# ANALYZING THE COLLECTIVE INTELLIGENCE APPLICATION SOFTWARE "WISDOM PROFESSIONAL" FOR ADVERTISING IN (SOCIAL) MEDIA, CASE STUDY: COCA-COLA

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**Abstract**: The main goal of this article is set to demonstrate how collective intelligence application software works and can be used for advertising purposes. Following this objective, it is aimed to optimize advertising in (social) media for a company or enterprise by using collective intelligence software. To this end, the Wisdom Professional software from MicroStrategy Company is utilized to derive required information. These data are kind of raw data that are derived from the information of Facebook users that are collected in Wisdom Professional. Wisdom Professional includes Facebook information of millions of people such as demographic, geographic, psychographic information and so on. The information of Facebook users in Wisdom Professional are considered to be representative information of the whole population in a sense that what is observed in this sample (i.e. Facebook users in Wisdom Professional) can be extended and generalized for the whole customer population. The data derived from Wisdom Professional are further processed by means of different methods to demonstrate the best possible advertisement options for a specific enterprise. The two utilized methods are Popularity oriented and lift factor methods. The results of analyses reveal that both methods provide with reliable and consistent outcome. As for the application part of this article, Coca-Cola Company is considered to be the chosen case study. Coca Cola fans' information are analyzed in Wisdom Professional to provide best possible advertising channels that this company could benefit by advertising its product in those channels.

Keywords: collective intelligence, Wisdom Professional, advertising, social media

ACM Classification Keywords: H.4.2 Information Systems Applications - Types of Systems - Decision support

#### Introduction

In this article it is aimed to analyze collective intelligence application software. This software is called Wisdom Professional and is a product of MicroStrategy. In this article the objective is to evaluate the situation of a company (here Coca Cola) by means of Wisdom Professional and provide the company with some helpful information that they can use to improve their business. The results of this type of analysis will empower organizations to make better business decisions, realize their status among competitors and ultimately improve their organization's efficiency through analyzing interests of millions of people on Facebook. It is very important for an organization, enterprise or a brand to know everything about its customers or target groups. The results of this article can help them to get a better insight into the position of their competitors and their status in market, products and partners for gaining competitive advantage. Therefore, the main motivation on carrying out this research is to show that adopting such business intelligence software could result in better decision making for a company and furthermore acting in a collective manner is more intelligent than deciding individually.

In this article, we aim at optimizing advertisements in Social media for a company or enterprise by means of collective intelligence software. Figure (1) shows the three major contribution factors of this article. Adopted software is Wisdom professional from MicroStrategy Company. Target Company is Coca-Cola and for the

comparison purposes some of its competitors and other Coca-Cola's brands (e.g. Fanta, Sprite and etc.). The study area is also selected to be Europe.



Figure (1): Relation between 3 key components in this article

#### Literature review

#### **Collective intelligence**

Collective intelligence means using more than an individual intelligence for achieving complex goals. The basis of this approach relies on the fact that a group of people is more intelligent than an individual [Surowiecki, 2005]. The crowd can collectively do something such as solving problems or recognizing patterns better than machines [Leimeister, 2010].

In general collective intelligence helps organizations to improve business outcomes through accessing to untapped knowledge and experience of their networks [IBM].

Collective intelligence could be categorized and defined as follows:

- The collective intelligence resulted from interactions among different people with diverse knowledge working together;
- The collective intelligence created by independent customers in a market;
- The collective intelligence of global information systems that can be achieved by means of computers (The Co-Intelligence Institute).

## Social theories

The classical social theory can help to have a better recognition of social media, collective intelligence and the relation between them. Merton (1967) declares in his social theories that humans need to act reciprocally, to learn from each another, share and exchange ideas to enhance level of knowledge and working together as a group to make better and more effective decisions [Merton, 1967]. In social capital framework, Bourdieu (1986) declares that social networks are an origin of capital that made up of social obligation and "social capital is actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition or in other words, to membership in a group" [Bourdieu, 1986]. The social value of a group improves when they think and act collectively. Field's (2003) social capital theory position is defined in a way that relationships matter and social networks are valuable assets where people develop communities and commit themselves to each other. The human experience of trust and tolerance bring benefits to people in the network including mutual understanding [Nickel, 2013].

#### Link between social media and collective intelligence

Social media and collective intelligence have close relation to each other. Using internet and online collective communication vehicles such as web sites and web pages, people can interact together and create, share and exchange their information and wisdom in virtual spaces. In other words, people can understand what other persons are thinking and feeling. This means using collective intelligence in social media. Two key examples are Wikipedia and Facebook.

In Facebook there is much information about users. This information includes demographic information such as age, gender, marital status, level of knowledge and so on and interests, idea or opinion of users. For example a media planner wants to plan for Coca-Cola Company. The goals he follow them are: which vehicles are more appropriate (TV, magazine, internet, ...) to advertise? And when and where is better for advertising? He can uses software like Wisdom Professional that it contains many information about users of Facebook. Now he should use needed Facebook information with regards to Coca-Cola plan to make decisions.

## **MicroStrategy and Wisdom Professional**

MicroStrategy is founded in 1989. It is a global provider of enterprise software for business intelligence (BI), mobile intelligence and social intelligence (i.e. Wisdom Professional software) applications. It provides reporting, analyzing and monitoring that enable organizations make business decisions better than before [Wisdom].

Wisdom Professional provides analytical application of existing data of Facebook users. It has many capabilities such as Dashboard, Demographics, Interest analysis, Place analysis, Psychographics, Scores and Comparison (compares several pages simultaneously). In this article main analysis is done based on Interest analysis capability (Figure (2)).

Wisdom PROFES	SIONAL	DASHBOARD	DEMOGRAPHIC S	INTEREST	S PLACE	S EMPLOYN	AENT PS	YCHOGRAPHIC	s scori	ES	
	Apply	👍 Interests Ana	lysis					G	rid Graph H	leatmap	
▼ Page	All	22 776 311 Decelo in f	ilter collection						Export: PD	E Exce	1
Search Page		Rank By Highest Affinit	y 🔹 Page Gro	oup (All)		<ul> <li>Page Catego</li> </ul>	ory (All)	[			
▼ Gender	All	Affinity IS THE ATTAC	HMENT OF THIS GROUP VERS			M NETWORK					
(AII)		Page		Affinity	People	% of Segment	30 day Growth	Growth %	Acceleration	Trend	
E Female		Facebook		1.0x	1,460,171	6.4%	691	0.0%	-6.3x	•	^
🗖 Male		Barack Obama		1.0x	1,366,464	6.0%	1,042	0.1%	-6.5x	•	
▶ Age Bracket	All	Family Guy		1.0x	1,332,551	5.9%	574	0.0%	-2.8x	•	
<ul> <li>Relationship Status</li> </ul>	All	YouTube		1.0x	1,268,919	5.6%	333	0.0%	-7.1x	•	
<ul> <li>Education Level</li> </ul>	All	House		1.0x	1,239,307	5.4%	236	0.0%	-29.9x	•	
Income Bracket	All	Michael Jackson		1.0x	1,228,900	5.4%	1,770	0.1%	-1.1x	•	=
▶ Urbanicity	All	Eminem		1.0x	1,222,457	5.4%	1,622	0.1%	-1.6x	•	
▶ Country Group	All	Starbucks		1.0x	1,202,568	5.3%	720	0.1%	-3.0x	•	
▶ Country	All	Lady Gaga		1.0x	1,155,999	5.1%	792	0.1%	-1.8x	•	
State / Territory	All	Bob Marley		1.0x	1,121,545	4.9%	2,390	0.2%	1.5x		-
▶ Metro	All	The Beatles		1.0x	1,101,984	4.8%	1,569	0.1%	-1.5x	•	
▹ Country of Origin	All	<u>Rihanna</u>		1.0x	1,080,408	4.7%	1,342	0.1%	-2.5x	•	
▶ Language	All	The Simpsons		1.0x	1,026,957	4.5%	1,011	0.1%	-2.2x	•	
► Industry	All	Megan Fox		1.0x	1,014,707	4.5%	991	0.1%	-1.6x	•	
▶ Employer	All	Coca-Cola		1.0x	982,525	4.3%	872	0.1%	-2.5x		

Figure (2): A snapshot of Interests tab in Wisdom Professional

#### Interest analysis

In interest analysis, Interests are divided into 14 groups such as companies/products, sports, music, movies, people, TV, books, games/Apps, art, general entertainment, going out, news/media, travel and other and related page categories. In this article, seven interests are selected namely TV, news/media, companies/products, music, movies, books and games/Apps. These interest categories are selected because they are the top interest categories with highest number of people in Wisdom Professional.

There are 5 main metrics that can be referred to for interest analysis, namely Affinity, People, % of segment, Growth and Acceleration [Wisdom]. Here we worked with two metrics, People and % of segment.

The People represent the number of people who are fans of a particular page. The % of Segment shows the percentage of fans of a specific page in the selected area.

## Wisdom data of Coca-Cola fans in Europe

In Wisdom database 160369 people who live in Europe like Coca-Cola. Demographic information of Coca-Cola fans in Europe is as follows: average age is 26, average yearly income is \$41k, in gender 52% are male and 48% are female, in marital status 47% are single, in education level 50% are holding at least a college degree, 76% live in urban areas [Wisdom].

#### Methodology

The problem we aim to solve in this article is optimizing media advertisement for companies. Due to the limited budget and time, companies cannot address their advertisements in all media. They need to advertise in most important and effective media that gives them the most benefit. As a solution for this problem, one could think of employing collective intelligence. Collective intelligence is a powerful method that gathers useful information by collectively gathers revealed preferences of a large scale population. A large scale population's decision is always more reliable than individual's decisions. For this purpose we aimed to analyze and use collective intelligence software namely "Wisdom Professional". This is the tool that systematically gathers Facebook users' opinions. In fact Wisdom Professional could be considered as a small community which appropriately resembles the real world and, therefore, its information can be generalized to the global population.

In order to analyze the information revealed from Wisdom Professional two major types of data are being collected. These data are basically population-based or penetration-based measures. Population-based measures are the ones where we exclusively consider the number of fans of a product but penetration-based measures deal with the relevant figures. In Wisdom Professional there are many different channels such as TV, News/Media, Companies/Products, Movies, Music, Books and etc. where people's interests are categorized in those channels. Each channel includes many cases which are basically Facebook pages. By having all those channels and their embraced cases, one could easily analyze a specific product (here in this article Coca-Cola) and different interests of this products fans. In this article and due to self-imposed constraint we focus on the top 10 cases of interest in any kind of analysis. In this way, we make sure to focus on the most popular and influential cases that gives us the most efficient advertisement opportunities.

The first method (i.e. Method A) deals with different approaches through which different raw numbers from Wisdom Professional are collected and further processed in order to achieve the goals of this article. These numbers are calculated to show which advertising channel is the most suitable one and via which channel Coca-Cola Company can target its customers more effectively. Method A mainly considers the number of fans of each case; however, Method B deals more with the penetration rate of different cases. In what follows a brief description of both two methods is illustrated.

#### Method A; Popularity oriented method

To achieve the best possible advertising method, there are 3 different approaches via which the best advertisement place can be identified. These approaches are the following:

- 1. Single product with single channel;
- 2. Single product with multiple channels;
- 3. Multiple products with single channel.

Here product means a type of drink (e.g. Coca-Cola), channel refers to the category of interests (e.g. Media, TV, Companies, etc.) and case or page refers to cases included in each channel (e.g. The Simpsons, House, etc. in TV channel).

Single product with single channel: in simple words, we should correlate only one product like Coca-Cola with only one channel and then find the top ten cases of this specific channel based on the products preferences from Wisdom Professional. These cases will be analyzed in terms of number of fans and the results will be further processed and reported accumulatively and in percentage. To limit our choices and to emphasize on the most beneficial cases for doing advertisements we highlight the cases by which 80% of top ten cases fans are already covered. The aim is to express which pages have more visitors in each channel and for each product. Details of this procedure are mentioned as follows.

Single product with multiple channels: This approach is the same as the first approach except of the fact that there are multiple channels such as TV, News/Media, companies/products or any other possible channels all together. When considering all possible channels together, the two considerably most favorite pages of Coca-Cola fans are YouTube and Facebook; these two pages cover the most number of Coca-Cola fans in comparison to any other pages.

Multiple products with single channel: Here the combination of two products is analyzed in correspondence with a single channel. There are 2 different methods applicable for this approach. The first method is appropriate for channels that have many similarities in their programs when combining Coca-Cola and the comparison product. In this method we can select top 20, 15 or 10 of Coca-Cola in a specific channel like TV. Then we should rank the other products based on Coca-Cola priorities.

The second method is suitable for channels in which Coca-Cola fans have several dissimilar favorite pages in comparison to their competitor product fans. In this method, products are mutually selected where always one party is Coca-Cola (e.g. Coca-Cola with Heineken or Coca-Cola with RedBull). Then top 10 of Coca-Cola and top 10 of the other product favorite channels are selected. At this stage, all repeated channels form this 20 channels list are kept once. At this stage the same procedure will be employed to distinguish the number of channels by which 80% of Coca-Cola fans will be covered.

#### Method B; Lift factor method

In data mining, lift is a quantity of the performance of a targeting model at predicting cases as having an improved respond (with respect to the total population as a whole), measured against a random choice targeting model [SQL Server Microsoft]. A targeting model is doing a good job if the response within the target is much better than the average for the population. In other words, lift factor is simply the representation of this ratio: target response divided by average respond. Lift factor shows how companies can prepare for their advertising plans by considering four main elements; 1) whole population of the study area (e.g. Europe zone), 2) number of specific product's fans in the study area (e.g. number of Coca-Cola fans in Europe), 3) total number of fans of a target channel that the company wants to advertise in it (e.g. "MTV" from TV cases) and 4) the percentage of a channel fans who like a specific product (e.g. percentage of "MTV" fans who like Coca-Cola).

 $lift factor = \frac{\frac{\text{Coca} - \text{Cola fans of MTV in Europe in Wisdom}}{\frac{\text{total fans of MTV in Europe in Wisdom}}{\frac{\text{total Coca} - \text{Cola fans in Europe in Wisdom}}{\text{total Wisdom population in Europe}}$ 

For example, imagine that a population has an average respond rate of 6.6% and a specific model has recognized a segment with a respond rate of 53%. Then lift of this segment will be 8. Above is an example of lift factor for MTV which is among the top 10 Coca-Cola cases in TV.

This should be noted that these lift factors are different from the affinity measures available in Wisdom Professional since for the calculation of affinity the geographical choice (i.e. here Europe as the case study area) is not considered and the calculation is made based on the whole population of Wisdom.

# Results

In this section the results of the two employed approaches will be explained. For a better representation, results will be mainly expressed in tables and graphs. Using visual aids such as graphs and tables is an effective way for an easy understanding of the results. First approach contains three parts, namely single product - single channel, single product - multiple channels and multiple products - single channel. The objective of this part is to demonstrate which channels in each category cover 80% of fans within top 10 favorite channels. Furthermore, the results of the second method (i.e. Lift factor method) are demonstrated.

## Single product - single channel

Single product - single channel means that the analysis considers one product like Coca-Cola, Red Bull, Pepsi and etc. and one channel like TV, News/Media and etc. Cases presented in Table (1) are top 10 Coca-Cola fan's TV category priorities and are ranked base on their popularity. The numbers of fans for each product are mentioned accumulatively. All numbers are derived from Wisdom Professional. The 80% threshold are calculated by multiplying 0.8 by the last number (i.e. 10th number which represents the number of Coca-Cola fans who like at least one of those 10 cases) of each product. For instance, 80% of top Coca-Cola fans are covered by any advertisement prepared for the first three TV programs, namely "The Simpsons", "House" and "South Park". For a better understanding of these results, Table (1) is followed by its corresponding graph.

		Coca-Cola	Red Bull	Pensi	Fanta	Sprite	Heineken
					Tunta	opine	пешекен
1	Simpsons	63100	46664	5069	10050	6920	11094
2	House	87222	60961	6440	11451	8484	17620
3	South park	94667	66975	6909	11895	9100	19946
4	MTV	101018	71295	7354	12489	9568	21244
5	Family guy	104300	74045	7566	12767	9721	22378
6	How I met your mother	107816	77485	7758	13002	9869	23902
7	Two and half man	109800	79709	7857	13116	9931	24964
8	Spongebob Squ.	111199	80450	7935	13228	10063	25189
9	Futurama	111802	80842	7968	13280	10091	25396
10	The big bang theory	112746	81504	8032	13346	10120	25856
80% of top 10 favorite cases 90196.8 65203.2 6425.6 10676.8 8096 20684					20684.8		

Table (1): Single product - single channel=TV in Europe



Figure (3): Single product - single channel=TV in Europe

Table (2) shows the absolute numbers of Table (1) in percentage. In Table (2) the numbers of each column in Table (1) are divided by total fans of each product. The aim is to show the percentage of each product's fans who like that specific product in comparison to its total fans. When only the absolute measures are considered, Coca-Cola is always on top because it has more fans in comparison with its competitors but when the rates are considered the orders will be different. This implies the fact that by advertising on a specific TV case, more fans (in terms of absolute numbers) but a smaller share of total fans (percentage of each specific product fans who like at least one of the top 10 TV cases. For instance, 72.50% of Coca-Cola fans like at least one of those top 10 TV cases. In fact what is reported as 80% of top 10 TV cases fans in Table (1), is 80% of this 72.50%. Table (2) is followed by its corresponding graph.

	() 0	1	0		, 1	•	
		Coca-Cola	Red Bull	Pepsi	Fanta	Sprite	Heineken
1	Simpsons	40.57%	41.05%	49.24%	59.73%	59.37%	22.46%
2	House	56.08%	53.63%	62.56%	68.05%	72.79%	35.66%
3	South park	60.87%	58.92%	67.12%	70.69%	78.07%	40.37%
4	MTV	64.96%	62.72%	71.44%	74.22%	82.09%	43.00%
5	Family guy	67.07%	65.14%	73.50%	75.87%	83.40%	45.30%
6	How I met your mother	69.33%	68.16%	75.36%	77.27%	84.67%	48.38%
7	Two and half man	70.60%	70.12%	76.33%	77.95%	85.20%	50.53%
8	Spongebob Squ.	71.50%	70.77%	77.08%	78.61%	86.33%	50.98%
9	Futurama	71.89%	71.12%	77.40%	78.92%	86.57%	51.40%
10	The big bang theory	72.50%	71.70%	78.03%	79.31%	86.82%	52.33%
	Total fans	155519	113676	10294	16827	11656	49405

Table (2): Single product - single channel=TV in Europe, in percentage



Figure (4): Single product - single channel=TV in Europe, in percentage

From the business point of view, when we cover fans of first three TV cases (80% of top 10 cases) in advertising for Coca-Cola, in fact we also cover fans of Red Bull, Pepsi, Fanta and Sprite which are Coca-Cola's competitors. This is due to the fact that fans of these products share a number of similar favorite cases. When considering the percentage of fans of competitor products the analysis reveals that for a couple of products, even a greater share of fans are exposed to Coca-Cola advertisement.

The aforementioned conclusion could lead to another business strategy which is usually referred to as cooperative advertising. Cooperative advertising is a cost-effective way for manufacturers and retailers to reach their target markets. If Coca-Cola strategy planners are well informed of the common favorite pages of their product and their competitors' products, they can easily set up a co-op advertisement where they can share both costs and benefits. This could sound more beneficial if Coca-Cola set up co-op advertisement with other Coca-Cola brands (e.g. Coca-Cola zero, Fanta and Sprite) or Red Bull since they do not exactly belong to the same category of drinks. On the contrary, it is almost impossible if they try to follow this co-op advertising strategy with Pepsi because they are exactly in the same category of drinks and are known to be the two opposing poles in the market.

#### Single product - Multiple channels

Single product - multiple channels approach means that one product like Coca-Cola, Red Bull, Heineken and etc. will be simultaneously analyzed with several channels like TV and News/Media and etc. The results of this analysis could give a great view of the fans of all possible pages together.

Cases in Table (3) are ranked base on top 10 Coca-Cola priorities. Number of fans of each product are noted accumulatively. As can be seen in Table (3), 80% of top 10 cases fans who like Coca-Cola are covered by the first 3 pages, namely "YouTube", "Facebook" and "The Simpsons". For a better understanding of this result, Table (3) is followed by its corresponding graph.

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		Coca-Cola	Red Bull	Pepsi	Fanta	Sprite	Heineken
1	YouTube	86154	57942	6760	11172	9106	14434
2	Facebook	103897	69729	7759	12749	9973	19378
3	The Simpsons	113984	78215	8230	13807	10464	22705
4	Rihanna	119707	82412	8512	14238	10724	24561
5	Michael Jackson	124830	85684	8714	14450	10883	26456
6	House	130524	89198	8920	14716	11046	28772
7	Red Bull	134013	116995	9146	15025	11181	30647
8	David Guetta	135756	116995	9208	15153	11243	31642
9	Eminem	136775	116995	9266	15242	11296	32039
10	Disney	138497	116995	9322	15369	11349	32516
80% of	top 10 favorite cases	110797.6	93596	7457.6	12295.2	9079.2	26012.8



Figure (5): Single product - multiple channels=all channels in Europe

Table (4) corresponds to the numbers of Table (3) but in percentage. In Table (4) the numbers of each column in Table (3) are divided by total fans of each product. The aim is showing percentage of each product's fans that like specific case in comparison to its total fans. Table (4) is followed by its corresponding graph.

		Coca-Cola	Red Bull	Pepsi	Fanta	Sprite	Heineken	
1	YouTube	54.00%	49.53%	64.73%	64.37%	76.33%	28.47%	
2	Facebook	65.13%	59.60%	74.29%	73.45%	83.60%	38.22%	
3	The Simpsons	71.45%	66.85%	78.80%	79.55%	87.72%	44.78%	
4	Rihanna	75.04%	70.44%	81.50%	82.03%	89.90%	48.44%	

Table (4): Single product - multiple channels=all channels in Europe, in percentage

5	Michael Jackson	78.25%	73.24%	83.44%	83.25%	91.23%	52.18%
6	House	81.82%	76.24%	85.41%	84.78%	92.60%	56.75%
7	Red Bull	84.00%	100.00%	87.57%	86.56%	93.73%	60.44%
8	David Guetta	85.10%	100.00%	88.17%	87.30%	94.25%	62.41%
9	Eminem	85.74%	100.00%	88.72%	87.81%	94.69%	63.19%
10	Disney	86.81%	100.00%	89.26%	88.55%	95.14%	64.13%
	Total fans	159532	116995	10444	17357	11929	50704



Figure (6): Single product - multiple channels=all channels in Europe, in percentage

# Multiple products - single channel

Multiple products - single channel approach means that two products like Coca-Cola and Red Bull or Coca-Cola and Heineken are analyzed in correspondence with a single channel like TV, News/Media and etc. For a better understanding of differences between Coca-Cola and its competitor cases they are mutually analyzed. It is worth mentioning that favorite cases are ranked based on Coca-Cola priorities.

The first method is more appropriate for channels that have many similarities in their favorite cases comparing with Coca-Cola. Following this method, top 20 or 15 or 10 of Coca-Cola fans favorite channels are selected. Furthermore, competitor's cases are illustrated based on Coca-Cola's ranking. In this method, from the business point of view if the ranking line of a competitor product (e.g. Pepsi) for a specific case is on top of the baseline (i.e. Coca-Cola's line) it means that specific case is less favorable for that competitor product in comparison with Coca-Cola. Therefore, it can be concluded that top favorite Coca-Cola cases that their ranking line falls below the baseline are better potential candidates for advertising purposes. It is due to the fact that by targeting those cases, not only top favorite Coca-Cola fans are covered, but also higher number of competitor fans are exposed to the advertisement. These results can be considered as helpful tools for media planners to have a better understanding of each product/channel position; however, the choice of which case to do the advertisement in remains dependent of many other factors like company's advertisement policies, advertisement costs and judgment of decision makers and media planning experts.

In TV category, top 20 TV programs are very similar to each other; therefore, the first method is used for TV. More details are followed by Table (5) and one of the corresponding graphs (Red Bull).

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		Coca-Cola	Red Bull	Heineken	Pepsi	Fanta	Sprite
1	Simpson	1	1	2	1	1	1
2	House	2	4	1	5	4	4
3	South Park	3	2	3	3	5	3
4	Family guy	4	3	4	2	2	5
5	MTV	5	5	7	4	3	2
6	How I met your mother	6	7	6	9	10	9
7	Two and half men	7	6	5	7	12	7
8	Spongebob sq.	8	9	18	6	6	6
9	Futurama	9	8	9	8	8	8
10	The big bang theory	10	10	8	10	14	12
11	Grey's anatomy	11	15	12	18	13	18
12	Friends (TV show)	12	14	10	11	17	11
13	CSI: Miami	13	13	15	12	9	10
14	American dad	14	11	17	13	7	13
15	Sex and the city	15	16	14	17	18	16
16	Scrubs	16	12	16	15	31	22
17	Gossip girl	17	17	22	21	21	17
18	Glee	18	19	34	14	11	14
19	NCIS	19	20	21	19	20	20
20	Desperate house.	20	21	24	24	27	28

Table (5): Multiple products - single channel=TV in Europe (first method)



Figure (7): Multiple products - single channel=TV in Europe (first method), Coca-Cola with RedBull

The second method is suitable for products which have differences in their favorite cases compared with Coca-Cola (e.g. Heineken as an alcoholic drink). In the second method, top 10 favorite cases of any couple of products (i.e. Coca-Cola and other products) are selected and combined in one single table. Expectedly many of these top 10 favorite cases are not similar, however, there will be a number of cases which are favorable for Coca-Cola and the comparison product. In this step, all repeated cases are refined and only kept in the table once.

For example top 10 cases in News/Media channel for Heineken are not completely the same as the ones for Coca-Cola. First we select top 10 favorite cases of Coca-Cola and top 10 favorite cases of Heineken in News/Media category. Then similar cases should be separated and only counted once. As can be seen in Table (6), there are 15 cases left in the News/Media table. According to the measures in Table (6), 80% of top 15 cases fans of Coca-Cola are covered by first eight cases of News/Media. Table (6) is followed by its corresponding graphs. The first graph corresponds to columns 2 and 3 and second graph corresponds to columns 4 and 5.

		Coca-Cola	Heineken	Coca-Cola	Heineken
1	National geographic	23692	8030	15.12%	16.12%
2	Playboy	31555	11039	20.13%	22.15%
3	Ta' bonito	37313	11793	23.81%	23.67%
4	Patatine fri.	44530	12551	28.41%	25.19%
5	WWE	48626	12972	31.02%	26.03%
6	Publico	49857	13337	31.81%	26.77%
7	Sports on FB	52533	14196	33.52%	28.49%
8	The New York times	54368	14910	34.69%	29.92%
9	Celebs on FB	57485	15183	36.68%	30.47%
10	Fanpage.it	59885	15634	38.21%	31.38%
11	Mashable	62545	17341	39.90%	34.80%
12	Eurosport	63997	18002	40.83%	36.13%
13	VICE	65029	18821	41.49%	37.77%
14	The Economist	65710	19164	41.92%	38.46%
15	The Cool hunter	66269	19588	42.28%	39.31%
80% of top 15 favorite cases		53015.2	15670.4		
Total	fans	156737	49827		

Table (6): Multiple products-single channel=News/Media in Europe (second method)



Figure (8a): Multiple products-single channel=News/Media in Europe (second method)



Figure (8b): Multiple products-single channel=News/Media in Europe (second method), in percentage

What was reported in Table (6) was an example of situations where two products have so many dissimilar favorites. As can be seen, the 80% constraint will be met when advertising in several cases and not a few cases like TV channel. This implies that advertising in News/Media channel might not result in favorable business outcome since the number and percentage of expose fans are significantly less than other channels.

#### Method B, Lift Factor

The meaning of lift factor is mentioned in methodology section in detail. Here the interpretation of the results will be explained by reviewing the values mentioned in different tables. There are 3 tables and 3 corresponding graphs for each channel such as TV, Companies/Products, News/Media, Music, Movie, Books, Gams/Apps and All channels together.

In Table (7) TV programs are mentioned and ranked based on the number of Coca-Cola fans' preferences (column 1). The numbers of each top ten program are expressed individually and independent to each other. These numbers include fans of each TV program in Europe in Wisdom network (column 2), Coca-Cola fans of each TV program (column 3) and ratio that expresses percentage of Coca-Cola fans in comparison to entire related TV program fans in Europe. These ratios (column 4) are calculated by dividing column 3 by column 2 and

the lift factors that are proportions of ratios divided by the fix figure of 6.6 % (column 5). Table (7) is followed by its corresponding graph.

		,	1 '		
	Total fans of Coca-Cola in Euro	ope / wisdom population i	n Europe is 6.6%		
	TV program	Fans in Europe	Coca-Cola fans	Ratio (%)	Lift factor
1	The Simpsons	181566	64846	35.71%	5.409
2	House	194147	55240	28.45%	4.309
3	South park	138979	49614	35.70%	5.407
4	Family guy	155668	49473	31.78%	4.813
5	MTV	79676	42216	52.98%	8.025
6	How I met your mother	140307	31745	22.63%	3.427
7	Two and a half men	116320	31207	26.83%	4.063
8	SpongeBob Squ.	56456	29930	53.01%	8.029
9	Futurama	73755	28697	38.91%	5.893
10	The Big bang theory	103892	25113	24.17%	3.661

Table (7): Lift factors, TV channel in Europe, individual measures



Figure (9): Lift factors, TV channel in Europe, individual measures

In Table (8), TV programs are ranked based on highest to lowest lift factor of table (7) and measures in columns 2 and 3 are accumulatively calculated. Table (8) is chosen to be the best and most useful Table for advertising purposes because programs are ranked according to individual lift factors in Table (7) in descending order and also accounts for accumulative representation of case fans. When the lift factor is high the ratio is high as well and this means more numbers of specific case fans like Coca-Cola rather than others. In other words, higher lift factor for an individual program or a higher accumulative lift factor for a combination of programs represents the most favorable programs that should be considered for marketing and advertising purposes. For TV programs most favorable programs would be SpongeBob, MTV, Futurama and etc. respectively (the number of chosen

programs depends on the budget that is dedicated for advertisement). For better representation of this result, Table (8) is followed by its corresponding graph.

	TV program	Fans in Europe	Coca-Cola fans	Ratio (%)	Lift factor
	SpongeBob Squ.	56456	29930	53.01%	8.029
or	MTV	112577	54441	48.36%	7.324
or	Futurama	159946	65191	40.76%	6.173
or	The Simpsons	257983	85458	33.13%	5.017
or	South park	306992	92516	30.14%	4.564
or	Family guy	349097	96159	27.55%	4.172
or	House	451278	109485	24.26%	3.674
or	Two and a half men	492643	112363	22.81%	3.454
or	The Big bang theory	520712	113922	21.88%	3.314
or	How I met your mother	552846	115695	20.93%	3.170

Table (8): Lift factors, TV channel in Europe, accumulative measures, ranked by highest to lowest lift factors



Figure (10): Lift factors, TV channel in Europe, accumulative measures, ranked by highest to lowest lift factors

To have a better overview of all possibilities together, lift factors of top 10 cases for all studies channels are drawn in a single graph. Figure (11) depicts the relationships between lift factors and the number of Coca-Cola fans of top 10 cases in each channel. If the position of a channel is more to the right it means that by advertising in that channel you cover the most number of fans, while the more you go to the top advertising will be more influential (i.e. the greater the impact factor will be). As can be seen in Figure (11) "Company" and "All" are the

most advantageous channels to advertise in. Figure (11) deals with the number of fans of cases who are also Coca-Cola fans. To have a broader impression on the total number of people that will be imposed to a possible advertisement, Figure (12) correlates the lift factors with the total number of fans of each case (i.e. regardless of whether they are Coca-Cola fans or not). The results of Figure (12) further confirms previous findings that the most favorable channels are "Company" and "All" channels.



Figure (11): Relationships between lift factors and number of Coca-Cola fans for all channels



Figure (12): Relationships between lift factors and total number of fans for all channels

# **Conclusion and discussion**

As it was mentioned earlier in the introduction, the main objective of this article was set to analyzing the collective intelligence application software "Wisdom Professional" with "Coca-Cola" as the case study. The study area is also considered to be Europe. To this end, it was tried to introduce Wisdom Professional, explain application of collective intelligence in this software, and use collective intelligence information from Wisdom Professional for improving advertisement in (social) media for Coca-Cola case. Wisdom Professional software was utilized as collective intelligence software that uses Facebook information of users to make better decisions in advertising.

In order to select the best advertising case from any possible channel, two methods were used. First method was named as "popularity-oriented method". The basis of this method relies on the number of fans of Coca-Cola who like a specific Facebook page. Based on different possibilities in categorizing Facebook fan pages, this method is followed in three different directions. These three directions are called "single product – single channel", "multiple products – single channel" and "single product – multiple channels".

By following the first method, the results of single product – single channel in TV category showed that 60.87% of Coca-Cola fans are also fans of top three TV programs that are "The Simpsons", "House" and "South Park". This implies the fact that for advertising purposes we should pay more attention to these three programs because 80% of top 10 TV program's fans like these three programs.

By following the first method, the results of multiple products – single channel based on first way (similarities) for TV channel showed that top 20 TV Programs for six products namely Coca-Cola, Pepsi, Red Bull, Fanta, Sprite and Heineken were very similar to each other. It means Coca-Cola competitors fans also like these top 20 programs just with a little difference in the order of these TV Programs. It shows that when we advertise in each of these top 20 TV programs, competitor fans are also watching Coca-Cola advertisement because these top 20 TV programs are the same favorite programs for them as well.

By following the first method, the results of multiple products – single channel based on first way (dissimilarities) for news/media channel showed that 80% of top 15 cases contain first eight news/media cases for Coca-Cola. These news/media cases are the same for Heineken plus 3 other cases. Therefore when Coca-Cola advertise in first eight cases, Heineken fans also watch the advertisement because these 8 cases are similar but when Coca-Cola wants to attract more customers of competitors like Heineken should pay attention to 3 other exclusive Heineken favorite cases as well.

By following the first method, the results of single product – multiple channels revealed that 71.45% of Coca-Cola fans are also fans of top three cases that are "YouTube", "Facebook" and "The Simpsons". This implies that for advertising purposes we should pay more attention to these three cases because 80% of top 10 all cases fans like these three cases.

In the second method and as for the TV channel different cases are ranked based on highest to lowest lift factor. The first five programs are "Sponge Bob squ.", "MTV", "Futurama", "The Simpsons" and "South park". This means that for instance, the proportion of "Sponge Bob's" fans who like Coca-Cola in comparison to total fans of "Sponge Bob" are more than other programs. Therefore, media planners are advised to advertise in these channels since a bigger fraction of fans will be covered by advertising in these channels.

Now the question is which method is more appropriate for advertising in (social) media, popularity-oriented method or lift factor method? The answer to this question would be that we need to use both methods. The reason is that popularity method covers more people and on the other hand lift factor method highlights the penetration degree on specific market. That is why media planners need combination of high popularity and penetration for better and more effective advertising. However and in the case of having contradictive results, the priority should be given to popularity-oriented method. However, the final choice of channels or pages to advertise in, depends on companies' objectives and their social media planning strategies. Companies might have different advertising strategies for short-term as well as for long-term. Achieving highest penetration rate might be more suitable for long-term while attracting more customers in short-term might be more beneficial.

Currently we have no information about the costs of advertising in social media that is why we cannot offer any recommendation in this area that which social media is better for advertising in terms of expenses. In this article expressed opinions are based on the results from the methodological analysis and not the economical assessments.

#### Acknowledgement

We would like to acknowledge Mr. Eddy Conjaerts for providing us the access to Wisdom Professional and also for his constant support.

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