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Predicting Arab Consumers' Preferences on the Korean Contents Distribution*

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Abstract

Purpose - This study aims to examine the analysis of pattern on Arab countries consumers' preferences of the Korean Contents using social media, Facebook since Korean entertainment contents have been distributed in the global marketplace. Then we focus on developing Predictive model using a Data Mining Technique.

Research design, data and methodology - In order to understand preference growth of Korean contents in Arabic countries, we- collected data from two popular Facebook pages: 'Korean movies and drama' and 'K-pop'. Then, we adopted a data-driven approach based on Data Mining techniques.

Results - It is obvious that the number of likes for K-pop will increase for all North African and Middle Eastern countries, however concerning Korean Movies and Drama except Tunisia it is decreasing for Algeria, Egypt and Morocco. Also, concerning Saudi Arabia and United Arab Emirates, the number of likes will decrease for Korean Movies and Drama which is not the case for Iraq.

Conclusions - It is noted in this study that K-contents such as drama, movie and music are sometimes a gateway to a wider interest in Korean culture, food and brands. Moreover, this study gives significant implications for developing predictive model to forecast Korean contents' consumption and preferences.

Keywords: Korean Wave, Entertainment, Social Media, Data Mining, Predictive Analysis.

JEL Classifications: C32, C53, L82, M31, N75.

1. Introduction

The Korean Wave (K-wave), or Hallyu literally meaning 'flow from Korea' in Korean, referred as "the growing popularity of Korean pop culture, such as TV dramas, films, pop music, fashion, beauty, and online games being widely embraced and shared among the people of Asian countries in the late 1990s. In addition, with the rapid spread of social media like Facebook, YouTube and Twitter, K-wave has expanded its fandom outside of Asia to the West. That is, currently, this Korean wave has become the phenomenon of Korean popular culture rolling over the world not only Asian countries but also North and Latin America, Europe, even Middle Eastern countries and North Africa with Korean entertainment contents. Recently, Psy and his song Gangnam Style were not only a world-wide phenomenon, but also a great significant turning point in the history of K-Pop and Korean pop culture(Park, 2015; Park, 2017). The global dissemination and distribution of Korean popular culture such as Gangnam Style would not have been possible without global social media or social network service (SNS) sites (Park, 2013).Finally, the world-wide success of Korean pop culture contributed to improve the 'Korea' image and make a positive impact on Korean economy (Ahn et al., 2013).

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However, while it has been more than 15 years since the Korean pop culture phenomenon has emerged, academic analyses have not sufficiently addressed its consumption of Middle Eastern and North African area from a global perspective. The existing literatures on the Korean Wave focus their attention on the Asian market and tend to still define it primarily as an intra-Asian flow of particular forms of content without sufficiently addressing its distribution through social media and its technology and effect on Korean Wave from a global perspective (Jin & Yoon, 2016), even this topic using social networking sites in promoting and sharing business information has grown to be a dominant theme (Lee et al., 2015). Thus, it looks over how a wide range of Western, Middle Eastern and African fans of Korean pop culture engage with social media and are networked with other fans (Jin & Yoon, 2016).

Moreover, there has no analytical research and forecasting system to find the key factors affecting consumers' demand in these regions. In this regard, drawing on preference pattern with these regions' fans of the recent Korean wave, this study explores how the Hallyu phenomenon is integrated into Middle East and North Africa through a social media. Finally, this paper aims to develop the pattern modeling of consumption behavior, systemically, in Middle East and North Africa using Data Mining techniques to build marketing strategy for Korean contents and manage it to enhance marketing performance expectations by applying the results to the company's prediction system.

2. Literature Review

2.1. K-Contents' consumption in the global marketplace

The Korean Wave refers to the increase in global popularity of South Korean culture including dramas, films, pop-music(hereafter, K-pop) and online games since the 1990s. The transnational fever for Korean popular culture has developed hand in hand with the Korean Wave(literally meaning 'flow from Korea'), led by the extreme popularity of Korean TV drama series in East Asian countries in the late 1990s (KOCCA, 2009; 2013; Jung & Li, 2014). Likewise, other term Hallyu is used interchangeably to indicate the same phenomenon. K-contents'distribution and then success in Asia are associated with the political and economic changes in South Korea (Kim, 2013). First, Korea's improved diplomatic relations with neighboring countries allowed Korean media to enter the regional markets. Second, Korean entertainment companies have experienced a severe loss of profits in the domestic market because of illegal content downloading since the early 2000. These factors forced the Korean entertainment industry to expand globally for survival (Jung & Li, 2014).

First driven by the spread of K-dramas and K-pop across East, South and Southeast Asia during its initial stages, the Korean Wave evolved from a regional development into a global phenomenon, carried by the Internet and social media and especially, the proliferation of K-pop music videos on YouTube (Yoon, 2010; Mark, 2012; Brown, 2012). Much of the success of the Korean Wave owes in part to the development of social networking services such as Facebook and online video sharing platforms such as YouTube, which have allowed the Korean entertainment industry to reach a sizeable overseas audience. Use of these mediums in facilitating promotion, distribution, and consumption of various forms of Korean entertainment has contributed to their surge in worldwide popularity since the mid-2000s (Yoon, 2010; Mark, 2012; Brown, 2012). Particularly, Psy's video for "Gangnam Style" went viral in 2012-13 and was the first YouTube video to reach over a billion views. The platform of YouTube was vital in the increasing international popularity of K-pop, overriding the reluctance of radio DJs to air foreign-language songs in reaching a global audience (Mark, 2012)

Meanwhile, since the 1970s, Korea has provided technical and human resources for the Middle East construction boom, and Arab nations have shared their natural resources with Korea (Lee, 2008). Moreover, Korean popular cultural texts have gained popularity in these regions since 2004. However, studies have not addressed the recent Korean Wave phenomenon in the Arab world. Considering the paucity of scholarly research on the newly emerging Hallyu phenomenon, this study focuses the attention on how Middle Eastern and North African consumers consume Korean contents and probes the burgeoning Middle Eastern fandom of Korean dramas, movies and music.

The Middle Eastern fan's encounter with Korean culture seems to be a life-changing experience. Consumers of Middle Eastern area share how their perceptions of Korea have been affected by their trans-cultural fandom by social media such as Facebook, Twitter. Specially, the Arabic women actively participate on mediated excursions to Korea to expand their understanding of global society (Kim, 2010). Cause most fans in Europe, South America and the Middle East, unlike their East Asian counterparts, have little direct access to the Korean pop culture via mainstream television and music stores, appropriate proliferation of Hallyu cultural contents through the social media has a significant meaning (Kim, 2013). The social media encourages fellow fans and new users to participate in trans-nationally imagined fan communities. Fans, whether of ethnic Korean backgrounds or not, turn to the social networking services to proclaim their devotion and may further enact the fantasies of these imagined worlds through language learning, travel to Korea, and the purchase of Korean cultural products through e-Bay and several websites (Yin & Liew, 2005). Especially, the number of tourists to Korea from Middle Eastern nations is on the rise. According to the Dubai branch of the Korea

Tourism Organization in early May 2016, the number of Middle East tourists from January to March in 2016 recorded 17,999, which is a 19 percent rise from the same time last year (15,125 visitors). During this period the number of tourists from Gulf Cooperation Council states – Bahrain, Qatar, Oman, Saudi Arabia, Kuwait and the United Arab Emirates - hit 1,436, which is up 54 percent from the same period last year. This is a very encouraging sign for the Korean tourism industry as well as entertainment industry, and currently Korea is only in the early stage of being discovered by many Arab nations.

2.2. Korean Wave and Social Media

Social media is the collective technology of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. In recent years, social media such as Facebook, YouTube, Twitter, LinkedIn has become ubiquitous and important tool for social networking and content sharing(Jin & Yoon, 2016). And social media analytics is becoming the practice of gathering data from blogs and social media websites and analyzing that data to make business decisions. The most common use of social media analytics is to mine customer sentiment to support customer's favorite contents.

Despite the flourishing researches about the characteristics of Korean contents, Hallyu, its forms and global demanding from the market, there is a lack of empirical studies addressing social media as a key distribution method or signal of Hallyu. That is, the studies examining social media, rather than content, in regard to the Hallyu phenomenon are still few in number. However, they can be categorized into two streams of research, institutional-oriented perspective and user-oriented perspective (Jung, 2011; Ahn et al., 2013; Oh & Park, 2012; Shim & Noh, 2012; Jung & Shim, 2013; Oh & Lee, 2013; Ono & Kwon, 2013; Jin & Yoon, 2016).

One group of studies examines how social media are involved in the Korean wave by observing the media industries' strategies toward global and intra-Asian markets. This approach, which explores the top-down process initiated by entertainment corporations, can be referred to as an institutional analysis (Ahn et al., 2013; Oh & Park, 2012; Oh & Lee, 2013; Ono & Kwon, 2013; Jin & Yoon, 2016). These studies have related to the way in which Korean entertainment companies strategically adopt social media by maximizing social media channels, leading users to promotions, events and stimulating them with exclusive content (Jin & Yoon, 2016). These institutional approaching empirically proves the increasing role of media convergence in the transnational flow of Korean pop cultures. However, they do not sufficiently address how global audiences are participating in the media environment (Jin & Yoon, 2016).

In this respect, the studies by Jung (2011), Shim and Noh (2012) and Jung and Shim (2013) pay attention to the media users of the Hallyu phenomenon and the technological distribution. This group of empirical studies, which can be called a user analysis, addresses how users participate in, and negotiate with, the social media-driven technological mediation of Korean popular culture(Jin & Yoon, 2016). Jung (2011) pointed out common fan practices enhanced by social media, that is, the collaborative recreation and redistribution of original texts, as evidenced in cover dance performances and fan fiction writing. Moreover, Jung and Shim (2013) explore K-pop fandom in Indonesia as an articulation between corporate-controlled media processes and fandom-led grassroots practices (Jin & Yoon, 2016). These two approaches attempt to explore the role of digital technology of social media in the Korean wave phenomenon, which still remains under researched.

2.3. Predicting with Social Media using Data Mining

Data mining is an essential and powerful tool in the process of knowledge discovery in databases in which intelligent methods are applied in order to extract patterns. Predicting is one of the most interesting and challenging tasks where to develop data mining applications. The use of computers with automated tools, large volumes of data are being collected and made available to the research groups (Shweta, 2012). As a result, many researches were carried out on various datasets using the data mining techniques to enhance forecasting in the business and medical fields (Delen et al., 2005; Sarvestan et al., 2010; Shweta, 2012; Der-Chiang Li et al., 2012; Khana et al., 2013; Fan et al., 2014).

Especially, predictive analytics has been useful in predicting the frequency of trading and the stock price for the next day, based on data from social media such as Twitter. This model was developed by Riverside and other researchers. A trading strategy supported by this model was created by three researcher, Vagelis and his graduate students (Amigobulls, 2015). Their trading strategy performed 1.4%-11% better than other baseline strategies. In addition, during a 4-month simulation, this strategy outperformed the Dow Jones Industrial Average. Vagelis's study looked further than the effect of negative and positive sentiment on stock prices, it looked at the quantity of tweets and the interrelationship between tweets, users and topics.

Recently, Arthur (2015) has found the relationship between Facebook popularity and consumer brand stock prices (Amigobulls, 2015). The premise of his study aimed at finding out whether popularity (measured in Facebook likes) affected performance (share prices). He identified 30 brands that had the maximum number of followers, and tracked the likes these companies got for a period of one year as well as their share price on a daily basis. He found that 99.95% of the changes in share prices could be explained by the change in the number of fans. He did not see a direct relationship between likes and an increase or

decrease in share prices, however, stock market trends were affected by the appreciation a company got on social media. The majority of a change in a particular company's stock price was linked with the likes that brand received for that period. Finally, the data of social media sentiment has become most applicable to produce other predictive models. The study will be helpful for building energy management systems to reduce operating cost and time by not having to detect faults manually or diagnose false warnings. In addition, it will be useful for developing fault detection and diagnosis model for the whole building energy consumption. The study will be helpful for building energy management systems to reduce operating cost and time by not having to detect faults manually or diagnose false warnings. In addition, it will be useful for developing fault detection and diagnosis model for the whole building energy consumption.

Jin and Yoon (2016) examine how Hallyu fans engage with a social media-saturated environment, drawing on qualitative interviews with North American fans of Korean pop culture. In comparison to the existing cultural analyses of the Korean wave, which focus, at best, on the content of particular genres or texts and their consumption, they map out transnational pop cultural flows with reference to the media environment through which the participatory culture of media users is spread (Jenkins et al., 2013; Jin & Yoon, 2016).

However, most studies tend to focus on either the role of digital technology of social media or predictive analytics using data mining techniques without fully consideration their conjunction between social media and data mining technique (Lee et al., 2016). Based on these existing studies and our awareness of research limitations, we approach to explore predictive models with social media using a data mining technique for application of this concept into the consumption of Korean pop cultures. From this study, we, therefore, engage with the notion of spreadable social media in disseminating Korean pop cultures, and developing predictive models of K-contents' consumption and demand for the future, especially in the Middle East and North Africa.

3. Methodology

3.1. Data Collection Method

In order to understand popularity growth of Korean contents in Arabic countries, we collected data from two popular Facebook pages: the first one about 'Korean movies and drama' and the second one about 'K-pop'. Numbers of likes recorded on a daily basis by different countries over a period of two years (October 10th 2014 to October 10th 2016) have been collected. Then, we selected only those of Middle East and North Africa. Four North African (Algeria, Egypt, Morocco and Tunisia) and three Middle Eastern countries (Iraq, Saudi Arabia and United Arab Emirates) liked the Korean Movies and Drama. These countries except the United Arab Emirates also liked the K-pop page (see <Table 1>).

<Table 1> Number of likes of Korean pages by North African and Middle Eastern Countries over a period of two years

		Korean Movies & Drama	K-Pop
North Africa	Algeria	7155335	260879
	Egypt	10475598	198190
	Morocco	7152532	269912
	Tunisia	5059424	386222
Middle East	Iraq	3421466	166695
	Saudi Arabia	1286017	105315
	United Arab Emirates	633538	0

During the last two years and compared to other Arab countries (Algeria, Egypt, Morocco, Iraq and Saudi Arabia), Tunisia has the smallest population (around 11.317 million people), nevertheless it has the largest number of fans of K-pop (about 386.222 likes). On the other hand, Egypt (about 10.475.598 likes) has the largest numbers of likes of Korean movies and drama compared to other Arab countries.

3.2. Predictive Data Mining

Aiming to analyze the popularity of Korean contents in Middle Eastern and North African countries, we adopted a data-driven approach based on Data Mining techniques. The collected data as described above represent a time series composed of a chronological sequence of observations on number of likes by country associated to public Korean pages (movies/drama and K-pop). Predicting future likes trends of Korean contents for Middle Eastern and North African countries can look ahead to future consumption behavior in order to maximize the success and profitability of Korean contents in these regions. This task falls under time series forecasting which is performed with different techniques including statistical and machine learning ones. The latest are often more powerful than the classical statistical techniques such as ARMA and ARIMA (Saigal & Mehrotra, 2012). Different Machine Learning algorithms have been used for time series forecasting such as Linear Regression, Robust Regression, Gaussian Processes, Support Vector Machine (SVM), etc. SVM algorithms have been used with a considerable success and often outperformed other methods (Ristanoski, Liu, & Bailey, 2013). In this research work, we use SVM for regression (namely, SMO reg in Weka Software) in order to predict future likes trends of Korean contents for different Middle Eastern (Iraq, Saudi Arabia and United Arab Emirates) and North African countries(Algeria, Egypt, Morocco and Tunisia). We use the Mean Absolute Error(MAE) in order to evaluate our model. MAE is used to measure how close predictions are to the eventual outcomes. MAE is given by the following equation:

$$MAE = \frac{1}{n}\sum_{i=1}^{n}|f_i - y_i|$$

Where f_i is the predicted value and y_i is the true value.

4. Results and Discussion

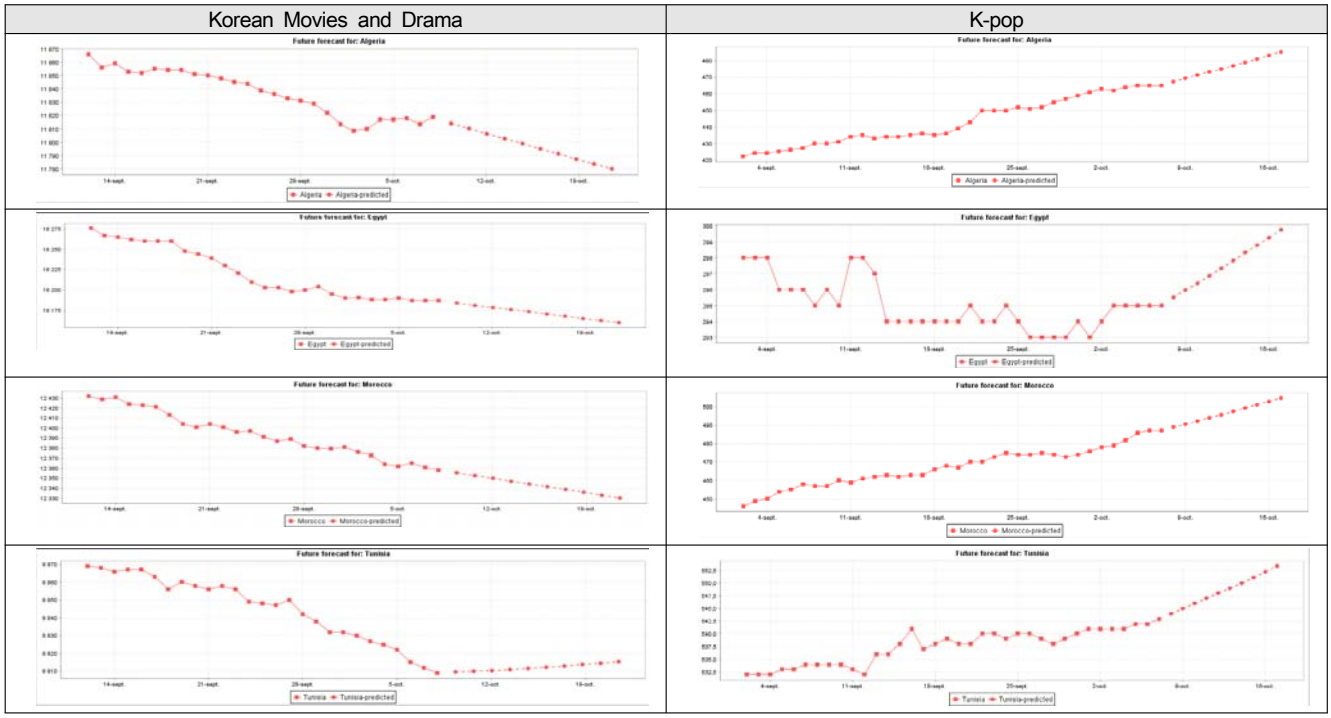
In order to forecast the future trend for the number of likes of Korean music, movies and dramas since Korean contents have been distributed in the Arab countries, we employed WEKA forecasting plugin (Saigal & Mehrotra, 2012), which is a time series analysis and forecasting model. The target variable to be predicted is the number of likes that will be collected in 1 day until 10 days into the future.

The collected data was divided into training data (used to estimate the model) and test data (used to evaluate the forecasts). The size of the test data set depends on the size of the whole data and number of time units to forecast and should ideally be at least as large as the maximum forecast horizon required (Hyndman & Khandakar, 2008). In this research 5% of the total sample used to evaluate the forecasts for a period of 10 days. The performance results of the algorithms are based on the Mean Absolute Error (MAE) and are reported in <Table 2>.

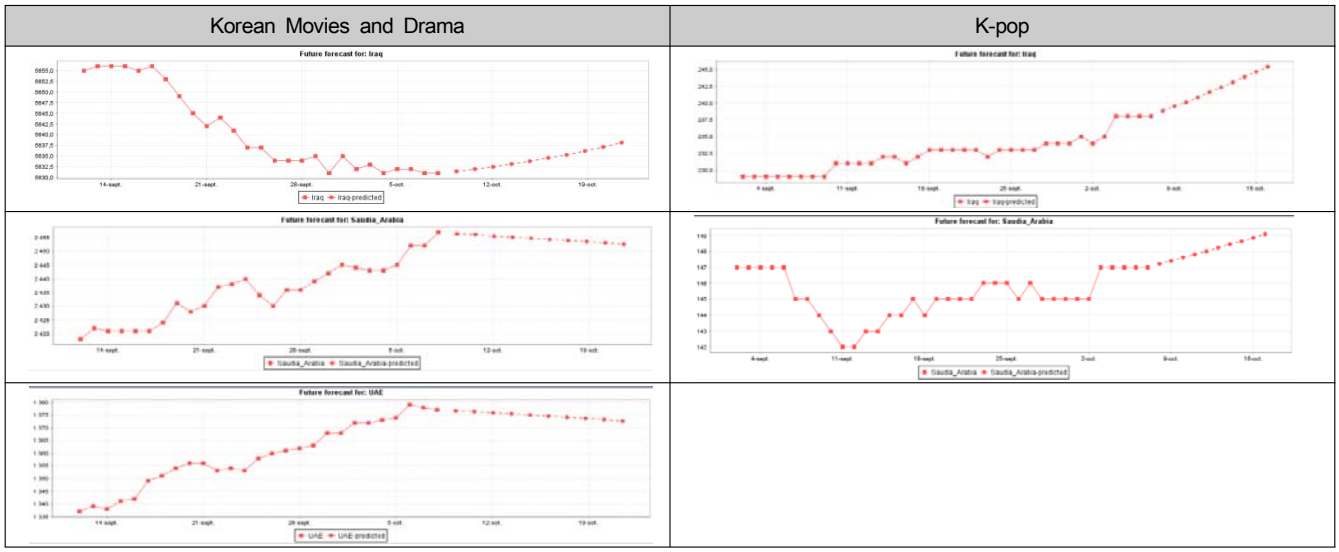
Preference trends of Korean Movies and K-pop in the North African and Middle Eastern countries are respectively presented in <Figure 1> and <Figure 2>. On the Y axis are the number of likes and on the X axis are the weekly dates in the last month.

<Table 2> Evaluation of SMO reg for predicting the number of likes of Korean pages within a period of 10 days using MAE.

MAE	Korean Movies and Drama										K-pop									
	1 day	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
Algeria	3.658	5.873	8.115	10.191	12.029	13.684	15.133	16.588	18.037	19.972	1.296	2.050	2.517	3.014	3.281	3.422	3.649	3.805	3.950	4.067
Egypt	3.826	6.034	8.033	9.847	11.430	12.738	15.385	17.949	20.482	23.246	0.826	1.255	1.683	2.049	2.365	3.243	2.764	3.660	4.142	4.597
Morocco	2.769	3.759	3.824	4.212	4.352	4.536	5.354	5.770	5.197	5.781	1.340	1.740	2.110	2.708	2.955	3.456	3.652	3.957	4.467	4.847
Tunisia	3.359	5.614	8.112	10.704	13.373	16.169	18.885	21.408	24.371	27.152	1.122	1.619	2.082	2.588	2.943	3.346	3.834	4.243	4.775	5.398
Iraq	1.989	2.561	3.745	4.868	6.210	7.572	9.226	10.795	12.518	14.009	0.662	0.979	1.186	1.341	1.612	1.833	2.121	2.405	2.713	3.091
Saudi Arabia	2.892	4.801	6.527	7.942	9.065	10.914	12.951	15.08	16.856	18.781	0.549	0.821	1.130	1.373	1.605	1.722	1.850	1.907	2.050	2.034
UAE	2.166	4.061	5.969	7.751	9.491	11.449	13.231	14.865	16.475	17.887										



<Figure 1> Actual and predicted values of likes by North African Countries for Korean Movies and K-pop using SMO reg



<Figure 2> Actual and predicted values of likes by Middle Eastern Countries for Korean Movies and K-pop using SMO reg

For the next ten days, it is obvious that the number of likes for K-pop will increase for all North African countries, however concerning Korean Movies and Drama except Tunisia it is decreasing for Algeria, Egypt and Morocco. Preference trends of Korean Movies and K-pop in the Middle Eastern countries are presented in the <Table 4> below.

Similarly to North African, Middle Eastern countries recognize an increase of the number of likes for K-pop. However, concerning Saudi Arabia and United Arab Emirates, the number of likes will decrease for Korean Movies and Drama which is not the case for Iraq.

From the results, we found some interesting findings as follows.

First of all, the trend for the number of likes of Korean music, movies and drama shows differently between genres. The number of likes for Korean movies and dramas is decreasing while the number of likes for K-pop is increasing. This result can be explained with time difference. In the beginning, people in Arab countries started to enjoy Korean contents with drama and movie. And then over time they also enjoyed Korean drama's songs (OST: Open Source Track) after they got used to Korean contents by dramas.

Second, from the actual and predictive trend, we found that the trend and also speed for the number of likes of Korean contents are totally decreasing while Korean contents became more popular in Arab countries. This result can be explained with the change in consumer behavior. At the beginning with the emergence of Social Media, users were interested to share their experiences about Korean drama and movie through Facebook, but more and more after many websites and private applications (such as 'www.myasiantv.se'; www.viki.com; www.kissasian.com; www.baykorean.net; www.dramafever.com; www.dramayou.com; www.dardarkom.com; http://kshowonline.com; http://aradrama.com) appeared to make people enjoy Korean contents directly, users access several websites related to Korean contents straightly without using social networks like Facebook.

Lastly, as we noticed in the results, the number of likes of Korean products by Gulf countries is very small comparing to other countries; this is because we believe that Twitter is more popular than Facebook in these regions. In addition, some countries have started to broadcast Korean drama through main public channels, for example MBC, the main channel of Saudi Arabia spread Korean dramas with Arabic subtitles. This also affects the future trend of Korean contents in Arab countries.

5. Conclusions

This study aims to examine the analysis of pattern on Arab countries (Middle East and North Africa) Consumers' preferences of the Korean Contents using social media, Facebook since Korean entertainment contents have been distributed in the global marketplace. Then, we focus on developing Predictive model using a Data Mining Technique. Based on our analysis and results on predicting preference of Korean contents in Arab countries, we found some valuable implications as follows.

First, K-contents such as drama, movie and music are sometimes a gateway to a wider interest in Korean culture, food and brands. Korean brands can be inserted into dramas and music videos. South Korea's government long ago embraced pop culture as a way to transform itself into global market's trendsetter and fuel its economy (Park, 2015). Product placement is huge in K-drama. Korean companies' products such as Samsung phones and Hyundai

cars make frequent appearances. In 2016, market observers who forecast that one Korean drama "Descendants of the Sun" alone will boost the Korean economy by $261 million, partly by driving demand for tourism and products. With this huge effect, prediction on K-contents' consumption in the attractive, emerging markets such as Middle east and North Africa will be tremendously significant. Increasing the awareness of Korean brand by promoting Korean cultural content will remove entry barrier and create some opportunities for Korean companies which seek to operate a business in Arab countries.

Second, Korea entertainment companies can take into consideration the cultural characteristics of the Middle East. There was a long queue to taste Halal certified traditional Korean food, such as bibimbap, and bulgogi and beauty or fashion tips for Arabic women. Considering and depicting these unique points, contents companies can produce distinctive cultural contents to integrate with Arabic culture.

Third, this study gives valuable implications for building global marketing strategies on Korean contents to manage it and reduce operating cost and time in the global marketplace through the technological distribution by social media (Kim et al., 2014; Jung et al., 2014). Moreover, it will be useful for developing predictive model for the whole building Korean contents consumption and preferences, also for overcoming liability of foreignness in the host countries.

Even though our findings were significant, this study has some limitations. Such limitations and the future direction of the research are as follows.

First, we need to study many other features such as demographic (age, gender, etc.) comments in order to build more individualized, customized, localized marketing strategies.

Second, we need to collect comments entered by users and apply sentiment analysis techniques in order to analyze their satisfaction about some features of Korean products. Companies, through a business intelligence process, aim to analyze customers' feelings about the products, services, agents and organization. This can lead to the development of new strategies for global customers' satisfaction and can provide the company with a competitive advantage in the global marketplace. Technologies that automatically recognize unhappy customers can be extremely useful to companies.

Third, in this research, only Facebook is used to collect the data, we need also to use another social network and specifically Twitter. Facebook is more popular in North African countries however Twitter is more popular in the gulf region. Given this market difference, this study cannot describe the general market situation, and this should be considered in future studies.

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