

Development of a reporting model for a new fashion e-tailing service provider

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*“É preciso viver, viver como um homem comum entre homens comuns.
Só um homem comum pode fazer grandes coisas.”*

António Lobo Antunes

Abstract

Omnichannel and digital commerce are among the hottest topics for luxury brands. Farfetch Black & White (B&W) is a fully-fledged agency and white-label solution for brands that build websites and set up whatever services or infrastructures the brands want to use, leveraging the established e-commerce platform of Farfetch - an e-commerce luxury goods company.

When the e-tailing world becomes a reality, the amount of ever increasing data and unknown processes, together with the brands' lack of experience in the area, add clutter to the clients' e-commerce managers. The main objective of this project is to feed those brand clients with a performance reporting model, and delineate all the operational reporting strategy to help them in whatever they need.

Farfetch's processes and reporting methods are analysed first, and then two different workstreams are established using both a methodology based on Action Research. Regarding the operational reporting strategy setting, reports are discussed with the brands and its content decided. Concerning the development of the performance reporting model, some Farfetch's KPIs are adapted and new ones are constructed. After all the useful data being acquired and filtered via SQL, the report is constructed and published on Tableau. The report allows flexible periods analysis, is divided into six main areas (Sales, Sales Details, Digital Marketing, Operations, Fraud and Payments, and Customer Service) and is developed with a focus on interactive features and on simple and effective data visualizations.

With the project under this dissertation it was possible to ease the day-to-day order and return processing at the stores and improve the operational results; to endow the clients' managers with an interactive performance report capable of assess performance, establish comparisons and discover trends in a flexible way; and, through this innovative reporting approach, distinguish B&W as a practitioner of some of the most pioneer client-focused reporting practises within the industry.

Desenvolvimento de um modelo de relatórios para um novo prestador de serviços de comércio eletrónico na área da moda de luxo

Resumo

O comércio digital e o omnicanal são alguns dos temas mais em voga entre as marcas de luxo. O projeto Farfetch Black & White (B&W) criou uma agência totalmente desenvolvida e uma solução de marca branca que desenvolve websites e inicia quaisquer serviços ou infraestruturas que as marcas necessitem, alavancando-se numa plataforma de e-commerce já estabelecida pela Farfetch – uma empresa de venda online de artigos de luxo.

Quando o retalho eletrónico se torna uma realidade, o constante aumento da quantidade de dados e de processos desconhecidos, em conjunto com a falta de experiência na área por parte das marcas, cria desordem e confusão junto dos gestores. O principal objetivo deste projeto é disponibilizar às marcas clientes um modelo de um relatório de performance, assim como delinear toda a estratégia de relatórios operacionais de forma a ajudá-los naquilo que for necessário.

Os processos da Farfetch e os modelos de relatórios já existentes são analisados em primeiro lugar e depois são estabelecidas duas diferentes linhas de trabalho, ambas utilizando uma metodologia baseada em investigação-ação. No que diz respeito à definição dos relatórios operacionais, estes são discutidos com a marca, procedendo-se à decisão do seu conteúdo. Já no que concerne ao desenvolvimento do modelo do relatório de performance, alguns indicadores-chave da Farfetch são adaptados enquanto outros novos são construídos. Depois de adquirir e filtrar todos os dados via SQL, o relatório é desenvolvido e publicado recorrendo ao Tableau. O relatório permite análises com periodicidades flexíveis, está dividido em seis áreas principais (Vendas, Detalhes de Vendas, Marketing Digital, Operações, Fraude e Pagamentos, e Serviço ao Cliente) e é desenvolvido com um foco em funcionalidades interativas e em processos simples e eficazes de visualização de dados.

Com o projeto desta dissertação foi possível facilitar os processos diários de encomendas e devoluções junto das lojas e melhorar os resultados operacionais; dotar os gestores das marcas com um relatório de performance interativo capaz de avaliar o desempenho, estabelecer comparações e ajudar na descoberta de tendências de forma flexível; e, através deste relatório com uma abordagem inovadora, distinguir o B&W como detentor de uma das mais pioneiras práticas de relatórios no ramo.

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List of Acronyms

AM	Account Management
BI	Business Intelligence
B&W	Farfetch Black & White
GTV	Gross Transaction Value
ID	Identification
IS	Information Systems
KPI	Key Performance Indicator
MoM	Month over Month
MPO	Monthly Performance Overview
MTD	Month to Date
NPS	Net Promoter Score
OM	Operations Management
PMSP	Previous Month, Same Period
PS	Partner Services
PWSP	Previous Week, Same Period
SKU	Stock Keeping Unit
SoS	Speed of Sending
WoW	Week over Week
WTD	Week to Date
YoY	Year over Year
YTD	Year to Date

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1 Introduction

Online commerce is one of the hottest themes for luxury brands. With 75% of all luxury sales influenced by digital and with an online market evaluation that could grow up from €14 billion by 2015 to €70 billion by 2025, luxury brands are highly pressed to grasp digital commerce and become omnichannel (Catena and Remy 2015). Nevertheless, it is necessary a great expertise to successfully consolidate the two business channels.

Farfetch is an e-commerce marketplace for luxury fashion, launched in 2008. Considering the gathered know-how of both luxury and technology, it has recently launched Farfetch Black & White: a full-service agency, based on Farfetch's core systems and services, selling multichannel e-commerce solutions to luxury fashion brands.

However, when the digital world becomes a reality, one of the main concerns that e-commerce managers are facing is related to the ever increasing available amount of data. These worries are augmented, when several metrics are new and managers are subjected to a steep learning curve. The present dissertation, developed at the B&W Operations Team, focuses on developing a new reporting model for the forthcoming brand clients. To guarantee they have access to the crucial information to run their internal operations and to provide them with a set of dashboards containing the most important business and operational metrics along with simple data visualizations.

1.1 Farfetch Black & White integration

The launch of a new business unit like B&W represents a novel era for Farfetch. Notwithstanding all the similarities between the two business units, adaptations were required and even the company structure needed to evolve, in order to incorporate the new agency. Bearing in mind this new paradigm, it is important beforehand to understand what Farfetch is and how it is organised, what are the B&W proposals and its placement within the organisation, as well as how the two sides will interact, mainly when it comes to operations.

1.1.1 Farfetch

Farfetch is an online high-end fashion platform that connects the world's most famous luxury boutiques with their customers around the globe. Founded in 2008, Farfetch is a London based company that through its distinctive business model and continuous growth have snagged a \$1 billion valuation. Currently, Farfetch platform provides access to an assortment of more than 150,000 products from up 400 boutiques, connecting over 1,000 top designer brands and other emerging designers with customers in 190 countries. All in 1 single address, around the clock and 7 days a week.

Such diversity, surpassing all its competitors' offer, is mostly explained by Farfetch business model. The service Farfetch provides stands out from the other competitors because it is commission based and constructed around a win-win partnership with boutiques. The company does not keep the products it sells in stock. Instead, when the end customer is buying a product

at Farfetch portal, he is purchasing the item from a partner boutique and has it shipped directly to him.

This drop shipping fulfilment strategy, well described by Youderian and Hayes (2013), helps to explain Farfetch fast growth. It was easier to get started, and also less capital was required, owing to the chance of launch an e-commerce platform without investing huge amounts of money in inventory up front. At the same time, overhead expenses are quite low compared to those of brick-and-mortar businesses and, by leveraging the boutiques, the company is able to expand with short incremental work and less growing pains, since most of the work to process an additional order will be carried by the boutiques. The no need to purchase inventory and the broad boutiques' network allows the company to offer a wider selection of products, because whenever a boutique stock some new item, Farfetch is able to offer it on its own platform at almost no additional cost.

Despite all the listed advantages, Farfetch's business model also addresses some complexities. When a company is supplying from multiple boutiques, which are also selling through other channels, inventory changes in a constant basis and even with synchronisation technologies, there are always problems to ensure the accurate amount of stock each time an order is placed online. It is also necessary to establish great and solid partnerships with the boutiques, in order to guarantee the boutique is always willing to offer its best items at the portal. In regards to shipping, when the stock is held in multiple stock points, an order can be split and shipped from different points, which makes the operation more complex. In addition, Farfetch is always responsible for potential packing errors or other boutiques mistakes, capable of harming Farfetch's own reputation.

To succeed with this model, Farfetch had to grow and to become capable of providing the best support and services for both the boutiques and the final customers. The company is currently operating in 10 offices around the world: London, Porto, New York, Guimarães, Los Angeles, São Paulo, Japan, Hong Kong, Shanghai and Moscow. Each office presents differences regarding the structure and departments. Considering Farfetch Portugal – Guimarães, hosting the European Production team and Porto, where this project was conducted - the company is currently divided into eight main departments:

- Operations;
- Merchandising;
- Account Management;
- Partner Services;
- Technology;
- Finance;
- Office Operations;
- Human Resources;
- Production.

The Operations department, where this project was carried, will be analysed in-depth on Section 1.1.3. Merchandising is responsible for forecasting boutique sales and helps defining the best product assortment for boutiques and brands. Account Management and Partner Service are responsible for all the communication with the boutiques, advising on strategic and planning concerns or on operational issues, respectively. The Technology department deals with all tasks related to back office applications, the website, IT support and other technological improvements. Finance, controlling company's money, Office Operations, managing all the office needs and Human Resources, dealing with recruitment, are more common departments. Farfetch's business model does not include production itself, but the Production department is responsible for all the processes an item needs to go through to be available online: product and materials identification, quality control, photography and so on.

1.1.2 Farfetch Black & White

B&W is a fully-fledged full-service agency, selling multichannel e-commerce white-label solutions to luxury fashion brands, based on Farfetch’s core systems and services. It has risen to exploit Farfetch’s know-how and experience, near a growing market of interested brands keen to start their online business. The objective is to make use of Farfetch’s own platform to build another website and deploy it in a modular way whatever infrastructures or services the brands want to use.

As a matter of fact, Farfetch holds some significant advantages when comparing to other luxury fashion e-commerce retailers. The number of customers, boutiques and brands involved is large and continuously growing, which places Farfetch in an increasingly prominent position on the online luxury fashion world. Then, over the past years, Farfetch has accumulated experience and gathered know-how about every important theme regarding e-commerce operations. With this magnitude, Farfetch also benefits from economies of scale and it is very unlikely that a single boutique or brand is able to offer a similar service with the same conditions. And at last, B&W can leverage the Farfetch platform to link inventory from brands’ physical stores to their website and offer services like click-and-collect (which offers the chance for the customers to collect the order from the physical stores) and same-day delivery (taking advantage of brands’ flagship stores in the main cities, to deliver the order on the same day it is placed) to provide a truly omnichannel experience.

However, with B&W business unit, Farfetch has some potential benefits and objectives aside from B&W financial and operational stability. First and foremost, B&W aims to establish connections with either brands from big fashion groups or with emerging and promising designers. This connections will lead to closer ties with important groups and desired brands, which will possibly help to achieve the second objective: bring supply to Farfetch. As a growing company, and not disregarding the enormous stock Farfetch has available nowadays, the main problem the company faces is supply. Therefore, with this B&W approach and developing websites for brands, Farfetch aims to reach agreements to have the stock available on the two sides: both the brands’ and Farfetch’s website. With this purpose, Farfetch will secure not only more stock and variety, but also agreements with brands who are not yet on the platform but are object of customers’ desire, giving in return global exposure and huge amounts of traffic.

Regardless of its still short lifetime, B&W has become one of Farfetch’s strategic pillars. The business unit has launched one e-commerce brand site in January, another in March and two in June. Another one is coming in August and there are more brands on the pipeline for the upcoming months.

Regarding the business unit organisation, the B&W departmental structure and main roles are represented on Figure 1.

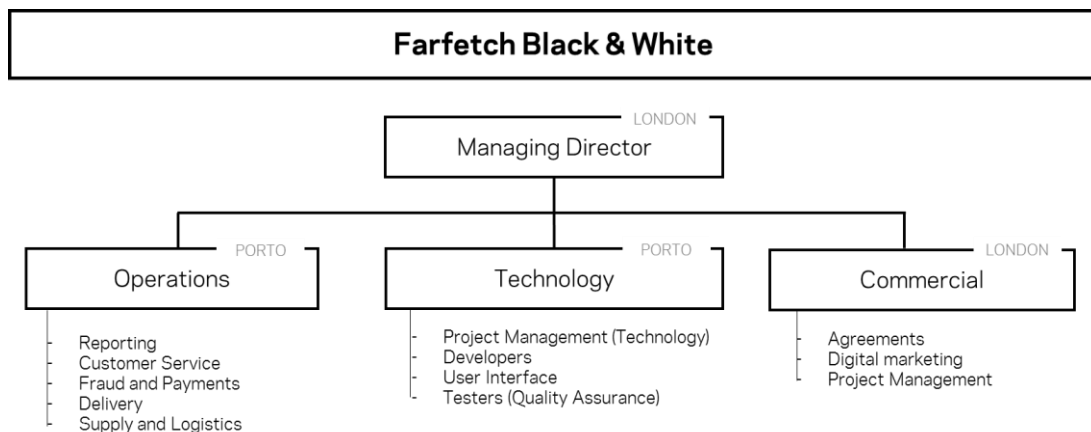


Figure 1- Farfetch Black & White departmental structure

As a recent business unit, the roles are not yet fully defined. However, as B&W takes advantage of Farfetch resources, the departments conceived represent the dedicated teams created to support the project. All the other resources not displayed on Figure 1, and even some of the operational tasks shown, are now shared between B&W and Farfetch.

Regarding the B&W Operations department, where this project was held, a detailed explanation and its interaction with Farfetch Operations department is available on Chapter 1.1.3. The B&W Technology department is responsible for the websites development and user interface, as well as the development of tools like the Content Management System and other client-oriented tools. On the other hand, more general technology such as, per example, the order processing software, is the same used for Farfetch’s boutiques and, therefore, Farfetch’s resources are used to implement any required improvements. The B&W Commercial team is based in London and does all the commercial work with the brands. Digital marketing is also under their responsibility and the Project Manager works alongside the team as well. All the departments are supervised by the Managing Director, who is also based in London, close to Farfetch’s executive team.

1.1.3 Farfetch Black & White Operations

B&W Operations is an integral team of Farfetch Operations department, in Porto. Operations covers a range of important tasks in a day-to-day e-commerce activity. This department is subdivided in many different teams and its organization is expressed on Figure 2.

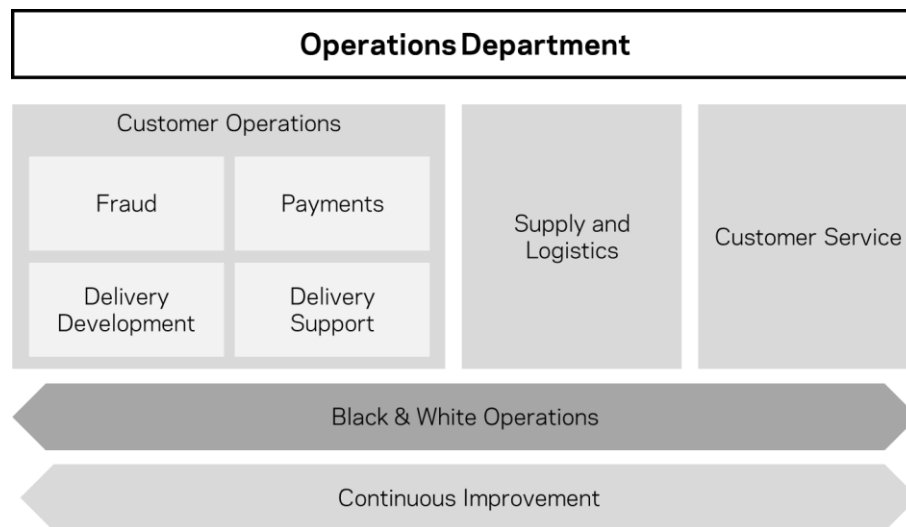


Figure 2 - Farfetch Operations department structure

Customer Operations, as the name suggests, deals with activities that directly impact the customer, such as fraud check, payments control and methods, delivery support in operational queries and delivery development to find cheaper and better shipping solutions. However, Customer Service, which is also directly related to the customer, represents an independent team. This is justified by the significant size of the team and by the importance given to customer support in an online business. Hence, Supply and Logistics controls the boutiques’ performance to ensure service levels and helps with the set-up of the boutiques dedicated e-commerce rooms. Continuous Improvement is, as B&W Operations, a transversal team. It is accountable to improve the organization’s services and processes using a Kaizen approach.

B&W Operations is also a transversal team that exploits the other teams in favour of the B&W project. The team’s usual work stream can be divided into three main phases, as shown on Figure 3.

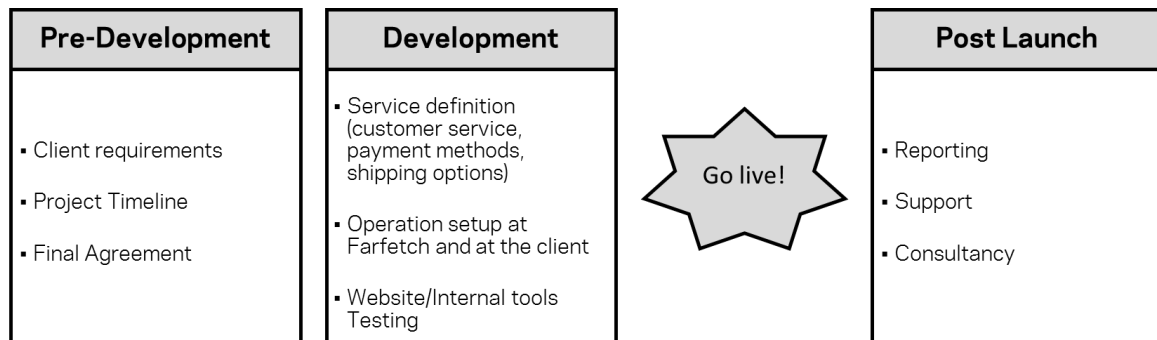


Figure 3 - B&W Operations work stream

This work stream is a simplified representation of B&W Operations’ independent activities. While the agreement with the brand is being discussed, it is necessary to understand the client requirements to estimate if some developments are needed on the platform and the necessary time to implement and prepare those client demands. While the B&W Technology team is developing the site, the B&W Operations team need to, together with the brands, precisely define the service that the brand aims to provide. Among others, it is required to define customer service hours and languages, which payment methods will be available, what are the shipping destinations and prices, which delivery methods will be offered, define the packaging, and so on. It is also essential to test the website and the internal tools, as well as to help the brand with all the operation set-up. After the launch of the e-commerce, full support is given and best practices are shared with the brand in order to improve performance. At the same time, and remembering the main purpose of this project, reports are defined, discussed and prepared during development, to be shared with the client after launch.

The customer support is done by an independent B&W team inserted on the global Customer Service team. The remaining activities, triggered by an order placement, are assured by Farfetch global teams. The fraud check is done by the Fraud team, payments and refunds are controlled by the Payments team, and so forth.

The Operations department is a good example, though complex, of the shared synergies between Farfetch and B&W. The objective is to share the maximum resources, in order to take advantage of what is already being properly done and start, improve or adapt everything else. In fact, improving one business will also push the other further.

1.2 Project motivation and goals

From the outset, one of the main stakeholders of any project are the clients. They get even more relevant when considering that B&W is a service provider, in this case, to luxury fashion brands. At the same time, information and data are becoming more important, or even crucial, to any e-commerce operations. So, a full reporting strategy needs to be defined and put in place, in order to endow the clients with both operational information and analysis about their own performance.

As mentioned before, the project is inserted on a new business unit. Taking that into account, it is easy to understand that all the reports must be created from scratch. However, given the similarities between Farfetch and B&W, the reports sent from the parent-company to its partners (both boutiques and brands) could be used as a preview of some of the clients’ requirements. Because many clients are having their first contact with e-commerce, this expertise accumulated by Farfetch and its more mature processes, can be used to counteract any possible lack of experience from both B&W and the brands.

Given this setting, two main goals were defined:

1. Structure all the operational reporting strategy;
2. Develop a full-fledged performance reporting model.

The first goal is important to fill the gaps not covered by the information systems provided to the clients. In a similar way to Farfetch's procedure with the boutiques, B&W provides the brand tailored software (or integrations within brands' own software) to cover order processing and other operational issues. However, to maintain the stores' performance, it is necessary to highlight some evidence on a daily basis and to provide the brands with some additional information not available on the referred software. It is important to understand the brands' main operational pain points, to define what reports need to be constructed as well as the periodicity of each one.

The second objective is to construct a complete performance report. It is very important to a brand with its own e-commerce to have access to data, even more when it is being helped by another company to run its business. Given that, it is required to listen to the brands main demands, to be able to identify the metrics that are important to measure in this business and accordingly to the brands strategy. It is also very important to evaluate what is the best presentation method for each chosen KPI. The final result must be a report with all the metrics identified as important, ready to be utilized by the brands, in order to update and inform them with how the business is running.

Assembling all the pieces, this project aims to reach not only a reporting system entirely customised to each brand, but also a full reporting strategy, prepared to address the most common and expected requirements from the clients.

1.3 Methodology

Considering the nature of B&W business model and the main goals of the project, it is fundamental to involve the clients on the research. Either to define a reporting strategy, or deciding the most important performance metrics to measure.

Bearing that in mind, it was decided to use an Action Research (AR) approach. As the name suggests, AR is an approach to research that aims at both taking action and creating knowledge about that action. However, it must not be confounded with consultancy, since it is more rigorous in the inquiry and documentation, it requires theoretical justifications and unlike consultancy, that is frequently linear (engage, analyse, act and disengage), AR is cyclical (Coughlan and Coughlan 2002).

The methodology steps are shown on Figure 4. It is an adaption of both the implementations of AR that Coughlan and Coughlan (2002) suggest and the AR cycle proposed by Susman and Evered (1978).

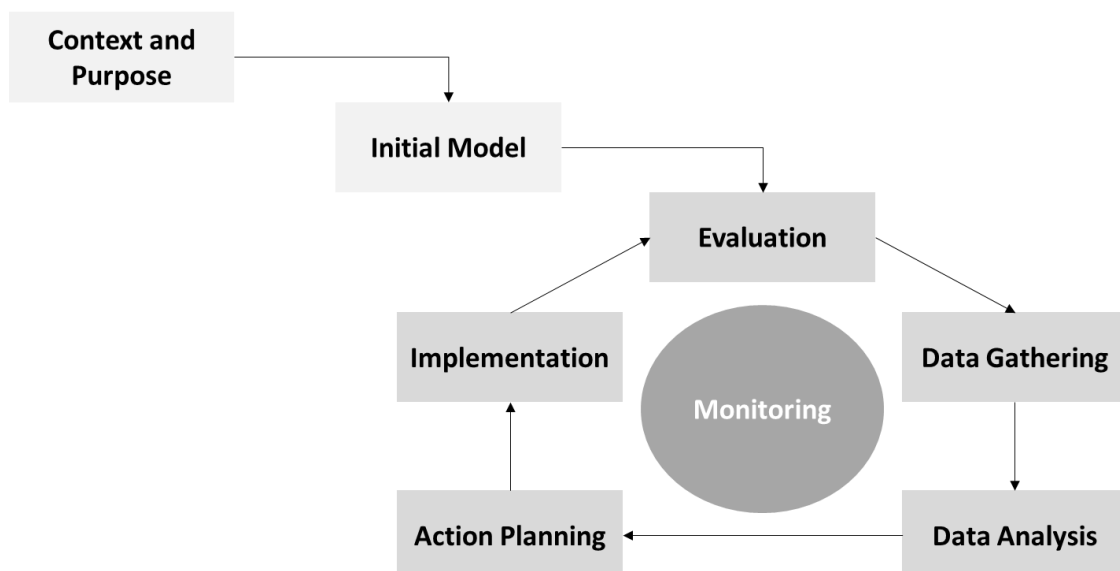


Figure 4 - Methodology based on AR

There are two initial pre-steps. Context and Purpose consist on defining both the rationale for action and for research. After that, Farfetch reporting examples are consulted, Farfetch managers' feedback is gathered and other established processes are analysed in order to construct an initial reporting model.

After those initial steps, the clients are involved and take part of all the process until a satisfactory result be attained. All the feedback is obtained thanks to the e-commerce managers of the first three B&W clients, which are the ones who experience the reports directly. The researcher must deal with each manager independently, but always aims to reach a unique and stronger model.

Evaluation involves reflecting on the outcomes of the action (of the initial model, in the first iteration) and is a key to success. Data is obtained through observations, discussions and interviewing. Every opinion or suggestion given on meetings, on a simple conversation or by e-mail must be considered. After all the data (of each of the three clients) being gathered, the full data and opinions are anonymously shared to each of the brands' agent and are analysed. Following the analysis, further action is planned and the main implementation points are identified. After the implementation of all the identified improvements, a new iteration starts and all the process is repeated until the model reaches a stable and complete version.

Monitoring occurs through all the cycles. The researcher must monitor all the project in order to satisfy the clients' requirements but, at the same time, he should never forget the research stream and the finding of a theoretical reason for each of the required actions.

1.4 Report structure

The remainder content of this dissertation is structured in four different chapters.

Chapter 2 presents a literature review on the main themes addressed along the project. The first review is about luxury fashion, its relation to e-commerce and e-tailing, and why the luxury fashion brands feel the need to outsource e-tailing. Performance measurement, reporting methods and data visualization are also covered areas. Finally, the action research methodology and its adoption in OM is explained.

In Chapter 3 an overview on the reports that Farfetch is currently sending to its brands and boutiques is performed. Both the more operational and the monthly performance reports are analysed and scrutinized.

After reviewing Farfetch's practises and inputs, the interested parts are continuously consulted to help defining the operational reporting strategy and to opine about what are the indicated measures and aspects to consider on the performance report. All this framework of thought is explained in Chapter 4, as well as all the models and definitions that have been reached are presented.

Chapter 5 concludes this dissertation, reviewing the proposed reporting strategy and model, and presenting ideas for future development.

2 Literature review

This chapter aims to provide a literature review of the key topics that are relevant to this project. Firstly, the e-tailing business in the luxury fashion world is addressed, as well as the reasons why many companies are selecting to outsource to enter online retail. After, performance measurement is reviewed. Some reporting methods are then analysed and the best practises within data visualization are scrutinized. Finally, a review of the action research methodology in OM is presented.

2.1 Luxury e-tailing and the need of outsourcing

Luxury is not a product, but an identity, a philosophy and a culture (Okonkwo 2007). Luxury products are an expression of the indirect social stratification (Okonkwo 2009) and are consumed for their psychological values instead of their practical utility (Doss and Robinson 2013). Luxury is a term usually connected with wealth, power, premium quality and exclusivity (Brun et al. 2008). Factors such as craftsmanship, sustainability, brand reputation and emotional connection are powering the experience of luxury over simple ownership as a growing trend (Abtan et al. 2014).

Technology has changed the landscape of consumer behaviour and the way business is conducted, including luxury fashion management (Okonkwo 2007). For sellers, e-commerce creates new paths to reach global customers. Customers, on the other hand, gain a wider product range and more control over information (Johnston, Clark, and Shulver 2012; Goad et al. 2015).

Nevertheless, e-commerce and luxury fashion retail are not full complementary. The fear of diluting the brand image through more product accessibility, the challenges in reproducing online the high-impact experience of luxury retail and the inability to reproduce the sensory attributes of luxury goods, are some of the reasons why luxury brands remained reticent in join e-tail (Okonkwo 2009). However, the existence of an online luxury consumer population is no longer in question and it is growing rapidly and steadily. It happens because convenience and accessibility, aside from being prominent benefits of e-tail, are now ranked high among the luxury customers' expectations (Okonkwo 2007). Today's luxury customers are also more knowledgeable about brands, more sophisticated and more demanding (Abtan et al. 2014). For the last reasons and after the economic downturn on the late 00's, luxury brands were forced to expand online because while physical stores were decreasing sales, e-commerce was rising at double digits (Okonkwo 2009).

Developing a stable multichannel fulfilment operation requires large capital investments at the beginning and over time, even more when the life cycles of information technology systems are still being compressed with rapid technological changes (Pentina and Hasty 2009). Through e-commerce outsourcing, the fashion companies gain access to superior expertise, business risk mitigation, strategic flexibility and asset transfer while are able to leverage costs and increase the project success rate probability (Pentina and Hasty 2009; Sun, Li, and Zhao 2015).

When addressing e-commerce through outsourcing, the company is able to follow many strategies, including the outsourcing of all the e-commerce related activities or just part of them

(Okonkwo 2007; Sun, Li, and Zhao 2015). Using different providers for different activities is not recommended by Pentina and Hasty (2009), because it will increase costs and complicate the process of multichannel coordination and integration. Given the highly dynamic and turbulent environment of e-tailing, strategic outsourcing is pointed as the more beneficial approach, at least for the initial stages of multichannel retailing (Pentina and Hasty 2009). Despite the small number of companies, the luxury industry is quite relevant in sales and influence (Ko and Megehee 2012), which also makes this sector compelling for e-tailing service providers.

2.2 Performance measurement

Performance measurement is a fundamental principle of management, which is important to identify gaps between the current and the desired performance (Weber and Thomas 2005). Although it is a topic which is often discussed but rarely defined, it is described as the process of quantifying action (Neely, Gregory, and Platts 1995). Measurement helps to identify areas of strength and weaknesses and provides the basis for an organisation to assess how well it is progressing towards its objectives. (Amaratunga and Baldry 2002).

Traditionally, performance measurement was based on accounting information and financial measures and ratios. When the world market changed in the late 1980s, companies shifted their strategic priorities and implemented new technologies and philosophies. These changes revealed the many limitations of the traditional performance metrics and the urge in developing new measures (Ghalayini and Noble 1996). With this shift, financial figures, which were treated before as the foundation for performance measurement, became just one among a broader set of measures (Eccles 1991). The main turning point, however, was when Kaplan and Norton (1992), through the concept of the Balanced Scorecard, suggested the use of both financial and non-financial measures (learning and growth, processes and customers). Nowadays, performance measurement practices are commonplace in all sectors of industry and commerce (Bititci et al. 2012).

Key Performance Indicators (KPIs) are quantifiable metrics which reflect the performance of an organisation in achieving its goals and objectives. They measure the business health of the enterprise and ensure that all individuals are “marching in step” to the same goals and strategies (Bauer 2004). The building of the most appropriate set of KPIs should focus on the end result, bearing in mind what the company wants as outcomes of the work processes (McNeeney 2005). The success of any performance management program is related to the selection of the correct KPIs. Although all KPIs are metrics, not all metrics are KPIs, and selecting the wrong KPIs could result in sub optimised results (Bauer 2004).

Selecting the right measures is vital for effectiveness (McNeeney 2005). The new era performance measurement metrics should be simple, easy to use, and actionable, with a proactive approach enabling fast feedback and continuous improvement (Gunasekaran and Kobu 2007). In addition, they should capture the essence of the organizational culture, being based on the company strategy and goals, and relate to strategic tactical and operations level of decision making (Gunasekaran, Patel, and McGaughey 2004). The metrics must be built into a performance measurement system that allows individuals and groups to understand how their behaviours and activities are fulfilling the corporate goals (McNeeney 2005). They should also allow for reviewing, revising and refining, contributing for organizational learning (Wouters 2009).

When implementing new metrics, the systems and procedures must be put in place to collect and process the data that enable measurements to be made regularly. This may involve computer programming to trap data already being used and present it in a more meaningful form. If needed, some new procedures must be initialised to capture the information not being recorded (Bourne et al. 2000). It is also critical to ensure that the metrics are evaluated and

updated constantly, in order to guarantee that organizations are ready to respond faster to new opportunities or threats of the market (Cai et al. 2009).

The implementation of a performance measurement system can be subdivided in three main phases. The design of performance measures, where the key objectives are identified and the measures designed; the implementation of measures, which includes an initial collection, collation, sorting, analyse and distribution; the use of performance measures to both access the implementation strategy (measure, review, act) and challenge strategic assumptions (reflect) (Bourne et al. 2000).

A key principle of performance management is to measure what you can manage, or in other words, each function on the organisation must focus on the amount of indicators that they influence in order to maintain and improve performance (Weber and Thomas 2005). However, many organisations that have information systems have data overload, because most of them generate redundant performance reports (Neely 1999). There is a certain level of information that results in the most accurate decisions. More or less information decreases the decision accuracy and could lead to less consistent decisions (Chewning and Harrell 1990). Another problem regarding the performance measures in many organisations is that they are usually unaligned with the business process and are rarely integrated with one another (Neely 1999).

Automation of KPIs provides reliability and abate the time elapsed collecting data, offering more time for applying the metrics and achieving benefits from them. However, it is a challenge to understand how to collect the data needed with a systematic and routine based approach (McNeeney 2005). Most of all, when designed and implemented warily, KPIs allow to know precisely where to take action to improve performance (Weber and Thomas 2005).

2.3 Reporting methods

Communicating is imperative across every company (Ying, Lijun, and Wei 2009). KPIs provide a mean of aligning the entire organisation with the company's key strategies, but they also require careful communication and education (OSIsoft Inc 2007). The effectiveness of the KPIs is not only represented by the way they are defined, but also by the way they are presented to all stakeholders involved (Ying, Lijun, and Wei 2009). Effective reporting processes should ensure that all stakeholders receive appropriate reports in a timely fashion (Parmenter 2010; International Federation of Accountants (IFAC) 2013). That is because high-quality information promote better internal decision making and is one of the major drivers of sustainable organizational success (International Federation of Accountants (IFAC) 2013).

Depending on the audience, on the type of information to be presented and on the regularity needed, several methods of reporting can be adopted. It has emerged the need for a tool able to integrate the diverse systems of a company into a coherent picture of where the organisation is heading and what needs to be done to improve its progress (Pauwels et al. 2009). There are many reporting tools, however three of them have earned greater emphasis on the literature: scorecards, reports and dashboards.

A performance scorecard is a tabular visualization of measures and their respective targets with visual indicators to see how each measure is performing against their targets at a glance. It is an essential component of the Kaplan and Norton (1992) balanced scorecard methodology. However, they are also used independently, to monitor the progress of any organizational goal and identify at a glance what is more important (Chang and Morgan 2000).

Reports are usually described as text and table based documents, which periodically include visual components. Normally static and arranged via pagination, reports continue to be a standard reporting method when it comes to displaying raw level data or pixel perfect data views designed for printing or for exporting to digital document format (Zenko 2016; Chiang

2011). For these reasons, reports are scheduled for automatic distribution and tend to be used on a more regular basis (Zenko 2016).

Dashboards became a reporting method increasingly used by companies to communicate and display important measures. They are expected to improve decision making, through the amplification of cognition and the capitalisation of human perceptual capabilities (Yigitbasioglu and Velcu 2012). According to Few (2006), *“a dashboard is a mean of presenting information to decision-makers, with a focus on visual communication, so that important information is consolidated and arranged on a screen in order to be easily monitored”*. Eckerson (2011), in turn, describes a performance dashboard as a performance management system that translates the organisation’s strategy into metrics and objectives, providing timely information and insights that enable the business users to improve decisions, optimise processes and plans, and work proactively. It is expected to collect, summarize and present information from multiple sources in order to elucidate the user about how the various KPIs are performing (Yigitbasioglu and Velcu 2012).

The information presented on a dashboard must agree with its purposes. The number of perspectives in a performance measurement system should depend on strategies, competitive threats and economic conditions facing the organisation (DeBusk, Brown, and Killough 2003). However, by reducing complexity, decisions can be made quickly (Ying, Lijun, and Wei 2009). So, unnecessary information should be eliminated, in order to avoid cognition impairment, disregard of information and poorest decision accuracy (Yigitbasioglu and Velcu 2012; Velcu-Laitinen and Yigitbasioglu 2012).

When designing a dashboard, both functional and visual features are utterly important and must be considered and planned. The visual features are related to data visualization and to how effectively information is presented (and will be addressed separately in Chapter 2.4), while the functional features are linked to dashboard functionalities like drill down capabilities or automated alerts (Yigitbasioglu and Velcu 2012).

Traditionally, business intelligence tools have been focused on reports with little interactivity and visuals. However, with the modern data discovery applications, new tools have risen and allowed exceptional interactive visualizations (Zenko 2016). The increasing scale and availability of digital data provides an extraordinary resource for business operations, and to get the most out of such data, users must be able to make sense of it: to pursue questions, uncover patterns of interest and identify errors. To do so, it is necessary to introduce some interactive dynamics to allow users to filter out data to focus on relevant items, to sort items to expose patterns or to select items to highlight or manipulate them, among many other features (Heer and Shneiderman 2012).

Nevertheless, when this interactivity level is attained many authors consider that the tool at issue is no more a dashboard because it loses the “at-a-glance decision making” and the short and concise characteristics defined by Few (2006). Since it is not primarily text and table based, it does not fit into the report definition either. This hybrid approach is not much described in the literature yet, but it is usually identified as a visual analysis tool (Heer and Shneiderman 2012; Chiang 2011). The definition of each method is always generalized, since every dashboard does not need to be concise and with interactive limitations, and every report does not need to be static and fully detailed (Zenko 2016).

Most of all, the reporting methods utilized should be simple and effective in order to allow managers to assess performance and to enhance decision making based on the metrics displayed (Wind 2005). Selecting the right quantity of information - always aligned with the company purposes - and finding an optimal point is necessary to make accurate decisions. It might be difficult to achieve the right fit, however a good strategy is to implement more flexible solutions that allow for easy upgrades (Yigitbasioglu and Velcu 2012). A properly created reporting

method will provide means to drive effective management and resource allocation decisions (Wind 2005).

2.4 Data visualization

Visualization, as the name suggests, is based on exploiting the human visual system as a means of communication (Munzner 2014). People visualize data either to consume or produce information relevant to a domain-specific problem or interest. Visualization design involves a mapping between domain problems or interests and appropriate visual encoding and interaction design choices (Brehmer 2016). It allows people to analyse data even when they do not know exactly what questions they need to ask in advance (Munzner 2014).

When constructing new visualizations, all the processes from obtaining the data until the final product are essential. Given a set of data, it is difficult to know how to extract meaningful information from it, and to most, this process is opaque. However, Fry (2004) proposes a seven step process prepared to deal with these problems, from the simple to the most complicated ones:

1. Acquire: obtaining the data;
2. Parse: providing structure, ordering into categories;
3. Filter: removing all but the data of interest;
4. Mine: applying statistics and data mining;
5. Represent: determining a simple representation;
6. Refine: improving the basic representation;
7. Interact: adding methods for manipulate the data and control other features.

The described seven stages of visualizing data are related along the path. Therefore, despite the steps may be headed by different people, it is important to guarantee a mutual alignment to run all the process effectively (Fry 2008). It is important to remember that information visualization is an iterative process (Börner and Polley 2014).

Data visualization is only recently becoming properly appreciated for the benefits it brings to business. First providing the means to make sense of data, to then communicate the discovered information to others (Few 2007). In line with the improvements of technology, the volume of data and its availability has increased, which in turn gave people something new to visualize (Yau 2013). Since the appearance of the computer first, and visual analysis software later, that the user is able to not only represent data graphically, but also to interact with those visual representations according to his/her own pretensions, generating analytical insights not approachable by traditional manners (Few 2007).

There are five major visualization types (Börner and Polley 2014):

- Chart: a visualization that have no inherent reference system (e.g., pie charts);
- Tables: a simple but effective way to convey data, can contain graphic symbols or color coded cells to help in the interpretation;
- Graphs: the most common visualization, can display qualitative or quantitative data (e.g., timelines, bar graphs, scatter plots);
- Geospatial maps: use a latitude and longitude reference system (e.g., world maps);
- Network graphs: trees or network graphs (e.g, hierarchies, migration flows).

There are many types of visual displays and many different graphs. Nevertheless, after years of experience and analysing the most used displays, Knafllic (2015) highlights a dozen different types of visualization. Simple text is utilized when there are just one number or two to share, making it as prominent as possible combined with a few supporting words in order to make the point. Tables are great to read across rows or down columns, or to compare values. An interesting approach to mix the detailed information of a table with visual cues is via a heat map

(in addition to the numbers, coloured cells convey the relative magnitude of the numbers). The more used graphs usually fall into four areas: points, lines, bars and area. While tables interact with the verbal system, graphs interact with the visual system, which is faster processing information. Scatterplots are useful for showing the relationship between two things. Line graphs are most commonly used to plot continuous data of single or multiple series. Bar charts, in turn, are usually easy for the eyes to read when designed correctly. Sometimes they are avoided for being common, but instead, they should be leveraged because they are common and that means less learning curve. The bar chart must always have a zero baseline to avoid false visual comparisons (correct length) and generally the bars must be wider than the white space between them. There are also many types of bar charts. The vertical bar chart, or column bar chart, like the line graphs, can represent single or multiple series. The stacked vertical bar charts allow to compare totals across categories. The waterfall chart can be used to show a starting point, increases and decreases, and the resulting end point. The horizontal bar chart and stacked horizontal bar chart are similar to the vertical relatives but better for categorical data. Finalizing, the area graphs. Are indicated to visualize numbers of vastly different magnitudes, and the second dimension (using a square) allows to do it in a more compact way than possible with a single dimension. The use of 3-D graphs and the use of pie charts, are also discouraged because they are hard for people to read when segments are close in size and, as a result, decision making is biased (Yigitbasioglu and Velcu 2012; Knaflic 2015).

Visualization is composed by four main ingredients, with data as a driving force behind them: context, scale, coordinate system and visual cues. Context main objective is explain how people should read a visualization. When the audience is unfamiliar with the data, the values must be clear and somehow explained. Scale is also important and the increments utilized should make sense and increase readability. Yau (2013) identified six main types of scales: Linear (where values are even spaced), Logarithmic (with focus on percent change), Categorical (a discrete placement of bins), Ordinal (when categories' order matters), Percent (representing parts of a whole) and Time (units of years, month, days, or hours). Still, when encoding data, the objects need to be placed somewhere and are the coordinate systems who dictate that. There are three main coordinate systems used in data visualization: Cartesian (the x- and y-coordinate system generally known), Polar (when coordinates are placed based on radius and angle, e.g. pie charts) and Geographic (latitude and longitude locations in the world) (Yau 2013). To finish, visual cues. It is important to understand that visualization, in its most basic form, is simply mapping data to geometry and colour.

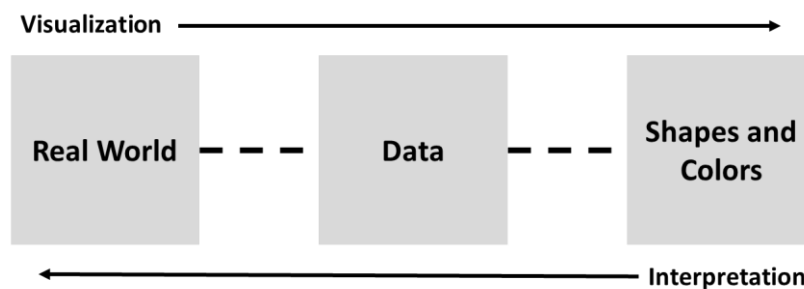


Figure 5 - Connecting visual cues to data and to the real world. Source: Yau (2013)

The connection between visual cues and data is key, because data is what connects a graphic to the real world (Figure 5). If readers are not able to decode visual cues, they are not able to interpret anything. On the other hand, the visualization process is about encoding values to shapes, sizes and colours (Yau 2013). Depending on the purpose, there are nine main elements to be adapted: Position (where the data is in the space), Length (how long the shapes are), Angle (rotation between vectors), Direction (slope of a vector in space), Shapes (symbols as categories), Area (how much 2-D space), Volume (how much 3-D space), Colour saturation (intensity of a colour hue) and colour hue (the usual colour definition) (Yau 2013).

When identifying which elements are the information we want to communicate (signal) and which might be noise, the Gestalt Principles of Visual Perception must be considered (Yigitbasioglu and Velcu 2012; Knafllic 2015). The Gestalt principles aim to identify how individuals perceive order around them, and many are used to create order out of visual stimuli (Knafllic 2015). Among all the principles, when thinking about visual information and dashboards, some deserve to be considered: proximity, similarity, continuity, enclosure, closure symmetry and connection.

Every single element added to a page or screen takes up cognitive load, or in other words, takes brain power to be processed. There are visual elements that take up space but do not increase understanding - Knafllic (2015) refers to this as clutter. In the same way clutter is an enemy, pre attentive attributes like size, colour and position can be used to highlight important elements and to strategically help direct the audience's attention. Size matters. Relative size shows relative importance and bigger sizes should be used to emphasize something important. Position on page should also be considered and the most important things should be placed on top, since the majority of people will start on the top left of the page (Knafllic 2015). Considering colour, it can improve the process of visualization and is a powerful tool to discriminate particular objects. Colour must be used sparingly and consistently, and must be chosen having the colour-blind in mind (Knafllic 2015).

Programs are designed to be fast and work outside the context of data. Although, it is up to the analyst to make the right decisions along the way and to make the computer's output something for humans, knowing beforehand that most of this knowledge will come from practice and experience (Yau 2013; Munzner 2014).

There is always a story in data (Knafllic 2015), and when allowing comparisons, considering its context and what it represents, structuring shapes and colours for clarity, and highlighting the proper elements, readability is more easily achieved (Yau 2013). This data visualization area offers potential for more research, since a lot of articles and books have arised in the recent years. Nevertheless, when applying these basic tools and insights, one must be able to create visualizations that are thoughtfully designed, driving to better decision making and inciting the audience to act (Knafllic 2015).

2.5 Action research in operations management

There are many empirical research methods and considerable experiences on the social sciences using them. Operations Management (OM) has some of the characteristics of a social science, involving people and groups in organizations, what helps to validate this approach (Westbrook 1995). Flynn et al. (1990) provided a systematic approach to encourage operations management researchers to use empirical research, because the development of the field of OM would be enhanced by this type of research. They used the term "empirical" to describe field-based research which uses data gathered from naturally occurring situations based on real word observations and experiments. Their systematic approach consists of six main steps:

- Establish the theoretical foundation;
- Select a research design;
- Select a data collection method;
- Implementation;
- Data analysis;
- Publication

They described a number of empirical collection methods (such as archive analysis, interviews, questionnaires, content analysis, participant observation, outside observation) which could be used, alone or in combination, with the chosen research design. Many empirical research design

methods has already been identified, such as case studies, panel studies, focus group, surveys and action research (Flynn et al. 1990; Westbrook 1995).

Action Research (AR) represents a juxtaposition of action and research, of practice and theory, because it is committed to shape new knowledge through the seeking of solutions or improvements of real world problems (Mckay and Marshall 2001). While the aim of positivist science is the creation of universal knowledge, AR focuses on knowledge in action (Coughlan and Coughlan 2002). Susman and Evered (1978) demonstrated how AR can be used as a method for correct the deficiencies of positivist science, generating knowledge while solving problems that organisations members' face.

It is an established research method in use in the social and medical sciences since the mid-twentieth century. However, since the 1990s that many papers address the use of this research method in OM (Westbrook 1995; Coughlan and Coughlan 2002) and in the Information Systems (IS) research arena (Baskerville 1999). Westbrook (1995) concludes that are surely roles for all research paradigms in OM, however, if it is needed to include practitioners, then the stream of empirical research, and of action research in particular, must be recognized as the main possibility. Baskerville (1999), in turn, consummates that the method produces highly relevant research results, because of its aim at solve an immediate problem situation while carefully informing theory, responding directly to the pronounced needs for relevance in IS research. AR is even recognized by many as the ideal post-positivist social scientific research method for IS research (Baskerville and Wood-Harper 1996).

Coughlan and Coughlan (2002) gathered several broad characteristics that define AR. First, AR focuses on research in action, rather than research about action. Second, AR is participative and members of the system which is being studied must engage actively in the process. Third, AR is research concurrent with action. Finally, AR is a sequence of events and an approach to problem solving. A sequence of events because it works through a cyclical process of planning, taking action and evaluating the action, leading to further planning and so on. A problem solving approach, because through the solutions to the immediate problems, it is expected to learn from the outcomes and improve scientific knowledge.

The usual representation of the AR process is using a single cycle, with possible iterations. The most simple and typical representation is the one developed by Kemmis and McTaggart (2005), where each iteration of the cycle is composed by four steps: plan, action, observe and reflect, that leads to a further revised plan, action and so on. Susman and Evered (1978), in turn, idealise AR as a cyclical process with five steps, all of them necessary for a comprehensive definition of AR (Figure 6). Both the infrastructure and the action researcher, maintain and regulate all of the five steps jointly.

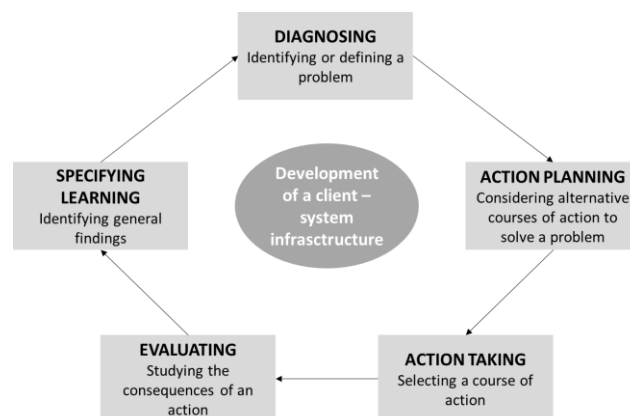


Figure 6 - The cyclic process of action research. Source: Susman and Evered (1978)

Notwithstanding most authors describe AR as a single cycle, McKay and Marshall (2001) point that the process must be viewed as a dual parallel cycle, one representing the research interest and another representing the problem solving interest.

An even more interesting approach is the one developed by Coughlan and Coughlan (2002) related to the implementation of action research. The main innovation regarding their approach is related to the presence of a pre-step, before the cycle, and a monitoring meta-step. The pre-step is driven by the need to understand the context and the purpose of the project. Monitoring, in turn, is a meta-step that occurs through all the cycles. The researcher must not only be concerned with how the project is working, but also monitoring the learning process.

AR involves core skills at engaging with others in process of inquiry and action. There are three different typologies of inquiring. Pure inquiry is where the action researcher listens carefully and neutrally while prompts the elicitation of what is taking place. Exploratory diagnostic inquiry is where the action researcher begins to manage the process of how the content is analysed by the other. Confrontive inquiry is where the action researcher challenges others to think from a new perspective, by sharing his/her own ideas (Coughlan and Coughlan 2002).

There are no prescriptions when conducting AR. However, Westbrook (1995) outlines some practical rules of thumb obtained through experience. The researcher must prefer data to opinion, despite he must remember that opinions are also data. The problematic areas or issues must be agreed with the collaborating companies, but any solution would be pre specified. The researcher must always seek for multiple viewpoints and record everything in simple semi-standard formats in order to compare different situations without compromising lines of investigation not previously foreseen. The researcher must always construct some write-ups with all the gathered data and have the other participants to check them.

Although the potential relevance of action research, and general empirical research, is motivating, it is necessary to guarantee its methodological fit, which refers to the consistency among the elements of a research project – research question, prior work, research design and theoretical contribution. Creating fit is an iterative process that involves feedback and modification at many stages, what makes field research (and so, empirical research) an iterative and cyclic learning journey (Edmondson and McManus 2007).

All the areas approached are important to the proposition of this project. The luxury e-tailing is the business area where this project is being held and outsourcing is directly related to how B&W approaches the brands. Get to know the foundations of both areas is vital to develop an adapted and accurate basis for reporting. To strengthen the reporting, however, it is necessary to understand how to measure performance, which are the indicated reporting methods and analyse the key points to develop effective data visualizations. With the review of these themes, it is possible to enrich the reports with some of the best practises. The AR methodology is also important to understand how a research of this kind should be addressed.

A new application of AR in the OM of a fashion business is conducted. However, the main contribution of this dissertation is the performance reporting model developed, particularly when performance needs to be measured in the luxury fashion business. Performance measurement, reporting methods and data visualization areas are a considerable field of knowledge, and with this project it is possible to review that knowledge by applying those concepts to the development of the reporting model, highlighting some areas less studied.

3 External reporting paradigm

Although B&W represents a new service, Farfetch is already using some report models with its partner brands and boutiques. It is an advantage that B&W can use in its favour, because the most common operational concerns are previously identified and even some solutions and alternatives are designed since then. From another perspective, it is important as well to analyse what metrics are being used to show the partners their performance across the various areas, as well as the periodicity in which the reports are sent.

Before analysing the reports used at Farfetch, a brief explanation about the order fulfilment process is given in Chapter 3.1. With this explanation, it becomes easier to understand Farfetch (and B&W) operational flow and the main concerns and lack of information to which the boutiques usually are exposed.

3.1 Order fulfilment

Before having a look at those reports, it is important to understand how relevant the order processing is and what steps are behind it. The returns process will also be analysed, because it also adds a great value to the customer experience.

3.1.1 Order processing

Once the customer places an order, a portal order is generated with the customer's purchase information. This portal order is then split into many boutique orders, according to the boutiques where the items were purchased. Farfetch has developed an application - STORM - that boutiques use for order processing. Each time a boutique order is generated, it is displayed on the STORM account of the boutique in hand. At STORM it is possible to inspect what orders need to be processed and at what step of the processing they are.

The order processing can be divided into six steps, as demonstrated in Figure 7.

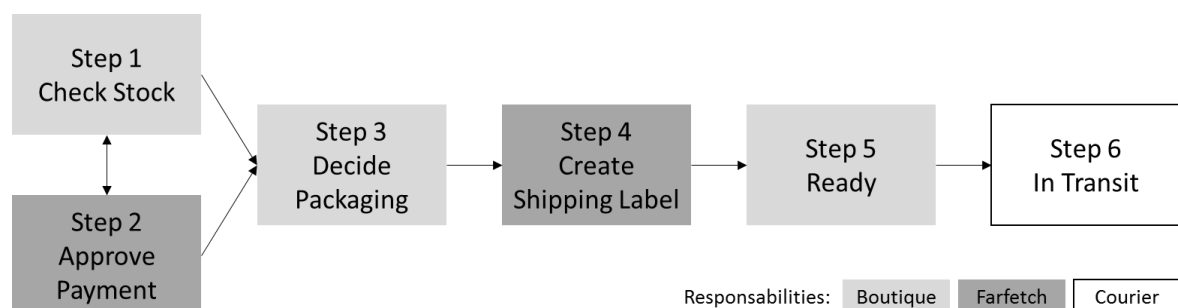


Figure 7 - Order processing flow

Step 1 - Check Stock

From the moment the order is placed until the boutique confirms the stock existence, the order remains in step 1. If the ordered item is not available, the order is cancelled by no stock.

Step 2 - Approve Payment

This second step is parallel with the first one. Instantly after the order is created, either the Farfetch's Fraud team can approve the payment or the boutique's staff can confirm the stock existence on STORM. The Fraud team analyses the order details to approve or reject the payment. When there are suspicions that the order is not trustworthy, the order is cancelled and the motive is reported. If there are no fraudulent suspicions, the order proceed to the next steps.

Step 3 - Decide Packaging

After the stock is confirmed and the payment approved, the boutique must decide the best packaging according to the selected items, as well as printing all the documentation that need to go along with the parcel.

Step 4 - Create Shipping Label

The creation of the Air Way Bills (AWB) is usually done automatically. However, in some cases it is required intervention from the Delivery Support team due to country misspellings or wrong zip codes.

Step 5 - Ready (Send Parcel)

Once the AWB is created, the order automatically moves to the fifth step and is flagged as ready to send. Some boutiques have daily pick-ups while others need to book the pick-up with the courier. When the courier scans the package and the AWB, an e-mail is sent to the customer informing that the order has been shipped and the order is moved to the last step.

Step 6 - In Transit

The order remains in the last step until the courier delivers the order to the customer.

3.1.2 Returns processing

Relative to returns, the flow is slightly different. The control of returns on STORM is not so scrutinized and delays on the acceptance of returns are more regular, what ends denigrating customer experience.

The returns process is triggered once the customer requests a return pick-up within the established time limit. After the courier picks the order up and delivers it to the boutique that sponsored the item, the boutique must check the product and decide if the return will be accepted or if, for some reason, it will be contested. If the return is in mint condition and is accepted, the Farfetch's Payments team processes the refund to the customer.

3.2 Farfetch reports

All the reporting strategy at Farfetch can be divided into two main categories. By one side, we have all the reports with information regarding the KPIs designed to measure the performance of the miscellaneous relevant areas of the business. These reports can still be subdivided between the ones sent to the boutiques and the ones sent to the brands. Although some of the information is similar, there are relevant differences between the data provided for the two partners. On the other hand, all the e-mail and automatized reports, conceived to inform the stores about the course of their operations.

3.2.1 Boutiques' performance report

All the partner boutiques are very important to Farfetch because all the business revolves around the boutiques, the stock they share and their performance and celerity dispatching orders.

However, from another standpoint, Farfetch is also very important to many boutiques. With Farfetch, the boutiques earn a new sales channel and are able to commercialize to almost anywhere in the world. In some instances Farfetch needs some boutiques because of their prestige and, in other instances, because even some of the most remote boutiques provide the company with good and complete assortments of products. The boutiques also need the platform because it is a new way to increase sales. In most cases, we are talking about win-win partnerships that must be treated seriously and with respect.

The main purpose of the feedback given from Farfetch to the partners is to align the boutiques' performance with Farfetch's business strategy. The company aims to deliver the best experience to its customers and the Partner Service (PS) agents are the ones responsible to address the boutiques with any activity that need to be held to not jeopardize this objective. The PS agents are also the ones responsible to, on a monthly basis, send a Monthly Performance Overview (MPO) to the boutiques. One more time, the essence of the report is related to the measurement of operational metrics and acts as a monthly summary of how the boutique has performed.

Even taking into account the boutiques' importance for Farfetch, any sales report is periodically sent to the boutiques showing how much they are selling at Farfetch and not even how they are performing at other areas. Moreover, the current MPO reveals two main problems that must be avoided on a future approach to the B&W reports: the lack of consistency and a very time-consuming process. These happens because each PS agent sends the MPO via e-mail to the boutiques, with different analysis and personalized comments. The problems described along with a report more focused on Farfetch interest than in the boutiques' real performance do not constitute an ideal reporting exemplar. Notwithstanding the lack of some non-operational metrics, it is still useful to analyse what are the operational metrics considered and how they are presented.

The current MPO can be split into four main topics: Returns, Speed of Sending (SoS), No Stock and Net Promoter Score (NPS).

Returns

Regarding returns, there are two main blocks of information and data. The first block addresses the information regarding the number of returns (Figure 8) and the second one gives an overview over the number of contested returns (Figure 9).

RETURNS					
<i>* number of returns received during the current month</i>					
N Returns					48
America					48%
Asia					19%
Europe					27%
Oceania					6%
Grand Total					100%

TOP BFC	% of Returns	Main Category	% of Returns	Main Reason	% of Returns
KENZO	18,8%	Clothing	66,7%	Item is too big	44,4%
BOUTIQUE MOSCHINO	10,4%	Clothing	100,0%	Item is too big	40,0%
NEIL BARRETT	8,3%	Clothing	100,0%	Item is too big	50,0%
SONIA BY SONIA RYKIEL	8,3%	Clothing	100,0%	Item is too big	50,0%
COMME DES GARÇONS COMME DES	6,3%	Clothing	100,0%	Item is too big	33,3%
Y-3	6,3%	Shoes	100,0%	Other fitting problem	66,7%
MSGM	4,2%	Clothing	100,0%	Item is too big	100,0%
ASH	4,2%	Shoes	100,0%	Item is too small	50,0%
PREMIATA	4,2%	Shoes	100,0%	Item is too big	50,0%
COMME DES GARÇONS PLAY	4,2%	Clothing	100,0%	Other fitting problem	50,0%

Figure 8 - Returns information present on the boutiques' MPO

As it is possible to observe, the data in Figure 8 is all about the number of returns. In the first table it is possible to observe the number of returns during the last month and the percentage distribution of this returns by geographic region.

The second table, still on Figure 8, is way more complex. In the left columns (in red), the top ten brands with more returns and the percentage of the total number of returns for each brand is presented. The middle columns (in grey) show, for each brand, what is the main category returned and the respective percentage of returns regarding that category and that brand. Finally, in the right columns (in black), and similarly to the columns in the middle, it is presented the main reason to return products for the brand at issue and the percentage of products from that brand that ended returned because of that reason.

As an example, and to simplify the explanation, it is possible to conclude that, for some boutique, Neil Barret was the third brand with more returns (8,3% of the total). From all the products returned from Neil Barret, 100% were from the clothing category and half of the times the reason was because the item was too big.

CONTESTS		
Contest Returns	Number of Contests	2
	% of Contested Returns	4%
Contests Decision	N days to Decide Contests	9,24

Figure 9 - Contested returns information present on the boutiques' MPO

Looking at Figure 9, it is possible to conclude that the information concerning the contested returns is more concise. The tables just show the number of contests the boutique have done during the month, the number of contests as a percentage of the total returns and the average number of days to decide a contest is also presented.

Speed of Sending

The SoS is a KPI that measures the time between the moment an order is created and the moment it is picked up by the courier. In line with the company developments, it is currently measured in two different ways, the SoS Gross and the SoS Net.

The SoS Gross measures the difference between the date the order is created and the date it is sent. It is expressed as in Equation 3.1.

$$SoS_{Gross} = Date_{OS} - Date_{OC} \tag{3.1}$$

Where:

- Date_{OS}, is the date and time the order is sent by the boutique, and
- Date_{OC}, is the date and time the order is created

However, the SoS Gross could lead to incorrect conclusions when evaluating a boutique's performance. First, because the boutiques usually have a limited working schedule (not working during weekends) and also because the pickups of the prepared orders only occur during weekdays also.

To deal with these constraints and to provide the boutiques with accurate measures, the SoS Net was developed and is calculated as revealed in Equation 3.2.

$$SoS_{Net} = T_{Step\ 1} + T_{Step\ 3} + T_{Step\ 5} - Wknd - Hol - T_{Hold} \tag{3.2}$$

Where:

- T_{Step1}, is the period of time that an order spent on Step 1
- T_{Step3}, is the period of time that an order spent on Step 3
- T_{Step5}, is the period of time that an order spent on Step 5
- Wknd, is the period of time for which an order could not be processed due to weekends
- Hol, is the period of time for which an order could not be processed due to bank holidays, and

T_{Hold} , is the period of time that an order spent on Hold

The steps 1, 3 and 5 are the steps for which the boutiques are responsible, so, the time spent on these steps are boutiques' responsibility. If an order remains in one of these steps during the boutiques' not working times, like weekends and bank holidays, that time is discounted from the measure calculation. If something freezes order processing and it is not boutiques' responsibility, the order is placed on hold. This time is also discounted from the calculation, to guarantee that the time considered is exactly the time the boutique needs to fulfil the order.

Although, when analysing a set of orders, the most common way to present this KPI is not recurring to the average SoS Net time, but as a percentage of orders sent that met a specific SoS Net range criteria. Internally, the most used is the percentage of orders with SoS Net below 2 days, as shown on Equation 3.3.

$$\% SoS_{Net} < 2 \text{ days} = \frac{\sum Orders_{SoS Net < 2 \text{ days}}}{\sum Orders_{Sent}} \tag{3.3}$$

Where:

$Orders_{SoS Net < 2 \text{ days}}$, are the orders sent with SoS Net not above 2 days, and

$Orders_{Sent}$, are all the orders sent

However, when transmitting the information to the boutiques, the ranges most considered are the orders with SoS Net in less than 1 day and between 1 and 2,5 days. This misalignment occurs because of a policy of incentives and penalties accorded with the boutiques that take into consideration these different ranges.

Regarding the SoS information present in the boutiques' MPO, all the metrics are about the SoS Net, and are shown on Figure 10.

SPEED OF SENDING				
TOTAL	100,00%			
Steps			Grand Total	
Step 1	0,19		0,19	
Step 2	0,04		0,04	
Step 3	0,36		0,36	
Overall SoS Net	0,58		0,58	
	Total N° of Boutique Orders			
Range	# Orders	% Orders	# Orders	% Orders
< 1	257	89,5%	257	89,5%
> 1 to 2,5	30	10,5%	30	10,5%
Grand Total	287	100,0%	287	100,0%

Figure 10 - SoS information present on the boutiques' MPO

One more time all the data is presented in tables and either previous values or targets are shown as a possible comparison basis. The upper table presents an average of the period of time elapsed in each step and overall. The other table shows the SoS Net as a percentage of the total orders sent, considering the two previous identified time ranges.

No Stock

A no stock happens when the stock is not well synchronized or when a last item sale is made offline while the same item is ordered online. This results in a bad customer experience that must be avoided and countered. The No Stock main metric is expressed in Equation 3.4.

$$No \ Stock = \frac{\sum Orders_{No \ Stock}}{\sum Orders} \tag{3.4}$$

Where:

$Orders_{No \ Stock}$, are the orders that experienced a No Stock, and

$Orders$, are all the orders considered

The No Stock metric is very susceptible to seasonal variations. The main reason is because at the beginning of a season the stock is larger and there is more product available, which results in a lower probability of occurring a no stock.

On the boutiques' MPO there are some more metrics complementing the main No Stock metric. All of the mentioned are displayed on Figure 11.

NO STOCK						
TOTAL						
0,93%						
TOP 10 BFC	Nr of Cancelled Items	% of Cancelled Items	Main Category	% of Cancelled Items	Main Gender	% of Cancelled Items
ASH	1	33,3%	Shoes	100,0%	WOMEN	100,0%
MSGM	1	33,3%	Clothing	100,0%	WOMEN	100,0%
KENZO	1	33,3%	Clothing	100,0%	WOMEN	100,0%
Grand Total	3	100,0%		100,0%		100,0%
TOP SEASONS	Nr of Cancelled Items	% of Cancelled Items	% Discount Items	Total Value		
SS16	2	66,7%		156,92		
AW15	1	33,3%	100,0%	57,39		
Grand Total	3	100,0%		214,31		

Figure 11 - No Stock information present on the boutiques' MPO

Besides No Stock, there is also data concerning the number of cancelled items due to no stock. Similarly to the previous explanation on Returns, the upper table divulges the number of cancelled items for the brands with more no stock occurrences as well as the percentage of no stock contributions that each of the top brands have considering the total no stock. The main category and the main gender of cancelled items due to no stock for each brand are also considered. On the last table, the segmentation is done by the top seasons and the total value of the items along with information concerning the price (full price or price with discount) are also presented.

Net Promoter Score (NPS)

The NPS is a metric used to measure the customer loyalty and level of satisfaction. After the purchase is delivered, the customer automatically receives an e-mail with the form displayed on Figure 12.

TELL US WHAT YOU THINK

RATE THE SERVICE (required)

Please provide an overall rating for the boutique you have ordered from ★ ★ ★ ★ ★

Please rate how well the boutique packaged your order ★ ★ ★ ★ ★

Please rate the speed of your delivery ★ ★ ★ ★ ★

Would you recommend the boutique you ordered from to your friends or family? (required)

● ● ● ● ● ● ● ● ● ● ●

0 1 2 3 4 5 6 7 8 9 10

Not likely at all Neutral Extremely likely

Would you recommend farfetch.com overall to your friends or family? (required)

● ● ● ● ● ● ● ● ● ● ●

0 1 2 3 4 5 6 7 8 9 10

Not likely at all Neutral Extremely likely

Figure 12 - Net Promoter Score form

The first three questions are used to calculate three additional ratings: Boutique Rating, Packaging Rating and Delivery Rating. These ratings are a number between 1 and 5, depending on the number of stars selected by the customer.

The last two questions about how likely the customer would be to recommend both Farfetch and the boutique, in a 0-10 scale, are used to calculate the NPS for each entity – one for the boutique and another for Farfetch. The NPS calculation is mathematically expressed in Equation 3.5.

$$NPS = \% Promoters - \% Detractors \tag{3.5}$$

Where:

NPS, is the Net Promoter Score

% Promoters, is the number of Promoters over the total number of reviews, and

% Detractors, is the number of Detractors over the total number of reviews

The answers to the questions related to the NPS may vary between 0 (not likely at all) and 10 (extremely likely). Answers between 0 and 6 represent a Detractor, while answers between 9 and 10 represents a Promoter. Answers with 7 and 8 represent a Passive.

The NPS, even more when combined with the Boutique Rating and the Packaging Rating, is an important metric to understand what image the boutique is sending out to the customer. Also for that reason, it is considered as part of the MPO sent to the boutiques, as exhibits Figure 13.

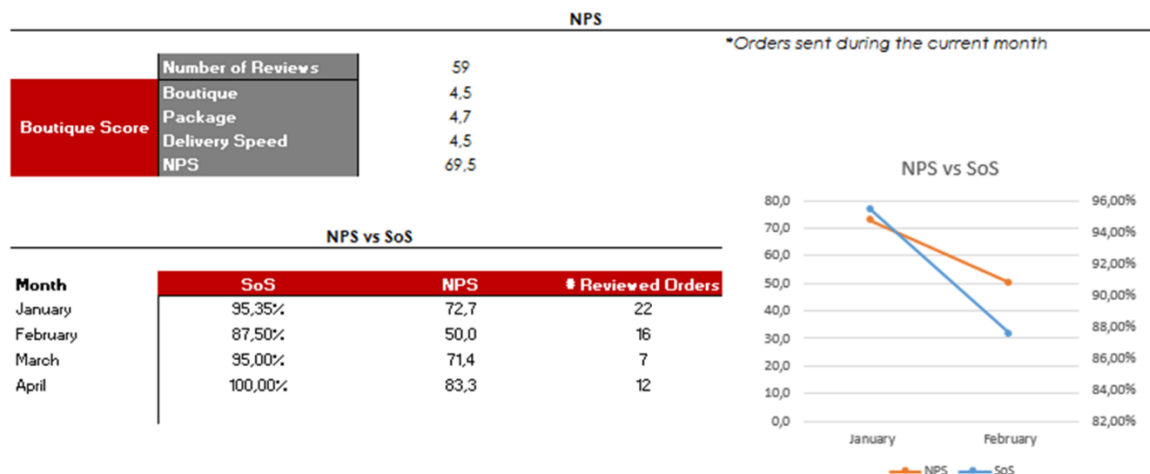


Figure 13 - NPS information present on the boutiques' MPO

The left upper table shows the main indicators regarding NPS. The number of reviews represents the number of answers to the form displayed in Figure 12. After, the Boutique Rating, the Package Rating and the Delivery Rating are also shown (from 1 to 5, as explained before). Last, the Boutique’s NPS percentage result, for the answers considered, is presented.

The lower table and graph aim to show a direct correlation between NPS and SoS. It is expected that one of the main distinctive features to the customer is the SoS and, considering that assumption, when the boutique is faster preparing the orders, the NPS result will also be better. This is a valid assumption, however sometimes this relation can be affected by other factors. As an example, even if the boutique is fast preparing the order but the courier transportation time is a lot lagging than the average, the customer will still have a not so good experience, even considering the boutique’s quickness. However, it is an excellent way to convince the boutique to enhance its SoS and consequently improve its image near the customer.

A positive example here is the first attempt concerning the full MPO to demonstrate a metric’s evolution and not only the absolute value of the month. Both the table and the graph, show the SoS and NPS metrics’ results from previous months and its evolution until now.

Summarizing, the MPO is exactly what the name suggests: a snapshot of the boutique's performance of the month. There are almost no comparisons between the current and previous months and it is only possible to interpret the value as absolute. It is not possible to understand how the values are relatively because there is any point of comparison, except if, on the e-mail, the PS agent writes about how the metric has performed comparing to previous months or to the targets. Furthermore, almost all the information is presented in numbers or tables and there are some columns that are not totally clear, which may lead to misunderstood information.

Nevertheless, the MPO reemphasize the focus from Farfetch in improving the operational effectiveness and efficacy of the boutiques, to reach the major objective of amaze customers. The B&W brands will be subject to the same working procedures and, therefore, the used metrics may also help the brands to reach similar targets.

3.2.2 Brands' performance report

More recently, and taking advantage of the existing platform, Farfetch started to deal directly with some brands. Their products went online through new mono brand boutiques, which are an useful simplification of the brands' stores or stock points. Starting to deal directly with brands was a very important milestone for Farfetch, because this implied a misrepresentation of the company initial mission and a lot of cogitation was needed to take this step. However, today, the brands are very important to Farfetch, as far as this more direct relation allowed to close cooperation between Farfetch and the brands. The main Farfetch's objective is the same, that is, bring supply. However, working directly with a brand and expecting to enhance the relationship with the fashion brands and groups, involves some more demands and obligations that need to be fulfilled.

In the path of what it is done to the boutiques, it is equal or more important to provide the brands with detailed data and information about their performance. So, in a similar way, also exists a MPO to resume the brand's performance. Despite sharing the same concept and many metrics, the reports are not equal. Each MPO focuses on different areas and has some important differences that deserve to be highlighted. The boutiques' MPO focus is essentially on the performance of the operational area, through areas like Returns, SoS, No Stock and NPS. All these information is also present on the brands' MPO, albeit it is presented on different, and more complete, ways. Nevertheless, in addition to the KPIs of the operational area, some data about the brands' sales is also provided.

Regarding the operational KPIs, since they are all the same, only the main differences to the boutiques' MPO will be accentuated. Given the novelty, the sales area will be more deeply analysed, because it is a very important introduction to the B&W sales reporting relevance.

Operations

The exact main metrics used on the boutiques' MPO are also used on the brands' MPO. However, given the changes on the destination target, some data is presented in a different way to meet the identified needs of the brands.

Starting with returns, the number of returns on the month is also presented. However, the boutiques' brand segmentation no longer makes sense. So, instead, the quantity of items returned, and its percentage of total, are grouped by the return reason, as it is possible to understand on Figure 14.

Returns

Brand	Return Reason	Returns - Qty	
		Items	Returns - Qty Items2
BRAND ABC	Item is too big	4,00	36,36%
	Changed my mind	2,00	18,18%
	Item is too small	2,00	18,18%
	Other fitting problem	1,00	9,09%
	Return to origin store	1,00	9,09%
	Quality	1,00	9,09%
Grand Total		11,00	100,00%

Figure 14- Returns information present on the brands' MPO

Concerning SoS, No Stock and NPS, the metrics used are exactly the same. However, as explained before, there is no place for brand segmentation, because on the brands' perspective that just does not make sense. The main advantage comparing to the boutiques' MPO is that year over year (YoY) evolution and targets are shown. This was an issue very criticized on the boutiques' performance reports, but that is improved on the brands' report. Using SoS as an example, and despite the available data merely considers two months of the current year, it is possible to understand on Figure 15 the scheme utilised to compare the metric YoY and show the target values. A graph is also utilized, which greatly improves the user interpretation of the displayed data.

> Speed of Sending Net

Month	% Orders with SoS < 2 days	% Orders with SoS < 2 days - Last Year	Var
Jan			
Feb			
Mar	94,3%		
Apr	72,1%		
May			
Jun			
Jul			
Aug			
Sep			
Oct			
Nov			
Dec			
Overall	84,4%		

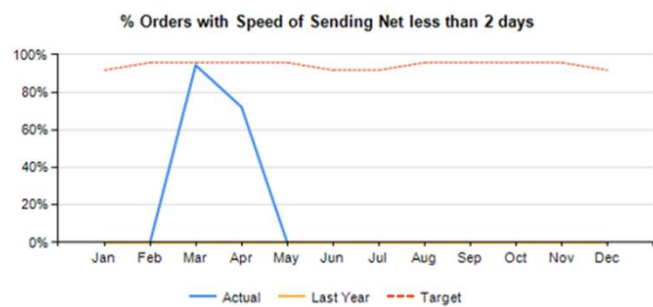


Figure 15 - Graph and comparisons present on the SoS analysis of the brands' MPO

Despite Figure 15 considers SoS, the same graphic and display styles are utilized for No Stock and NPS metrics. Beyond the comparisons to the last year and to the target, with the graphic it becomes clearer to understand how the metrics' evolution month over month is. It is important to verify that some effort on comparison values is done, which is far better than what it is done on the boutiques' MPO.

Sales

Brands are more demanding than boutiques regarding sales values. Queerly, any performance information on sales values is considered on the boutiques' MPO. At a glance it is strange that sales are not considered on the boutiques' reports, however that situation is corrected on these MPOs and more relevant information starts to be provided to the brand. Brands are pickier and demand more frequently the need to understand sales and its growing.

The most important sales metric applied is the Gross Transaction Value (GTV). GTV is a good indicator of the growth of an e-tailing company, as it measures the value of the number of transactions handled. GTV is equal to the number of items sold multiplied by the average order value (AOV). It is important to emphasize that the price collected considers the item full price

value (no discounts are considered), the shipping fees, duties and so on. So, GTV is a truly representation of gross sales.

Considering the reports, the brands are provided with the GTV value for the current and past months, as well as with YoY comparisons of the metrics' values. The values are transmitted in a table.

Nonetheless, it is also important to show sales metrics considering other parameters. Sales by gender, season and item category seem to be very relevant to the brands. On the brands' MPO, the top combinations of gender, season and category are revealed, accompanied by the GTV value and the percentage of the total GTV associated with each combination. One more time, the tabular form is the chosen one to present the data, as demonstrated on Figure 16.

Brand	Gender	Season	Category	GTV* Store Value	%
BRAND ABC	MEN	SS16	Trousers Sweaters &	2.190,18	36,97%
BRAND ABC	MEN	SS16	Knitwear	1.648,39	27,82%
BRAND ABC	MEN	SS16	Shirts	691,15	11,67%

*GTV: Gross Transaction Value

Figure 16 - GTV by gender, season and category combination

In order to complement the sales data, the bestselling items are also presented to the brand. With that information, the brand gets able to understand what are the most wanted products and can rebuild its offer considering the current trends.

People from brands are not used to product names, barcodes or other products' identification codes. Those people may not know the name of a product, but they are sensitive and experts about the product itself. They know how the product is and how it looks. For that reason, the bestselling products are presented to the brands as in Figure 17.



Figure 17 – Bestselling items information present on the brands' MPO

With this list of pictures, it is expected that brands get more familiar with the information and capable of processing the information faster.

To sum up, the brands' MPO is more complete than the boutiques' report. First, aside from the operational performance information and metrics already in use for the boutiques, sales values are also presented to the brands. These data enriches and completes the performance report a lot, given the sales information importance for the partners. Second, the use of targets and comparison basis are important. For companies that are not used to some of the metrics (the operational ones, mainly), the usage of these values is very important because it allows them to understand how are they positioned comparing to last year or to defined targets. Last, but not least important, the application of data visualisation techniques must be praised and welcome.

Even employing some simple graphs, the processing capability of the assignee improves and it becomes easier to spot trends and faster to interpret values.

3.2.3 Operational reports

Farfetch's success is highly dependent of boutiques' performance. Therefore, many automatized operational e-mails and reports are sent to the boutiques, both daily and monthly, in order to help them improving performance. Some of them aim to help settling some particular complications of each boutique, while others are more general. Reinforcing that the best way to define this kind of reports is hearing the interested side, there are, although, two general reports that deserve to be addressed, because they are sent to every boutiques and have helped improve each boutique's performance since day one.

Thus, it is important to analyse what information is passed to the boutiques, to understand what could be used and what needs to be adapted when considering B&W clients. After a deep analysis of all the many operational reports sent to the boutiques, the ones identified as most important and that will be fully analysed are the Daily Operational Report and the Monthly Service Performance Report.

Daily Operational Report

The Daily Operational Report is sent every mornings to the boutiques and consists on a snapshot of the order fulfilment steps at the beginning of the day. It displays how many orders are in each step of the order processing, as well as the delay range of each set of orders. An example is present on Table 1.

Table 1 - Daily snapshot of the order processing steps

Delay Band/ Level Detail	Check Stock		Decide Packaging	Send Parcel	Grand Total
	NORMAL	SA	NORMAL	NORMAL	
x<1	5	0	0	0	5
1<=x<2	3	1	0	0	4
2<=x<=4	3	0	1	0	4
x>4	0	0	1	1	2
Grand Total	11	1	2	1	15

From reading the table present on the report, it is possible to understand that there are eight orders that have not been fulfilled yet. Four of them are in the process at less than one day, while one order is between one and two days and three orders are waiting to be processed at more than two and less than four days. It is also possible to understand that seven orders are waiting on Step 1 – Check Stock, while another one is on Step 3 – Decide Packaging. It is also possible to cross both information, as an example, two orders are waiting in Step 1 – Check Stock at more than two days and less than four. Receiving this information in the morning is very important to the boutiques' managers, because gives them the current status of the situation and advice about the need to speed up the process.

The orders with the bigger delay bands are then detailed on a second table, as it is possible to understand on Table 2.

Table 2 - Detail of the more delayed orders

Delay Band	Level Detail	Order Code
2<=x<=4	Check Stock	OTT1536748
		OTT4849203
		OTT1928485
	Decide Packaging	OTT1939404
x>4	Decide Packaging	OTT8349950
	Send Parcel	OTT1734893

The most critical delays (if the order has been placed between two and four days before or at more than four days) are reemphasized on this second table, as well as the steps in which the order is stuck. The boutique order number is presented to invite the managers to take actions and process these orders, to avoid a poor SoS performance.

Monthly Service Performance Report

The Monthly Service Performance Report is sent at the end of each month for the boutiques. Although the majority of the metrics used are similar to the boutiques' MPO, the approach of the two reports is very different. The MPO aims to give an overview of the performance of the boutique, while this service performance report addresses the metrics for each of the orders sent during the month.

The report is constituted by three main tables. The first contains the month overall results of SoS and No Stock, in a similar way to what is already presented on the boutiques' MPO. The other tables, however, show more detailed results for each order. The second table details the SoS Net results for each order sent, as it is possible to understand on the sample present on Table 3.

Table 3 - Detailed SoS information

Boutique Name	Order Number	SOS Net (days)	Send Date	Range (days)
Boutique123	OTT089089	2,34	2016-06-02	1<x<=2,5
Boutique123	OTT987483	1,95	2016-06-09	1<x<=2,5
Boutique123	OTT123234	0,99	2016-06-11	x<=1
Boutique123	OTT123949	0,68	2016-06-11	x<=1
Boutique123	OTT248243	2,53	2016-06-11	x>2,5
Boutique123	OTT189471	1,48	2016-06-11	1<x<=2,5
Boutique123	OTT198343	1,91	2016-06-12	1<x<=2,5
Boutique123	OTT194814	2,52	2016-06-22	x>2,5
Boutique123	OTT234234	0,22	2016-06-24	x<=1
Boutique123	OTT134234	0,57	2016-06-30	x<=1

With this data, among other things, the manager will be able to understand the reason why some orders took so much time to be processed. To conclude, the third table details each order that has been returned and is pending a store action. With this info Farfetch aims to guarantee the manager does not forget about those orders and can decide what action the boutique should take.

Although simple, these reports are very important to the boutiques day-to-day operational issues. The information displayed and presented on these reports helps the managers responsible for the e-commerce channel to make decisions on time and assists them with the management of the online related operations.

4 The new reporting model

The fully-fledged B&W new business unit aims to sell white-labelled e-commerce solutions, through Farfetch's platform, to retailers and designers. Notwithstanding, as a new born agency, many processes are not yet defined. Despite the fact that many processes are leveraged from Farfetch, reporting is one of the most important innovations due to the importance of data and information sharing between parties.

Two main reporting branches were defined as priority and are addressed along the present chapter. First, defining the operational reporting strategy, since deciding the reports to assist on day-to-day operations, to define monthly operational summaries. And second, the development of a complete performance reporting model, covering all the key areas of the business.

4.1 Operational reporting strategy setting

The ordering process performance of a brand is something that will not affect Farfetch or B&W directly, but the brand itself. However, considering that many brands will have e-tailing operations for the first time, it is B&W Operations' responsibility to provide the best information and to assure that the brands get used to the operational workflow, allowing them to improve. Although it is possible to follow order and returns processing through STORM, it remains necessary to provide each client with many instructions, such as reminders about its order backlog, which returns are incoming and what is the client's recent operational performance at a very detailed level.

The methodology explained in Section 1.2 was also used to define the list of operational reports that must be sent to the clients. After the analysis of all the similar reports that Farfetch shares with the boutiques, the most relevant and complementary reports were selected and presented to the brands as a starting evaluation point. A stable list of detailed reports was achieved after iterative events of feedback gathering and analysis, new actions planning, implementation, and evaluation.

More than a list, all the defined reports must have a reason lying behind them and be aligned with a strategy. Four reports were identified as fundamental for every client, two of them on a daily basis, and the other two on a monthly basis:

- Daily Operational Report;
- Monthly Service Performance Report;
- Daily Orders and Returns Information;
- Monthly Orders and Returns Information.

Although two of the reports have already being presented on 3.2.3 as used practises for Farfetch, some changes were necessary to fulfil all the clients' suggestions and to adapt them to the new reality of B&W. The other two reports, in contrast, are very similar in content even though they have different periodicities, and were created from scratch.

There are some underlying operational differences between a Farfetch boutique and a B&W brand, especially concerning the stores' network. The vast majority of Farfetch's boutiques

have only one store (the boutique itself) and, therefore, just one stock point. However, almost all the B&W brands are using, or will use, more than one store to fulfil the online commerce channel.

For luxury brands it is normal to have a vast network of stores around the world in the most important cities. It is the brand that must decide which are the stores and the warehouses to use, to address the full e-commerce operation. The client is able to consider stores in different cities or different countries around the world, knowing beforehand that the more stores and the more geographic dispersion, the closer the brand will be to the final customer and more customers that will get satisfied with faster delivery times. However, when using more than one store to fulfil online orders, also more than a single stock point must be considered on the Farfetch platform.

With these assumptions and looking at some operational metrics, it is easy to understand that the granularity of the information must change and the data must be segmented by stock point or shipping point. As an example, despite it still makes sense to analyse the overall SoS, much better results will be attained once the brand's e-commerce manager gets access to the SoS information divided by different shipping points. That information allows action directly on the source of the problem, if needed, instead of searching out before what reasons are behind the overall results. At an operational level, this quickness is not only necessary, but mandatory.

In order to reach these imposed demands of using more than one stock point to dispatch orders, the reports were changed and re-designed in order to guarantee that the brand's manager always gets access to the most important information segmented in the most appropriate way possible.

The main goals of these operational reports are to help the managers control the day-to-day operational issues, to provide some detailed information regarding operational metrics by stock point and to endow the managers with some data for their own analysis and comparisons with other B&W reports. The tabular form is common on all the reports. First, because the present numbers are objective and second, because with this approach the brands can more easily manipulate the numbers and therefore analyse them freely.

Daily Operational Report

Remembering what has been presented in Section 3.2.3, the daily operational report usually contains two main tables. The first one displays how many orders are in each step of the order processing, by delay range, while the second table focus on discriminate which are the orders with bigger delay bands (at more than two days being processed).

As explained before, when preparing and defining this report to the B&W clients, the main concern was the growing number of stock points presented by the brands. However, every parts agreed that an indication of the stock point on the second table (in each of the orders with bigger delays) would be enough, as presented on Table 4.

Table 4 - Delayed orders detail with stock points information

Delay Band	Level Detail	Order Code	Stock Point
2<=x<=4	Check Stock	OTT1536748	Store ABC
		OTT4849203	Store ABC
		OTT1928485	Store DEF
	Decide Packaging	OTT1939404	Store ABC
x>4	Decide Packaging	OTT8349950	Store DEF
	Send Parcel	OTT1734893	Store GHI

When inspecting the orders that are taking more time to be processed, a consensus was reached about the need to have the stock point indicated. With the implemented new column, the

managers have all the main information they need to act over the more critical orders alerting the right stock point, without consulting any other tool.

Regarding the order processing panorama, it is preferred to maintain the global view of the e-tailing operation as a whole. A split by stock point was also considered, however the global information is more valuable and easier to read.

When receiving this report embedded on an e-mail every mornings, the client's e-commerce manager will be able to have a global overview of the order fulfilment process and understand what orders are transiting from the previous days. The second table, in turn, allows to investigate the orders that need to be monitored more closely, providing the order code and the related stock point to enable faster actions.

Monthly Service Performance Report

The Monthly Service Performance Report is sent after the end of each month, as a Microsoft Excel file, and is used to transmit some more detailed information regarding the SoS and No Stock metrics, and to inform about possible returns that are pending a store action. The reports were adapted from the ones Farfetch was using for its boutiques, but one more time the various stock points had to start being considered.

The first table now details the number of No Stock Cancellations during the current month, as well as the number of orders that have been sent by each stock point, in each range of time (less than one day, between one and two and a half days, and more than two and a half days). Table 5 exhibits an example.

Table 5 - Detailed performance metrics by stock point

Performance Metric	Stock Point	Range	Qty
No Stock Cancellations			1
Speed of Sending	Store ABC	$x \leq 1$	18
Speed of Sending	Store DEF	$x \leq 1$	6
Speed of Sending	Store GHI	$x \leq 1$	2
Speed of Sending	Store ABC	$1 < x \leq 2,5$	16
Speed of Sending	Store DEF	$1 < x \leq 2,5$	8
Speed of Sending	Store GHI	$1 < x \leq 2,5$	4
Speed of Sending	Store ABC	$x > 2,5$	2
Speed of Sending	Store DEF	$x > 2,5$	2
Speed of Sending	Store GHI	$x > 2,5$	8

These metrics information will certainly be present on the performance reports. However, at a more operational level it is important to have more detailed information. The SoS metrics are ordered by range (first the number of orders each store sent in less than one day, second between one and two and a half days, and so on) because presenting the data this way makes it easier to sum each of the stock points quantity and reach the overall quantity of orders sent in each range.

To detail even more the information, the second table presents the SoS Net results for each of the orders sent during the month. It now also contains the stock point information and is ordered first by stock point, and then chronologically by the send date. Such information allows the manager to calculate global or per stock point metrics from the detailed information provided. A very simplified example is shown on Table 6.

Table 6 - Detailed SoS information by stock point

Stock Point	Order Number	SOS Net (days)	Send Date	Range (days)
Store ABC	OTT123234	0,99	2016-06-11	$x \leq 1$
Store ABC	OTT123949	0,68	2016-06-11	$x \leq 1$
Store ABC	OTT134234	0,57	2016-06-30	$x \leq 1$
Store DEF	OTT089089	2,34	2016-06-02	$1 < x \leq 2,5$
Store DEF	OTT987483	1,95	2016-06-09	$1 < x \leq 2,5$
Store DEF	OTT194814	2,52	2016-06-22	$x > 2,5$
Store GHI	OTT248243	2,53	2016-06-11	$x > 2,5$
Store GHI	OTT189471	1,48	2016-06-11	$1 < x \leq 2,5$
Store GHI	OTT198343	1,91	2016-06-12	$1 < x \leq 2,5$
Store GHI	OTT234234	0,22	2016-06-24	$x \leq 1$

The report finishes with a table detailing each product returned and pending a store action, that is to say, a return that has not been accepted or refused yet. These information does not need to be split, because despite all the stock points a brand could have, usually there is only one return address active. In other words, regardless of the original stock point, all the products are returned to the same address. This information allows the manager to investigate at the end of each month why some products have not been accepted or refused yet, in order to provide a better and faster service to the customer.

Orders and Returns Information

While discussing the other reports, the need of detailed data regarding orders and returns information arose. After understanding the clients' needs, two different periodicities were established: a daily and a monthly report. Both are sent as a Microsoft Excel file with two sheets, one regarding the orders and the other regarding returns. The daily report is sent in the mornings and provide data from the day before. The monthly one is sent after the end of the month, with all the considered data from the month. Besides the information is very similar in both, the methods and assumptions used to collect the data are not exactly the same, because the objectives and the collected requirements are also slightly different.

The main reason why these reports are necessary is related to the lack of availability of data. All the information regarding orders and returns is present on Farfetch's applications like STORM or SALES. Nonetheless, it is impossible to export that information, making it difficult when the clients want to perform their own analysis. B&W is a service provider, so all the information must be clearly transmitted to the clients. This was the main initial requirement, made by the vast majority of the brand clients. Yet, while developing the report, other questions equally valued appeared and some handy information for the brands was also identified and considered.

The Order Information sheet aggregates information related to the order and to the product(s) in its content, such as: Order Date, Order Code, Order Total Price, Shipping Price, Customer Name, Customer E-mail, Shipping Country, AWB, Order Line Status, Item Barcode, Item ID, SKU, Item Price, Gender, Size, Colour, Main Category, Sub Category, Season and Collection. These data provides a good basis to any analysis, since it contains details at least from the order, the customer, and the product. While the daily report presents the orders from the day before, the monthly one aggregates all the orders from the month.

Concerning returns, the daily and monthly reports are constructed over the same basis, but the assumptions when filtering the data are not the same. The returns table contains the following information: Order Date, Order Code, Order Line Status, Return Date, Refund Date, Return Status, Customer Name, Customer E-mail, Shipping Country, AWB, Item Barcode, Item ID, SKU, Item Price, Gender, Size, Colour, Main Category, Sub Category, Season and Collection.

At the beginning of the operations, some brands were struggling with the lack of awareness about how many returns they would receive in the upcoming days. So, on a daily basis, each return that is picked up by the courier is presented in the returns sheet of the daily report. Many dates would be considered, as the date the customer exercises his option to make the return. However, when considering the pick-up date, it is almost sure that the customer will not change his mind and the return will effectively arrive to the store during the next days.

Regarding the monthly report, the brands' concerns were not the same. Monthly, the most important is to understand how many returns were done, how many were accepted and which were refused. In addition, the brands were also struggling to check the returns information on the financial reports sent by the B&W team every month. So, the choice was to represent the returns in the same way the financial report was doing it, that is to say, using the date of refund. However, if only this date was considered only the returns accepted would be present on the report. Concluding, the best way found to filter the information was considering all the returns that have been refunded during the month in hand, as well as all the returns received by the store during the same month. This way, all the desired information is present on the report and the manager is able to re-check the store's decision over the returns and still compare and check the returns refunded during the month to the ones present on the financial report.

4.2 Performance reporting model

The performance reporting model has several challenges. Firstly because it is hard to approach all the data and have to define how to measure performance when many clients are facing the e-commerce reality for the first time. And secondly because brands usually have different modes of action and expectations. Consolidating all the information in order to please them all, proved to be a difficult task. However, with the used methodology, improvements are implemented by step, some problems are identified and corrected along the path, and some changes are considered. A resume of the entire process is made on the next chapters.

4.2.1 Conception

One of the main challenges of any project based on an AR methodology is the capability of taking action while creating knowledge. Given the chosen methodology, it is anticipated that more than one cycle will be necessary to reach a stable model. Regarding conception, the two initial pre-steps of the methodology (Context and Purpose, and Initial Model) are essential to achieve a good starting point. The cycles are also important for the conception, and the first opinions are the more relevant. At a certain point, the concept will be fully defined and the methodology cycles will continue, but, as a rule, it will be merely necessary to improve certain measures or visualizations.

The first important definition is related to the Context and Purpose. The rationale behind the research context has already been addressed at Chapter 2, however the rationale for action is also important. It is necessary to define the main requirements and objectives, in order to align the goals of any reunion or interview. The reporting tool must, then, inform the brands' e-commerce manager about the performance of many areas, from sales, to operations and even the digital performance of the site. Through the report, the manager must be able to control the operations, inspect sales values and check the site and the general e-commerce performance to identify trends and plausible improvements. A weekly and a monthly periodicity were the initial settings defined.

The initial model is a good way to provide the brands a starting point and a basis to start evaluating. Farfetch have expertise in the area, and despite the external reporting be almost non-existent, it still can add value. It is true that the B&W clients will have different goals and expectations, but the next steps in the cycle will serve to work on that direction. Farfetch's

managers and analysts were consulted to understand what data would be shown and what would be the best metrics to consider. Despite dashboards being very used internally at Farfetch, they are more used to provide high level insights rather than operational details. In spite of a dashboard should be used to show operational details, it was decided to consider a customised report able to provide some more information, but also impressive data visualizations.

On the initial report model, five main areas were outlined: Sales, Digital Marketing, Payments and Fraud, Customer Service and Operational. The most used metrics at Farfetch, like the ones used on the MPOs and other internal metrics, particularly the ones which represent useful information to the brand, were considered. After the construction of the model (from data acquisition to data visualization), the result was shared with the brands in order to start delineating new features, settling up some metrics calculations and improving the interpretation of data and visualization.

During the process, many requests were made by the managers. New features regarding specifics of fashion, different considerations in metrics, improvements of unclear charts, and many others. The report evolution found some obstacles too, because some requested and meaningful information was not able to be considered. Among the examples are the NPS, stock and merchandising metrics, and further digital marketing metrics. The NPS was not yet being sent. The stores' stock information, and analysis like the sell thru, were not able to be performed because the multi-tenant structure in the data warehouse was not ready yet. The vast majority of the digital marketing data is extracted via Google Analytics, however the database was not extracting and saving all the metrics available.

Nevertheless, many data regarding possible improvements was evaluated, gathered, analysed and implemented, until it was re-evaluated again and the report entered a new cycle.

The final report model is constituted by six different areas: Sales, Sales Details, Digital Marketing, Operations, Fraud and Payments, and Customer Service. Sales Details were added to cover some sales metrics comparisons and segmentations, but the other areas also changed and ended more complete than in the beginning. The main difference, however, is regarding the periodicity. While at the beginning weekly and monthly was the periodicity defined, most of the managers feel the need to constantly have present week to date (WTD), month to date (MTD) and year to date (YTD) values. Hence more, sending the same report on a weekly and monthly basis, with values from both week and months would be confusing and nonsense. This way, the final report enables the user to consider at what date he wants to analyse the position of the business and the period he wishes to consider (this will be better explained on Section 4.2.4). Yet, summary tables in each area always give insights on WTD, MTD and YTD values.

At the same time, and between the initial model and the final one, Tableau has passed from just a tool to construct the reports to a mean of provide them also. In the beginning the aim was to construct the reports on Tableau, in order to improve data visualizations and construct more ambitious reports. However, Tableau is more than a tool to develop reports, it is also a mean to share and interact with them. That way, the final reports started being thought to be more dynamically and interactive, because a Tableau account for each brand was achieved and so, they would consult the reports directly via Tableau.

With the final reports, the main areas are covered, the most important metrics are being measured and all the report enables the manager to achieve the defined goals, considering any analysis he would like to perform.

4.2.2 Metrics and considerations

As explained before, some metrics are already being used on the MPOs explained on Chapter 3.2, others were adapted from internal reports and some were even constructed from scratch. All the metrics present on the report (Appendix A), and not only the KPIs present on the top

tables, are presented and explained. For ease of consultation, the metrics will be presented divided by the considered areas: Sales, Digital Marketing, Operations, Fraud and Payments, and Customer Service. The Sales Details area only considers different segmentations of Sales metrics and so, it is not addressed because any further metric would be considered.

Sales

- **Sales**

Despite GTV being used on the MPOs, it is not considered on the B&W reports because it does not represent the sales value from a store perspective (reminding, GTV includes shipping fees and duties and is a “Customer view” of the sales value). So, the name “Sales” was used to facilitate the understanding of the metric, and it represents the “store view” of sales value: without shipping fees and without duties and VAT, and equal to the item(s) base price.

$$Sales = \sum_{i=1}^n Item\ Base\ Price \quad (4.1)$$

Where:

Item Base Price, is the base price of the product sold, and
n, is the total number of products sold

- **Orders**

Represents the total number of orders placed on the website, on the period considered.

- **AOV**

The AOV is calculated as follows:

$$AOV = \frac{Sales}{Orders} \quad (4.2)$$

Where:

Sales, is the Sales metric previous explained, and
Orders, is the Orders metric explained before.

- **Net Sales/ Net Orders/ Net AOV**

Net Sales, Net Orders and Net AOV are equal to the main metrics, but not considering orders, or products, that have been returned or cancelled on the meantime. Net Sales and so, also AOV; are also net of any discounts.

Digital Marketing

- **Visits**

The total number of visits to the website. A visit, or session, is the period of time a user is actively engaged with the website.

- **% New Visits**

An estimate of the percentage of first time visits, as follows:

$$\% \text{ New Visits} = \frac{\text{New Visits}}{\text{Total Visits}} \quad (4.3)$$

Where:

New Visits, is the estimated number of new visits, and

Total Visits, is the total number of visits/sessions.

- **Conversion Rate**

The Conversion Rate is the percentage of visits that resulted in an e-commerce transaction:

$$\text{Conversion Rate} = \frac{\text{Orders}}{\text{Visits}} \quad (4.4)$$

Where:

Orders, is the total number of orders (e-commerce transactions), and

Visits, is the total number of visits, as explained before.

- **Sales and AOV**

The Sales and AOV metrics present on the Digital Marketing report are the same metrics present on the Sales area report. The metrics are repeated because they are fundamental for comparisons on the Digital Marketing field.

Operations

- **Speed of Sending**

The SoS metrics were already approached on Chapter 3.2.1. The SoS Net is always the metric considered and so, the weekends, bank holidays and possible holds are taken into account.

The % Speed of Sending metric for B&W, in this case, is exactly the same % Net SoS < 2 days explained before. Remembering:

$$\% \text{ Speed of Sending} = \frac{\sum \text{Orders}_{\text{SoS Net} < 2 \text{ days}}}{\sum \text{Orders}_{\text{Sent}}} \quad (4.5)$$

Where:

Order_{SoS Net < 2 days}, are the orders sent with SoS Net not above 2 days, and

Order_{Sent}, are all the orders that have been sent

- **No Stock**

A No Stock occurs when an item is sold online but due to some stock error, it is not available to the client. In contrast to what was previously demonstrated on Chapter 3.2.1 as practise for the boutiques, the No Stock metrics on the B&W reports are not based in the number of orders, but in the number of items sold. When considering orders, usually the metric is easily misunderstood. If an order contains more than one item, only a partial No Stock occurs and the product(s) available will proceed and be delivered to the customer. When this happens, it is always questioned if the order would be, or not, considered as a No Stock.

However, the original No Stock concept is built over a product measure, a No Stock occurs when a product is not available. So, the No Stock metric is also calculated considering items, and not orders:

$$\% \text{ No Stock} = \frac{\text{Items}_{\text{No Stock}}}{\text{Items}_{\text{Sold}}} \quad (4.6)$$

Where:

$\text{Items}_{\text{No Stock}}$, is the number of items sold that experienced a No Stock, and

$\text{Items}_{\text{Sold}}$, is the total number of items sold.

- **Cancellations**

A cancellation can take place for a number of reasons: the order is refused by the Fraud team, the client cancels the order, among others. A No Stock may also lead to a cancelled order, however, as it is addressed apart on another metric, it is not considered on the main Cancellations metric.

So, the % Orders Cancelled is calculated as follows:

$$\% \text{ Orders Cancelled} = \frac{\text{Orders}_{\text{Cancelled}}}{\text{Orders}} \quad (4.7)$$

Where:

$\text{Orders}_{\text{Cancelled}}$, is the number of orders that have been cancelled due to same reason except No Stocks, and

Orders , is the total number of orders, as explained before.

- **Returns**

Similarly to what happens on both MPOs, a Return occurs when the customer brings back any item. So, such as in the No Stock situation, the metric is constructed over the number of items and is calculated as follows:

$$\% \text{ Products Returned} = \frac{\text{Items}_{\text{Returned}}}{\text{Items}_{\text{Sold}}} \quad (4.8)$$

Where:

$\text{Items}_{\text{Returned}}$, is the number of items that have been returned to the store, and

$\text{Items}_{\text{Sold}}$, is the total number of items sold.

Fraud and Payments

- **Payment Approval Time**

Once an order is placed, the Fraud team needs to accept or refuse it. This can happen through automatic processes or manually. Some time passes since the order is placed until a decision is made and measuring an average of that time, it is possible to control it and pursue the goal of minimise it. When measuring the payment approval time as an average, the value can be influenced by some outliers. However it is a simple and direct metric, and it is complemented by an analysis of the number of orders accepted or refused by ranges of time, which helps prevent some inconclusive values. The metric is calculated in minutes and as follows:

$$\text{Avg. Payment Approval Time} = \frac{\sum_{i=1}^{\text{Orders}} \text{Payment Approval Time}}{\text{Orders}} \quad (4.9)$$

Where:

Orders , is the total number of orders that have been placed, and

$\text{Payment Approval Time}$, is the time, in minutes, that an order takes to be approved or refused.

- **Refused Orders**

While the vast majority of the orders are approved, some are refused due to fraud suspicions. The % Refused Orders represents the ratio between the number of orders that are refused and the total number of orders, as follows:

$$\% \text{ Refused Orders} = \frac{\text{Orders}_{\text{Refused}}}{\text{Orders}} \quad (4.10)$$

Where:

$\text{Orders}_{\text{Refused}}$, is the number of orders that have been refused by fraud, and
 Orders , is the total number of orders, as explained before.

- **Automatic Approval**

While some orders are approved manually by the team, others are approved or refused appealing to automatic processes, such as white and blacklists or even to a SaaS of fraud and chargeback prevention. So, the automatic approval represents the percentage of orders that are approved automatically, as follows:

$$\% \text{ Automatic Approval} = \frac{\text{Orders}_{\text{Automatically Approved}}}{\text{Orders}} \quad (4.11)$$

Where:

$\text{Orders}_{\text{Automatically Approved}}$, is the number of orders that have been approved by automatic processes, and
 Orders , is the total number of orders, as explained before.

- **Accepted Orders after Investigation**

Sometimes, when the percentage of Orders Refused is bigger than normal, an idea that many orders are being refused can upset the clients. However, a bigger percentage of orders refused can just be related to a bigger number of Fraud attempts and not to intolerance from the Fraud Team. So, calculating the percentage of accepted orders from all the orders that have been flagged as suspicious, the client can better understand the work that is done. It is calculated, as expressed next:

$$\% \text{ Accepted Orders after Investigation} = \frac{\text{Orders}_{\text{Accepted}|\text{Suspicious}}}{\text{Orders}|\text{Suspicious}} \quad (4.12)$$

Where:

$\text{Orders}_{\text{Accepted}|\text{Suspicious}}$, is the number of orders that have been accepted from the ones flagged as suspicious orders, and
 $\text{Orders}|\text{Suspicious}$, represents the total number of orders flagged as suspicious.

- **Authorization Rate**

The Authorization Rate is related to the number of successful attempts to process a payment at the payment provider, and its formula is:

$$\text{Authorization Rate} = \frac{\text{Successful Payment Attempts}}{\text{Payment Attempts}} \quad (4.13)$$

Where:

$\text{Successful Payment Attempts}$, is the number of attempts that have been accepted, and
 Payment Attempts , is the total number of attempts to process a payment.

Customer Service

- **New Tickets**

The New Tickets are the number of created, but only the ones related to the customer. Any internal ticket between departments is considered on this analysis, because those are Farfetch's internal processes. The number of new tickets is calculated as:

$$New\ Tickets = \sum Tickets\ Created_{customer} \quad (4.14)$$

Where:

Tickets Created_{customer}, are the tickets created that are directly related to the customer.

- **Backlog Tickets**

The backlog represents the number of tickets that are waiting its resolution. It is calculated as follows:

$$Backlog\ Tickets = \sum Tickets\ (Status = Open) + \sum Tickets\ (Status = Pending) + \sum Tickets\ (Status = On\ Hold) \quad (4.15)$$

Where:

Tickets(Status=Open), are all the tickets that are still open,

Tickets(Status=Pending), are all the tickets that are waiting for resolution, and

Tickets(Status=On Hold), are all the tickets that are on hold due to some reason.

- **Solved Tickets**

The number of tickets solved is calculated as follows:

$$Solved\ Tickets = \sum Tickets\ (Status = Solved) \quad (4.16)$$

Where:

Tickets (Status=Solved), represents the tickets that have been solved and closed.

- **Tickets Response Rate**

The response rate is calculated as follows:

$$Tickets\ Response\ Rate = \frac{Tickets\ Replied_{<24\ hours}}{Tickets\ Replied} \quad (4.17)$$

Where:

Tickets Replied_{<24 hours}, is the number of tickets replied in less than 24 hours, and

Tickets Replied, is the total number of tickets replied.

- **Tickets Satisfaction Rate**

After a ticket is solved by the agent, the customer automatically receives an e-mail to evaluate the service as "Good" or "Bad". This metric is calculated as follows:

$$Tickets\ Satisfaction\ Rate = \frac{Tickets\ Reviewed_{Good}}{Tickets\ Reviewed} \quad (4.18)$$

Where:

Tickets Reviewed_{Good}, is the number of answers with a "Good" score, and

Tickets Reviewed, is the total number of answers to the form.

- **Total Inbound**

This metric represents all the calls received, as follows:

$$Inbound = \sum Calls (Direction = Inbound) \quad (4.19)$$

Where:

Calls (Direction=Inbound), are the calls received.

- **Total Inbound Answered**

Represents all the calls received and answered by the agents:

$$Inbound Answered = \sum Calls (Direction = Inbound \text{ and } Connected = Yes) \quad (4.20)$$

Where:

Calls (Direction=Inbound and Connected=Yes), are the calls received and answered.

- **Total Inbound Not Answered**

Represents all the calls received but not answered by the agents:

$$Inbound Not Answered = \sum Calls (Direction = Inbound \text{ and } Connected = No) \quad (4.21)$$

Where:

Calls (Direction=Inbound and Connected=Yes), are the calls received but not answered.

- **% Inbound Answered**

The ratio is calculated as follows:

$$\% Inbound Answered = \frac{Inbound Answered}{Inbound} \quad (4.22)$$

Where:

Inbound Answered, is the number of inbound calls answered, and
Inbound, is the total number of inbound calls.

- **Total Outbound**

This metric represents all the calls received, as follows:

$$Outbound = \sum Calls (Direction = Outbound) \quad (4.23)$$

Where:

Calls (Direction=Outbound), are the calls made by the agents.

- **Calls Inbound vs Outbound**

It establishes a comparison between the received (inbound) and made (outbound) calls. Taking the percentage of outbound calls as an example:

$$\% Outbound = \frac{Outbound}{Inbound + Outbound} \quad (4.24)$$

Where:

Outbound, is the number of made calls, and
Inbound, is the number of received calls.

- **Phone Response Rate**

The Phone Response Rate represents a ratio between the calls answered and the total number of calls received. It is calculated as follows:

$$\text{Phone Response Rate} = \frac{\text{Inbound Answered}}{\text{Inbound} - \text{Abandoned}} \quad (4.25)$$

Where:

Inbound Answered, is the number of calls received and that were answered,

Inbound, is the total number of received calls, and

Abandoned, is the number of income calls not answered, but with a ring time not superior at 20 seconds

4.2.3 Data acquisition and processing

As described in Chapter 2.4, Fry (2008) defined a seven step process to understand data. The first four steps compose the majority of the data acquisition and processing procedures: Acquire, Parse, Filter and Mine. The other three (Represent, Refine and Interact) will be addressed on Section 4.2.4. All the fields, however, must be considered as parts of a single process.

The Acquire and Parse steps are not part of the scope of the project. Still, after a site being implemented, all the actions and interactions are obtained and saved, and so is all the e-commerce related information. The BI team is responsible for the acquisition and integration on Farfetch's databases (Acquire), as well as for parsing all the information and make it available to the analysts and other users (Parse).

However, to construct the reports, not all the data available is necessary. Once the most important metrics are defined, it is necessary to filter the data, or in other words, remove all but the data of interest (Filter). After that being achieved and all the important data being selected, it is necessary to place the data into mathematical context, calculate the necessary KPIs and apply other data mining methods to identify patterns and even question if the chosen KPIs are making sense (Mine). All the process is iterative and one change in any step ahead may cause repercussions and more changes on any of the steps behind.

The data warehouses available for B&W are the same available for Farfetch, as they are shared. Both the Online Analytical Processing (OLAP) and the Online Transaction Processing (OLTP) were necessary to gather all the information, in order to meet the identified needs. However, with the beginning of the B&W business, all the database architecture was redesigned to be multi-tenant. As a result, Farfetch and each brand launched are part of the same system, but of a different new tenant.

Once it was decided that Tableau was the tool to use, the best way to share and access the data through the application started being studied. Despite the software was already being used internally at Farfetch, the identified process was not the best because many similar queries and connections were being replied and the database was being requested too much times. Currently, and in accordance to the reached conclusions after an analysis with the BI team, the process changed and have been simplified.

Five new data sources were constructed. One for Sales and Operations, another for Fraud & Payments, another for Digital Marketing and two for Customer Service – one for tickets and another for calls. The data sources are based on views developed on the database and constructed via SQL Server. Behind the views, there are queries where some of the filter and mining processes were utilised. However, the aim was always to maintain a query not too much specific, and to allow other people (even from Farfetch) to use the same data to similar

requirements and, this way, do not force the data base too much. This was not a problem because Tableau was also used to mine some additional data, due to the high processing capability and simplicity of the tool.

Summarizing, the data sources are extractions made directly to the views on the database. The extractions are uploaded to the Tableau Server and everyday a refresh is scheduled. The workbook (the basis where the reports are constructed) then communicates directly with the data sources through Tableau Server, and all the analysis are based on that information. This way, there is only one connection to the database (and scheduled) and each time the dashboard needs to be visualized the connection is made to Tableau Server, letting the database free. This way the process becomes more coherent and efficient.

The construction of each area from the report, or each sheet from the workbook, implies an initial connection to the data source and the development of tables and graphics – addressed on the next chapter. After all parts of the report being assembled, the full workbook gets its shape. After being published on Tableau Server, it starts being available remotely and can be accessed using any browser connected to the Farfetch network, for now, and through any network in the near future.

4.2.4 Data visualization, interaction and features

Represent, Refine and Interact are the final three steps, but are not least important. In fact, all the steps are correlated and important to transmit the desired information through data. However, it is through data visualization and interaction tools that the user interacts directly with data and absorb the information being passed, so these methods and decisions represent a fundamental part when constructing reports and dashboards. Data visualization is very important to pass the intended information in a consistent way, showing trends, insights and easing up the user's work. In turn, all the features available and the way they are disposed to allow interaction are fundamental to immerse the user into the report and all the available data and information.

From Sales to Customer Service, all the areas will be focused and an explanation about the data visualization process of the main components will be given, while all the available features and possible interactions are also explained. Each report presents different metrics and different information, resulting in different data visualizations too.

However, each report (except, one more time, the Sales Details) has a very similar table to show metrics' values on the considered periods and establish comparisons to previous periods. The tabular form is chosen because it is a simple and effective way to convey data, great to read across rows or down columns and is also great to compare values (Börner and Polley 2014). Furthermore, the cells related with the comparison are colour coded to help in the interpretation (Knafllic 2015).

This way, the manager is able to consult each area main KPIS quickly and effectively only going through the many areas of the report and consulting the summary tables on top. To do it properly, it is only necessary to select a date before and that date will be considered in all the different areas.

The user is able to select the date (Figure 18) he wants to consider on the analysis – not only for the tables, but for all the report. Any date until the present day minus one is available. After the date is selected, all the data in any report will be filtered until the date considered and all the values will be shown not surpassing the chosen day.

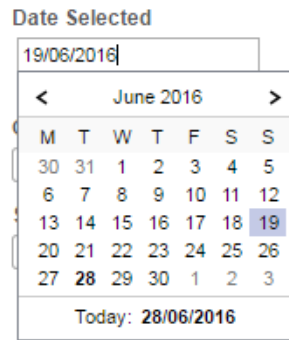


Figure 18 - Date selector

The summary table contains the main KPIs of the area at issue and 7 columns, each one representing a time period or a comparison - Week to Date (WTD), Previous Week Same Period (PWSP), Week over Week (WoW) comparison, Month to Date (MTD), Previous Month Same Period (PMSP), Month over Month (MoM) comparison and Year to Date (YTD). Weeks are considered starting at Monday, and the WTD is from Monday to the weekday of the day selected, and the same is considered for PWSP, but considering the previous week. MTD and PMSP follow the same considerations, but considering all the days of the month, from day one to the day selected. Finally, in YTD the same logic is accomplished, but no other yearly periods are considered – first, because there is no data, and second, because all the structure is focused on short-term comparison and grow. An example of the summary table is represent on Figure 19.

	WTD	Previous Week, Same Period	WoW (%)	MTD	Previous Month, Same Period	MoM (%)	YTD
Sales	25,288.50	25,983.59	-2.68%	89,077.56	122,945.77	-27.55%	363,890.37
Sales AOV	616.79	721.77	-14.54%	610.12	698.56	-12.66%	648.65
Orders	41	36	13.89%	146	176	-17.05%	561
Net Sales	18,249.38	18,446.37	-1.07%	68,202.99	91,667.14	-25.60%	282,211.56
Net AOV	570.29	878.40	-35.08%	675.28	694.45	-2.76%	667.17
Net Orders	32	21	52.38%	101	132	-23.48%	423

Figure 19 – Example of summary table with the main KPIs

On the fashion business, the comparison method more usually utilized is comparing the period in consideration, to the same period on the years before – this is the method used by Farfetch, too. However, regarding the B&W brands there are not values from the previous years to compare, and the majority of the clients at the beginning do not have defined any forecasts, targets or budgets. At the same time, and also because the brands are launching a new operation, the main objective is to grow, and sell more tomorrow than today. With those characteristics in mind, were drawn up short term comparisons with the previous equal period. For that reason, WoW compares the WTD column with the PWSP one, while MoM compares the MTD with the PMSP, always in percentage. Increases and decreases in the comparison columns are identified with different colours – blue for increases, orange for decreases.

Colour is very important in any data visualization. And it is also necessary to adapt it to the many people that would interact with it, namely the colour blinded. For that reason, the traditional red and green to transmit positive or negative insights were avoided. Orange, like red, is a high energy and high visibility colour which even in small amounts can help convey warning signals, which makes it a good choice for KPIs that are performing below expectations. Blue, in turn, is a colour typically perceived as positive and colour-blind friendly (Marks 2009).

Blue was also the chosen colour for almost all the graphics and charts in the reports, because it is the best-liked of all colours (Marks 2009). Colour must be used sparingly and consistently (Knafllic 2015), and so, depending on the purpose, almost only tones of blue were considered. However, every time it was necessary to show some not so positive aspects, the orange was used. Different colours are only used in the case of segmentations where different blue tones

cannot be distinguished properly. The colour choices are similar along all the areas from the report.

After the table with the main KPIs, those metrics and others more are analysed in the remaining report of each area. Whereas in the table the periods considered are always constant (week, month or year from the beginning until the cut-off date), on the remaining report more broad time periods would be considered to spot trends or deepen the analysis. The time span will always be decided by the user and all lists, graphics and charts will consider that period. This way, defining the start date and the end date of all the information, the user could use the report for any purpose he wishes, from weekly analysis, to monthly, yearly or even with random desired time periods. The unique limitation present is that when considering graphics showing the evolution of some metric over time, the unit of time displayed on the x-axis is the week, since the minimum period comparison on the table is WoW and to maintain the coherence. This way, it also becomes easier to compare the accumulated data from different weeks, than dispersed up and down daily values. The sliding bar which allows the user to choose the time period and a graph example filtered by the mentioned period are displayed on Figure 20.

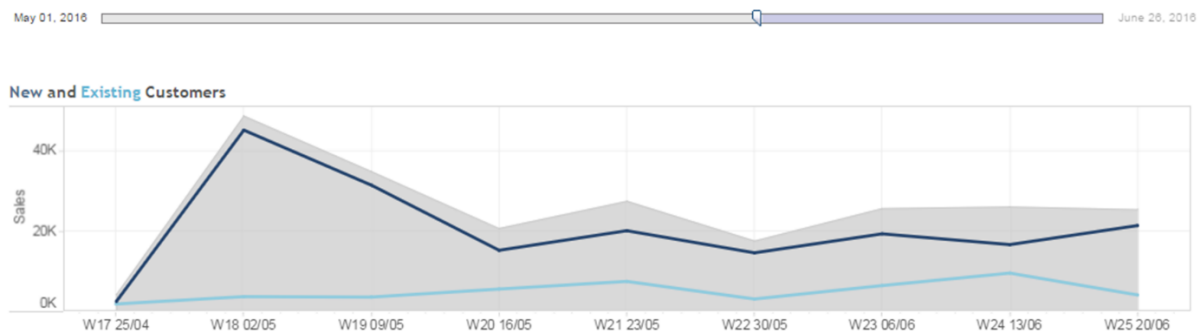


Figure 20 - Sliding bar to choose time period and graph example

On the example above, the time period being considered is from the 1st May 2016 to the 19th June 2016. The 19th June has already been selected on the date selector and is blocked on the sliding bar. The user, that have already decided the cut-off date, must decide also what is the beginning date, considering the time period he wishes to analyse. Then, the metric evolution is shown for the period considered. From the Week 17, that started at the 25th April (however, only values after the 1st May are considered), to the Week 24, that started at the 13th June (and ended at the 19th, the chosen date). The example shown is a graph, yet, the period considerations would be the same for a list of best selling products, a chart regarding the percentage of inbound and outbound calls, or any other representation.

Sales

Three different data visualizations were composed to complement the summary table. First, a graph with the evolution of sales over the weeks, which can be decomposed on an area graph and two line graphs. Each of the line graphs, the light blue and the dark blue, represent the value of sales by existing and by new customers, respectively. The grey area graph shows the total sales value, without the explained segmentation. In this case, the colours of the graph line were associated with the new and existing customer directly through the title, avoiding the use of legend (Figure 20).

The concept of new and existing customer, depends on the period being analysed. A customer is considered as existing when he has already made a purchase before the start of the period considered, and makes another acquisition during the period. In turn, the customer is considered new when he has not done any purchase on the website before the start of the considered period. So, to clarify, if a customer have never done a purchase before the start of the period in analysis, even if he is responsible for more than one purchase during the period, he will always be considered as new.

The second visualization represents the top N markets, considering the sales value, and shows the sales percentage representative of each market. The distribution of orders and the AOV are also shown. Top N because in every visualization where a top is displayed, the user is able to select the number of lines he wants to consider and, that way, control the deepness of the analysis.

The third also consists on a top, in this case of the bestselling products. So, the N products with more orders are identified and displayed. To ease the interaction with the user, when he hovers the mouse pointer over the list, a picture of the product is displayed at the right side. This was one of the most asked improvements because in fashion, being a so particular world, people feel the need to be in permanent contact with the product, rather than with its code, name or designation because it is the most simple way to understand what is the product in hand.

During all the interviews and conversations with the brands' managers, it was possible to understand that the Sales report and the sales metrics were always among the top concerns. The fashion world is characterized by some special considerations when analysing sales. A brand often needs to understand not only how it is performing globally, but also considering special aggregations of products – like gender, category, season and collection. Other identified problem was related to the currency used by the brand clients. When working with brands which have origin in many countries, it is normal to have requests to present results in different currencies.

All these inputs were considered to improve the reports and to prepare them to the majority of demands any e-tailing brand would make. To fulfil the requirements, a control panel was constructed on the top left corner of the report, as shown on Figure 21.

The image shows a control panel for a sales report. It consists of several dropdown menus and one text input field. The 'Currency' dropdown is set to 'British Pound'. The 'Date Selected' field contains the date '26/06/2016'. There are four more dropdown menus: 'Gender Selected' (set to 'All'), 'Category Selected' (set to 'All'), 'Season' (set to 'All'), and 'Collection' (set to 'All').

Figure 21 - Sales control panel

The currency combo box allows the user to choose the currency in which he desires to consult the entire report. The exchange rate utilised is the one saved on the Farfetch's database at the time each order was placed. So, the values in any currency are always true values considering Farfetch's exchange rates and not approximations.

The remaining combo boxes, regarding Gender, Category, Season and Collection were constructed to fulfil the other requirement. This way, the user is able to select some product characteristic and filter the entire Sales report. As an example, the user would choose Women in the Gender combo box, and all the report, from the summary table, to the graph and the tops will only consider sales regarding women products. Each characteristic would be used independently, but two or more characteristics can also be intersected (as an example, the user is able to filter the entire report by women shoes from SS16).

Sales Details

While Sales shows total or filtered sales values, Sales Details focus on comparisons. Each of the product characteristics available to filter data in Sales is available in Sales Details for comparison. The user can choose two product characteristics to compare, through the two

available combo boxes (in the example, shipping region and gender were chosen). The area square graph (Figure 22) shows how combinations of the two variables are performing comparing to others. The user may also choose just one variable and, therefore, just analyse the distribution of one characteristic.

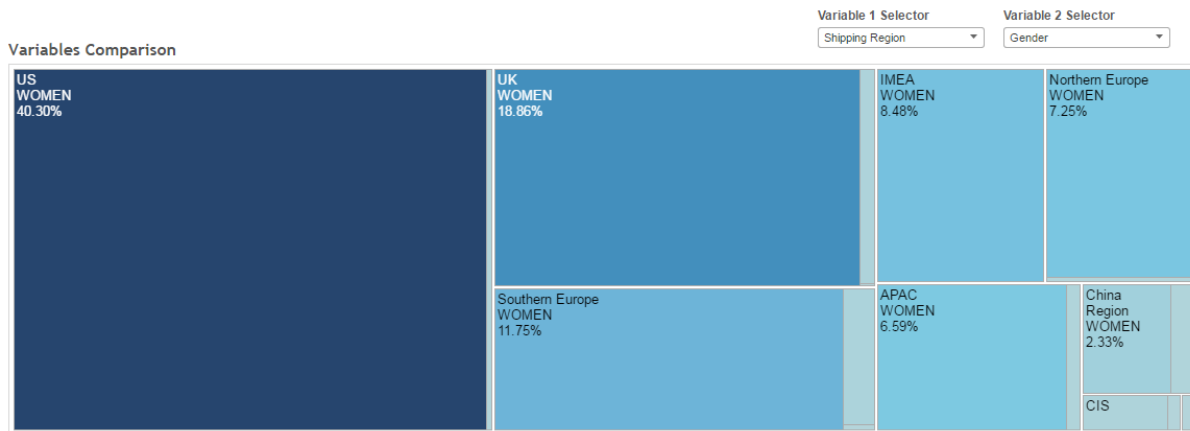


Figure 22 - Sales comparison between two different variables

The remaining charts show comparisons between different elements of different product or order characteristics, like: Category, Gender, Sales vs Full Price vs Promo Codes, Standard Shipping vs Same Day Delivery, Shipping vs Click and Collect, and Delivery Method.

The currency selector is also present, and the sales values (in these cases, usually present just on the tooltip) appear considering the chosen currency.

Digital Marketing

Digital Marketing contains three different data representations: a metrics' segmentation, a metrics' comparison and a top traffic sources.

The graph with the metrics' segmentation allows to select one of the available digital marketing metrics and also select a segmentation out of three hypothesis: Traffic Source Type, Device and Region. Two different examples are given on Figure 22.



Figure 23 - Two different possible selections on the metrics' segmentation graph

Disregarding the differences between the goals of each graphic, the metrics' segmentation and the metrics' comparison graphs have a similar operation mode. However, the two combo boxes

of the last only present metrics options. The main goal is to compare the evolution of different metrics and understand its correlation over time.

Finally, a top N of the traffic sources which generated more visits is presented. It is also possible to filter the top by traffic source type. As an example, the top N referrals or the top N affiliates can be displayed instead of the overall traffic source type.

Operations

The Operations area focus on four main metrics: SoS, No Stock, Cancellations and Returns. For all of them, a graph is presented with the metrics' evolution over time.

For the SoS, aside from the graph, it is also displayed a chart with the percentage of orders sent in each time range (before one day, between one and two and a half days and more than two and a half days). For the Cancellations and the No Stock, the reasons behind the occurrence and the percentage attributed to each reason are also presented.

The most N returned items, the most N cancelled item and the N items with a higher number of no stocks are also shown in three different top lists. One more time, beyond the code and the designation, a picture of the item is displayed (the same picture, for the three different lists).

Fraud and Payments

Regarding Fraud and Payments, it was concluded that the more simple graphics were the ones which were driving to the best interpretations. The average Payment Approval Time was present on the summary table, however it was decided to make a chart showing the percentage of orders that are approved or refused considering 4 different time ranges (less than 30 minutes, between 30 minutes and 2 hours, between 2 and 6 hours, more than 6 hours). The remaining fraud metrics were displayed using line graphs.

On the payments subsection on the bottom, the authorization rate graph was subdivided between many line graphs, depending on the quantity of payment methods used by the brand client. The authorization process behind each payment method is different and independent, so it makes sense to show this information segmented. The main payment failure reasons invoked by the provider are also shown, as well as the percentage of each one over the total.

Customer Service

The Customer Service report is divided in two parts, one regarding tickets and the other regarding calls. The new tickets are represented by a bar graph with the number of tickets per week.

The backlog and the solved tickets, instead, are represented by ranges. A snapshot of the backlog is taken every day at midnight and stored in the database. This way it is always possible to understand how many tickets and at how long time the tickets are on the backlog. The backlog presented is the backlog at the date selected. The solved tickets are also shown by range and at the date selected. This way, it is possible to understand how many tickets are being solved and at the same time compare the solved tickets in each range to the backlog at the end of the day. These are the only two representations on the whole reports that do not obey to the considerations of the date period and are based only on the date selected (because fixed ranges are being compared, and not previous periods).

The contact reasons are evaluated based on the categories assigned to the tickets by the agents. So, a breakdown of contact reasons gives the idea of what are the type of queries more and less solicited. They were grouped into simpler and more understandable groups, in order to provide information about the main reasons behind the contacts and the contribution of each reason to the total number of tickets. The tickets response rate and the tickets satisfaction rate were displayed using line graphs.

Regarding calls, a global chart of inbound calls answered and not answered is presented, as well as a comparison between the percentage of inbound and outbound calls. Similarly to the tickets response rate, the phone response rate is also plotted through a line graph.

The distribution of calls is also analysed, but in two different granularities: a distribution by day (Figure 24) and another by hour. The approach and assumptions are similar in both cases.

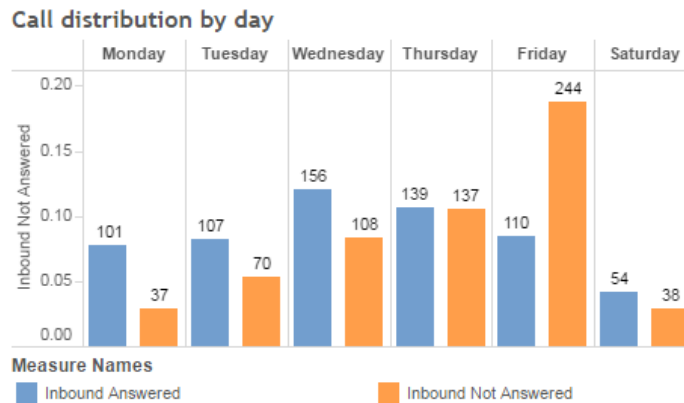


Figure 24 - Call distribution by day

All the period selected through the sliding bar is being considered, so the number of answered and unanswered calls in each day is being calculated through the average of answered and unanswered calls of all the weekdays at issue. As an example, the numbers on Monday are an average of all the Mondays from the period being considered. The same happens in the call distribution by hour.

Another interesting interaction is that when selecting a day on the call distribution day graph, the hour distribution will show the average numbers contemplating only the selected day. Explaining through another example, if Monday is selected, the hour distribution will not be an average of all days of the period but, instead, it will be composed by average numbers of all Mondays.

The calls section have also two filters related to operational issues available. Regarding only the calls section, it is possible to consider the total number of calls or only the calls inside the customer promise times. When the customer promise option is active, all the data from calls is filtered to consider only the calls at the time when the agents are working. The second filter is related to language. When a brand client decides the characteristics of the service to provide, in addition to the customer promise times, the available languages are also decided. Different languages represent different phone numbers, so it is possible to filter all the data by language and understand what are being the languages most requested, as well as how are the agents performing considering each language.

5 Conclusions and future work

The launch of an e-tailing business is never an easy job. Notwithstanding the brands expertise concerning retail, with e-tailing the brands always experience difficulties when defining new processes and addressing the complexity of international business. The online commerce is also becoming more important, even in the luxury market, and, therefore, brands are feeling more pressed to make their products available for the global customer through e-tailing.

B&W was born to sell multichannel e-commerce solutions to luxury fashion brands, taking advantage of Farfetch's expertise in the business. Therefore, the brands feeling doubtful about undertaking this journey have a new partner who is able to offer and manage full-service operations. Every detail is important when launching a new e-tailing business, but with the markets becoming more competitive each day, the measure and control of a company's performance level is mandatory. The luxury segment is also very demanding and the customer always expects a high-level service, even more in an online experience. So, as a fully-fledged service provider, B&W is also responsible to assist and provide brands with important information regarding operational issues and performance. However, no reporting strategy was defined and Farftech's external reporting was short of expectations to fulfil the most exigent needs of a service provider.

For all these reasons, the definition of an operational reporting strategy and the development of a performance reporting model were vital to the openness and transparency of information between the two sides. These reports, after being well analysed, also give means to improve the service to the customer to a higher level.

With these dissertation, the most important KPIs to share with the clients were chosen. Among them, some were already being send internally or externally, while others were created or redesigned. The construction of the interactive performance reports also endow the brands' managers with mechanisms for the measure and control of those KPIs.

After the project, and because the brands' managers were involved since day one on the development of the report, they are aware of the considerations of each metric. When new brands appear, they will need more time to get used to the report. However, wise data visualizations were chosen to ease the understanding and the majority of the metrics are explained on the report's tooltips. At the same time, the interaction features also appeal to the manager, in a way he feels more tempted to analyse different sets of data, trying to establish comparisons and discover trends. With so flexible reports, different views and periodicities can be tested to assess performance and the manager always know what is being measured and controlled.

The operational reports also ease the day-to-day processes at the stores, because the e-commerce managers have now more information to control order and return processing. Through that augmented knowledge, the store is more likely to reach better operational results and therefore better satisfy the final customers. Those reports also facilitate the analysis of the orders and returns on a monthly basis, leaving more time to other relevant tasks capable of impacting positively the company's performance.

A performance report is never a finished job. Monitoring and controlling of performance is continuously changing, because metrics need to evolve and to adapt to the business strategies, because it is always important to have everyone working to the same goals and targets.

Targets are one of the most important works for the future. Actually, the comparisons established are only being done considering the last similar periods. Because for many brands the launch of e-tailing represents an entry in the e-business, there is no data from previous years. That is why the targets are revealing to be so important in the near future, even despite their potential lack of accuracy during the first times. Analysing retail values and taking into consideration the enormous amount of data Farfetch is gathering from many brands, products and boutiques from sales in the Farfetch's portal, it would be possible to establish some concrete targets. This for the case in which the brands do not have their own targets or forecasts previously estimated. Anyway, it is a very important step to improve the reports in the future, to provide a new term of comparison and to establish a goal for each brand e-tailing operation.

During the execution of the project some problems regarding lack of data were identified. Items stock information and the basis for a sell thru analysis were not yet available on the data warehouse. Once this information is available, it is very important to complement the existing reports providing some more information related to merchandising. Google Analytics is also being used to extract user interaction information from the brands websites. If using an own clickstream platform would be very laborious and costly, then all the information available on Google Analytics must be squeezed to the last drop. This way, deeper analysis would be done in the digital marketing area, and hence contribute to improve the website and the campaigns to meet the customer preferences and modes of action. The NPS is another tool that would be adjusted to B&W and used to understand what the final customer is thinking about the overall e-tailing experience of the brand. This data would provide more insights and compared to other metrics would add value to certain analysis.

Regarding the operational information, there are also some improvements to be done. Although many information is being sent by the reports, those numbers and tables are conceived to help the manager to control order and return processing. However, he can only do it at least on a daily basis. A possible future work would be the construction of a dashboard where the manager would be able to monitor the order processing in real time.

Once bigger brands and groups start to be more regular on the list of B&W clients, it will be necessary to establish the best way to share information. Until now, reporting is an interesting way to measure and show performance. However, brands with its own analysts usually ask for some more detailed information to accomplish the internal analysis they are used to. Following this requirement, it would be necessary to define which would be the best way to guarantee access at data to the partner company. If giving access directly to the database, or if considering other types of reports prepared to provide larger amounts of information.

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APPENDIX A: Performance Reporting Model

