then it's more cost effective to do that than put it in 700 stores.** [I5E26]

So what is your current decision practise for these slow moving items?

We would have a flash out of sales. So at the moment it got to sell one in 10 weeks to be in the store. [I5E27]

Ok, how about the price. How you decide that?

So we now got a new processing, we've got a package called 'Pricing Algorithm'. It is a... obviously **doing price straitening on a daily basis, and then proposing action that we take on pricing.** [I5E28] So clearly we will look at the **competitions, deals** [I5E28], and... but the Pricing Algorithm is a very new system that we got, **which is helping to inform those decisions now on daily basis, but part of that we are doing on a weekly, quarterly basis. But Pricing Algorithm just price straitening, pretty much all the time.** [I5E28]

So about the daily pricing model, what elements would you consider?

It's... **we will need to look at margin, that would be a key, we will look at stock, see if we got stock to be priced accordingly. [I5E29]** And then that would be the **market comparison, price scoping from others. [I5E30]** We got the tool now, which **allow us to price on a... dynamically, and propose price changes that we should make. And that's quite interesting, because you been using that tool, and then drop in prices and then founded out we haven't stock, so we haven't got stock built into the model yet, but that's coming. [I5E29]** So just give you an example of where we drop the price or product when haven't got any, it's a bit mad.

So the dynamic pricing I think it's quite difficult to implement, is it more on the online channel or on the physical channel as well?

Online. We do do price... but we don't really have product on display in store. **The difficult we get is where we got catalogue, clearly we got price in catalogue, and that would be different to the online part. [I5E31]** Our customers are quite aware of that now. They know that, chances are the price has changed from the catalogue, and we also do a lot of promotional flyers as well. **So we are constantly changing the promotional plan and flyers. [I5E31]** So they regularly keep customer up to data.

Ok, the ranging decision, down to which level it goes to?

It would go down to kind of operational manager level in suppliers. **What we are trying to do is let the system, which is a replenishment tools (algorithm). [I5E32]** And we are actually trying to use it dynamically do the ranging in stores, based on **the sales pattern, based on the demand capture that we got, and actually where we let the system do it and be more dynamic [I5E32]**, that's where we have seen the best sales so far.

Ok, and that will be based on each individual SKU in each individual store or regions?

Now it would be based on individual SKU by store. [I5E33] **We have a challenge though, we need to look at cluster performance. [I5E34]** A central stores store, which is a big store with full range, and then you have local stores for about five or six stores. So a cluster would be about seven store. What we are aiming to do is to **look at where we got local stores that are performing particularly well whether we need to put more stock into central stores and the local stores. [I5E34]**

Ok, how about the data you collect inside the store? Would that affect how you design the layout inside the store?

Not really. We are dynamic store warehouses, so you can put product anywhere in our store. [I5E35] So there is **no fix layout. [I5E35]** It is so flexible so agile, we have a bit of zoning but you can pretty much it everywhere in our stores.

What is the zoning about?

So we have voice activated put away. So **the stores are very basic in terms of the way they are designed. [I5E35]** Just lots of shelving, **and literately you can just go and put the products. 'cause they don't need to be zoned. [I5E35]** We are putting **fast track area. In terms of you pre-paid you move it to an area that's near to the till. So we can get that much more quickly, [I5E36]** but that just enhancing the process.

So, any plan you have the near future?

Our availability is terrible and our potential lost sales is serious, **we gonna drive our availability across all channel [I5E37]**, to get the right data help us to do that is gonna be key. And **we also need the data to interpret the trails. [I5E38]** You know, **we got hundreds of trails at the moment, so interpreting the trail so that we made the right decision is gonna be absolutely key. [I5E38]** So we are finding **is starting to use third party [I5E39]**, so we are using Company S, **analytical team to help us interpret data [I5E39]**, we're using Company T, another big data organisation who are helping us interpret things around pre-paid. I can only see that growing. **The other things we'll do is we'll bring more sort of leadership came around big data. [I5E40]** We recognise it in **suppliers we need to put our own function, so that we got people that can coordinate and put all together the data. [I5E41]** They are producing the scorecard so that we can measure the business. But then, in additional be able to tell the story. So we are **getting very focus on how do we get that capability in the team. [I5E42]**

The availability, you now already got relatively long time to prepare the stock, why do you think it gets so poor?

Because of the way we are capturing demand, you know **we capture a lot of duplicated demand. [I5E43]** We aren't operating as efficiently as we should do, so **have a very long lead time with our suppliers [I5E44]**, even the domestic suppliers. We aren't tough enough with suppliers, so **they don't deliver... when they do deliver they don't deliver in full amount. [I5E44]** And **we also don't execute well enough in terms of the way got our product set up. So we may have the wrong setting around product. [I5E45]** Actually we try to drive performance in all lines, we **needed to focus on the key lines, that's something we do. And we got, the top 3500 lines in Company Q generate about 70% of sales, but focus really are these 3500. [I5E46]** And getting those right, then we drive a big step change in performance which is the direction we are going down but it's taking **quite a**

journey to get there internally, with some of the organisational challenges we have with Company Q. [I5E47]

So which challenge you think is more difficult to tackle, inside the company or managing the relationship with suppliers?

Er... well it's both. **We got challenges internally, but making sure the suppliers are coming with us (is equally important). [I5E48]** We aren't a company in general, is being tough with suppliers, because at the end of day we have to fine them for lack of performance, poor performance. They got be able to follow us through. We are run out of people overturning that, **we don't wanna ruin supplier relationship. [I5E48]**

Ok, so I think that's more or less the question I would like to ask you. Thank you very much for taking part in the interview...

-End-

A.6 Interview 6

Respondent 7 – Professor - Academic Institute A

(...)

Thank you very much for taking part in my research, and this interview would last around 30 minutes, and I would ask you questions about how you use data in the supply chain, in a retail environment.

It's ok.

Ok, so, what data they are using? I know they have a lot of customer insight data but how they are used?

Ok, did you check their website?

Yes.

So you know that they has... Company F, that use Company D loyalty scheme data, so you know that much. And so you also know how companies use that data because they have case study and publications, and explaining that they use that data to help developing new product, to help develop their promotion plan, to help them their relationship with Company D and improve the marketing of their product.

So, that's more on the marketing side, do you think they also use it in the supply chain to support...

Ok, so you need to be specific, because a supplier is in the supply chain, so is supplier is using data to help them **identify new product and to inform their promotional... of their marketing plan, product, price, distribution [I6E1]**, and... So I guess as far as I am concern, the supply chain comprise these, those company involve in making, moving, delivering product, so everything I just said is consistent with use of big data in the supply chain but if you have some specific questions then you should ask them.

Ok, so, as you have experience in the food supply chain, do you think there is any particular application about using big data in food supply chain?

So, I am going to answer your questions as best as I can but the food supply chain is like any other supply chain, you have company making product, buying product, moving product, storing product, selling product, dealing with relationship. And you have big brand, you have a lot of brands, and in the case of Company D, both big brand and little brand, can use that loyalty scheme data, 17 million household shopping in Company D, buying their brand to determine how best to use their resources. So there is no differences. **The only different you might argue is, in certain product you have limited shelf lives. [I6E2]** So there are

issues around **perishability, some product they are issued around food safety and traceability [I6E2]**, but that doesn't related to the loyalty scheme data, they related to information about how the product is been made and where is been moved and that, I wouldn't classified that as big data. So, yes, if you asking me about Company D, more than half of their product are food product. So food is... subjected to regulation, and different aspect of demand but every product that Company D sells is purchased by somebody in loyalty scheme, **enable that suppliers to have a better understanding of what the customer does. How they behave, how they respond to changes in the marketing mix and merchandising, to ranging [I6E3]**, so all of those things are every bit as well as to computers, books, and games, and greeting cards and toys as they are food.

Ok, for the perishable product, I heard that Company D is doing some complicated algorithm to determine the price, to make the mark down. Do you know that?

No I don't.

Ok, you mentioned the merchandising, how do you think big data can help them do the planning better?

Well, depend how you define merchandising. If you think of merchandising as I do, visual merchandising is to with the way in which product is presented, this is very basic stuff. **If you understand who is buying your product, when they buy the product, what else they buy that product with, how often they buy that product, and how they responded to changes in the product, its size, its packaging, the way it is promoted, its pricing, its advertising. [I6E4]** Then you can adapt the marketing mix, which will include the extended marketing mix, if you think about it in the retail context, **would include the merchandising of their product to better meet the need of consumers. [I6E4]** So, **segmentation of their shoppers, and if they have segmentation of their stores [I6E5]**, which they do, like all of the supermarket, they have segmentation of their stores. The ranging of different product, the ranging of those stores would be different, the merchandising of the product would be different and **the whole purpose of using the data is to get the ranging, the merchandising more in line with the kind of people that are shopping in those and what they are looking for. [I6E6]**

Do you think...em, in a previous conversation with them, it seems like Company D is not doing the ranging very...often?

Not true, **every 12 weeks they review their ranging. [I6E7]** So I don't think there is any difference with any other retailers, **they constantly reviewing their ranging, they are reviewing their performance, and they make changes where they have to. [I6E7]**

So, in terms of the ranging, some people also said that... if you go to a Company D metro store, they have a whole aisle of toilet paper, do people really need so much choice on that. So do you think it is repeated or there is data to back it up and is reasonable.

Yes.

So, can you explain it a little bit in detail?

Em, well, I already has. If you have a... if you have a convenient store, if you have convenient stores, if you have big hyper market, **you have the data that tells you, which product sells in which category. [I6E8]** If I am responsible for that store, I want to **make the maximum return on the space that I am responsible for, so I am going to remove product that don't sell, and I am going to replace them with product that do sell. [I6E9]** And in determining which additional product I need to stock, I will be looking at the product that I sell most of, and who I sell them to. The use of data is expressively, especially, specifically, to inform decision about kinds of product that I should stock. **And big data, the loyalty scheme data, enable those stores to target household in the clasping area of those store [I6E10]**, and to award existing customer to their loyalty and to attract new shopper into their store, who have similar characteristics to the customer that currently shop there. So straight intelligent, evidence marketing.

Ok, so in terms of the stock, how do you think the big data can benefit it? More accurate forecast, or... in which way?

So, the buyers has to deal with suppliers, **buyers and suppliers together has to decide how much to manufacture, what to distribute, where to distribute, what is available, at store level. Managers have some description about how... which product to stock. But the store manager won't be using loyalty scheme data, they are ordering purely on sales. [I6E11]** But the **buyer and suppliers together can use the data to identify opportunities that are missed [I6E12]**, and product that should be delisted to remove wastes. So the use of data can be result in **more efficient distribution, increase revenue and less waste. [I6E13]** And if suppliers don't do that in consultation with buyers, their product will be delisted.

So, which product to list or not list, how is that determined?

By the, key performance indicators, that motivates the buyer behaviour. [I6E14] So I am a buyer, I need to make profit. So I am entirely **incentivised by making the maximum amount of profit for every square meters of retail space that I am responsible for. [I6E14]** If the product doesn't sell, and the margin is the same as the product that does sales, I would order less of the product that doesn't sell, and more of the product that does. It's very simple. Every 12 weeks those product are review, the performance is review **product that**

aren't selling is delisted, and they are replaced with product that, the buyer believe could be sell. [I6E14]

Do you think the use of customer big data would be very different from using the historical sales data or the POS data to do that?

They work together. So, **the big data, the loyalty scheme data enriches the sales data.** [I6E15] So the sales data just tells me who make the sale, but loyalty data tells me who it is, also tells me if the person is buying the product for the first time, or whether they are buying it for the second or they are loyal customer. So it is really really useful to know, that I have lots of people buying my product once, (than those who) buy it again. 'caues they means, eventually I would run out of first time buyers, and my product would be delisted. [I6E16] If I got evidences to show that my product is been purchased regularly by people, it must mean they are satisfied. And if I know the kind of people they are satisfied because they buy the product often, I can...(work out the kind of) people like them, who currently don't buy the product, we (use) promotional offer to get them to try the product, in the anticipation that once they try it they'll like it and they'll buy it again.

Do you think it is reliable in this sort of anticipations, and forecast is reliable?

Yeah, I think repeat rate are extremely reliable, yes.

Ok, how about the stock management? Inventory?

Yes, well that's got much less to do with big data. Stock management and inventory management [I6E17], em... you know. I am responsible for so many product, with all of those supermarkets they provide data for all of their suppliers that tells them how much they are selling every day, how much stock exists. In all of the stores, in all of the depots, so that the buyer can respond, by making more and distributing more to their depots.

But that would be... the availability is not... sometime it is very challenging.

It is certain challenging when you promote products and you don't know what the responds is going to be [I6E18], if you discount a product by 50% and sales in some store goes up by 5 times, in other stores it goes up by two times. Then chances are some of the store would have too much stocks, and other stores will have not enough.

So do you think if using big data, you can know what is going to happen after the promotion more precisely?

Well you have to be careful, you haven't defined what you understand as big data. So big data is not any data, big data is large, either lots lots of observation about one thing, or observations about many many things. **But not all data is big data. [I6E19]** Loyalty card

data like Company D loyalty scheme data is truly big data because they got 17 million shoppers, segmented 5, 6, 7 ways for half a million product across 2000 stores, so that is clearly big data. The data that supplier gets, telling them how much they sold today, which store they are selling and how much stock there is I wouldn't call it 'big data'. So you have to be clear about what you mean by 'big data'. Otherwise, you'll end up talking about all data, when not all data is big data. **Big data is big, it requires, large processing capacity to handle [I6E19]**, if you express it simple, it would filled many many many many spreadsheet, because if you got 2000 stores, if you got half a million products, and you got 17 million shoppers, work it out, that's huge data set. That's not the same as... if I supply you with three products, small, medium and large, in 16 stores, and you send me a spreadsheet telling me, or I access to data telling me how much I sold, how much stock there is, that's not big data. I can have that information in two spreadsheets.

Ok you think it have to do with the size?

That's what the word 'big' means, it's a ... **Big data is large, bulk data, so clearly size matters. Big data, data which is abundant, there is lots of it. And it is also details, it is rich in details, which is where segmentation, and the purchasing behaviour comes in. [I6E20]** So loyalty scheme data is rich, because the simple data is, I purchased something, or there is record someone purchase. The additional insights which is when is the last time you brought that data (product), what else do you buy it with, and what kind of person are you, life stage, life style, loyalty, that's what makes the data more complex, and richer, and therefore it is bigger.

Ok, when using customer insight to plan promotions, to what extent do you think demand generated form the promotion is predictable?

I don't think predicting the demand generated by promotions is at all easy but I also think the current methods used are inadequate – standard uplift percentages or reliance on what happened on the previous occasion is not good enough and results in sub-optimal allocation of stock, some stores get too much others not enough. [I6E21]

Ok, so the Company D practise is already very good, but on average, where do you think the industry is? Do you think they are close or not that much close.

No, the industry as a whole is way behind. [I6E22] There is a... **there is lots of data, but not much of it is used. Anything like is as much as it could be, because, data analysis is complicate, it is costly, and you have data analysis that's smart. [I6E23]** When you have insights from big data, that, what that result in is new insight which would requires changes in your behaviour. And ... generally don't want to change their behaviour. **So there is resisting in investing in something, that might require us to change what we do. [I6E24]**

So, where do you think is the major difference between the average industry behaviour and the best practise?

Well **I don't think there is such things as 'average industry behaviour'**. [I6E25] Company D is the only, well, Company D and Company U as you know are the only two that has loyalty scheme, **so none of the other retailers has got the richness of insights of shopper as they do.** [I6E25] Company D has that since 1994, so they have a long time to work out the value of understanding in great detail who their shopper are and what they do. **They are not the average, they are the top. Everybody else has nothing like same level of insights, so they rely on suppliers to do their research for them, they rely on guesswork.** [I6E26] And some of the time it is clear. If I am Company M, if I am Company N, my shoppers are the same, pretty much, they are focusing, primary on value for money. So the argument might be, 'I don't need to have these richness of data.' If you are... Company V, most of my consumers are, you know, up-market, they can afford to pay for more, interest in quality, so you might argue 'I don't need this insights.' **But Company U and Company D are serving everybody, from the richest people to the poorest people. So they are segment offers, so they need rich data to support their decision-making (in marketing mix).** [I6E27]

Ok, so, on the way Company D to... know what they can do with such data, what challenges did they have?

Er... well **they have to get supplier to purchase the data, the data is very expensive. So, cost is a barrier.** [I6E28] Once the supplier decided to buy the data, **they need to have the expertise and capability to interpret the data, that's a barrier.** [I6E28] 'casue they haven't got the right people, or the software to make sense of the data, and they got people who would buy the data, and have smart people to analyse the data, and then **need to have suppliers with the culture that is ready to change.** [I6E29] So, innovative, key suppliers that are willing to change the offer. The... **Company D need suppliers alike that, the majority of them are not.** [I6E30] And within Company D, they need decision making buyers who are like that and many of them are not either. So there is a resist, resist to change, which will.... And cost, which are significant barrier to making big data work in practise.

Ok, so. Since not all suppliers have the capability to use big data, then how would Company D extend the richness they get from customer to deal with these suppliers?

Well, you got... **In every category, there would be half of the product, you know, that half of them will be branded, and half of them would be own labelled. The biggest suppliers would be branded.** [I6E31] They will have the... **many of them would have the resources to invest in the data** [I6E31], so they would gain a lot of insight form the branded

manufacturer to invest in the data, and share with Company D. They'll do their own analysis internally, some of the buyers would offer some of the category... and they'll share that with suppliers. So, some category would be more progressive than others, but for the category where there are no brand, so **fresh produce, meat for example, is more challenges, because there are far fewer suppliers willing to invest and take responsibility.** [I6E32]

Ok, then, how about the buyer inside the company? They are resisting this, so they are not using it at all or?

There are some of them make a lot of use to it, and there are some aren't making any use of it at all. [I6E33] And I explain why that was. It is expensive, I don't have the people, I don't want to change. If I am a big company I do want to change and I am invest on the data, investing on the people, develop new product to grow my business.

The different between buyer comes from different category or...?

Yes, any business, with multiple divisions, you got some division that are doing better than others, but you got some division in which they are, people that are more progressive and others are not. Company D is a huge huge huge organisation, so not everybody can be fantastic, **not everybody can be interest in data** [I6E33], but they are getting better, and there is still huge **variation in how much, how many people within Company D use data, and how many decision are based on the evidence that the data present.** [I6E33]

So, in general, which category is performing better?

You don't need my opinion for that, you can get that data yourself. If you mean which category are making best use of big data, as I already explained, that's the branded category, because that's where the big, super manufacture exist. You have.... Buy the data, you have the people, and are constantly innovating.

So you think as long as the supplier is big enough, it doesn't matter whether it is er, doing food, clothing, or general merchandise?

No, as far as I concern it makes no different. Consumer insight is relevant to everybody, if they want to improve their business. [I6E34]

Ok, so what do you think would be the next step for leaders like Company D?

The next step... yeah, ok. The next step is for them to **change their system for introducing new product, adapting to insight so that the insights that is generated through the big data, can actually be implemented in their daily decision-making. So, there is a gap between understanding behaviour, through the richness of big data and your ability to respond to it.** [I6E35] And, that... You can image those system are very very complicated,

and very expensive, so there don't change every week or every month or every year. They might invest in new system, every what, 10 or 20 years. So they are getting more insights, to better use of data, but **their system aren't responsive enough [I6E35]**, then they can't do all the things that the data says they should.

The system you mention, is it referring to the system they use to do planning or the data processing?

Well, all of their system, so information system, their management system for sourcing product, allocating product, distributing product, the supply chain, you know, all of those system which are going to get out of data. [I6E36] All of those system would require updating to enable them to more responsive to get intelligent about what happening in stores.

So the reason for updating is about the software or is about the hardware?

Both. [I6E37]

Both, ok. So, the software is not programmed good enough and hardware is not have the capability, is that...?

Correct.

Ok, so thank you, I think that's pretty much the question I need to do my thesis.

-End-

A.7 Interview 7

Respondent 8 – Professor – Academic Institute B

This respondent preferred not to be recorded.

Summary from notes:

1. Big data is about consumer insights, demand. Major area of application would be marketing, buying & purchasing, promotions. There is a lot of practise in these areas. Big data can be used to inform logistics.
2. It is about the information flow in the whole process.
3. It can provide better visibility across organisations, better perspective on end customer demand. It is very difficult when many parties are involved.
4. Many parties are aware of it, but not necessary use. For example farmer and produce grower
5. Logistical collaboration on sustainability, optimised distribution network, with consideration of the environment impact can be an area for further research.
6. To forecast demand accurately is still very complicated and not possible. The data is there, but the analyse is not.
7. Barrier for extend consumer insights into supply chain: discrepancy in information (data not share across organization, problem in information exchange), silos, and corporate culture. Making people aware of the issue is also important
8. Some consultancies are doing such analysis.
9. Difference between online and traditional retail channel: not much difference in the how the data are collected and used, or analysed, but would be different in the way data are generated.

A.8 Interview 8

Respondent 9 – Partner – Company Z; Visiting Fellow – Academic Institute B

(...)

So, first of all, maybe talk about the availability. How it is managed at the moment?

Do you mean in the sense of generally in retail or...?

In general, or if you have specific example, we could also talk about it.

Ok, Em. First of all, **most retail businesses manage availability by the right product on the shelf in front of customer, when the customer goes into the store. So, it is quite difficult to actually maintain accuracy of the stock record in terms of what is on the shelf in front of customers. [I8E1]** Because within the store you have two places where the product can, can be on the back, although a lot of stores, a lot of business has get rid of their stock room but **there might be product on the back, on the stock room or on the shelf. Just understanding whether they are in front of the customer or not is a continual challenge. [I8E1]** And because you get shrinkage, you get inaccuracy that introduce from different perspective. You constantly having to try to make sure that the stock file is accurate and reflect truly what's there. Separately, **in a multi-channel environment, you also got product being make available for sale to customers from fulfilment centres and so there is also a DC or fulfilment centre stock accuracy requirement, that potentially is easier to maintained, because it is the DC environment generally. [I8E2]** So the stock control and product handling routine can be more consistent complied with keeping accurate stock record. [I8E2] So these are the two places when customer generally interacting with stock. **Some retailers try to use their in-store stock to help online ordering demand. That's very challenging because there is risk they may have some inaccuracy in their data, and also, they might well be product available on the shop floor. But by the time the person has gone to pick it to fulfil the customer order, it might have been sold, [I8E3]** so they may have a disappointed customer. **The other thing the business is doing is making product further up the pipeline available to be sold. [I8E4]** So that's brings into... **they need to have accurate purchase order record, accurate tracking of product, so they can accurate indication of when product is likely to arrive and therefore be able to given or sold or transfer to the customer, by whatever fulfilment route going on. [I8E5]** So, that's another part of delivering the availability challenges. So when you think about it then from a data perspective, having an accurate view of stock, so single view of stock, that gives customer for whatever channel they try to shop in, **visibility of what's available to them, in a given time frame by a whatever fulfilment offering is being put forward by the retailer. [I8E6]** It's part of delivering the whole availability promise.

So the fulfilment is... depend a lot on how you operate, it's not just the data...

No, no. Er, you are right. So if I, retailers, make product available to them, we called that a customer offer. So that may be immediately available, which means if you walk into a store you can pick the product up there, or it may be made available same day, for a store pick up, it could be a click&collect situation where customer goes online and looks, the store that they going to that product available in that store, so that I can go in and pick it up. Could be, the customer wants product delivery to their home, so on. **So each of the way the retailer is prepared to offer their product, the channel that they are offering.... Services offering goes with it, would dictate the kind of information they need and the time frame that they can operate in [18E7]**, in order to provide that product to the customer as the customer want it.

So do you think... if you have a single view of stock, you can do more about how you schedule the transport and deliveries?

Single view of stock is something that enables, so a customer if you like, to interact with the retail business. [18E8] Through the stock file, so you can see what is available to be purchased, and from what's available to be purchase then usually you can chose, as customer, how you want that product to get to you, whether it is in store or collect in store or deliver to your home or another pick up point or whatever. **But the challenges for retailer is to make, try to make, common stock pool visible to customer so that they can buy. [18E8]**

Sorry, common stock pool?

Combination of stock, yes. Let's say there is the fulfilment centre or DC has stock in there can be used for different channel, so one pool of stock, which can be used to supply fulfilment order or store replenishment order or whatever.

So how do you think with customer insight data, where a lot of big data research going on, do you think it can benefit fulfilling orders?

A lot of works is going on at the moment to understand how customer shop, what the online and offline journey is. So where do they looks, what product are they look at, which one do they select, how do they want to them to be delivered or would they collected them or whatever. **So, what retailer is trying to do is studying the behaviour of customers, in a very detailed way, picking up different transactions, if they buy something when they look at something or have something in the basket then take it out or whatever, try to develop some kind of insight to what is driving that customer behaviour. That is what I understand as 'big data challenges' [18E9]**, because there is many many many different aspect of customer behaviour, picked up by lots of little... trails whenever you go shopping

online. So retailers are studying that trails to see what you do, how best to explore what you do, to help buy their product. And **that is what I think a lot of... you know, 'which one is work', 'how they work' and so on, to understand customer and provide marketing team, product insight team with customer insight to drive what selected is part of ranges and where they provided from to the customer. [I8E10]** So a lot of customer facing stuffs going on, price behaviour and so on. Less...sexy, **but just as important is the back up data that helps business to understand how well their supply chain is working, how well their fulfilment is working and so on. [I8E11]** That operational data, understanding insight to that are not the focus but I think is just as important as the customer insight data. So it is not necessarily a 'big data' issues, but certainly a large data set issue, and the insight that you can get from there can help you to improve your availability or manage your cost more effectively **or give you insight into the economics of the channels that you are putting your product through. [I8E12]** And that data, is something which has a lot of value potentially to retailers to understand what's going on. But it is difficult to get hold of, so that data is... that's the place where I think, there is a big opportunity.

So when you talk about operational data, besides the stock, what else are you referring to?

Em, **the time to fulfil the order, is it delivered on time in full to the customer where they want it, what time slot was hit and what was missed [I8E13]**, all different KPIs that you would want to know. **When the customer buy particular product, to has it supplied by particular channel; did you make money out of that, so the net margin of delivery; can you allocate cost to that and get a net profit; understanding how much inventory is deployed in various places in the supply chain in order to provide the service level that you need to; is that cash effective; do you understand the total operating cost down each channel of the margin it deliver, the profit I deliver and the best way to exploit these channels, by product group or even down to individual SKU; the queue of what you are moving and how is that work in the economic of the deal you set up with; and the partner you got on fulfilment. [I8E14]** So all of those kind of things. I think need to be understood to inform the decision makers in terms of what they going to do about improving what they do. And that, is quite challenging especially in a world that's developing these omni-channel space. **Because a lot of retailer internal reporting and analytics is based purely on their... well, is derived from what they used to do in their stores. [I8E15]** But now they have to change the way they report, to take in consideration online. How do you integrate online and stores performances and how do you disaggregate them in the reporting. So you can understand what's going on. **Most retail business haven't got purpose-build reporting [I8E16]**, which start from that place, bring all of the relevant information together to give you the best insight. And that's a challenge in the data base.

It's more about the insight of how you operate.

Yes it is. And, **if you want to make changes, how you model, to understand implications of those changes. Because changing the way you operate in order to try improve something has potentially knock-on effect in other measures. [I8E17]** So say you try to improve your services, what's indication in the stock if you try change the way you operating. Or **if you need to take your stock down, how can you manage that in a way that maintain the service level or availability that you got doesn't cause problem for the customer yet allow you to become more effective and use of cash in your business. [I8E18]** So those sorts of modelling, and information required to support that, is a large data set question for retailers. So, and equally the routing reporting that's going on in the old world has to be adapted for the new world and that can be problematic as well. **So I think there are four challenges really.** One is about **the adjustment of routing reporting, and making sure you can deliver that. [I8E19]** The second one is the **historical trend and understanding what's happens, and looking for cause and effect relationship to help you manage improve the business. [I8E20]** Third one is **modelling future changes and understanding implication of those changes, so you can make the right management decision. [I8E21]** And fourth one is **data mining for ad-hoc data requests to answer questions and queries that come up from time to time, as they do each week. [I8E22]** These four areas of the data analytics, internal operation focus data analytics capability, needs to deliver, and I think **as time has gone by, retailers are struggling to maintain integrity of their reporting [I8E23],** and therefore what I just outline to you is an idealistic situation. **A lot of reporting is homegrown, ad-hoc and not so easily systemised [I8E23],** lot of introduction have multi-channel, omni-channel capability, that meant a lot of changes in the system in the information, that brings challenges into this.

So do you think this challenges is more because... now that the marketing side have do a lot of things so the supply chain is not capable of keeping up of this?

Well, the customer-facing team, try to make sense... The people who look at the customer insights, **when they get insight, they have a tendency to try things out, to see what happened. If they don't align that with what's going on in the back of it, in the back room with supply chain team, there is danger these two team become disconnected. When those two things become disconnected, there is risk that the customers get let down. [I8E24]** And generally, is easier and quicker to change the front end, I could change what a website does and looks like, much more easier than I can change the way my supply chain works, especially I if don't understand how it works in the first place. **So I think some of the challenge these days is, as people experiment with different customer offers, they put the supply chain in a difficult place, where they may not get the performance they**

expected. So that's not just the information challenges, that's the management challenges, [I8E25] dialogue... that's needed between the various function to make sure things are aligned. If you try to offer the customer an experience that's outside of your operational capability, then you gonna have a problem. Customers remember when things go wrong, a lot more when they remember when things go right.

Ok, so do you think now the big data from customer insight... for example promotions, are they more controllable?

Em, I think there might be a lot information about promotion and promotion performance, and price elasticity, what gets customer to buy or not. How that translates into supply chain is a good question. Because I think a lot of promotional management, promotion mechanic management that's always been challenging in the supply chain. Because **the time frame in which traders, markers tend to want to promote product, again, is outside sometimes the physical capability of the supply chain to respond. [I8E26]** So I think although there might be more insight in the customer end, **how do we do on this promotion operationally, where are the real benefit, and actually did it paid for itself in the end or did we just burn some margin selling some product that we didn't need to, is still a challenges.**

[I8E27] And that's back to the internal data analytics give people the insight that they may need. These days you can crunch that into, you know, store-SKU level, in varies time frame, understand what's going on much more dynamically, especially you got real time signal at there. Then you could do. **So the available of transactional data at very low level that could be crunched to give insight and people try to operate more effectively, try to learn how to operate more effectively. The opportunity is there, I don't think everybody exploit it as well as they could though. [I8E28]**

So this transactional level data, do you think it would be quite reliable to inform the operation in terms of, says, forecasting?

Em, I think... If you think about forecasting and replenishment... **the things is, forecast is forecast, so there always be error in it. [I8E29]** The sooner you understand whether a new product is tracking to its forecast or not, or a seasonal product, tracking to its forecast or not, or promoted product. Is... **it can help you to respond effectively, if that's giving you insights inside the time frame that you can do something about. [I8E30]** It's not much help if you have to buy a whole seasonal buy that you imported and you start try to sell it and it's not selling very well. I mean it could tell you, 'you need to mark down the product' maybe, to try and help it along discovering the pricing wrong or it might tell you that people just don't want it, they won't buy at whatever price. Em... **so if you could have flow that product... piece of time, a chunk of time and then you could adjust and put forward if**

you see a fast sales arriving or slow down or cancel if you a slower sale rate. That interaction across the supply chain from the insight from the data, potentially is available now [I8E31] but how people respond to it? I am not sure. But the more real time the data gets in the selling end and then in theory the more responsive that you could be within constraint of the supply chain. [I8E32]

OK. So you think now the supply chain planning cycle is still not very responsive in general.

Er... I think it depends, depends on what it is. I mean you got to have the capability and the planning cycle align to the characteristic of the product and as in the sales, or product life cycle characteristics. So if you apply, if you got the wrong perspective on a product and of course you won't get it right. So I can assure that your system is set up in the right way to response to, or can understand when the product's taking off because the sun raises, it could become very popular all of a sudden ,or that... so you get a response back up the supply chain quickly. It is important if that's what you want to sell more off.

So, how about the ranging, merchandising? Is it still planning a year or three weeks ahead, so it can not really benefit the supply chain?

I am saying, em, just like there are tools out there to help you with pricing, the dynamic pricing tools. What we do here we are looking at help to deploy a range of product to store. And the, **it's possible by using forecast sales insight, sales forecast, locations, store SKU locations ... to run us through algorithms that tell you what rates of sales you are expecting to get over what time period and whether or not you should position a piece of stock for that promo in a location or not. [I8E33]** So, by using tools that are known to us already you can get an idea of a range that is it emergent from that location or forecast you are expecting to achieve. **And therefore might drive you to put different type of products in that store than, for example, in another store. [I8E33]** So, use of data that way's already in flame.

So, to what extend do you think this kind of, em..., forecast, or anticipation is reliable?

Em ... it depends on what type of product it is. So the **volatility of the demand of the product can be very different from types of product. [I8E34]** Whatever it is there is no such thing as perfect forecasting. There are always error. The question is how wide the degree is the error are, and if you're basing something on the forecast itself that's location. You have to understand that in doing that you've already made a pretty big assumption so...

(The forecast is right.)

Yes. But what we found here is that **the forecast is good enough to help with that range deployment question, which is interesting, at the SKU level, the store SKU forecast level.**

[I8E35] The data is good enough to help drive to a decision-making process to decide whether a product should be ranged in that store or not.

So, how good is that, I mean, you say good enough.

How good? Well it varies.

Or why do you think it is good enough?

Because when that approach is deployed we are **seeing sales increases with reduce stock levels because we change the range that's available.** *[I8E36]* It's the data that suggests that is a good thing to do. And actually part of what happens, **if a product isn't available customers will substitute and to buy a different product, similar but different. It is possible to measure or estimate what that propensity to lead us to switch, substitute or ordering the product is. Therefore you can build model that allow you to make decisions based on that information as well.** *[I8E37]* That's another application of, I call it Large Data Set Analytics.

Not big data.

No, I don't like the term big data. I think it's too ... it's become too ... it's a marketer thing ... it's a hacked phrase, big data, what is it mean? Is there a little data question? Big data set, or large data set, you know, seeks operational insight (to suppliers). It's more describing what I think, an area which could be exploited more than it is.

So, about this range store deployment, can you explain it in more detail?

What the actual, how it works or?

Yes, so in terms of ... what data you get, in which level, I mean, to support your decision and how you make, how you decide where to deploy stock.

OK. So, I am talking about, say you have a store in an established location that's got a history. That's part of a total store base, here in 140 stores. **In the store locally we have a history of selling certain type of products in certain rates** *[I8E38]*, equally looking forward. So, you could, when you look the history, and also you take in consideration what you are doing to go forward. You can understand that that store would have a sales profile of certain product at certain rates. And if you, you could therefore hold a forecast, accepting that there is an error to that forecast, of store SKU unit sales at that location. And because stores sitting in different locations where they have different competitions or competitive sets and **all the stores have different roles** *[I8E38]*, so, a store might be a destination store through where customers, in which case, when they walked in they expect to find all the products that you sell are gonna be on sale. They are expected to find them all there and in

other stores, which are not so much as destination stores, customers might have more likelihood to look online, see if a product is there and check the reserve it. In that situation the customer is also more likely to order a products in and collect in that location as well. So **if you could run a supply chain that is responsive enough, you can decide how, less products on that location where there is a high order in or high substitution intensity, and rely on the fact that supply chain can get the product therefore when the customer's going to go and get it, whereas in a destination store, you probably wanna hold more of your full range there because the customers are less likely to buy something they have to wait. [I8E38]** So if you understand how the different types of stores work, and you understand the range of product that they may have sold in the past and you look forward to what the equivalent range that's gonna be there going forward. You can then derive at the store SKU level, a whole set of individual forecast for each product. **What you can then do is to put a filter on those and to decide which of those products below what level of forecast of demand, you won't hold there [I8E38]**, in other words, if there is a level of demand that you recognise as economically viable to hold a unit of stock there to make, then you stock that product. If there isn't, then you wait. So you can **put sales or cash margin logic into deciding whether you gonna hold products or not depending upon whether you're gonna to get a sale or an economic return on holding that inventory. [I8E39]** More than that, you can **dynamically or model to see what you do with the total product set from the store side. [I8E39]** That's how it works, roughly. It's a lot of data crunching that needs to go into that to make sense from that. But it's doable.

So, is this what already implemented or a conceptual model.

Both.

Does that mean there's some trials going on?

There have been trails going on in this business. Yeah. And **there are very promising in terms of the outcomes. [I8E40]**

So the next step would be to roll that out to the whole country?

Yes, (we are) finding the right time to do that. But that would be what next step would be. Clearly, as you learn, you can refine the approach. So there's been a number of refinement have been suggested. So it is a developing thing.

So what sort of refinement?

Segmenting the store base by different types of store at different store groups [I8E41] what it tend to sell, same type of product, you could learn all sort of different things. **So the idea really is to collect the right level of data and be curious about exploring it to see**

what insights you could get to improve the method. [I8E42] This is on it, it's been done on the trial basis here last year and during this year and it's now going to the next generation and thinking have we done on a broader basis, maybe up to a third of stores is run this way now. That's a big change. It's an application of insight from large data set manipulation. It's not customer facing... big data customer insight. That's not, that's different kind of insight.

Yeah, but some people would argue because you are segmenting store you are using historical data, and that comes from sales?

Well you forecast them on the basis of pretty good your sales or... and on an equivalent type of product you haven't sold yet. Then you think, you wouldn't say. It's the insight from that lowest level of data. **It's a challenge a lot of business don't look at that level in a systematic way to really make sense to what's going on. [I8E43]**

So when you are doing this set of analysis, what sort of difficulties or challenges you have along the way through.

The initial challenges are that the business isn't set up to provide data that way in a way that you want. [I8E44] The traditional reporting as going on in the business maybe sitting a level above that, so, to get to the transactional level of data is more challenging that history isn't help necessarily, because there's a lot of data to hold, say, you can't be so easy to go back to look over long timeframes to understand what's been happening. **The tools that are available in the business may not be appropriate. [I8E44]** This is beyond ...

What do you mean by tools?

Well this is about big data, well this is about data warehouses, large data set, and tools like SQL and things like that but ... **but to organise data you need a different reporting tools to sit up above the data to make sense what's coming out as well. [I8E45]** So, this requires, sometimes a rethink about how things are being done on the data collection and reporting form. And **then you might not have the right skill sets, the data may not be very clean so you need to clean it up. Er... 'cause it was in business that it might be in use this way, so, all sort of things that you need to sort out. [I8E46]**

OK, so when you do the store segment, is it very stable, say, this store, historically, has been used in this way and it has always been used in this way. It is not changing that much, so, ...

It doesn't, ... I suppose if you start to make changes, you monitor the stores to see what happens, 'cause you know you are introducing something different. This is new... so what we described is a new way of working. **So you monitor the stock levels, the sales level, the demand for varies products, you can try to cap... and to understand what your lost sales are, to validate that you are opening the right ranges within the store [I8E47],** to keep as

many customers as possible, happy, without over-investing. You can monitor all of the in rates, you can set up ways of interpreting data to infer substitution rates, although that's challenging. It's big assumptions in there. **All those things you can then start to understand, try to make sense of as well as, is that store being served effectively by distribution service, delivery frequencies while, was the product in the DC when it needs to be picked to support that store and so on and so forth. [I8E48]**

So is the transport routing also part of this or will be part of this? Because you mentioned time slot, the delivery time.

Yeah, the optimisation of supply chain, to deliver high service or high availability at lowest cost and cash, means **you gonna to try to optimise the flows to the stores, say delivery frequencies, stock investment and service. You've got these three things that you potentially need to optimise in order to be in the best position, [I8E49]** economically best position for the business at the same time as the best position for the customer. Some business might have put more emphasis on the customer experience and take a lower profit level with a higher cash involvement in order to make sure that they sustain very high service in the ability levels. (...)Is this helping?

Yes, thank you. Ok, I think that's more or less the question I would like to ask you. Thank you for taking part in the research.

...

-End-

A.9 Interview 9

Respondent 10 – Supply Chain Director – Company W

...

Ok, so, first please introduce yourself briefly, just about your current responsibility and your experience.

Ok, so, I am the Supply Chain Director of Company W and basically I look after all the physical distribution in the UK, the supply chain move, which is about the physical movement of the containers into the UK. And the replenishment of FMCG1 and FMCG2 product into our distribution centres.

So how you use data in managing the stock and distribution?

Well at the moment we use the system, and **basically that system probably manage all the data for us. [I9E1]** So, that effectively gives us **past performance in terms of what was sold and give us the future forecast based on the previous year/previous three years' history, number of stock that we've got, and then it uses the latest sales data based on the last six weeks or so, and to try to improve that forecast on forward. [I9E1]** So that system basically manages all of our sales history, transactional data, everything for the replenishment stock into our distribution centres.

Ok, so how about from the distribution centre to the stores?

Well, our distribution centres to our stores, em... we have **three different methods of ordering at this moment in time. [I9E2]** So we have a system. **That system basically holds the sales data for the store, and it uses that sales data to replenish to a pre-set trigger level or a minimum presentation level, roughly pushing the data back into the store. [I9E3]** So, again, well sale distribution, that system. The **second system is one of our location system. She's ... a big spreadsheet which enables us to allocate stock to our stores base on anticipation [I9E4]** and the third way is **the store manager can order anything they want from a catalogue of goods along (that) ranges for that particular store. [I9E5]**

So the allocation and the ordering is separated at the moment?

Yeah, **it is separated at this moment in time. [I9E6]** The intention in the future, it is to implement a new replenishment system. **And that replenishment system basically holds the range of store, the minimum presentation level of each product, the sales history and the sales forecast [I9E7],** well, base on what we sold last year and base on the last week or the last six weeks and, toward the stock, **when we implement the system, that will reduce**

demand of store intervention and reduce the amount of allocations because the allocation system would be attached to it. [I9E7] And therefore it will be able to take account of what stock is in store at any given time and to make sure that the allocation is more relevant to the store. [I9E7]

So how is the allocation being managed at the moment?

Effectively it is manual. [I9E8] The allocation system is really about the new stock coming into business. [I9E8] So if we have a new product line with a new stock, er, is in a limited supply, then you allocate that stock based on what we think the participation is [I9E8], but the effectively, it is a manual system that basically, we have bulk of stores and we allocate on that basis.

So, if it's about the new product going into it, is this a kind of job for marketing or you are collaborating?

A little bit of both. You know our product control team will do what they think it is the right thing to do in terms in the store size, etc. and the trader, or the buyer, will work with the supplier depend on what it is, (if) it is branded product... then the company level of use, the way it sales in another companies. If it is a brand new line into our company then it's a little bit of collaboration between the buyers and suppliers to say what you think it's gonna do and then we are plan in that basis. [I9E9]

So they would do some forecast on their own?

Yes. For example, to put a new pen into a stock, you know, a pen or pencil set. We will look at all the similar products that we've got within the company already and try it base on our sales, base on what are the particular product sells. [I9E10] If it is something that is completely unique and brand new, then that's a little bit of collaboration with people and says "what you do think it's gonna do?" and then we will try it and see.

So, for the distribution network, you mentioned system to manage the demand, but would you also incorporate the transport information about your delivery?

Yes, when we are trying to forecast exactly how much stock we need. It takes into account when the next delivery is going to arrive in store and how many days it uses. [I9E11] The way it is, yeah, so you know, if it is in Saturday and today is Thursday, the system will work out how much we are gonna sale between now and Saturday and make sure there is sufficient stock in the system to cover that till Saturday.

So what else element would you also take into consideration?

We take into account seasonality. [I9E12] So if there is anything going on, you know, makes that particular product increase its sales in the particular time of a year, so, obviously, Christmas, you know, some of the seasons that would mean the confectionary moves better, let's say. **And we take into account the weather. [I9E13]** I think these are something that we can improve. When we talked about the weather, we sort of look up the weather forecast and what's going on and then put a manual overlay. So somebody would says...you know, so normally when we got hot weathers sales increase by 25% on certain categories. Therefore, in our case look up that accordingly. **Nothing... there is nothing that's automatic enough in that ways that says, you know, 'if it is 25 degree, you sell 20% more, and if it is 30 degree, you sell 15% more, and if it is' ... you know, continuous in three day informing, we haven't got that level of data we can analyses. I think that's an area where we could probably improve, (to get) better system and better data. [I9E14]**

Ok, so about the allocation, is that based on store-SKU level or region?

It's... allocation is really based **on how many units we want to allocate out to... as a company. And it would spread across the store based on the, on the sales anticipation on that particular store. [I9E15]** So the store that selling the £100,000 a week will get more than store that selling £50,000 a week. It is a unit level, SKU level, yes.

Ok, so, how good do you think your availability data is? Do you think the data is accurate?

How accurate do I think it is?

Yes. Do you think the data you get from the store can reflect the fact you want?

I would say our... **our stock level, we check them out and something like 90% on our stores the stock is accurate, within plus or minus 6 units per SKU. So our stock is reasonably good from that point of view. What I don't think is accurate is when you then... that's how the average works. So when you then look at individual SKU within that, some are quite good some are quite bad. [I9E16]** And it is an area that we need to improve, I think as most company do and **I think we (will) only do that once we got, again, better data, in terms of, what do we think is in that particular store, what is sent and what is sold. [I9E17]** So at the moment we **try to use a no-sale report by product. [I9E18]** So every store get a report, I think it is once a week, that says, **'this are the SKU you haven't sold in so many days, please go and check' [I9E18]**, and make sure you... you know, you reset your booking, if necessary.

Ok, so you use the POS, the sales data to see how many are there and then check it, to see whether it is in line with...

Yes. But the one thing I would said is I don't think we particularly... I wouldn't say we can tell you any one SKU at any time, how accurate it is, we **only do that when we do a stock check, or we think there is problem with particular SKU. [I9E19]** So, if we gonna do a brand new product launch, we think something is really important, then we will do that, at that particular time. So we might not be... it is **not automatic in the way that it start looking to these SKUs because we don't think we got them in moment and time when we trying to do something in terms of allocating and checking a particular SKU. [I9E19]**

Ok, when would you think it is necessary to check the stock? Is it when you have to launch a new product or?

Well, **launching new product, and we think the product isn't selling as good as we like it to sell. [I9E20]** So if we think sales are normally, I don't know, 50,000 units for this particular item and we only selling 20,000, but we think we got lots of stock in stores, then we ask the store to go and check that they have got the stock. If they got the stock then to confirm it is on the shop floor available for sale.

Ok, so what do you think would be the biggest difficulties in your current practise?

I think our biggest difficulty is compliances. Getting the stores to actually count accurately at the right time. [I9E21]

Ok, so your next step would be to try to get more data about it?

Yes, **more data and I think more on a live-basis. [I9E22]** So more accurate counting at the moment in time we know that the stock file is actually correct as it work... updating immediately. So you know, put the stock file in a live basis would make it easier.

Can you explain it a little bit further? Is that already on your agenda?

Yes. **So at the moment the stock system, when we want to count stock, we can count the stock in the store any time of day. But we code the way our system process, it doesn't actually update the store book stock. [I9E23]** On the following day and the day after depending on when they have done it. So that means... It shouldn't make any differences but the stock might be gone up when we count particular product, if they don't do it in the right sequence, you actually... **So I think we got to improve our system in terms of timeliness, so we can get more accurate data to make our job better. [I9E24]**

Ok, so when you try to improve the timeliness of data, is there any challenges or difficulties on your way in implementing it?

Well, **I think as long as we got the right focus on it, the right level of management on it, I think we get the better job done [I9E25]**, which is what we done over the past six months

or so. **Really made people aware the important of counting stock and making sure it is accurate.** [I9E25] And our number have improve significantly.

So, can you talk a little bit about how you make the improvement? To make people get aware of this and...?

Yes, so **number one is make sure your procedure is simple.** [I9E26] Make sure that people understand that. And sure they understand the importance of why they doing it. And then making sure they are getting trained properly in our store and we follow through if they haven't done something. So I think, as long as you get the training is right, the procedure is right, tell people (it is) important, they understand why it is important that they doing it, and then **make sure you follow through** [I9E27], then it would start to work. I think if you don't put those things in place, if you don't follow through the people, generally, if they are not doing it, know the good of it, and therefore they don't bother.

Ok, so do you think it is difficult to get them aware of it, or it is manageable?

I think we, where we make people aware of how important it is and then measure that they are actually doing it, they understand why they are doing it and they start to comply. So we got a far better result by doing that rather than just sort of... put something in and then forget about it.

Ok, about the forecasting, and allocation, could you share what is your current practise and what's the plan for a near future?

So, **the forecasting we do at the moment is largely based on spreadsheet and based on history.** [I9E28] Unless we get it into that new replenishment system, which take all history and it is automatic, but that would be 40% of our product range. **The allocation system, again somebody manually going through what they think they gonna sell, and allocating it to our store, based on general participation: product, stores, category participation.**

[I9E29] And then the future is, we are about to embark on a, we spend six month trying to test the system, our new replenishment system, and then that would be... **We are in the process of rolling that out into our first store now, we will do a second store within a few months, and within the next six months one complete category, probably across...**

Probably not all store but a large number of store, but we will roll a category out [I9E30], as we think then we'll get some real result out what it can do across the whole category, rather than in one store. Because, previously where you got a lot of focus on one store, it improves anyway.

Ok, so the allocation system, from what I understand it is largely based on historical data.

Yes.

So how about the new product?

Well, again, when we go into the new system, that would enable us to pick a product, so. As I said to you before, **if we know a particular product sell in this particular fashion, we can use that profile to forecast what we think is gonna to sell. And apply that for store, rather than, somebody just give me a blind allocation, that's how it works. [I9E31]** So for example if a store got better participation, you know, stationary rather than food let's say. The allocation system, the system would know that particular store is got a better sort of participation at particular products, we will allocate more to the store based on that participation, rather than the average.

Ok, so do you now have any difficulties from the supplier side, will their performances affect your operations?

Em, in terms of suppliers. I mean again at the moment we tend to... **if we got a problem with suppliers, we'll contact them and says 'what is the problem'. [I9E32]** Again, **one of the things within the process we are doing, which we haven't got all the supplier, but is to share with them some of the forecast history, and the forecast of sales. And when we done, generally we got better result from our suppliers. [I9E33]** When we haven't share it, what tend to happen is they tend to try what we are doing, and that's leads to... I wouldn't say it is problem, but **differences in terms of what we think we are doing, compare to what they do. [I9E33]**

Ok, would you also use the operation system you have now to inform about the cost in the finance side?

No. We just haven't get that capability ... Clearly we hold the cost of the product and margins, those kind of things, but don't do anything in this moment in time that takes into account the, the characteristics of that product [I9E34] or the life of that product in any stock rotation, we got food because of it. So we don't get into that kind of sophistication at this moment.

Ok, how is the proportion of new product allocated to the store, does it takes a large portion of the whole product range or not that much?

We want to get all of the product range eventually (in to the store). At the moment, we probably only got 40% of the range of store. [I9E35] But that's purely because we just in our... we just try to learn about it basically. **At the moment we can do one-store trail. We put on category by category, week after week. Once we got comfortable when it is working, put the next category and so on. [I9E36]** At the moment I think we are

replenishing about 40% of the line in about 80% of the sales. And on the next few weeks, we would take that, probably 80% of the product and 95% of sales.

So this trail you would do it per store and see what work best?

Yes.

Ok, so would you also involved in the layout planning inside the store?

I personally don't get involved in that. But **one of the things we trying to try together is when we implement this new replenishment system, we need to know, you know, how much of the shelf a particular product takes up, and therefore, on all the category we put onto the system, which gone back into proper space management plan [19E37],** so that we can see which product is on which part of the shelf. How many facing it got, how big the shelf is, we can calculate the level of stock on the shelf. So, are we doing that everything at this moment in time? No we are not. Do we like to do it in the future? Yes. If you consider the nature of our business, we don't think we can get, 100% of store onto proper item level, or SKU level. But I think we might get 40% or 50% of store based on this.

Ok, so I think that's more or less the question I would like to ask you.

Yep.

Thank you very much in taking part in my research and for your support and help.

-End-

A.10 Interview 10

Respondent 11 – Vice President Pre-sales – Company X

(...some chatting ...)

The firm I work for is Company X, I am manager of the team of people who are responsible for explaining how the technology operates in the retail environment. And part of the solution set of that we offer, include consumer data insight, and we provide service and analyses, who take the page form retailer and help those manufacturers and retailers interpreter that in order to get closer understanding of how consumer behave within their stores and network environment. And the consumer insight element of my firm... **an integration of the business about a year ago, at which point we start to talk about the insight-driven supply chain. [I10E1]** So, how consumer insight could drive all of the operation from the consumer back up through the supply chain for support **more accurate decision-making and more accurate planning, and better responsiveness throughout supply chain as consequence. [I10E1]** So, that point, that was where I became a little bit more knowledgeable, and I said a little bit more, of the topic of big data. But there are people within my business and they know a little bit more than I do. So don't make me struggle too hard (smile).

No problem, I won't. I think there are a lot of things going on how to crunch the consumer data but there is actually very little about how they are used into the supply chain or the operation, so I think we can talk over that.

Ok. So **that very point which you'll find is that the idea is still in development. [I10E2]** People are still learning how this data can be use so there is an gap between theory and practise. And there is... **I am sure there is money to be made through better understanding of the consumer in determining assortment, layout, the efficiency of the supply chain and better use of localised and even customise level forecast for driving upstream supply chain activities. [I10E3]** But it is an emerging science rather than a mature one, that despite the fact that services have been around for many years already. **Most of the activities so far have been about driving customer to buy more rather than the optimisation of the supply chain. [I10E4]**

Ok, so in terms of assortment, how is the customer insight is now being used?

Well, how is it being used and how can it be used is different question. **The way in which it is intended to be used is to provide more localised assortment that meet the specific consumer need of individual stores in individual retail locations. [I10E5]** So, assortment is all about having the right product in the right location to meet the localised anticipated

demand. And one of the way to better understand how consumer is behaving as individual level, rather than how the customer group is behaving at the group level is capitalised on more and more granular data. [I10E6] So the data that we are paying currently, POS information through a aggregated... in order to provide a view on what's being brought by who, merge with the loyalty scheme data, 'this consumer buy this', enable retailer to potentially build an accurate picture, on the type of people that shops in their stores, (and) of their assortment requirement. [I10E7] So it is a... there always been a lot of science apply to getting the assortment right. But this level of consumer data, and understand who your profitable customer are, rather than just your non-profitable customer or medium (profitable) customer, and tuning your assortment to meet the range of your profitable customer group is really what part of that data is about. [I10E8]

Ok, so is this still underdeveloped and is for the future or there is already some trails going on in this sense?

This is activities already undertaken by customer that are wailing themselves, as customer insight data. [I10E9] So they are trying to tune it to build an automatic assortment. But at the moment, I suppose the gap is between the physical analytics that going to it and the actually automating the process through respond to the data. So in the middle there is awful lot of good old fashion analytics that goes on. [I10E10]

So by that... is that mean how fast you can analyse the data and get the insight, the gap?

Yes.

And you mentioned about assortment around the profitable customer, so could you explain that a little bit more in detail please?

The management of assortment is a continuous... retailer everywhere is trying to be more accurate in tuning their assortment (to) the local need of customer. So, **the customer who shop in the specific location. [I10E11] So, it's easier to get the few product right, but if you truly understand that which, what is the nature of your customer that are shopping at each individual location, you could fine tune your assortment to both exploit and maximise the type of client that already shop within your retail establishment. [I10E11]**

But you could also star to attracting those new customer, you may otherwise have gone elsewhere. So **consumer insight in terms of what type of (people are) living in which type of area, what (are) their typical spend and the crossover between their activities in one store or even multiple store and start to tune the assortment to a specific area. [I10E11]**

One example we... this maybe... is one of those things sometimes become a story, but very often, a retailer may for example, tune the assortment to the wealth of the region. So in the

UK, expensive area might be Knightsbridge, so there is an assumption therefore that, which type of product should sell in those type of stores. But underneath the data you may find some pattern that contradict that, and the reason is... so this as I said is a story, but you might find as a consequence, the wealthy people tend to have maids or people look after their houses, do their house work for them, work for them in the house, domestic servants. In fact, the domestic servants do the shopping rather than the wealthy landlords or house owners. And, domestic servants therefore buy a different range of product to those which found in the demographic. So what you start to do is you get a **contradiction between historical sort of demographic data, and the actual consumer data that indicate what product should be sold in which stores.** [I10E12] And really what... is all about optimising the information, making... capitalising on the right assortment based on the real type of people who shop in the location where your shop is. So you may think that the... those individual would buy expensive wine, and they may well do, there are maybe also other product in the range that needs to be there, that brought by the staffs, to support their own living whilst doing the shopping for the wealthier participants. Consumer insight data that can really gives you a chance to understand that balance. That's an example, is a little detrital but services the points.

Ok, so... we talked about that the analyses is not fast enough, so at the moment this is used in a long-term basis or how it is?

It is not slow, analytics takes place on a, often on a weekly basis, or more frequently. The challenge for a retailer is always the trade-off between the knowledge has and being able to implement the amount of changes in the store required to optimise. [I10E13]

There is a balance between getting it right all of the time and the amount of changes that need to take place. There has to an appropriate frequency of range changes, assortment modification. Because **customers get fed up with routine changes in the stores, they can't afford to make changes that they need to on such dynamic basis. So changes have to be managed accordingly.** [I10E13] So there is potential for a gap.

Ok, so how about the availability? So now you have the assortment right, how the supply chain capability come together?

Well, it is the... more and more people are talking about the real-time metric of retail. There is always **a challenge to get more assortment into same space, but also to have the right product on says, the different time of the day.** [I10E14] And what we are seeing is decide the area of **real-time retail**, being able to respond to what consumers are doing. **Not just on a daily or weekly basis, but what they are doing by time of day** [I10E14] is become an increasingly important feature of how retailers are optimising their supply chain. So, whereas

in the past there it was good enough to have a product available at the beginning of the day or at the end of the day, consumers are now looking for things to be available specifically during parts of the day. And for the range to change potentially, **retailers are looking to change their range during the day, even change their prices during the day [I10E14]**, in order to meet the demand of customer and information they get from elsewhere. **That's not just consumer insight, it is merge to other information available from their own insight or their analysis of what their competitors are doing. [I10E15]**

Ok, so the information that would merge together is consumer insight and competitors' and what else? Sorry I didn't get that.

Yes it's consumer insights, **it's space and where knowledge of what happen within the store [I10E16]**, and it's pricing: **most retailer has position their pricing according to their competitors. [I10E17]** So, they wish to be the same, or less expensive or more expensive by percentages of their key competitors, **and they want to be able to respond, sometimes in real time [I10E18]**, to knowledge what their competitors are up to. So the pricing side of insight... but from the supply chain, your second part of your question was, how do this drive the supply chain?

Yes.

And essentially, **it put new pressures on, in terms of being able to handle more item in small quantities but on a more frequent basis. And continue to be as efficient as ever in delivering to the stores. [I10E19]** So the supply is helping to handle smaller, more frequent deliveries, start to handle smaller product and more cases as a consequence. Moving to the supply chain... **as people try to optimise the case size, so that things can go straight to shelf. Having to handle to the elimination of back rooms in stores, warehouses, really optimise the amount of product that's on shelf. [I10E20]** And there is new information required about when was the product out of stock. **When was the next delivery required [I10E21]**, it is demanding perhaps, in day deliveries, more than the traditional patterns of deliveries. So, it's stressing all of these common issues that supply chain has always had to. **You has to be more complete, the data has to be more correct, the integrity of data at every point needs to be visible to everybody within the business, almost in real time, near real time. [I10E22]** They have to be reliable, **the supply chain has to be faultless reliable in order to support front shelf availability at every step. [I10E23]** And the in-store processes need to adjust, so **supply chain as a planning process is starting to creep into the store environment [I10E24]**, more activities, in terms of store planning, schedule, than ever before or needed to be. **Typically in the past, the supply chain kind of ended in the point at which the product is delivered to the stores. And thereafter is down to store**

operation to kind of manage themselves, once the product arrive. Now there is more routine being brought into the way in which stores operate. And increase systemisation of that. [I10E24] (At the) Same time you got the... the reliability of supply chain is faultless. **The responsiveness of the supply chain to unexpected event increase... needs to increase, to get a great deal more demand for shorter lead-time from warehouses to supplier to the store more frequently... same day delivery or multiple delivery per day, in order to support a more finely tuned assortment. [I10E25]** And lastly looking at more evidenced practises really, in terms of **challenging the way in which things has been done in the past, and looking at new ways of meeting the needs of customer. [I10E25]** See things like click & collect emerging as a concept, which is very common activity nowadays. You got the idea of drives, where can pick up from the store but having the other product placed directly into the car, and never even necessarily seeing the stores. You got dark store concept, which are like model stores, but consumer don't have to go inside them, so they are just like store but pick as they were warehouse, and the customer is served from the back entry of the dark store. **So we are seeing a lot of innovation if you like, in order to accommodate a more efficient, dynamic customer type. And the big data, if you like, helps you understand in more detail, what those consumer patterns are in reality versus in theory. [I10E26]**

So, you talked about the supply chain needs to be more responsive, so what would be gap from now compare to the ideal situation?

Well, it is **more frequent deliveries, smaller products, and more frequent, within day delivery of perishable product. [I10E27]** And... I tended to talk about grocery as oppose to other supply chain. But, **more customer-specificity, almost pre-conditioned item, so the knowledge of who the item is for, is visible higher up the supply chain than before. [I10E28]** So in the past for example an item is labelled for a store, now it may be labelled for individual customer within that store. **And it may have been customised to meet the need of that particular customer. So this is less true grocery typical but more true of fashion, more true of some other item, there is increasing customisation activities within the supply chain, aim at meeting the need of specific customer. [I10E29]**

Ok, so, do you think the supply chain is not able to handle this yet or...?

There are examples of it working well. I don't think anyone anywhere has got it right. But the supply chain typically, **most of the principles we talk about here, have been constant for the last, well since 'supply chain' was coined as a phrase [I10E30]**, this is about 1994 I think. So **the principle of supply chain have not really changed, what has changed is the degree of finest, and the acuteness of the need for all the activities to be working optimally. [I10E30]** So, lead-time are shorter, the range is bigger, but essentially supply

chain is there to make product available to the customer at the most efficient price, and it is just getting more difficult to do that. [I10E30] The challenges associated with doing that... the standard is increasing all of the time, and the required standard is moving all the time.

So, in terms of increase responsiveness, do you think more effort need to be done on the process and the infrastructure side rather than the data... the 'soft' side?

Well there is no point in just... in truth both have to understand each other. **So the value, the insight can provide needed to be understood more by the retailers and by the people within supply chain. [I10E31]** And in response, **the supply chain needs to be able to... to gear itself up to be able to provide the service that are required. [I10E32]** So, on the assumption that you are taking good quality information from inside available then the supply chain needs to meet those new challenges. And it can only, er... **the first rule is to understand what the challenges are and why they exists so that the communication channel right the way through. [I10E33]** It's one that needs to be better understood.

So you mentioned about the pricing different products even within the different times in a day. So how is it done?

Well, actually there is an indoor activity. But there are examples around the world of **customers' changing their assortment from early in the morning till late at night. [I10E34]** So base on the fact that you have the lunch time traffic, it may be looking for sandwiches and instant gratification, hot meals, food to go, food to be consumed within a few minutes if it's not there and then. But at the end of the day those very same stores maybe trying to sell an evening meal to be taken home and cooked later on or they may be doing the home shop for the whole week. So if you imagine, for example, a retail store on a railway station, the morning traffic is very different and the demands in the morning are very different to the returning-home traffic in the afternoon. **So the smart retailers are learning to adapt their ranges and their assortment during the course of the day in order to meet that different requirement. [I10E35]** This is a feature of convenience retail and it's one of the **big challenge stick to convenience retail that needs to address. [I10E35]** But the **knowledge of what to do and where those priorities might be is buried in the data that's available to the retailer. [I10E36]** And it's those kind of insights in those kinds of analytics adds up the value.

Some would argue that because this thing you can done it from analysing the historical sales data and you do not necessarily need to know which customers and, I mean, you do not need the big data insights to do that. Do you think that's the case?

Well, I think there is ... what is big data and it's back to your original question. **(I think) Big data is an amalgam of not just the consumer insights' data but, as you mentioned, the shipment data, the forecasting data available from POS or from other activities.**

[I10E37] It is knowledge about the assortment and the space and it's knowledge about the different behaviours of the trends, so, big data has the potential to answer every question. The challenge that the retails faces is identifying what are the priority questions that need to be addressed. And primarily responding to the insights that those can provide. So **most people start with the understanding of the data, a relatively structured approach to what they can obtain from the data that's available. But often those historically have been handle in isolation to one another. So consumer-insight data often was blind to the data available within the supply chain, for example, and the vice versa.** *[I10E38]* So, the challenge now is that **big data is to integrate the data sources in order to get value-adding insights from the totality of data that's available.** *[I10E38]*

So how do you think the supplier can be involved in to do the range planning or space planning?

It should be a collaborative process and the increasingly it is. So, for example, **in the area of category management, space management within stores, historically using... and manufacturers themselves, have been a contributor to the analysis of the assortment optimisation, practices that happen within stores, probably not enough, but they provide, if you like, a narrowed but deep insight into helping their products' operated within the store.** *[I10E39]* Whereas retailers obviously have different problems to solve, he has to manage the whole category of products, he has to manage the whole retail environment. So their focus tend to be wide and shallow. *[I10E40]* So the **benefit of the collaborative approach is that you gonna get a T-shape organisation** *[I10E41]*, which is constructed from the breath of the retailer and the depth of the manufacturer. And if you could focus on both of those teams appropriately on the data that's available, then you get a better level of analytics. **Historically, retailer has not had the analytical skills to provide the services, the rich insights themselves. Consequently there are businesses like us and others that provide the analytical services themselves and particularly for customer insights.** *[I10E42]* But also across the supply chain manufacturers were always played quite a detailed role in understanding the behaviour of the product in store and reporting that back to the retailers. *[I10E43]* So it needs to be a collaborative process ideally, to get it completely right between manufacturers and retailers, big data shares commercially between the parties. *[I10E44]*

You mentioned that retailers focus more on the breath and the manufacturers focus more on the depth so what is ... I don't quite get it...

Well the manufacturers have a limited of numbers of product to sell in the retail environment, so if they have the data available they can **dig deep into that data and they will look at how their products are behaving in a more focused area in a supply chain, whereas typically a retailer is structured, not structured but has to look more broadly across multiple categories. So typically what they are looking for are big commercial patterns across the retailer estate. So, by combining the breath of the retailer with the depth of manufacturer, you get a more completed view of your opportunity and the potential from the data. [I10E45]**

Do you mean that suppliers, they are focusing on one product; they tend to be more sophisticated in, maybe, forecasting demand of one product?

Well, that, forecasting would be one part of it, but it is the knowledge of how a particular... if you are brand manager, **someone at Company J or Company K or whatever it might be, you are very interested in what is the drive of sales of your products and interested in how it is that the people who shop your product, buy your product. [I10E46]** Whereas, a retailer would be more interested about how people who come into their store shop across a category, when they buy one product, what other product do they buy. And which is much less focus... it is the right focus for retailer. **So if retailer can work with these manufacturers, he can taking these information from the manufacturer about what drive the sale and behaviour in his store. [I10E47]** He can combine that with his own knowledge of the insight from consumer, and you get... There is a trade-off between sharing data and being the optimum shopping experiences for everybody. Because what's in the interest of Company J is not necessarily in the interest of the retailer completely. So, both sides need to be empower, if you like, to influence the decision. And the data, the data insight that the manufacturing can bring to retailing, particularly have the skill emerges, are huge. So they have the ability to... bring evidence to retailer about how their consumer shop their product in order to influence their positioning, the assortment, and the proportion of category that they might sell to customer.

Ok, so how about the space planning?

The space planning has always been collaborative activity. [I10E48] Typically both manufactures and retailer are involve in the space, but consumer insight data tells you really what sort of... **first part of category management, is assortment. And then once you got optimised assortment, you range that most efficiently and effectively. [I10E49]** So combine with data **how people shop, and the relative position and the adjacencies of product and these all have some influence. [I10E50]** So, if you like, what are the simplest level you can use customer data to understand the benefit of having one product on the shelf

above or below eye level, and can move those around. But that's kind of... so **what really the challenges now is to get the maximum assortment into the minimum space, using the space.** [I10E51] **I think big data, if you like, is only just being used to influence the location of products rather than the... it is being more effective use in promotions and the setting pricing and assortment than it is the actual physical layout of the store.**

[I10E52] But that's wrong, I mean the trajectory have to be that more data is used to better inform the layout of store and the adjacencies and the way that product looks on the shelf.

Ok, so now there is some case about planning the shelf with suppliers, talking about the packaging size, and all sort of that, so what would be the next step for the space planning, what sort of data you think should be included?

Well it is more about the... **I don't know to be honest**, it's a good question (smile). Where do we go from here, and... we got the assortment right, space need to be better optimised, more product would emerge, I think then... we reach kind of the inevitability of packaging and the type of packaging that are used. So there is... **if you follow that line to its conclusion you gonna get more smaller product, you'll (have) whole diversity of different product sizes depending on the type of environment, and that's the pressure supply chain always try to resist.** [I10E53] Because obviously you want to deal with the same products, and so it went to the retailer and all the way through. So, I haven't got an answer for how that would actually look, **but you could imagine the right things is really about targeting the assortment, that the product in the... by time and day within the retailer, supported by in-store and supply chain processes.** [I10E54] That's the step after that to that new requirement. So **historical measures of on-shelf availability in a point of day, now is about availability 24/7, it is whenever the store is open, having a good presentation whenever the store is open.** [I10E55] And that's gonna says so, basically the performance measures, that drive the supply chain, drive retail, will be tighten up, that new standard gonna be set. Perhaps some of the old way of looking at things needs to change. On shelf availability in particularly is been a... a banner for supply chain. When I was a boy it was 100% on shelf availability at the lowest, total supply chain cost, that was what our objective was, but our definition of on-shelf availability was on shelf, at the time, at which somebody chose to go in and measure the store. **Now I think you'll find there are target for on shelf availability that need to be parameterised by time of day or even by hour within the day. And if we really going to meet the need of this more fluid customer, more demanding customer, then the standard needs to be increased.** [I10E55] And by which mean we measure success, need to be changed.

That would probably change replenishment practices a lot as well.

Yes.

Ok, so in terms of the replenishment, what would you think is the state-of-art of current practices?

It changes all the time. It's about **real time knowledge of in-store availability.** [I10E56]
And there is a different and to more and more retailers... the concept behind that statement is really being able to understand the... **not just the inventory but it is a good example... It's about being able to understand the status of your stores, at any time during the course of the day, it's in real, or near real time. So you know your profitability, based on your current wholesale prices, which may be changing, you know your availability, where your gaps are, and how long that gaps would last, if there is a gap, and the ability to respond to that knowledge almost in real time. So, when a product is out of stock you do something about it there and then rather than wait till the next day.** [I10E57] So, I think the concept is about real time retailing.

Ok, and how far... if there is an average industry level, where would that be?

An average we don't know. But there is **some mix examples of good practises around the world and it rather depend on the prevailing technology.** [I10E58] For example, the **availability to be real time, does require some technological advancement.** [I10E58] For example if you want to change your price during the course of the day. You can't do that if you are dependent on old fashion paper label on the shelf. So, if you want to be response to pricing in real time, you need a mechanism by which you can change the prices on the shelf in real time. So, you need electronic digital things, there is an example of why technology need to anticipate and be available to support the trend. **System needs to be able to handle information in real time and most retail system have a degree of batch processing build in.** [I10E59] But with the development of web services and things of that nature it means that the opportunities to capture data in... **streaming data from one location to the other and the right-up-to-date in terms of what's just gone through the tills for example (is possible).** So, **the technology is available but needs to be applied and the old fashion idea of 'one day staring and another one ending' is kind of a...** [I10E60] it is all about being having the very latest information at your fingertips, responding in a minute.

Ok, right, ok. I think that's probably more or less the questions I would like to ask you, thank you.

Ok.

-End-

A.11 Interview 11

Respondent 12 - Director Projects & Business Development Supply Chain – Company Y

(...)

Ok, so my sort of background is corporate business, now worked for Company Y Europe...and you know, very extensive experience in different areas, including services, sales, marketing, buying, and specialised in supply chain and logistics, and now really, focus around continuous improvement. Currently directing a transformation program for the Company Y Europe business, which is transforming the whole business. And had a... quite a few in-depth conversations around our business intelligent capability, experienced around corporate system if you like, the biggest challenge we found in... **My experiences is around the legacy system, architecture and how you extract data for business intelligent and business use, and business insights and get it into a format, which is standardised and usable [III E1]**, and that's... the challenges this business has got right now. You know, **inform all various departments of what's going on and what's happen... so that they can predict and forecast the future. [III E2]**

So, about this transformation plan, is it about reporting the data to make it more consistent or that's just one part of it, there are still other elements?

Well, that transformation is touching every single area that business where... you know, **changing our business form a country focus, country based business to an European organisation structure, which literally is touching every area of the business [III E3]** and you know, one of the critical things... **make itself transparent as we going through the process is the need for good data [III E4]**, customer data, vendor data, product data, you name it. **To enable the sort of... the directors of the various functions to make informed decisions. [III E5]**

So, what would be the outcome form the transformation plan? It is make data visible to everyone or...?

Em, yea, really. It is... you know, we recognise that we need a central information service, where we have a... you know, **a team of skilled individuals who can build, the relevant data warehouses and the relevant reporting tools that sit on top of these data warehouses and can also incorporate external information, you know market information, trend information, and... etc., economic statistics that type of things. [III E6]** So that we can... you know, make proper informed decisions and prediction for the future.

Ok, you talked about adding the external data, how would these data be used? How can it help?

Well, the critical things is... you know business... my experiences is business tend to... you know, all fall into the same trap of trying to predict the future based on historical data. And to certain extent clearly you can do that, but what the expert would always tell you is, if you look backward to predict the future you go into the direction that you been going and if that's decline, you would continue to decline. The... **you know you need to understand what's going on in your market and what the trends are in the world, and the market that you operate, and what your competitors are doing, and also, you need information inside in terms of what your customer expectations are.** [III E7] You know, data in it self is good, historical data, trend analysis and... you know, you can... extra like that type of data. But almost in every cases, if you do that, you are not going to be sucking yourself for success, unless you take into account all the elements.

So, about the customer expectation, how would you collect that?

Through customer research [III E8], you know, I have done quite a bit of that. My experience, the only way you do that is go ask. We ask, for example, **this business ask customer, sample of customer on monthly basis through online research and telephone research, you know about their preferences and about their expectations, about their service requirement [III E8]** ... you know, what's happening in their business and... One thing that I don't think this business do really well is gaining that feedback through its sales force, through its touch point. So you know, **a business like Company Y got touch points through sales people through delivery agents, etc. And their potential opportunity to collect good insight... I have not seeing that done very well but it is... I would suggest it is a good way of collecting information from customer.** [III E9]

Ok, so when this system is implemented, what sort of the decision would be the main user of this system?

Emm, certainly the marketing organisation, within every business, sale organisation they are the one who own the customer basically. But then you got... you know, the merchandising community, particularly around product assortment, and... they are probably the key user of the data.

Ok, so about the merchandising, how their assortment are done at the moment?

Well, **decisions on assortment selection of... is pretty much driven around the information our vendors give us.** [III E10] You know **the vendors are very... you got good vendor relationship and when you develop these relationships with vendor you got**

good insight and information they have... they do a lot of trend analysis and research and research and development to the product. [I11E11] So, you know, that's good. To take that information, **but it... you know, you also have to have your own view of your market and your customers in terms of what are their requirements of a product expected. [I11E12]** You need you inform yourself from that through customer research.

Ok, is that one of the most important purpose of the transformation?

Well, it is all of it... it is not only merchandising, it is one of it, yea. But, you know... is to provide better data and better analysis and ultimately insights to all departments but the one I mentioned are the one that's... you know, **the most critical in terms of success of the business, marketing, sales and merchandising. [I11E13]** Supply chain would benefit from the data, customer services would benefit from the data... you know, every department would, but is sale that's gonna... will get most benefit.

Ok, and how this transformation plan is initiated? How it get started?

It is the business need, and... you know we... Frankly, were **initiated from a changing strategy form corporate level [I11E14]**, which is the right way, you know. As we then work out way through the various individual business area in terms of what... how they need to transform their business, it became apparent that... you know, one of the biggest challenges that we face, we would having good information, good data, good insights.

Ok, so beside the assortment, would you also do the pricing?

Yes, **that's part of the merchandising team. [I11E13*](**as further clarification*)**

And how is the price decided now? Is it also based on information from vendors at the moment?

Yea... **we do a little bit of competitive analysis, but nothing else. You know, there are price scoping tools that we use, which, you know, script the internet... our competitor sites prices on a daily basis actually. But how extensive is that incorporated into our business intelligent, I doubt. So, yea, it is mainly based on vendor information. [I11E14]**

Ok, so, for the new system, do you have plan to build in more element (for pricing)?

Yea we do, we **have a plan to strengthen our data warehouse capability and external data gathering capability and then, you know, overlay that with... you know, business intelligent reporting software we use. But you know, that's... basically needed to be upgraded in terms of IT architecture but also upgraded in terms of data quality, and data standardisation. [I11E15]**

Ok, the data quality issues, is it because the reporting is inconsistent or there are some other causes?

It is... poor source of data, data creation. That's it, really.

Can you explain it a little bit more in detail about the data creation?

It's manual. Er, far too manual [I11E16], you know, if you look at... The challenges for business like this one is that **we operate in... I forget how many different country, with different systems. [I11E17]** And **most of our data is created through contact centre manually, with interaction to customer, through customer inputting online, through teams within, you know, administration function creating product data, vendor data for example. And it is all... non-standardise, prompt to errors. [I11E18]** So that's, you know, big challenges to us.

Ok, so how about the availability of the product in the retail business, do you have any problem of that?

I don't understand the element of that.

So, would you face the situation of stock out, you do not have the right product on shelf?

Yep, yea, 'course we do, every business does for various reasons, you know, **poor planning, poor forecasting, poor vendor (performance) on anticipated demand. [I11E19]**

Ok, so the replenishment to the stores in retail business is based on forecast?

Yes it is, primarily, all with the problem for retail business. [I11E20] But there are, you know, good processes and software packages that you can implemented to improve that, and we done that. And now we are implementing integrated business planning and we integrated a new piece of software to standardise upon European basis, our forecasting capability. [I11E21]

So you mentioned the integrated business planning, and what is that exactly?

Er, that would take 3 hours to explain that to you. But have a look at it, research it, really interesting, it would be really well worth getting to know. **The goal is when it comes to integrated business planning... it is what it said. It is... you know, how you get all of those elements to the business on monthly basis, talking and working together to create an integrated plan, so that your forecast accuracy is greatly improved, reduce obsolescence, reduce stock out, etc. [I11E22]**

Ok, would you also involved in the layout planning?

Em, yes, planogram. So, you know, we have a planogram process in retail stores. Yep.

And how would that be planned?

You know, I don't know. Er, **I don't think there is any great deal of sophistication to it. Again, quite of a manual process. [I11E23]**

So, in the transformation plan, what would you think would be the challenges or difficulty?

Em, from a data perspective you mean?

Everything, it can be managerial issues as well.

Oh, em... **biggest challenges are the HR issues, around people. Manage, communicate how you consult [I11E24]** ... that's the biggest challenges and the biggest risks, do I need major transformation program.

So you mean the people they are not... they do not quite want to change how they operate?

Yea, yea, you need to **manage people through that change. [I11E24]**

Ok, and in the technical perspective you think it is fine or...?

Em, no, no. Not at all. It's... **the technical challenges are vast when it comes to big data [I11E25]**, not least, to which a business like ours, you have **multiple ERP system, you know, got various different data structure and you know, so a product appear in one is actually, you know... The way you enter that into one system is different from the way you enter into another one [I11E26]**, so from a business intelligent... you want to centralise your business intelligent, your data. **You somehow need to be able to, you know, consolidate and standardised that, and that's massive challenges. [I11E27]**

Ok, so when the transformation plan is... kind of finished, then... is it in your plan that you would have one team to manage all the system and analysis?

Yes, **we would implement a central intelligent, central information services effectively. It would manage the extraction of data and the data warehouses. [I11E28]**

Ok, and how about the analysis? For example, the merchandising, they would still have their own right to decide what data to use and what analysis to do, or that's...

Yes, that's exactly the approach, **we have a central information services, but we then have analyst within each of the functions to utilise that data. [I11E29]** And, you know, make prediction, etc.

Ok, so do you think the function aware that they can have more sophisticated analysis with the new system, or not really?

Absolutely they do. [I11E30]

Ok. I think that's probably more or less the questions I would like to ask you. Thank you.

OK.

-End-

A.12 Interview 12

Respondent 13 – Senior Vice President – Company F

(...)

Ok, so I lead data at Company F, which include all the data asset, as well as sort of the solutions that we have for managing the data, and we kind of oversee the overall of data community, all the people at Company F that manage and delivery data solution, which is probably about 180 people I think in the organisation today. And... so my background is principally been with Company F in various role including sort of... designing and managing databases. But also a lot of role around the use of the data and applying it in things like consumer insights and... particularly in retail sector, in other sector too, and also using data for driving personalised relevant of marketing communications.

Ok, so about these solutions, is it mainly about consumer insights and marketing application?

Yes, so the organisation as a whole is really about that. So how we create, how we can help our clients to use the data they have, and the other data asset that may not be in their business **to help them understand their customers and their business, through the eye of their customer, and then help them make better and smarter decisions to better meet the need of those customers. So they chose to shop their... em... you know, one more time and... you know, ultimately become more loyal customer [I12E1]** that... we are helping our clients in that trust and loyalty.

Ok, so what data would you... (use) as an input to create that insights?

So we have focus on certain sectors in the last few years, grocery retail and FMCG, and the data that we used to... help clients in those sectors is principally **retail shopping data. [I12E2]** So, **transactional data from grocery retail, sort of point of transaction. [I12E2]** And, we work with **Company D in the UK for instances, and we work with other retailers in other country around the world [I12E3]**, and we work with Company D in many of the... in all of their market in Europe and Asia, and... So **we include shopper transaction data, at the lowest level, so each item in the basket that's purchased, as well as the information around that basket, like the time of day and payment methods, all sort of things. [I12E4]** Ideally there is **some kind of customer identifier, they comes from typically a loyalty program in grocery retail. [I12E4]** And then there is **the loyalty amplification information, like personal contact detail [I12E4]**, so... you know, things like name and address, that sorts of contact detail are used for communicating with customers. And we may **get preferences or data of birth and age [I12E4]**, that sort of attributes too. And we need a lot of **retail reference information, to able to interpret the data, things**

like, product library, so that we know... you know, what each product code relates to. So, brand and pack size and the price and all of those sort of things. [I12E4] We get promotional information, to understand what promotions are being run in any particular time [I12E4], but we get information about the stores, so store size, the store layout, store locations, and we get information about coupon, coupon usage and the coupon details, we get contact history [I12E4], so there is kind of a lot of data within retail that... the retailer that we receive to be able to turn the... sort of data into information and then insights. And we use data and information that's outside the retailer business too. So that might be lifestyle survey, lifestyle type information, of demographic and age, it may include drive time data, competitive store data, we may use data from other sort of data aggregators, who gather things like, em, total market sales, or run shopper panel that gather market share information and understand customer shopping across different retail outlet. [I12E4] So we may use data like that, and then we may also use, kind of media data, to help understand the influences that are important to different customer, and how they respond, and also to help us to better target, communication and even advertising. [I12E4] So that could be things like 'how we could leverage asset like set of boxes', viewership data or social media data those sort of things. No, we don't necessarily access all of that, at low level and manage all together, some of that are very private data that we need to be respectful of. [I12E5] But, those are sources of data asset we typically used, and we drive insights from, so... Hope that helps.

Yes, there is a lot of data, so... I think it would be very difficult to blend them altogether, so, are you doing it or you used it for different purposes.

Yea, we do... well I guess depend on what you mean by 'blending together'. **Some of them needed to be used together, even if they don't fit into the same data structures. [I12E6]** But yea, effectively we need to make sure that the data are connected in data structures. 'Cause, particularly where things like customer insights, if you have... em, sort of 'isolated data set', or 'island of data' [I12E7], so you might have sentiment data tells you one things and research data that tells you another, and shopper panel data tells you something else. **If you manage those things separately, you can get different divergent insights from them, it is only when you integrated the actual data that your insights really come together and you get... sort of a single view of what it is that you are seeing and what you should do. [I12E7]** So the integration of data for customer insights is extremely important.

OK, so how did you manage to create a single view of customer from all these data in different structures and format?

So we... we **can build and manage some of the data structure that include all of that data.** [I12E8] And we can connect two data that allows us to derivate other information now. We **don't need to have personal detail about customers.** [I12E9] So for instances, we don't need to know that I am Respondent 12 and my address, **we just need to have a identifier** [I12E9], we will be able to connect to the right data set, using that identifier. So, having the actual contact, and name and address detail isn't important. But **for different customer ID, we are able to derivate and build up kind of, a understanding of who they are from the data that we have available of them.** [I12E10] So, for instances, within the world of shopping, we might be able to see that product purchasing that I have made over the last six month, and that's kind of the raw material data if you like. And what we do is to derivate and create new data on top of that, that describe who I am in a more relevant way or business decisions and strategy than actually the data itself. So **we might be able to identify that I am an adventurous shopper or I am very convenient orientated in the way I purchases, or that I have a family and** [I12E11] ... So we derivate those for use of the shoppers, through the different data set that we access. And it is that kind of view of data that become very powerful helping to **explain to an organisation who their customers are, where they are wining, er, which customer, where they are not meeting customer need sufficiently** [I12E12], and... And then really using that to apply across the business to help them be better forecaster against the strategy that have been chosen.

Ok, so how would they apply these insights and make decision? What kind of decisions can be benefit?

Yea, so there are **examples of applying it in a very strategic level.** [I12E13] So, em, with some clients and some... **In retail for instances, we have help retailer understand that... the choices that they made and the way their business is going is actually detrimental to some core sector customer, and therefore they need to re-align their strategy to better serve those customer.** [I12E13] So that's kind of insights... at very strategic level but helps the client work out what direction to go in, you know, whether to turn left or right, and some of those insights we provided have been very dramatic in helping our clients to change course and really get back on the right path of with the customer who are most important to them. So that's kind of strategic insights, like that, **and then there can be much more sort of... executional or activation insights, that is around how do you make sure you got the right product in a store and then you have the right pack sizes and you merchandise that right with the right product next to each other to help shoppers to... em, you know, navigate the store or buy the things that they need in a more effective way.** [I12E14] So it can be things like, those sort of assortment and merchandising inside, **so it could be price optimisation or promotion optimisation insights that we provide in... either in sort of ...**

strategic level, to shape the plan, or at the execution level, to actually says, you know, 'you need three facing of product X in those kind of store', so can be very tactical.

[I12E15]

So, when you talk about price and promotion, how customer insights can help to do price optimisation?

Yes, so the customer data helps to make better decision in pricing and promotion, than not using customer insights data. So, for instances, **you might look at the price elasticity of the product based upon all of the sales of that product and you would experience certain elasticity curve. If you apply customer data to it, what you can do is to slice the elasticity curve in different ways, if you like, by who are loyal customer.** [I12E16] So you could **remove from the elasticity, the sale that are associated with people who are highly promotional driven or cherry-picking that product, which can distort your view of elasticity** [I12E17], and if you distort that view of elasticity, you then would make sub-optimal pricing decisions based upon that. So that **customer data helps you make a more refined choice.** [I12E17]

Ok, so I suppose this would be a very complicated... process or algorithm, so is that very frequent you do the price optimisation or for, like, once several month for promotion?

Er, yes... not. It is very complicated, er... there are probably **different level of it.** [I12E18] **So when we first work with a retailer, we might provide some recommendation** [I12E18], that are about... you know, the top 500 product that they may need to get prices right for certain type of customer. But then it is... you know, as clients does get used to using customer data to pricing approaches, then we may look **to implement a piece software that helps them apply that to their business for day to day decisions.** [I12E18] So that they can use price optimisation software for pricing decision across their enterprises.

Ok, and how about the assortment?

Yes, assortment similar. So again we have... kind of ways of helping them **think about assortment and segmenting stores by different customer types, and what is the right sort of core range for those different segments.** [I12E19] But then also there are set of tools that we have, that allows clients to look at the most relevant assortment range in a specific store. So allow retailer to **make choices around the most appropriate ranges for specific store, and again that is a tool that can be on a desktop of the category manager who are making those choices** [I12E20] so that... you know across all the categories, the business is aligned on choosing the right products for the stores and **they can make those decision on a day to day basis, when they start using these sort of software applications.** [I12E21]

Ok, so how would these stores be segmented? How is the different types of stores are decided?

Yea, so **there are kind of nature classification of stores based on things like size [I12E22]**, you know, you got... big hyper market stores and you got small petrol... convenient type of stores. So, this kind of the nature classification **based on the store format. [I12E22]** **But then what we do is we look at the customer that frequent that stores, and understand what their profile and their needs are and then create a segmentation of stores based upon customer... sort of profile for the store. [I12E23]** So that may be as simple as we find that there are stores that need **to more oriented towards the value end of the spectrum, and stores that need to be orientated more towards... em, the high end or more upscale shopper. [I12E24]** So we identify those sorts of need through using the customer profile to help us understand... therefore what is the right profile for the stores.

Ok, but is that... if you have historical sales data you can also... kind of make similar decision based on what product sells well and what are not selling as well. So how do you think the extra customer insight can improve the decision, or what would be the difference of these two approaches?

I think **without the customer data or customer insights, you find that... those sort of decision about what the store... the role of the store is can be based on external data. [I12E25]** So, sometimes when you look at... where a store is located, you make **assumptions about who is going to shop there. And then you would make choices about the pricing and the product you put into the store based upon those assumptions. [I12E26]** What you sometimes find is, there are assumptions that you made, when you actually look at the customer data, (they) **don't reflect the type customer that shop there, they are actually... your store doesn't reflect the catchment but the index is much higher in certain part of the trading area. [I12E27]** Or you have a lot more, you know trend in trade or whatever it is. So, when you start to look at the customer shopping of that stores, you start to **see that the real need of customer who are there, that allows you to classified that store in a more relevant way and establish how you serve the customer that are shopping there as well as how you may better serve the catchment area. [I12E27]**

Ok, the customer type is classified according to their lifestyles and money they spend?

Yea, that kind of things, yes.

Ok. And how about the layout inside the store? Would you also use the customer data to benefit that?

Yes. So we work with retailer to help them **understand different types of needs, you know, different needs and adjacencies, things like that. [I12E28]** And... or in... you know things like home improvement stores, **help them understand the... the type of missions people do there. [I12E28]** So there may be refreshing their bathroom for instances. If you go to a home improvement store you may find that you got sinks in one part of the store, and you got pipes in another part of the store, and you got pumping material in another part of the store. And if you want to do a bathroom, just finding where those things are can be very difficult, particularly if you are looking at fittings and fixtures like tapes and those sort of things. By helping the customer understand the journey and understanding how customers are faced their shopping of a bathroom project for instances, where, they don't buy everything all at the same time. They buy a pumping pipe material first, and then they buy the main items, and then they buy the fittings and fixtures. So **you understand how they may buy those things, you need to make sure that you can help them navigate that so that they can make all those purchases in your store and that they can do that easily. [I12E28]** And by making that easy for them, they would... you know, kind of make those transactions in your stores rather than finding bit of pieces and then having to fill in the gap at competitors' stores.

Ok, I just think of a question about assortment, when you said it possible to change the product in display in day to day basis, is that some retailer are doing it or it is conceptual?

Em, so **it is not... obviously straight forward to do in a physical store. [I12E29]** So, not necessarily changing product everyday, it is **more about how do you... how do you refresh your category. And when you reviewing category how do you make sure that you are making the right revision to that category, whether that's increasing the space or decreasing the space. [I12E30]** And then making sure you got the right mix of product presented in the right way in that particular store. And, when it is online, **when you talking about e-commerce, then you may not necessarily change the product that you got available, but you may personalised how you render those in the screen so that they are... if you like, representative in a way that is most relevant to different type of shopper and their needs. So you really sort of personalising based upon how people buy a category. [I12E31]** So if you think about, nappies for instances, you know baby nappies, may already know from the people's pervious purchases that... the brand that they like and then the age and therefore size of the nappies that the parent choses and also the pack sizes they prefer. And so you rather than just providing a generic list of 'here are the product in the category', you can personalised that based upon your understanding of people's pervious preferences and choices.

So with e-commerce it is more personalised?

Yes.

Ok, and in the physical stores it is kind of based on the group of customer.

Yes. So, you can basically... **the data exist to help you to... if you like, personalisation it, in real time, it can, you are effectively limited by the execution and the level of... if you like, granularity.** [I12E32] So you have to execute at store level for a physical store, you can adjust a little bit for different days, we can obviously for different seasons and all of those sort of things, whereas online you can adjust much more personally. [I12E33]

And, in order to do that **you need more sophisticated real time analytics, you need kind of more use of the application of science from a pull maybe, rather than a push approach.** [I12E34] And so there is some different ways to think about the data and the analytics for that kind of environment but the principles are the same.

Ok, so what do you think is the biggest challenges for retailers to apply these solutions or applications?

There are a lot of challenges, I think it depend very much on the retailer and the market, so in some market you got things like distribution challenges and the way that product is distributed... I think **in the retail environment you got the fact that the science have to be combined to some extend with the art and the commercial and the relationship.** [I12E35] So, you know, **the product that you see in a grocery retailer are a combination of the retailer's private label product as well as national brand product from the FMCG... as well as the art of selling those product to customers** [I12E36], retailer has to deal with the art around buying successfully, and forming strong relationship with their partners. [I12E37] So, and those FMCG are looking to sell more and prioritise certain product, there is a real art to how those things are bought as well as how they are sold. So there is... if you like, all of those nuances means that the science isn't as pure as you think it can be applied. [I12E38]

Ok, so do you think the data application has been extend to how you deal with suppliers, in the purchasing side?

Yes, the data **can definitely be applied to purchasing side too.** [I12E39] It... it just comes down to negotiation ultimately. So, as a retailer you may be able to said 'well these are the product really important for my best customer, and these are things I want to really make sure I can deliver effectively and buy well'. **But the way to do that, as the brand company as selling, they may have different prices at different threshold. So you know, you got volume discount and all of those sort of things, you may have portfolio discount across a range of product, they got promotion that they are after** [I12E40], and they... You know,

so one of those have to go into that mix, so you definitely put science in there to help, prioritise, but there is a lot, of other dynamic that go into those conversations.

So, how about the physical capability, do you think now the supply chain is able to... kind of support these new decisions driven by customer data?

Yes it is not an easy things to do. I think the technical side of it isn't straight forward in itself. And then I think **the challenges of using the data is... something that can be difficult for retail because of the heritage and the legacy that they have in... if you like, operating in without customer data. [I12E41]** And so there are **used to a set of metric, incentive structure, decision making process that don't include customer [I12E42]** and that you know... therefore, very long... people experiences all of those things that may not be used to that data. So, the organisational change around that team to use data can be significant to... it's... probably... you know harder for business that have a heritage in the bricks and mortar space. **And I think for those business that have started as e-commerce business in the more recent history, and a lot more of these sorts of things will have been designed into the business from the start, whereas a lot of much older business are trying to add these things or change, which is much lot process and much harder thing to do. [I12E43]**

Ok, do you think the availability is also a challenge or how can the customer data help to improve it?

Availability in retail for product?

Yes.

Yes, customer data can definitely help. I mean... **I think with availability you don't necessarily need customer data to know that product are out of stock. [I12E44]** You know...there are ways and **increasingly sophisticated technological ways to sense whether you got product on the shelf and whether you got product in the back warehouse of the store to be able to replenish those products and... all link to the supply chain and ordering system and all that good stuffs. [I12E45]** So, a sophisticated way to doing that, **but I think ultimately, what a retailer need to be able to do is to understand when they should be expecting to replenish, when do they expected to be out of stock [I12E46]**, so that they don't get out of stock. And also, **how to prioritise when they do [I12E47]**, and... what you may find is that in different of day, you would prioritise product A over product B, but at other time of day, other day of a week you may prioritise replenishing product B over product A depending on the who is in the store. So, **customer data can help you understand which of those product is most important to the customer who are likely to be in your store at that time. [I12E47]** And even... you know, as customer shelf-identified or use self-scanned that can also declare whose even in your store at that point

in time, and therefore you can manage... you know, in theory of managing these need in a more real time basis and much more accurate way than just using a general pattern in the past. [I12E48]

Ok, so is this a conceptual application or there are some trials going on?

Yea, I think out of stock... **using data for availability has been done for some time, overlaying that customer lens have also been done for some times [I12E49]**, being able to say actually if I got these ten product out of stock... because of the customer in these stores, this is the most important one to replenish first. So that has been done for some time. **I think the whole 'real time' approach to doing it and sensing who is in the store and using store tracking information for working out which employee should be best of fulfilling their tasks, those things are also been tested. I don't know that (whether) they are fully rolled out or not in any retailer around the world, but a lot of those things are being deployed right now in a number of stores around the world. [I12E50]**

Ok, so there is a story about promotion that... you got stock out during the promotion and you got very low sales after the promotion. Do you think with customer insights these promotions can more controllable?

Yes, you can... by **understanding how customers shop individual product and particularly the rate of sale at different stores and the history of how promotions are always is in the past, allowing you to be more smarter at anticipating those things and going forward. [I12E51]** And...so... you know, for instances, understanding **whether when people buy in sort of promotions and at what price they buy at promotion, all of those things helps you navigate that in a more sophisticated way and understand... you know, whether if people buy in the promotion, they are actually punches loading or whether they are going to consumer that now and therefore the extent to which it would impact... you know, sales post promotion. [I12E51]** So I think those are all things you can anticipate much better with customer than without.

Ok. Thank you very much, I think that's more or less the questions I would like to ask you.

-end-