CHAPTER 1

INTRODUCTION

1.1   Research Object Overview

1.1.1   Fashion Week

Fashion week is a series of runway shows and a presentation of industry top designers upcoming collection. It is held twice a year (Spring/Summer and Fall/Winter) in major style capital by inviting editors, retail store buyers, fashion bloggers, industry influencers, and famous people (Hoo, 2015).

The concept of fashion show is displaying a new clothing collection on moving bodies to the audience aiming to introduce novelty, temporality, and modernity. The parade of moving bodies as an essential future of a fashion show, has risen to the modelling profession. The role of fashion model is crucial in fashion industry as it becomes a cultural icon in its own right (Skov et al, 2009). Their presence aims to seduce viewers both inside and outside the industry to the designers work by emphasizing on the creative aspect then the commercial aspect (Friedman, 2015).

1.1.1.1. The Big Four Fashion City

The Big Four are the cities of the most prominent fashion cities in the world, including New York, London, Milan, Paris. The biggest fashion houses, brand, magazine publishers, and influential designers are located in these cities, where major influence on the upcoming international fashion trends is defined (Fashion Days, 2014). All major cities give a certain feel and shape to ideas which becomes the identity that influence both its inhabitants and its visitors (Godart, 2014).

Fashion week is an essential event in fashion industry. New York Fashion Week reinvents the show into less overtly commercial, but emphasis on the creative (Friedman, 2015). Through the show, a designer or brand can most fully control an aesthetic vision or concept of their works. Typically, models walk the catwalk dressed in the designer's collections with elaborate sets and added

elements such as music, lighting and technological components. The designers attempt to tell a story of their collections through the shows (Skov et al, 2009).

Paris is the first city that introduced the concept of fashion week, "défilés de mode", literally known as "fashion parades". Parisian-based designer Charles Frederick Worth, so called "father of haute couture", began the idea of presenting his collections through live models in 1860s. Later on 1930s, Worth invited his clients to his studio at the beginning of each season showing off the collection, this type of fashion show was known as a salon show (Skov et al, 2009).

Figure 1.1 London Fashion Week
Source: www. fashionweekdaily.com

As the modeling industry expanded from Paris to New York, Fashion Week was started in New York City in 1943, called Press Week, organized by Eleanor Lambert, a well-known fashion publicist. The event initiated with main purpose giving fashion buyers alternatives to French fashion during World War II, in which before World War II, American fashion journalist traveled to Paris for fashion inspiration. Press Week gives a chance for American designer to showcase their innovation and to gain international attention (Fortini, 2006).

Years after, other cities hosted the Fashion week. Milan Fashion Week founded in 1958 organized by National Chamber for Italian Fashion. Following years, London Fashion Week began in 1984 organized by British Fashion Council

and Paris Fashion Week in 1973 by French Fashion Federation, which finally allowed to exhibit ready-to-wear collection during fashion week. The cities become ' The Big Four' of fashion week and are the major cities that influence international fashion trends (Harpers Bazaar, 2017).

1.1.2 Fashion Model Directory

Fashion Model Directory (FMD) is the world largest online fashion database collecting information about professional models, brands, designers, modeling agencies, editorials and a modern data zine. FMD has been described as "the IMDb of the fashion industry" in Italian TV. It was launched in 1998 by Stuart Howard as an offline project that went live as an online fashion database web in 2000 and taken over by British media Group Fashion One Group in 2002

The FMD database contains entries for more than 10.000 fashion models, 2.400 fashion brands, 2.200 magazines, 50.000 editorials and works, 2.000 designers, 1.700 agencies, and 1.000 photographers. The FMD has reached more than 50.000 audiences, 1.7 million readers per month and 3 million content pages (The FMD, n.d.)

Figure 1.2 Fashion Model Directory Logo

Source: www. en.wikipedia.org

As a fashion platform, its self-proclaimed mission is to represent and manage fashion projects and to catalog the most accurate professional information about female fashion models and search result for the fashion industry (The FMD, n.d.).

1.1.3 Models.com

Models.com is an online fashion database information of fashion models, modeling agencies, stylists, editorial, directors, production companies, and

creative talent agencies. It was founded by Stephan Moskovic and Wayne Sterling in 1999 and is based in New York.

The website highlights the latest information about fashion campaigns, trends, collaboration, rising stars, editorials and work portfolios for the list of models, stylists, photographers, editorials and other creatives, enacting it as a beneficial information for the fashion industry (businessoffashion.com, 2018).

Figure 1.3 models.com logo

Source: www.womeninfashion.co.uk

1.1.4 Instagram

Instagram, known as IG, is a photos and video sharing from a smartphone available for free on iOS and Android, in which users can interact by following, being followed, commenting, liking, tagging and private messaging (Moreau, 2018)It is founded by Kevin Systrom and Mike Krieger and was first launched on October 6th, 2010 exclusively for iOS and Android version was released a year and 6 months later

Instagram was acquired by Facebook in 2012 as the app has been exponentially growth (Dogtiev, 2018). It has been one of the most popular photos sharing social network with high levels of user engagement leading to bring Instagram as powerful marketing platform. As of 2018, Instagram has reached more than 1 billion monthly active users worldwide with approximately 500 million daily active users, more than 400 million daily stories and 80 percent of accounts follow a business on Instagram. (Instagram, 2018)

In 2017, 90 percent of Instagram users are younger users below age of 35 with celebrities as the most influential person on Instagram. The situation leads to e-commerce via social media marketing, numerous brand endorsements of

products and services, where people use Instagram as media to reveal brand personality and as platform for community engagement (Statista, 2018)

Figure 1.4 Instagram logo

Source: www.instagram.com

1.2   Research Background

Fashion is a multi-billion-dollar industry with social and economic implication worldwide (Park et al, 2016). Fashion industry values three trillion US dollars with 4% of global market share worlwide, where retail value of luxury goods market worth 339.4 billion dollars and the value of the womenswear industry worth 521 billion dollars (Adegeest, 2018). Global Fashion revenue predicts to grow where 33.2% of the fashion enthusiast is mostly 25-34 years old, 23.7% are 34-44 years old and 53.8% of the market dominated by female (Statista, 2018).

According to Jander & Anderson (2016), Fashion Week is one of the most important events within fashion industry, an effective marketing tool and retail platform that brings together retailers, designer, and consumers to a common showcase platform for promotion and selling activity, introducing the new fashion trends and new faces of the season. Lanquist (2016) said that *"fashion week belongs to the people now. And the industry is finally catching up"*. The global fashion industry has emerged number of cities worldwide hosting fashion weeks, but the major cities, Paris, New York, Milan, and London, so called "The Big Four" leading the global fashion capital. The "big four" has a long history through the fashion evolution (Global Fashion Capital, 2015). Each Big Four cities have a signature that distinguish the show styles: New York is known for the sport war, London for Edgy, Avant-grade design, Milan for over-the-top yet stylish design

and Paris for couture (Sese, 2009 in Jander & Anderson, 2016). Reportedly, New York Fashion Week brings in total income €540 million in 2017 follows by London Fashion Week earns €278 million total income (Parcerisa, 2018). Fashion Week as an essential show aims to introduce new trends and collections on moving bodies, presenting how the cut and fabric interplayed with the body (Skov et al, 2009). A moving body represents by fashion models, a special talent in fashion who displays the attractiveness of the brand in advertisements and runways (Park et al, 2016).

Figure 1.5 shows that fashion models is discovered through agency who also distribute them to the network of fashion world. Networks of agents, scouts, assistants, editors, stylists, photographers, and designers establish a production world that leads models to fashion consumers. The role of scouts and agents are to discover the talents that fit to clients (photographers, designer, art and casting directors, stylist, brands) that will be featured to client's work for period of time. The talents seen as the media to seduce fashion shoppers and final consumers to make purchase out of the look (Mears, 2011).
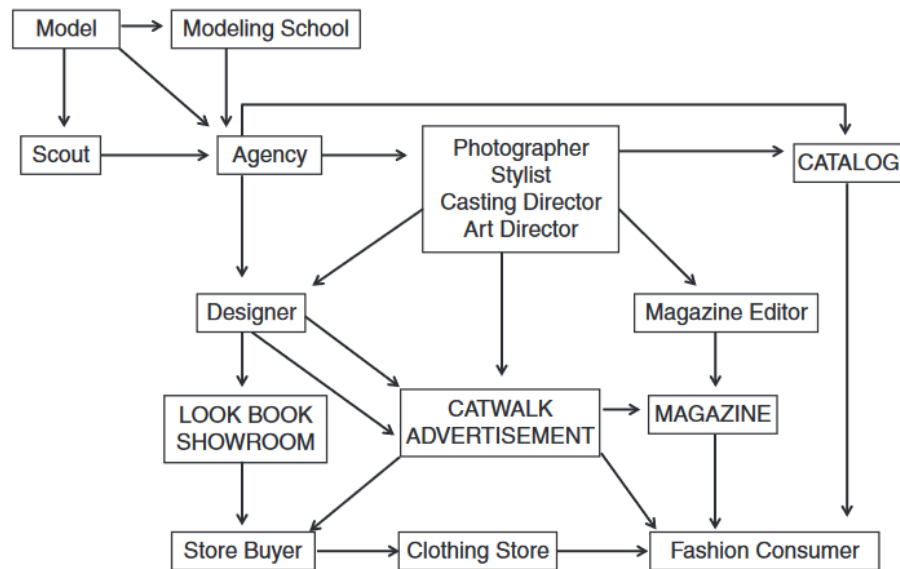

Figure 1.5 Production world behind the look

Source: (Mears, 2011)

According to Mears (2011), in cultural industry the success factor is highly uncertain and unequal. Casting director is faced with impossible task, choosing

out of hundreds of new faces for the next season (Park et al, 2016). Fashion is fundamentally about change, when casting the model agents never assure who meets the client's aesthetics and the client cannot predicts who want to be perceived by customer and able to successfully promote the products.

Modeling agency is the curators that discover beauty to define aesthetic of agency (Marie Claire, 2015). Modeling agencies are always looking for new talents, also called scouting. Signing up to a reputable agency can be a gateway to modeling agency for an aspiring model to make a career.

According to IBISWorld report, Model agencies industry has inclined upward over the five years to 2019 with revenue expected to increase 2.9% in 2019 alone. One of key external drivers for products and services segmentation are demand from fashion designer and clothing stores that hire models for promotional and marketing purposing. Model agencies supply compulsory services for fashion designer by 6.5% of total industry revenue, as models are booked for fashion show, primarily for the show in New York, Paris, Milan and London. In total, commission from model representation contributes 60.5% of market segmentation (IBISWorld, 2019). Modeling agency takes 20% commissioning of talents earnings and charges 20% of talent's rate from brands (Robehmed, 2015).

According to Jeni Rose, Vice President of scouting and development of IMG and Emma Quelch, director of IMG Models on interview with Marie Claire, new talents are frequently found on variety of places such as high street store, festivals, and concerts. for instance, Kate Moss was discovered in JFK airport, Adriana Lima in a charity fashion show. However, the emerging of digital platform, especially Instagram has unfolded the opportunity for potential talents to be discovered through Instagram's hashtag #WLYG.

According to Robehmed in Forbes (2017), Supermodels are a high-paid job, where the total earning of 10 highest-paid models is $109.5 cumulated from June 2016 to June 2017, before taxes and fees. The highest-paid models ranking is shifted following the change in fashion. Kendal Jenner replaces Gisele Bundchen's revenue in 2017. Kendal earns $22 million while Bundchen becomes

second highest income with $17.5 million in a year. Kendal benefits from her 85 million followers on Instagram that let her disseminate advertisements. The President of IMG Models said *"with social media, there are more opportunities to create your own content and use your voice. The stars are using it"*. Furthermore, the highest-paid models list is dominated Insta-girls. Third highest-paid, Christ Teigen with income $13.5 million has a huge number of followers. Another Instagram famous, Bella and Gigi Hadid leverage a large number of social audiences, while Karlie Kloss engages using YouTube.

Industry Data

	Revenue ($m)	Industry Value Added ($m)	Establish-ments	Enterprises	Employment	Exports	Imports	Wages ($m)	Domestic Demand	Total Advertising Expenditure ($b)
2005	814.8	333.1	5,414	5,405	7,811	--	--	295.9	N/A	271.1
2006	832.3	318.4	5,585	5,577	7,523	--	--	280.1	N/A	281.7
2007	851.7	363.3	5,622	5,610	7,677	--	--	320.8	N/A	276.2
2008	861.1	345.4	5,668	5,657	7,963	--	--	306.9	N/A	270.7
2009	817.7	334.9	5,806	5,793	8,057	--	--	299.6	N/A	231.1
2010	847.5	340.7	5,982	5,968	8,100	--	--	303.7	N/A	252.3
2011	834.3	349.9	6,093	6,079	8,207	--	--	313.2	N/A	267.3
2012	862.7	363.6	6,260	6,243	8,456	--	--	324.0	N/A	274.8
2013	894.7	378.4	6,433	6,412	8,726	--	--	335.9	N/A	282.9
2014	916.6	388.3	6,580	6,558	8,918	--	--	344.3	N/A	287.8
2015	946.4	400.4	6,748	6,721	9,176	--	--	355.6	N/A	297.9
2016	980.1	416.7	6,938	6,907	9,465	--	--	368.4	N/A	309.5
2017	991.8	421.1	7,077	7,049	9,612	--	--	374.3	N/A	302.1
2018	1,023.5	433.9	7,274	7,243	9,894	--	--	386.6	N/A	311.7
2019	1,047.2	445.0	7,450	7,418	10,129	--	--	396.7	N/A	318.1

Annual Change

	Revenue (%)	Industry Value Added (%)	Establish-ments (%)	Enterprises (%)	Employment (%)	Exports (%)	Imports (%)	Wages (%)	Domestic Demand (%)	Total Advertising Expenditure (%)
2006	2.1	-4.4	3.2	3.2	-3.7	N/A	N/A	-5.3	N/A	3.9
2007	2.3	14.1	0.7	0.6	2.0	N/A	N/A	14.5	N/A	-2.0
2008	1.1	-4.9	0.8	0.8	3.7	N/A	N/A	-4.3	N/A	-2.0
2009	-5.0	-3.0	2.4	2.4	1.2	N/A	N/A	-2.4	N/A	-14.6
2010	3.6	1.7	3.0	3.0	0.5	N/A	N/A	1.4	N/A	9.2
2011	-1.6	2.7	1.9	1.9	1.3	N/A	N/A	3.1	N/A	5.9
2012	3.4	3.9	2.7	2.7	3.0	N/A	N/A	3.4	N/A	2.8
2013	3.7	4.1	2.8	2.7	3.2	N/A	N/A	3.7	N/A	2.9
2014	2.4	2.6	2.3	2.3	2.2	N/A	N/A	2.5	N/A	1.7
2015	3.3	3.1	2.6	2.5	2.9	N/A	N/A	3.3	N/A	3.5
2016	3.6	4.1	2.8	2.8	3.1	N/A	N/A	3.6	N/A	3.9
2017	1.2	1.1	2.0	2.1	1.6	N/A	N/A	1.6	N/A	-2.4
2018	3.2	3.0	2.8	2.8	2.9	N/A	N/A	3.3	N/A	3.2
2019	2.3	2.6	2.4	2.4	2.4	N/A	N/A	2.6	N/A	2.1

Figure 1.6 Modeling Agency Industry Data

Source: Author Documentation

The growing popularity of social media and online technology has opened a new way for talents to self-promote and agents to scout for new talents. Technological changes provide several opportunities. However, it also opens a new threat as it enables the talent to advertise themselves and for agencies to discover the talents. phenomenon also provides an encouragement for model agencies to develop new avenues to grow the business and to cut out the middle man in scouting. Recently, model agencies outsource talent scouting and other related services that cost 25.3% of revenue.

Industry enterprise will continue to deal the internal competition along with the further expands of social media. The number of enterprises increase with average annual rate of 2.5% until 2019. Social media growth exposes a competition among agencies to hire potential top talents as their profile reveals widely online. Modeling talent is essential for success of the agencies, therefore, hiring the right talents is necessary. Therefore, hiring the accurate talents expose to market opportunities of approximately 20 to 25 billion USD (Solodkiy, 2016).

Huge amount of data provided on the internet opens a new way for fashion industry to process the business. The State of Fashion, a report by Business of Fashion and McKinsey said "*Leading innovators will reveal the possibilities of artificial intelligence across all parts of the fashion value chain, exploring new ways of creating value for those employed in the fashion industry. AI enhancements will go beyond the traditional areas of machine tasks into creative and customer interaction processes, blurring the line between technology and creativity*", statistically state that 75% of fashion retail plan to invest in AI in 2018/2019 (McKinsey; BoF, 2017).

Many fields of study have been shifting to digitalization, including fashion industry. One of key pillars in fashion industry 4.0 is the emerging of artificial intelligence (Lectra, 2018), allowing us to imitate the knowledge of traditional talent scouting process into an automation model based on machine learning practice. Machine Learning (ML) describes as an automated data analysis process that extract patterns from data through supervised or unsupervised learning (Kelleher et al, 2015; Arusada, 2017).

Machine Learning and Data Mining is common analytical method used (Alpaydin, 2010). Machine learning is a branch of artificial intelligence that enables machine to perform the job without programming explicitly by using intelligent software; requiring data to learn in prior (Mohssen et al, 2017). Classification is type of Machine learning algorithm, building a mathematical model containing input and output desired (Russel & Norvig, 2010). Several studies use classification techniques such as Decision Tree, and Random Forest to predict the science of success in art and cultural productions (Park et al, 2016; Arakelyan et al, 2018; Ren et al; 2016).

The primary objective of this study is to build an automation model of talent scouting process using application of Machine Learning for Classification task. Specifically, the paper consider Decision Tree, and Random Forest to predict early success of fashion model under the merging framework of science of success. The accuracy of prediction model depends on the type and structure of data and implementation of feature extraction and engineering give great improvement. The secondary objective is to look at the most suibtable classsification algorithm to predict the success of fashion model and to support decision making in talent scouting.

In accordance with the explanation above, the author is interested to do research entitled Prediction of The Model Prediction for the Next Runway Model using Decision Tree and Random Forest (Case Study: The Big Four Fashion Week)

1.3 Problem Statement

Fashion considers as a massive industry, about three trillion USD covering 4% of the world's Gross Domestic Product (GDP). Fashion week as a primary event in fashion industry contribute 540 million euros income in New York Only. Paris, New York, London, and Milan are the Big Four cities in fashion industry contribute in social and economic impact, and fashion trend globally. The big four are the major influencing cities when analyzing global fashion industry. Modeling industry is highly linked with fashion since models take a special role in fashion shows. Designer's and brand's collections are represented at the runway during fashion week on moving bodies, the models. Fashion week held twice a year making it a challenging work to choose models out of hundred faces, particularly for the new faces. Casting directors should consider several factors such as objective physical characteristics, subjective considerations, and strong cumulative advantage effects in choosing the models. Beside representing the aesthetic of the designer's and brand's collection, having the right fashion models is a powerful marketing tool for promoting new product, engaging the customers in dialogue, affecting the purchase intentions and increasing brand awareness.

Many fields of study have been shifting to digitalization, including fashion industry. Reportedly, 75% of fashion retail plan to invest in AI in 2018/2019. However, the study related to fashion modelling industry have never evolved to the utilization machine learning as the application of AI, which allows us to imitate the knowledge of traditional talent scouting process into an automation model based on machine learning practice. Classification is the algorithm used for predicting the next top models using Decision Tree, and Random Forest techniques by learning the data such as body measurement, professional records, and online social engagement.

1.4   Research Question

According to the background explained above, the research questions are formulated as follows:

1. What is the impact of additional data of relevant social media activity in improving the predictability of fashion model to be selected?
2. What classification algorithm that has the highest accuracy in building an automation model for the next runway model using given data?
3. What factors that modeling agency should consider in choosing fashion models?

1.5   Research Objective

According to the research questions above, the objectives of this study are as follows:

1. To identify the impact of relevant social media activity in improving the predictability of fashion model to be selected.
2. To identify the level of accuracy obtained by Decision Tree, and Random Forest in building an automation model of talent scouting process of fashion models using physical, professional and relevant of social media characteristics.
3. To discover the importance factors in selecting fashion models.

1.6 Significance of the Study

1.6.1 Business Aspect

In term of business, this research is expected to be useful information for agencies in selecting the talents to be distributed to the clients for many purposes such as fashion show. This research also expected for people who work in creative industry especially fashion industry to realize the importance of big data use in making decision.

1.6.2 Academic Aspect

This research is expected to give benefit and give novelty in management area, business and machine learning to build an automation model that is growing recently. The result of this study also can be used as a reference for academicians to add insight and knowledge, also can be used as a reference guide for future researchers.

1.7 Scope of the Study

This study has restrictions aimed at preventing widespread problems and maintaining consistency of the researcher's objectives. The scope is as follows:

1. This research uses Fashion Model Directory and Models.com data consisting of physical and professional characteristics data, and a model's Instagram likes, comments, and number of posts data.
2. Dataset used from Fashion Model Directory only collecting models profile who participated in Fashion Week 2018 in Big Four fashion cities (New York, London, Milan and Paris, while models.com data used for collecting list of agencies.
3. Instagram data is crawled for one-month period (January 2019).
4. Prediction using Decision Tree, and Random Forest.
5. Identifying the impact of each automation model (physical, professional and relevant of social media characteristics) in improving the level of accuracy of each classification algorithm (Decision Tree and Random Forest).

1.8   Writing Systematics

This research is presented into 5 (five) chapters, the systematics are arranged as follows:

CHAPTER I: INTRODUCTION

This chapter briefly presents general explanation of the research. The content includes overview of research object, research background, research questions, objectives, significance of the study, and writing systematics.

CHAPTER II: LITERATURE REVIEW

This chapter contains literature review and previous researches which are related to the topic and variables of the research.

CHAPTER III: RESEARCH METHODOLOGY

In this chapter, the researcher describes the characteristic of the research, operational and variable measurement, steps, sample, resources, validity, and data analysis method.

CHAPTER IV: ANALYSIS AND DISCUSSION

This chapter provides results of the research systematically in order to be analyzed by using the methodology and also discussion.

CHAPTER V: CONCLUSION AND SUGGESTION

The last chapter of the research presents the conclusion which is derived from all the data processing and analysis and recommendation for further development field of the research.