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PREFACE - SYSTEM PERSPECTIVE ON MODERN MEDIA

The system thinking stresses interactivity, interdependence and emergent character of reality. It combines many elements together in an organized way to produce a meaningful whole. In our society, hard and soft systems are combined together and we should take care about their harmonious relations. As the demand for availability of information grows the role of media increases.

Many aspects of today's society ranging from economy, via politics to everyday social relations are influenced if not saturated by media. The accelerating pace of attention economy is increasing the importance even further. Talk about post-factual society and alternatives to truth prove the vulnerability of the media environment.

The word "media" refers to the Latin "medium" which means "in the middle". Media are between the receiver and reality. They allow for communication on the one hand, but distort it at the same time. The human body can be regarded as a fundamental medium, but with the development of industrial revolution, man has invented many other tools facilitating communication. They belong into the category of hard systems, but are used by man who manipulates them, interprets the transported content and uses it. Therefore, their smooth system integration is necessary.

The nature of media can be illustrated by three metaphors. Container or channel metaphor stresses the ability of media to store and transport content. The language metaphor highlights the representational character of media, the grammars, communication practices and discourses. The media environment metaphor focuses on how different media and different work of media in different times produce different societies and vice versa. We can with M. McLuhan distinguish cultural periods according to the dominant medium.

Media have brought us many advantages. They have spread information, which helped in the awareness and education of population. Internet and social media have broken the monopolies of knowledge and provided a democratic platform for information exchange. However, the integration of media into society is not without problems. Media strive for sensations, fresh news rather than proven facts, media owners follow their interests and support marketing and consumerism, their reader suffer from information overflow, prefer amusement to serious content, live in digital bubbles. Many people lack information and media literacy and succumb to manipulation and misinterpretation.

The modern devices collecting, storing and processing data are related to media, too. In its most advanced form the transport of information is almost automatic and autonomous as can be seen in the case of internet of things and big data analysis. Currently, we are facing problems regarding privacy intrusion, surveillance, dependence on forecasts instead of explaining narratives, decision paralysis, non-transparency of technologies functioning, confusion etc.

UNDERSTANDING OF ECONOMY AND MANAGEMENT CONTENT FROM THE YOUTUBE

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ABSTRACT

The article deals with the issue of using YouTube's offer in individual e-learning in economics and management, with an emphasis on exploring of the understanding of their content and the possibilities of their use in practice. The aim is to define the current profile and possibilities of innovative forms of acquiring new knowledge in economics and management, determined by quantifying the results of a qualitative survey about university students understanding their content from the YouTube offer, with the intention of discovering and later implementing selected innovative elements of individual e-learning in the management of teaching in universities at present, with the expected time-lagged contribution to the efficient functioning and improvement of public and business practices.

KEYWORS

Content, Economics and Management, Education and Practice, Understanding, YouTube

INTRODUCTION

The current state of knowledge of the innovative forms of individual education using the Internet is based primarily on sources, that define informatisation and its technologies, education and the potential to of development their mutual relationships.

A. V. Bataev (2017, p. 640) stresses: "Lately the development of information and communication technologies has led to the creation of a new type of economy, called information economy, based on the introduction of the latest advances in computer technology. The innovative economy expansion requires new advanced approaches in all areas of development, including engineering and economic education. In the last few years, the evolution of computer networks and the Internet has reformatted educational processes, moving from traditional forms of education to distance ones through electronic learning systems."

Similarly, according to K. Zimermanová (2017, p. 21) "Information technology influences life in all spheres of business and civil life. This situation arises, in particular, from the relatively easy availability of information and communication technologies."

Innovation "comes directly from two major areas: creativity and insight. Creativity can be spawned from the methods, processes, and applications". (Koval'ová, 2016, p. 20)

In this context it is necessary to state knowledge management, that is actually applied by every person and organization. "Knowledge management in a strategic, innovative, and operational level of decision making aims to develop awareness of the interactive role of technology and science towards business

success. Furthermore, knowledge management strategies aim to the development of flexible organizational structures that encourage entrepreneurial creativity, structural flexibility, and managerial change. Managing business processes in higher education institutions appears similar to contemporary organizations and therefore, practices of knowledge management and information technology equally influence this industry." (Drosos, D. et al., 2016, p. 395)

"According to the development of konwledge management system for teaching through internet based learning for self-directed learning in higher education, it has served as a supporting mechanism used as a guideline for development of teaching delivery to facilitate knowledge management networks for lecturers and students." (Sittiwong, T. - Manyum, W. 2015., p. 751)

It is assumed, that learning promotes a general understanding of the phenomenon in the nature. According to the meaning dictionary, the notion of "understanding" means the ability to capture the sense, meaning of something, or the ability to have or not to have understand for someone or something. One remembers the more, if are more senses involved in learning. It is true, that we remember: "10% of what we read; 20% of what we hear; 30% of what we see; 50% of what we see and hear; 70% of what we discuss with others; 80% of what we try separately; 95% of what we teach someone else." (Černák, I. – Mašek, E., 2007, p. 49)

Education "as a fundamental human right, where anyone around the world with the ability and the motivation could get the skills that they need to make a better for themselves, their families and their communities" (Krasny, ME, 2018, p. 120)

"The core product of the college in the field of education is the study program, which is provided by the service "education" to the customers - students ... the most important trait of the educational institution is active participation of the customer (student) in the production of the service (co-production). In the co-production services is a higher degree of uncertainty in achieving tof he goal, because as part of the responsibility of the service and its results is passed on to the customer, and on the understanding of its role, motivation and behavior depends a large measure of the achieved service output." (Hrnčiar, M., 2015, p. 6 - 7)

According to M. Hrnčiar anad Š. Tkačik (2014, p. 35) the basis of the process approach is the awareness of the structure of processes at college. ... One of the examples of the division of processes: managerial, implementation, and supportive.

"Elliot Masie defines e-learning as a tool, that uses network technologies to create, distribute, select, administer, and continually update educational materials. ... In order for e-learning to be complete, it should contain the three basic components, that make up the education system: content of education, distribution and management of studies." (Černák, I. – Mašek, E., 2007, p. 44 - 45)

According to his own definition, YouTube is "a database of videos, mostly short. YouTube was founded by Chad Hurley in 2005 and Google bought it in November 2006. Currently, it is the world's largest video file sharing system on the Internet. Everyone can sign up for free and share their videos with others."

A system approach to improving understanding of the content of science disciplines in economics and management requires engagement, activity and interactivity of the individuals, they are the stakeholders in the relationships between themselves and e-technologies.

OBJECTIVE, METHODOLOGY AND METHODS

The objective of the analysis was to find out the opinion of university students on the form and content of YouTube's offer in individual e-learning in Economics and Management (E & M). The reason for the limitation to just YouTube's offer for individual E & M education was the test results of the questionnaire before. The respondents identified YouTube as the most widely used resource on the Internet, offering

a variety of information, being an innovative form of creating, sharing and receiving knowledge, shaping the level of information and economic literacy of users.

The own qualitative, primary survey using the formalized questionnaire was conducted in 2018, in the target group of students aged 19 and more, in selected Slovak universities in the E & M study program, in the Prešov region, with personal distribution. Altogether 300 university students were approached, using 226 questionnaires (75%).

Have been chosen these criteria: comprehension of content, traits of YouTube's supply, primarily language selection, customization of content to individual user requirements, improvement of understanding, average number of repetitions in individual video and audio tracking, respectively graphical and multimedia recording.

In the quantitative evaluation, the median, the mean values of the modus - the most frequent value of the statistical sign, the order was determined, from the answers. The COVAR and CORELL statistical functions in Excel were used to determine dependency between characters. Kovariance was used to determine the leak tightness of the relationship between two sets of data and the correlation coefficient to determine the relationship the degree of leakage of dependence, that is high if the result is close to 1. The relationships between the selected characters were followed, first the choice of the language and then the number of views' reps content to a sign of improving understanding.

RESULTS

Up to 116 students (51%) by the preparation for learning necessarily need the Internet, online are connected on average daily 12 hours. They have been spending most of their time on entertainment (43% of time), then E & M education (32%), 25% of the time devoted to searching for other information. Up to 162 students (72%) are willing to pay for their education on the Internet. In individual e-learning, students prefer: 1. Graphic, audio, and graphical and multimedia on-line YouTube presentations: 166 students (74%); 2. On-line courses with E & M certificates: 33 students (15%); 3. Text - www: 27 students (12%). The structure of the selection of subjects (channels) was the most dominated by: 1. YouTubers, who presented their experiences (32%); 2. specialists and their online lectures, eg TEDx and others (31%); 3. peers, who have similar interests (16%). 12% of all are attending training courses and PR content from businesses. Up to 186 students (82%) evaluate presentations, provide other feedback. Types of activities and student engagement in E & M education on the Internet are in favor of receiving (56%), sharing (32%) and then creating content (12%).

The ranking of reasons for using the Internet in E & M education is for respondents: 1. better understanding, 2. better results, 3. better knowledge, 4. better skills, 5. other. Because the most important reason for using the Internet, with the greatest use of YouTube students, has been marked by improved understanding of the issue, the survey has been extended to evaluate this feature in more detail.

The concept of "understanding" of YouTube content in E & M is for 61 students (27%) explained as "learning completely something new", for 52 as "knowledge deepening" (23%), for 47 as "knowledge enhancement" (21%); Responses with equal distribution (10%) followed: better self-management of one's own education, others, stimulating to find new ways of learning or independence.

The highest response rate (ranking) according to the dichotomous selection of YouTube content in E & M reached: noncontinuity (201 responses), loss of user independence (190), non-systemability (184), simplification (176) interactivity (165), incompleteness (164), low user involvement (162), complexity (150), generality (148), mass (142), expertise (137), no feedback (133).

The level of the E & M understanding depends on the language in which the content is presented too. Most, 61 students (27%) they were watching the videos in native language and in foreign languages in the same ratio. 55 students (24%) watch more videos in the Slovak language. At least 28 responses

(12%) prefer foreign language to native language. Almost 20% of respondents are watching the content in a foreign language only. More than half of students use automatic translation function in the offer.

When assessing the current state of adaptation to the content of E & M to the individual users requirements, up to 147 students perceive the content as very mass (65) and more mass (82). The content is appropriately adapted to individual requirements for 79 students (35%).

The subjective perception of achieving an improve level of the E & M's understanding from YouTube's was determined by 91 respondents at 50% and by 85 respondents at 25%, if they did not follow videos at all. Only two said, that YouTube is not helping to increase the level of understanding, but 14 say - it has increased their understanding much as 75%.

In addition, the average number of repetitions in viewing specific individual video, audio, graphical, and multimedia content from YouTube was investigated, to achieve the highest level of understanding in E & M. Table 1 shows the results.

e		•
The count of views' repetition	Number of Responses	Relatíve Value
1 time	40	17,70
2-3 times	102	45,13
4 – 10 times	45	19,91
more than 10 times	39	17,26
Total	226	100,00
6		

Table1 The average rate of views on YouTube for perfect content comprehension

Source: by searcching

To the most significant results of correlated variables the interdependence between features: belong at first - language choice, after - the number of view repetition, to the improving of the understanding level. The results are graphically illustrated in Figure 1.



Figure 1- Relation between traits improvement of understanding the content by the count of view's repetition

The value of the covariance index 394.96 expresses a high degree of leakage between the selected signs of improving the level of understanding and the choice of the language in which the content is presented

on YouTube. The result of the coefficient of correlation coefficient ryx = 0.9 expresses a high leak of dependence as the result approximates to the value of 1.

Other result of the covariance index of 635.75 equals the high leakage intensity between the selected characters, and the result of the correlation coefficient value of rx = 0.6 expresses a high leak of dependence between characters - improving the level of comprehension and the number of repetition of the YouTube content, which is retrieved.

CONCLUSION

The student's informatics and economic literacy profile, based on E & M's understanding of YouTube's offer, is based on the results of exploration, where the visual, audio, graphics displays, with preference for selecting subjects - YouTuber, experts and peers, have been dominated, as the source of knowledge-gathering.

The "understanding" of the problems means for the user, in particular, to acquire new knowledge. The current offer of content they refers mainly like non-continuous, submissive, unsystematic, but also to simplifief and massive. They also search for content in native language in a foreign language as well. Watching YouTube content helps to improve understanding at half, if not watching YouTube. In order for achieving students' sufficient degree of understanding E & M, each replication record must be tracked on average three times. It is from the number of views and from the language in which the content is presented that the individual level of understanding of the subject matter depends.

Based on the research results, its defined the profile of the E & M knowledge content from YouTube in relation to the required level of understanding of the issues in individual e-learning, as the features: massiveness, relatively low ability to conform the content to individual user requirements, non-systematicness and non-continuity of information.

In order to fulfill the intent to implement the research results into practice, specifically in the management of teaching in universities in the E & M study programs, it is appropriate to apply a systematic approach in order to better understand the issue. In the process of systematization, it is recommended to combine individual and collective e-learning approaches with the use of video and recordings. The elements and relationships between the elements are: A) entities (creators, recipients, providers, academic and business people, public sector, students and others); B) means (technical, communication, electronic and other); C) Relationships - content-oriented processes (motivation to activity and interactivity, mutual learning, theories and practice interconnection, sharing, receiving, planning, organizing and controlling content, processes of increasing expertise, to a specific language, etc.), ensuring a higher level of clarity, continuity, complexity of individual records, managerial, implementation and supportive processes, others).

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SPORT WEARABLES - FROM THE FIRST HEARTH RATE MONITOR TO ONLINE SERVICES

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ABSTRACT

The paper focuses on the main development milestones in segment of personal ICT market for mass amateur sports and tries to derive more general trend for the given segment of ICT from it. The most widely used specialized sport device historically and also nowadays are hearth rate monitors which represents first milestone discussed in the paper. The first hearth rate monitor offered on the market was device Sport Tester PE2000 introduced by Polar. From the point of view of today's boom of wearables and smart mobile devices we can state that the heart rate monitors were ahead of these trends by about twenty years. The second discussed milestone is concept of downloadable application and their development environment for dedicated sport devices. Existing solutions have a lot of limitations and do not provide much perspective for further market development. The last discussed milestone are online services of training diaries and performance analysis. The paper concludes that the greatest development can be expected just in this field. Training data, movement data and body characteristics data are really "big data" with considerable potential for further use and it will become more important to track body data with respect to the general health of the individual.

KEY WORDS

Sports wearables; hearth rate monitors; downloadable applications; training data; online services; health monitoring.

INTRODUCTION

Although the use of information and communication technology (ICT) in sport does not belong to the critical area or mainstream of ICT industry, it is an area that is interesting in terms of its development and especially in terms of the future outlook. The development of sport and fitness market sector of personal ICT can be significant for future development of broader segment of ICT. Relevant ICT companies are well aware of market potential of amateur athletes and also wellness fans and so a wide variety of products and solutions directed to sport area can be found. It includes various kinds of hardware accessories, sport and fitness software applications, online services and completely designed equipment developed and offered in the market.

In this overview paper we will focus on the main development milestones in this segment of personal ICT market (i.e. ICT solutions for mass amateur sport) and we will try to derive more general trend for the given segment of ICT from it.

DAWN OF WEARABLES

Historically longest period in the sport market have sport watches with the function of hearth rate monitor (heart rate indicates present state of human body and its ability to adapt to stress provoked by physical activity) and they are also probably the most widely used specialized sport device historically and also nowadays. It is usually a sport watch displaying and recording the actual heart rate of their users mostly via wirelessly connected chest belt or via optical sensor directly on the device. This concept comes from the Finnish company Polar. According to information presented by POLAR the idea originated in 1975 during a cross-country skiing tour of future company founder and national coach of the Finnish cross-country ski team. Then in 1977 at the University of Oulu a finger pulse sensor was developed and its market variant was introduced in 1978 by Polar. A prototype of wireless heart rate monitor was introduced at the same time, initially designed for the needs of the Finnish cross-country ski team. The wireless heart rate monitoring method was developed for Polar at the University of Oulu (department of electronics). As mentioned before it was originally aimed at Finnish cross-country team to help raise the quality and efficiency of their training. This measurement method was also useful for researchers. With this invention starred gradual expansion of methods of training by heart rate and necessary equipment has begun to penetrate the market and reached also the segment of amateur and recreational sports. From point of view of market was a major breakthrough year 1982, when company Polar began to sell device Sport Tester PE2000 - "The world's first wireless wearable heart rate monitor (Polar, n.d.)." Following models also al-low the evaluation of the training load and its effect through connection to a personal computer (IBM PC).



Obr. 1. The first wireless wearable heart rate monitor - Polar Sport Tester PE2000 (Polar, n.d.)

Seen by the prism of today's boom of wearables and smart mobile devices we can state that the heart rate monitors were ahead of these trends by about twenty years. Current offer of smart sports watch with heart rate function is very broad. The main leaders in this segment are marks Garmin, Polar and Suunto. All top of their models use GPS signals to specify distance measurements during user activity and collect also other data from a number of internal or external sensors. An individual athlete generates a series of personal data by each of his recorded activity. For instance an 15 km run by moderate pace (6 min/km) with recording every 1s generates approximately 1,2 MB of data.

DOWNLOADABLE APPS

As the first described milestone of development was indeed a breakthrough invention, at least in terms of segment of wearable devices, the second represents an opposite trend when the already well-proven concept in the wider mobile segment was introduces in segment of specialized sport devices. At a time when downloadable applications have already been the ultimate standard in smart phones, Suunto first came up with this concept in sports watches in year 2013.

However, this is not just a passive option to download an existing application. The so-called Suunto Apps allow also to create own applications in a proprietary scripting language and add them to the sport modes. Publicly downloadable applications are available in the App Zone of portal movescount.com. A tool called App designer is available on the same portal for the creation of applications. Basic mathematical and logical operators, some mathematical functions and so called Suunto functions are offered (beep, backlight, distance and heading between two points according to the geographical coordinates) and over 200 variables from the device such as the speed characteristics (current speed, average speed, maximum speed, pace, etc.), distance characteristic, heart rate, ambient and many others are available for coding of an app. The basic output of the Suunto script is figure (RESULT) displayed in time format or as a numbers. This output can be supplemented by the text field before and after the output (PREFIX, POSTFIX). Total number of displayable characters together for PREFIX and POSTFIX is only six. There are many limitations resulting from scripting language and the device (very small memory available for application, the limited display capabilities etc.) but on other hand it is very easy to create useful new function to the watches.

The code for a very simple application (to calculate the pace to reach the tar-get half-marathon finish time) can take the form of, for example:

RESULT = ((6000-SUUNTO_DURATION)/(21.1-SUUNTO_DISTANCE));

The following picture shows a more complex Suunto App in App designer.



Obr. 2. App designer on movescount.com (Movescount, n.d.)

About two years later (On September 2014) Garmin introduced competitive concept Connect IQ (Garmin, n.d.) for Garmin devices with a complex object-oriented programming language Monkey C which is much more powerful and limited only by hardware.

The language Monkey C is working similarly to Java, PHP, Ruby, or Python, and that language is a definite combination of them. Monkey C is an object-oriented language that works with the Monkey Brains virtual machine for easy application development for portable devices. It uses reference counting to automatically clean the memory, so you do not need to focus on memory management. Monkey C requests are dynamically linked to the system. Monkey C can contain arguments that do not need to declare a type. Also, it is not necessary to declare the function return values. The value returns from the function with the return statement. If the function does not return, it returns the last value in the stack. All Connect IQ applications require a manifest file. Manifest file is an XML that determines application properties such as application type and supported products. The manifest file is automatically created for the Eclipse plug-in, but can also be created manually.

Except the above mentioned limitations, main obstacle for market development of this concepts (by Suunto and also by Garmin) is fact that both of them are highly proprietary. These limitations do not provide much perspective for further market development. This is confirmed by the solution and offer of the latest products, especially for Suunto. Polar has a difference strategy in the field of downloadable applications and offers some models with a standardized operating system Wear OS. Even in the case of Polar, it is more a reaction to competition than a major development trend.

ONLINE TRAINING DIARIES AND PERFORMANCE ANALYSIS

Downloadable applications and especially proprietary programmable applications for dedicated sports devices do not seem to be a long-term successful solution (at least from a market point of view), however, with the general development of connectivity to the Internet in recent decades, an on-line service for storing, displaying and analysing sport data plays an increasingly important role. Digitalization of training data is historically closely linked to Polar's first models of hearth rate monitors. Polar released to market first hearth rate analysis soft-ware for IBM PCs in year 1986 and continues to be pioneer in this field by introducing training analysis software for MS Windows in 1991 and first own online training diary in year 2001.

There are nowadays dozens of different online services for storage, visualisation and analysis of sports data on market. Most manufacturers of wearable sports equipment offer their own solutions of online training diaries together with online settings and customization of given devices. For the three abovementioned main brands these are: Polar Flow (flow.polar.com), Suunto Movescount (www.movescount.com) and Garmin Connect (con-nect.garmin.com). There is also wide offer of device/producer independent online services like Strava, Endomodo, Runtastic and many others.

Users (athletes) using wearable devices and other attached external sensors collect a lot of data about their activity, including body data measurements. These data are online or subsequently batch uploaded to the appropriate online storage where they are further processed, visualized and analysed, both at the level of a single athlete or whole training team, but often also at the population level. Graphically, we can illustrate it as follows.



Obr. 3. Collection and processing of data

CONCLUSION

This paper discusses with a brief historical excursion three crucial milestones in history of ICT solutions for mass amateur sports. These three milestones represents also three different layers from the perspective of ICT architecture. First wearable device fits to hardware layer. Downloadable applications and their development fits to application software layer. And online training diaries fits to external online (cloud) services layer.

From the point of view of development of hardware devices, we can expect some minor improvements of accuracy of measured values and device power consumption. And gradually also the development of additional sensors to measure body characteristics and motion characteristics.

It is difficult to predict future developments in the software area. Individual manufacturers will try to maintain and develop their own proprietary solutions. There is no expectation of a development analogous to the smartphone segment, because the sports wearables is rather narrow and specialized segment so the market tendencies are quit different.

The greatest development can be expected in the field of online storage, visualization and, in particular, data analysis. Training data, movement data and body characteristics data are really "big data" with considerable potential for further use. Even basic regular heart rate measurement and evaluation can be used as an indicator of the health of the user in longer term period.

With the aging of today's generation of "sensored" amateur athletes as well as aging of populations in general, it will become more important to track body data with respect to the general health of the individual. From the viewpoint of motion monitoring, remote monitoring of patients or seniors in general will be important. Today, such products and services can be found on the market, but certainly not in the range of sports devices and online services. We expect this to change gradually towards a wide range of wearables and online services for health monitoring.

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SYSTEMIC APPROACH TO AHP METHOD, INCREASING CONSISTENCY

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ABSTRACT

The paper describes partial problem of the decision-making method, the Analytic Hierarchy Process (AHP), constructing the matrix of pair-wise comparison and calculation of the eigenvector of the pair-wise matrix. The article is focusing to the consistency of the pair-wise matrix and one of known method to increase the its consistency.

KEY WORDS

AHP method; decision-making; consistency

INTRODUCTION

People make three general types of judgments to express importance, preference, or likelihood and use them to choose the best among alternatives in the presence of environmental, social, political, and other influences. They base these judgments on knowledge in memory or from analyzing benefits, costs, and risks. From past knowledge, we sometimes can develop standards of excellence and poorness and use them to rate the alternatives one at a time. This is useful in such repetitive situations as student admissions and salary raises that must conform with established norms. Without norms one compares alternatives instead of rating them. Comparisons must fall in an admissible range of consistency. The analytic hierarchy process (AHP) includes both the rating and comparison methods. Rationality requires developing a reliable hierarchic structure or feedback network that includes criteria of various types of influence, stakeholders, and decision alternatives to determine the best choice (Saaty, 1994).

The goal of decision-making is a certain future state of the decision maker following from the necessity to realize certain needs or to fulfil certain functions. The goal should be reached by the realization of some variant of decision-making. The goal of decision-making is usually hierarchically divided into partial goals, which are being transformed into the form of decision-making criteria (Ramík, 2010).

Decomposing the multi-criteria decision-making process into partial decisions will put the decisionmaking process away from the questions or discussions such as: 'yes, x is a better option, but what if y is better from another perspective, how do we decide?'. The decision maker or decision makers always concentrate only on one question in this decomposed decision process, e.g.: 'x is how much more significant than y according to criterion z? This is the principle of the AHP method. This systemic approach to the decision-making process enables the processing the answers of simple questions into the pair-wise matrix. And its processing is then a process based on mathematical methods. And then, linear algebra and matrix computations do not affect any subjective feelings or impressions of decision makers. It is worthwhile to use a system approach that is the decomposition of the decision-making process and the subsequent mathematical processing of the pair-wise matrix. This article focuses on

increasing the consistency of the pair-wise matrix without the need to ask questions again to decision-makers.

MULTICRITERIA DECISION-MAKING

The AHP consists of following five steps: 1) break down a decision problem into component factors. 2) arrangement of these factors in a hierarchic order. 3) assignment of numerical values (Saaty, 1977) to determine the relative importance of each factor according to their subjective relevance. 4) set up of a comparison matrix. 5) computation of the normalized principal eigenvector, which gives the weight of each factor (Saaty&Vargas, 2012).

AHP is widely used across industries for dealing with multiple criteria decision-making problems involving subjective judgment. However, AHP is often criticized for its inability to adequately accommodate the inherent uncertainty and imprecision associated with mapping decision-maker perceptions to an exact number (Somsuk, 2013).

Analytic hierarchy process (Saaty, 1977, 1994) is one of the most commonly used utility-based methods for multi-criteria decision making. The AHP uses objective mathematics to process the subjective and personal preferences of an individual or a group in decision making. In Saaty's hierarchical analysis, a decision maker is asked to provide his/her ratios A_{ii} for each pairwise comparison between issues (alternatives, candidates, etc.) $A_1, A_2, ..., A_n$ for each criterion (objective) in a hierarchy and also between the criteria. To make comparisons, a scale of numbers should be used to indicate how many times more important or dominant one element is over another element with respect to the criterion or property being compared. In Saaty's fundamental nine-scale measurement used in making a comparison, the numbers for the ratios are usually taken from the set 1, 2, ..., 9. It consists of verbal judgments that range from equal to extreme (equal, moderately more, strongly more, very strongly more, extremely more). The numerical judgments 1,3,5,7,9 correspond to the verbal judgments and compromises between these values. For example, if a person considers A_1 to be moderately more important than A_2 , then a_{l2} is equal to 3/1. The ratio a_{ii} indicates the strength with which A_i dominates A_j . The nine-scale measurement is widely applied in AHP. However, the language description disagrees with the numerical values of the scale division in various aspects (Yang, 2010, 2013).

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CONSISTENCY

In the paper we are focused at a small part of AHP method, called consistency and one of known method to increase it.

For the success of the AHP method the consistency index is important. It holds, that the maximal eigenvalue of the square matrix of pair-wise comparison $A = (a_{ij})$ of the type $n \ge n$. This matrix is always reciprocal but does not need to be consistent. Eigenvalue, if the matrix $A = (a_{ij})$ is consistent, is always $\lambda_{max} = n$. Consistence index is the number CI

$$CI = \frac{\lambda_{max} - n}{n-1}$$

Well know relative consistency index is CR = CI / RI(n), where RI(n) is a random index whose value depends on *n*. Random index RI(n) determined Saaty by calculating 50 000 randomly generated

matrices. If relative consistency index is $CR \ge 0,10$ pair-wise matrix is not fully consistent (Saaty, 1994). In this paper we demonstrate on short example method to increase the consistency.

Workflow of decision-makers work could be show by flowchart at Figure 1.



Fig 1 – CR resolution and repairing process

Saaty also presented "a method to increase observed efficiency in practice. It is based on the fact that

$$n \lambda_{max} - n = \sum_{\substack{i,j=1\\i\neq j}}^{n} (\varepsilon_{ij} + \varepsilon_{ij}^{-1}).$$

This suggests that we examine the judgment for which ε_{ij} is farthest from one, that is, an entry a_{ij} for which $a_{ij} \cdot w_j / w_i$ is the largest, and see if this entry can reasonably be made smaller. We hope that such a change of a_{ij} also results in a new comparison matrix with that has a smaller Perron eigenvalue." (Saaty, 2003)

To show how it works, we use an example from thesis which describes the use of the AHP method in tourism. At thesis autohor selected four variants for comparison. These are four tourist destinations that will be compared by the well-known integer AHP scale against the selected criterion for each variant. One of the criterions is distance between decision maker's residence and destination, which will be assessed.

The pair-wise matrix is in Table 1, where w is positive eigenvector of the matrix A and v is positive eigenvector of the positive matrix A^{T} , which is normalised.

variant:		v1	v2	v3	v4	w	v
Croatia	v1	1	9	7	7	0,678	0,050
Egypt	v2	1/9	1	1/7	1/3	0,038	0,308
Greece	v3	1/7	7	1	5	0,211	0,560

Spain	v4	1/7	3	1/5	1	0,073	0,081
2 4 4 4 2		CI_{-0} 147		CR=0.16			
$\Lambda_{\text{max}=4,442}$		CI=0,147		4			

Table 1 – pair-wise matrix $A = a_{ij}$ (source: autor)

"To identify an entry ripe for consideration, construct the matrix $\varepsilon_{ij} = a_{ij} \cdot w_j / w_i$ (Table 2)". (Saaty, 2003) The largest value in Table 2 is 2,17847, which focuses attention on $a_{13} = 7$.

1,00000	0,50442	2,17847	0,75369
1,98246	1,00000	0,79323	0,64035
0,45904	1,26066	1,00000	1,72986
1,32681	1,56164	0,57808	1,00000

Table $2 - \varepsilon_{ji} = a_{ij} \cdot w_j / w_i$ (source: autor)

We replace a_{13} by w_1 / w_3 and corresponding diagonal entry a_{31} by w_3 / w_1 . So, $a_{13} \leftarrow w_1 / w_3 = 3,213$ nearest value from integer AHP scale for a_{13} is 3 and corresponding value for a_{31} is 1/3.

variant:		v1	v2	v3	v4	w
Croatia	v1	1	9	3	7	0,583
Egypt	v2	1/9	1	1/7	1/3	0,042
Greece	v3	1/7	7	1	5	0,289
Spain	v4	1/3	3	1/5	1	0,085
$\lambda_{max=}4,165$		CI=0,055		CR=0,06		

 Table 3 – modified pair-wise matrix A (source: autor)

Consistency index CI is now more acceptable because $CR \le 0.10$ and λ_{max} is closer to *n*.

CONCLUSION

We have shown that consistency of pair-wise matrix in AHP method could be improved by using the principal eigenvector. This method could be useful when repeating the multicriteria decision-making process is not possible with decision makers. If consistency of pair-wise matrix does not fall in desired range this method could help to find final solution.

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CHINA'S SOCIAL CREDIT SYSTEM

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ABSTRACT

This paper is dedicated to the social credit system that is being implemented in the People's Republic of China since 2014. The introduction describes the basic history of the project in question, including an outline of the basic principle of its functioning. In the view of the difficult available information in this area in the article are presented the examples which have been published during the trial operation of this system. Further, there are described the main risks and contradictions that the gradual introduction of this social credit system has provoked by the professional public. The authorhas used the methods of collecting and analyzing of relevant information that are available on this area.

KEY WORDS

Social credit system, credit, points rating, plus and minus of activities, camera systems, security, risks

INTRODUCTION

Totalitarian regimes have always wanted to get the most out of their citizens' activities. Previously in history, the absolute control was not technically achievable. But with the onset of automation, artificial intelligence, social networks and ubiquitous camera systems, begins to change.

Forty years back, totalitarian states have been building extensive intelligence and security services, trying to promote proper civic awareness and reporting among close family members. But people are unreliable. Occasionally, their loved ones and friends just blur the eye and pass it through. And then, when people are not under surveillance, they begin to think about crazy ideas such as freedom of speech or democracy. Just horror. But if all the surveillance did not lie on the people themselves but was largely automated, it would be another song. Such an algorithm does not know a brother. This is probably the main motivation for creating a Chinese social credit system that plans to rate the behavior of 1.4 billion people.

HISTORY

The system was introduced in 2014 by the Chinese State Council. According to an official government document dated 14 June 2014, in which the new evaluation strategy was introduced. The goal of the system is to create a credible public opinion environment. The assessment should focus on four areas, namely "honesty in government matters", "business honesty", "social honesty" and "credibility of the courts". Eventually, other Government documents were issued to the system under preparation, which clarified the policy of the evaluation, and introduced a principle according to which a breach of trust by a citizen in one place would result in his being punished in several places.

Several institutions are involved in creating a governmental concept of the social credit system. Ten of the significant institutions is shown in the following figure.



Table 1: Top 10 data providers for China's National Credit Information Sharing Platform

The project is coordinated by the influential Central Leading Small Group for Comprehensively Deepening Reforms. The Leading Small Group has assigned the National Development and Reform Commission (NDRC) to lead the implementation process in close cooperation with the People's Bank of China (PBOC). Since August 2015, both have authorized a total number of 43 pilot cities and city districts to implement the Social Credit System and experiment with related mechanisms.

Furthermore, in 2015, the government commissioned eight (8) private technology companies to develop algorithms and create smaller test systems. These companies included for example China Rapid Finance, a partner of the WeChat conglomerate Tencent, or Ant Financial of the Alibaba Group (the Alipay payment system operator) that created the credit system (named Sesame Credit) that using the users data from individual services of this groups.

The essence of the system is to create a personal credit for every citizen who will then increase or decrease according to his social behavior. At the ultra large data processing is used the technology for large data analysis. The exact calculation methodology and the individual aspects that enter in the evaluation are not known. According to the media information, credit will be adjusted based on:

- compliance with legislation. The citizen respects the law; i.e. no traffic violations, smoking in forbidden places etc.,
- payment morals and handling of funds. Does the citizen pay its obligations in full payment and on time? No money for inappropriate activities and objels ? What does they buy?
- social behavior. Do not cheat his partner, get military service? Or who does the citizen meet with? Are his friends and family well-ordered citizens? If they are not, then this is the reason for lowering their own points,
- behavior in the digital world. Citizens are judged by what site they are going to, what they read, what they share, what games they play, and how often.

Surveillance is carried out at all available technological levels. Motion is monitored by ubiquitous cameras. Currently there are around 170 million cameras in China, and by 2020, when the system is supposed to be set to run nationwide, there is planned to increase the number of cameras by another

dizzying 400 million. Most of them are supportive for automatic face recognition and person tracking. The smartphone then adds which applications and pages a citizen uses and specifies its location.

The evaluation system will take into account information from most state databases. Evaluation include health records and health status, school and work results, traffic offenses. Just practically everything that will be available. If a close person commit everything wrong that is negatively evaluated, then it will negatively affect the score of the citizen himself. This puts social pressure on society as a whole, so that undesirable citizens change their behavior. Otherwise, the company is motivated to exclude such citizens themselves. The future of children will be also evolve from their parents' behavior (and thein score).

PRESENT – TRIAL RUN

There is currently a trial run, involving several million people on a voluntary basis. Certain cities and technology platforms also participate in these testing. Full implementation of the credit social system with mandatory participation by all citizens of the People's Republic of China and some companies is planned for the year 2020.

The social credit consists of a three-digits based on a secret algorithm to reward trustworthy and to discipline dishonest sinners.

The ideal citizen can have 800 to 900 points (the maximum limit is different and depend in each test area). For misdemeanors or undesirable behavior, the points are subtracted.

The achieved score affects the social security level of the given population, availability and conditions of credit financial products (credit, mortgage, credit card), access to catering, quality of accommodation and tourist services, availability of individual modes of transport or internet connection speed, or decide about access to better education or employment (managerial positions in state-owned companies or large banks).

In other words, high-pointed citizens will gain access to VIP treatment at airports or hotels, loans will be more attractive for them, or will be given priority in the best schools etc.

On the other hand, low credit than may also cause the total avoid of the access to certain services.

On the contrary, people with fewer points will be penalized with worse access to services, on the better schools will not be get, loans will get worse, some jobs will be forbidden and travel will not be able to them, because they can be punished by home imprisonment.

Examples of selected plus and minus activities are shown in the following table.

(+) Plus activities	(-) Mínus activities
 blood donation volunteer community help waste sorting frequent shopping in luxury brand shops (a loaded credit card just does wonders) 	 crimes traffic offenses (fast ride and crossing the road outside the pedestrian crossing) purchase a large amount of computer games smoking outside the designated area late payment of bills and taxes spreading fake news on the Internet

Table 1 - E	Examples of	selected	plus and	minus	activities
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WHAT ARE THE GENERALLY AVAILABLE KNOWLEDGE FROM THE EXISTING FUNCTIONING OF THE SOCIAL CREDIT SYSTEM

Comprehensive solutions does not exist yet, however, some fragments of the social credit system are already working. Some parts are governed by city councils, other data are acquired by private technology platforms. Private companies have developed clever cameras for the government to help find the wanted criminals. But they're watching everybody. Once the camera records people, bikes, cars or buses, it can identify them immediately.

Due to a poor score, over 12 million people have been punished. The most common punishment is the restriction of freedom of movement. Prohibition of flight by airplane, or prohibition of travel by Chinese express train.

The following event can be illustrated as an example. With effect from May 1, 2018, 9 million citizens lost the ability to buy domestic flights and 3 million citizen lost the ability to buy tickets in the business class on trans, for up to one year.

These restrictions have prompted for 11 million low-level Chinese to refuse using of airline services at the Chinese New Year celebration. Every inhabitant of the city is longing to visit a family that usually living somewhere in the country, so the airport cracks in the seams. That's how the overpressure has been slowed down slightly in favor for "good citizens".

Another example was the fate of one investigative Chinese journalist (Mr. Liu Hu), who uncovered corruption with high-ranking members of the ruling Communist Party. In 2015, he was included in the list of unwanted people, lost his job, his Weibo and Wechat accounts, where him watched over two million people, were canceled. Travel options have also been limited to him, so the reservation system will not allow him to buy a train ticket. Because of the negative score, he got into social isolation. He tried to appeal the punishment, but without access yet.

CITY OF SHEN-CHEN

An extensive camera system, for example, has one of the largest Chinese cities: Shen-chen. One case that arguably could be argued by supportem of cameras was played in 2017 when a man arrived at a police station to report the disappearance of his three-year-old child. He was afraid that his child were kidnapped, which in China is not a rarity. Police have found a baby with an unknown woman thanks to cameras, which using recognition software that has been able to identify her face. Subsequently, police found that the woman was at the train station and than boarded a train to Wu-chan town. When she arrived, the cops were waiting for her at the stop, and the child rescued - the whole event, after the announcement of disappearance, lasted only 15 hours.

This positive example shows how powerful can be a combination of cameras and face recognition. And Chinese are at the forefront of the development and innovation of this technology, which is highly lucrative for China and China's major security interests, and brings big financial profits to private companies.

Another fragment of the functionality of the system in question was a banal event that happened in the spring of 2018. A woman in the city of Shen-chen went out of the pedestrián crossing. Two traffic police men subsequently told her that she had violated the traffic regulations of the People's Republic of China. The woman who hurried apologized and hoped that the incident would be over. But police asked her for identity card. But she forgot it at home. Police officers took a picture of her with a cell phone that has installed face recognition technology. Within a few seconds, they had all the information - the name, the identity card number, and the date of birth. In a nearby kiosk, one policeman printed a document on the issue of a fine using QR code that the "sinners" had to apply through the WeChat application that is administered by the privately-owned Chinese company Tencent.

Next example is the case of pedestrian crossing. If you switch to red on in Shen-Chen's pedestrian crossing, the watch camera will record you automatically. It also recognizes your face and instantly

identifies you. The offense photo along with your surname and part of your ID number is then posted on one of many public screens and even on a website. This "shame bulletin" have supposed to discourage people from other offenses, which is supposed to succeed: there has been a reduction in the frequency of recurrence.

But that's not all. Intellifusion company, which operates the camera system for the city, is now in touch with mobile network operators and Chinese social network operators such as WeChat. The goal is to achieve that those who pass on the red on received a message immediately on their mobile phone about them misconduct with the fine which they immediately also can pay. In China, smart phones and payments through them are very widespread so its make it easy to introduce similar practices.

Another element in the given context is the emerging aspect of psychology. Combining technologies and psychology can greatly reduce the occurrence of red-rushing and avoid repeat offenses. It is not just a financial penalty or a sense of guilt: this system will remind to people that they are under constant supervision. The cameras are everywhere and they can recognize you. Even a small offense is recorded and causes an immediate penalty. All the time you will go outdoors, you will know that every step you take can be tracked and all behaviors evaluated.

CITY OF PEKING

Last year in May, the pilot credit system began operating in Peking. It is mainly aimed at businesses companies that are cheating. Those who do not deal with the correction will find themselves on a black list. The system already works in aircraft and high-speed trains.

Another example is city security. Police officers in Peking wear glasses to recognize the faces of people and link them to information in the databases. Glasses help police officers look for compliance with the criminal offender's database, but in the future they can as well show the value of social credit as well. By 2020, China plans to double the number of surveillance cameras in the streets, so few pass the crossing of the road outside the pedestrian crossing without losing points.

CITY OF ROMGCHENG

The last example of the functioning of the social credit system is the city of Romgcheng. In the 740th citizen city of Rongcheng each got 1000 points in the beginning. For the acts of heroism, family care in difficult situations or sample business, officials have scored positive points for you, and / or you went to minus for drunk driving or late paying bills for energy. Now the city's population rating ranges are from 350 to 950 points.

OTHER IMPACTS OF THE CREDIT SYSTEM TO THE COMPANY

High social welfare makes many things easier. In some Chinese hotels, you do not have to pay a prepayment when booking, you will get lower interest rates when you apply for a loan, and for a nice high number, recruits are also being searched.

A person with a low credit may also forget to jobs in banks and state-owned companies. In several cases, the refusal of the military service caused a nice squeeze of social credit, which meant for the offenders the termination of studies or the inability to sign in to selected schools. Speculation is also about introducing limited access to private schools for children whose parents have desperate low social credit.

For entrepreneurs, credit ratings ensure good reputation among business partners. Even though the social credit system is gripping Chinese society for two years, many people are now asking for their own triple allocation voluntarily. They are attracted by discounts, easier access to some public services (eg in healthcare) and greater attractiveness in online dating sites (for example, the largest Chinese dating site Baihe added social credit to their users' profiles, so it is not hard to guess who had the chance to find a soul mate upside down).

What can be further pursued within the concept of the social credit system: the criminal record, records from public databases and payment history at banks that complements by the list of everything the person has bought and when. In China today you almost pay anything by mobile apps Alipay and WeChat Pay. Data from them goes into the algorithm for social credit calculating.

The same fate awaits for digital footprints left on social networks. If you do not want to lose valuable points, it is not advisable to criticize the government in your contributions, and perhaps not too connected with people with low social credit. At least it makes you a suspect citizen.

RISK AND CONTRADICTION

According to many critics, the system is a major threat to the freedom of the individual and together with the huge number of security cameras in the country (a total of 170 million, many of which thanks to modern software tools can effectively recognize faces, with the addition of another 400 million cameras over the free years) creates a complex and extremely sophisticated system of mass surveillance with political overlap that can be likened to the Big Brother's dystopian vision created by George Orwell in his novel 1984.

According to some opinions, the system can be abused, it can happen for gradual stratification of the company to several levels, and the possible development of corruption. Another consequence may be the increase in social isolation of low-rated citizens in social networking as a result of a user with a better credit (preventively in order to avoid lowering their own ratings) or even personal contact due to the virtually ubiquitous camera system.

CONCLUSION

It is clear that China wants to introduce a nationwide cameras surveillance system that will be linked to an already active digital system that will give all citizens and businesses personal points of trustworthiness which are a motivation due to the gained benefits from good behavior, while for the violation of social and legal standards will follow the punishment.

China puts the state above the citizen, and collectively over the individual, unlike the Western society, which claims to practice the opposite model, building citizens over the state, and individual over collective.

The Chinese system of social credit introduces so-called "algorithmic management," where complex artificial intelligence programs will replace human decision-making in terms of enforcing the country's socio-legal standards. This requires that the government eventually gain complete camera and digital control over every aspect of the country and integrates these two systems into a holistic system that also divides the privileges and penalties associated with behavior of citizens and businesses in real-time. This mass surveillance therefore requires a huge amount of electricity to feed the computer processors responsible for the operation of the system and the preservation of all the data, which means that it probably will take many years until it is implemented at national level.

Even though that Peking will be soon a pioneer of this project in a publicly disclosed form, it have to be considered several important points. At this point, it is not clear whether subjects will be allowed to free access to records of their "social credit" and whether they will be able to appeal if they think they have been improperly punished. This also raises the question of how long digital data and camera recordings will be stored. Another issue is whether the state selectively publishes information about people in the public domain to embarrass them and strengthen the company's overall support for system standards. Depending on what will be published, it could have serious psychological consequences for the alleged infringer.

In addition, no one knows how the algorithm works and whether certain social-legal misconduct may be erased after some time and / or through the various rehabilitation programs. This means that there might be a possibility that youthful friability and irresponsibility, other than criminal, could destroy one's life. In connection with this, the system's social credit records would be removed from the context of the lives of the subjects, for example, taking into account the violent relationship of the

offender with respect to the mitigation of any punishment assessed if it would have any effect on the socio-legal violation - for example, if a woman would give a public scumbag to her partner who would be verbally harsh. This could cause difficulties in countless cases, but it is up to the Chinese themselves to come up with any possible solution.

Finally, it is not known whether the social credit system will be applied to government and military leaders, or whether they will be "class for themselves", whose actions will judge human beings rather than artificial intelligence. It can be argued that their inclusion in the system could be abused for political purposes if the human supervisor or the guardian were corrupt, but on the other hand they would also be responsible for any crimes they would commit, and hence would increased in the public's eyes the confidence in the Communist Party.

Still, most Chinese with a similar system have no problem. On the contrary, it supports its implementation. Privacy in China is not as valuable as in the West. Most Chinese prefer public interest to individual rights. The social credit system attracts them on the feeling of greater security and a more stable society. However, it seems that most of them do not fully realize the full range of supervision that the system will have over them. It is no wonder - no discussion of acceptance or non-acceptance is not lead because it is not allowed by the ruling party. Social credit in China will simply be implemented and done.

We will to see whether these questions, including many others concerning to the Chinese social credit system, will be answered in the future, but now only the biggest country in the world is entering an unprecedented era of algorithmic management. How much the final version of the social credit system will be work in practice show the time.

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SPECIFICS OF SOCIAL MEDIA INFLUENCERS IN PERU

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ABSTRACT

Human interaction has been revolutionized, over the last decades, by the appearance of new vehicles through which people can communicate. Digitalization era has impacted the medium through which society communicated - society involving both consumers and sellers. Brands are now updating their marketing techniques from traditional mass media to social media. A new branch, influencer marketing, has arose along with this digitalization movement. This trend is current in Peru and the way brands are now reaching their target audience is different. With a sample of five main female influencers on five different fields of expertise, content sharing is analyzed. A comparative analysis regarding engagement is performed. Findings show that although there is a low percentage of engagement, diverse brands decide for deals with influencers due to their personality and quality of audience reached.

KEY WORDS

influencer, Peru, content creator, Instagram, brand deals

INTRODUCTION

If the concept traditional doesn't include the concept of digitalizations then we can talk about an outdated version of a current trend. This statement is particularly true for publicity and the way brands engage with their public. Traditional mass media vehicles such as print (newspaper and magazines) and broadcast (radio and television) are now a saturate. Adding to the issue of a lowering rate of effectiveness; traditional media has lost recurrency of their target audiences. In a way to counterattack such, brands are now riding into the digitalization wave and with such marketing techniques evolved from traditional media to social media. Terms like: content creator, influencer, youtuber and more are now introduced on nowadays strategic planning.

In 2011, Airbnb started an aggressive international expansion led by overseas acquisitions and opening of offices all around the world. Nowadays, the company operates in 15 countries and has enlisted more than 4 million people to host strangers in their homes. (Backaler, 2018) Airbnb's success is not a result of luck but rather the result of the right balance of a global strategy mixed with local implementation. The use of local influencers was key to generate brand awareness and the actual penetration was generated thanks to the online personalities which have the authenticity and trust of their following. Quoting Brian Chesky, CEO of airbnb, *"local influencers made a foreign brand a local one"*.

This is a tool that many brands in Peru are using. Not only international brands wanting to make their own share in the local market but also small companies who can't afford traditional media for communication. The following paper will focus on the instagram activity of five main peruvian female influencers, each of different categories.

OBJECTIVES

Although the concept of influencer is standard throughout the globe, the behavior influencers in Peru have differs since it is a very fresh concept that boomed in the last year. Brands are recently been very active with brand engagement through local influencers, reason why in the following study the main

objective is: *to analyze the panorama of brand deals different category of influencers engage*. For such, the following specific objectives are relevant: (a) identify the ratio between personal posts and ads, and (b) identify the reach of ads vs personal posts.

ACADEMIC RESEARCH

Worldwide, the number of users of diverse platforms such as Twitter, Facebook and Instagram kept growing with each year. Now, not only has the users increased, but also the breadth of different types of social media platforms (Hoffman & Novak, 2012). With such growing force, social media has reshaped the way humans look-for and consume information. It is an integral part of everyday life, transforming socialization and communication habits thus consumer behavior has remold making companies to respond. With the dramatic emergence of digital media, particularly social networking services; the strategies and tools which companies apply in order to interact with their consumers had taken an innovative spin (Virtanen, Björk, & Sjöström, 2017). In order to reach audiences, enterprises need to adapt to the rules of social media outlets, therefore the algorithms and aspects of shareability (Roese, 2018).

Alongside with the consumer behavior, commerce has taken a turn leaving space to social and mobile commerce to emerge. These new ways of making business has embraced Instagram in a big way (Walsh, 2017). The organic advertisement and high engagement of users has made Instagram one of the main mediums for brand building. A company can have social media presence by managing their own accounts or through influencer marketing. In the digital world, word-of-mouth is particularly powerful when it comes from an influencer. This new way of doing marketing involves finding popular social media figure who is affined to the brand personality and inducing this person to mention, promote or advertise the brand in his or her stream of communication to their following (Pophal, 2016). Yet defining who is this person is vague.

The word "influencer" is commonly ascribed to someone who has clout through her digital channels, or as some like to call it, "social currency". Nonetheless, having a large following doesn't make the owner of the account an influencer. There is a distinction between a content creator and a lifecaster (Walsh, 2017). Although both can be considered influencers, since they have the ability of high reachability and therefore influence the decision making of their followers, the nature of such categories differ. Lifecasters are people who are living their best life and they have a following due to the extravagance of their feed. Examples of such are: entrepreneurs, high-end models, celebrities, and notable persona (politicians, activists). A content creator, on the other hand, is someone who makes videos, takes photos, writes blog posts and more which builds a relationship with their following, therefore developing trust and crave to see more. This person needs to implement various marketing tactics to increase their audience size and recurrency. If such person has various platforms, then different tactics will be implemented in order to adapt their content since what works for one social media does not work for another. Even within the category of content creator there are types of such depending on what their main theme the content is about: fashion, lifestyle, health, etc. This paper will focus on content creators as influencers and the interaction they have with brands on Instagram.

As a way to give dimension to the social media panorama in Peru, out of 32.3 million Peruvians, 22 million of them are internet users (68% of the population). From this number, 20.1 million are cellular phone owners and 20 million of them use it to access social media. The growth of social networking services is translated to a 10% in regards of 2017. In Peru, Facebook is the most popular social media, yet Instagram has 4.2 million users active per month which represents the 13% of the total population of the country. Demographics of Instagram users are quite even with a 53% female vs 47% male (Vizcarra, 2017).

Hypothesis

Having a well-defined concept of who is the subject of study and the reach of Instagram in Peru, the following hypothesis will be tested: *influencers have a high percentage of engagement which motivates companies to make brand deals with them despite not being 100% of the same category.* By "high engagement" a percentage of 50% is the minimum. Complementing this main hypothesis, specific ones have been drawn.

SPECIFIC HYPOTHESIS

- A. Most brands will engage on a "shoutout" style of promotion
- B. Personal posts will have more engagement than ads

METHODOLOGY

Although there is literature regarding influencer marketing and how brands are engaging with their target group with help of content creators, a more in-depth research of the panorama for Peru. It is a recent trend that companies in Peru has employed in full force; making the study relevant. For such, the following methodology was implemented in order to test the hypothesis details lines above.

DATA SELECTION

In Peru, the ratio of female and male influencers differs. The study focuses on the behavior of five female Instagram personalities, each of a different category of content. Table 1 details each of the subjects analyzed and their general specifications.

Table 1: Influencers analysed							
Name	lg handle	Category	Followers	# posts			
Katy Esquivel	@whattachic	Fashion	2.3M	1,462			
Ximena Galiano	@ximenagaliano	Comedy	343K	582			
Daniela Rita & Fátima Sotomayor	@misiasperoviajeras	Travel	165K	396			
Paloma Derteano	@palodirtyano	Lifestyle	64.4K	504			
Alejandra Chávez	@alechavezsm	Fitness	126K	1,783			

Table 1. Influencers analysed

It is relevant for the study to have different style of content creators. In such way it will be possible to test the authenticity of the recommendations and the coherence between the content creator's personal brand and the companies they have relationships with.

Although five is not a sample big enough to make generalizations, the five chosen are the most representatives for the category. Due to such fact, results will be interpreted as a general pattern for female Peruvian influencers.

DATA COLLECTION

The study collected data for a time period of one month: from October 15th to November 15th. This time frame was selected in order to analyze the average behavior of an influencer per month. Posts from each influencer has recorded under 17 variables which can be categorized in three groups: general profile specs, about the ad and details about the brand deal. Table 2 illustrates the variables.

Variable	How to fill in	Category
Total posts	# of post	
Total picture	# of pictures	
Personal pictures	# of personal pictures	
Likes PP	Max of likes for personal pictures	
Ad pictures	# of pictures as an ad	
Likes AP	Max of likes for ad pictures	General profile
Videos	# of videos	apeca
Personal video	# of personal videos	
Views PV	Max of views for personal videos	
Ad videos	# of videos as an ad	
Views AV	Max of views for ad videos	
Contest	# of contest ads	
Shoutout	# of shoutout ads	about the ad
Discount / promo code	# of discount ads	
# of brands	# of brands	and the second second second second
Name of brands list of brands		details about
Category of brands	type of brand	the biand deal

 Table 2. Variables analysed

It was taken into account both the personal posts as well as he ads in order to get a ratio of how influencers distribute the content they share. Also such information allows comparison for the analysis. It is important to mention that the content evaluated are only permanent posts and not Instagram stories. Although many of the influencers mention brands in their stories, they have a "live" value of 24 hours which makes the chances of reach of the message lower than if it is a permanent post to which followers can go back to it even after 24 hours since the time of post. Adding to the volatility of the ad, it can't be measurable since the views of stories are not public; meaning that only the account owner can know who and how many users has watched the stories. Although most users watch stories they do not necessarily like regular post, such behavior is important since the record of likes (or views for the case of videos posted) represents real engagement and reach of a post. For likes, the user evaluates and pays attention to the post making the conscious decision of giving it a like. With stories, on the other hand, it doesn't particularly engage active *listening*.

Regarding the process of data collection, the Instagram profiles of each influencers was the source of information. Not all of them posted precisely on October 15th yet the time frame is still valid since it depicts the frequency of posts per month. Therefore, the first step was identifying the post closest to the starting date of the time frame of study. Once identified which posts are valid for the research the record of information in database followed.

The following flowchart illustrates the process of data collection.



ANALYSIS

Regarding a general overview of the profiles, the five of them use picture format rather than video when posting which tells us that the preferred format is photo. It is important to mention that for @alechavezsm and @ximenagaliano the percentage is more because of the nature of their content. The latter is a comedian who got known because of her skits and the first one is a fitness personality who posts at least one workout routine in the format of video per week on her feed. Also, for pictures, out of portrait, square and landscape, they opted for portrait frame in most of the posts. When posting portrait, the picture takes over more screen display meaning that the chances of someone scrolling past a picture without seeing it are less. Regarding video format posts, there is not major findings. The number of videos posted in comparison to picture is not significant to the general feed of the influencers - for such reason, the rest of the data analysis focuses on the picture posts.



FORMAT DISTRIBUTION

When it comes to pictures, how the influencers distribute between ads and personal pictures we can conclude that on average 64% of the picture posts are personal posts. It is important to mention the presence of a minimum of 46% by @ximenagaliano and a max of 80% by @palodirtyano. Although @whattachic if the most followed account out of the sample she doesn't represent the account with most ads - this could be interpreted as her being very much more selective of what she shares, yet it doesn't discredit the choice of @ximenagaliano of having more than half of her feed as ads.



@ALECHAVEZSM



She (@ximenagaliano) alongside with @alechavezsm has the most brand deals with 6 different brands, followed by @misiasperoviajeras with 5 brand deals; which could explain why they have a considerate amount of picture ads in contrast to @whattachic and @palomadirtyano who has 2 and 3 brand deals respectively. Also, it is relevant to point out that the category of the influencer does not delimit the type of brands they engage with. For example, @whattachics brand deals are tourism and traveling related yet she's a fashion content creator. The range of brand categories is very diverse yet they all have as common denominator: their influencers marketing strategy. It can be shown that fashion brands are the ones which applies influencers the most for promotion followed by tourism related brands (hotel + tourism) and food brands.

		Table 3: brand	deals			
Info	- Andrew	Details about the brand deal				
Handle	Category	# of brands	Name of brands	Category of brands		
@whattachic	Fashion	2	Conrad Koh Samui	Hotel		
			Explorer Tours UAE	Tourism		
@ximenagaliano	Comedy	6	Huawei	Technology		
			Agata Shoes	Fashion		
			Nuda	Fashion		
			Pilsen	Beverages		
			Movistar	Communication network		
			Puma	Sportwear/Fashion		
@misiasperoviajeras	Travel	5	Red bus	Travel agency		
			Ostento ateliere	Food		
			Sin parar	Food		
			Bata	Retail		
	New Aller		Power footwear	Fashion		
@palodirtyano	Lifestyle	3	Nike	Sportwear/Fashion		
			Vizzio	Food		
			Baker	Dog food - pets		
@alechavezsm	Fitness	6	Afit	Fitness		
			Nike	Sportwear/Fashion		
			H&M	Fashion		
			Loccitane	Beauty		
			Aranwa Hotel	Hotel		
			Herbalife	Suplements		

Table 3. Brand deals

In regards of how the influencer brings the brand into their feed; the *shoutout* style if the most common - in 4 out of 5 influencers is the only format used to involve their community with the brand mention.

Table 4: style of deal						
Info	About the ad					
Handle	Contest	Shoutout	Discount / promo code	Total ads		
@whattachic	0	2	0	2		
@ximenagaliano	0	8	0	8		
@misiasperoviajeras	2	3	0	5		
@palodirtyano	0	4	0	4		
@alechavezsm	0	7	0	7		

Table 4. Style of deal

About the level of engagement, it is clear that the number of followers do not depict the most engaged community. Although @whattachic has the biggest number of followers, she is not the one topping the engagement percentage. In reality, the engagement levels are quite low representing less the one quarter of the total followers for all of the five influencers.



Finally, when it comes to ad engagement, the numbers are lower compared to personal posts. This is true except for @misiasperoviajeras who has a 0.19% engagement in favor of ads. Yet the engagement levels remain low in contrast to the total following.

Table 5: engagement						
Handle	Followers	Likes PP	% engagement	Likes AP	% engagement	<>%
@whattachic	2,300,000	198,918	8.65%	139,141	6.05%	2.60%
@ximenagaliano	343,000	59,179	17.25%	38,177	11.13%	6.12%
@misiasperoviajeras	165,000	14,482	8.78%	14,796	8.97%	-0.19%
@palodirtyano	64,400	8,093	12.57%	6,304	9.79%	2.78%
@alechavezsm	126,000	7,044	5.59%	4,492	3.57%	2.03%

Table 5. Engagement

PERSONAL POST LIKES VS ADS LIKES



CONCLUSION

As usual, the results presented on the study should be taken with a grain of salt. The sample was not representative of the whole influencer community in Peru, only the top representative of 5 categories were analyzed. Also, the time frame was of one month. It could be that this particular range of dates was "low" for the brand deals. For such reason, it would be interesting for a future study to keep track of the monthly behavior of influencers throughout a year in order to identify if there are high seasons for ads, if the style of promotion changes or if there is any other behavioral tendency as a general annual pattern of content creation and sharing.

Brands engage in diverse mediums to generate communication with their target audience; influencers are one of the ways how-to. Yet the hypothesis cannot be rejected nor accepted. On one side, analysis shows that (from the sample) influencers have an average of 11% of engagement in their most liked posts. Nonetheless, brands still opt to build relationship with the content creator regardless of their category. This shows that the person itself is more valuable for brands that the category they are in - the believability and personality is what companies look for when meshing brand values.

Additionally, data analysis proves that the way the brands are intertwined with the content shared is through mentions, in other words through *shoutouts*. Although companies can also be involved with an influencer's community through contests, like giveaways, and promo-codes, such techniques were not commonly used for the case of Peruvian content creators. The lack of promo-codes can be explained

since the online-shopping culture in Peru is very low. Only 37% of the total of NSE AB population¹ engage in online transactions, so for brands it is doesn't generate much traction to implement promotional codes in a society which online purchase is not well developed.

Summarizing the results, influencer marketing is vivid in Peru. It is a tool brands are making smart use of. Despite the low % of engagement the quality of the audience is higher than the one reached on traditional media, making it worth it for brands to switch their marketing techniques. Digital media - primarily social media - has allowed to transform communication habits of consumers and enterprises.

¹ NSE AB population: The top two segments of the social-economic valuation of the peruvian population. This represents 27% of the total population of Peru (32M total population)

ANNEX

6

< ... whatthechic 1,462 2.3M 681 following. followers Follow Katy Esquivel 🔿 On my way to everywhere 3 Fashion & dessert lover ♥ Currently: #Lima Info@whatthechic.com Check this ↓ foreo.se/eo8ck Followed by IGTV LA 🐱 Filipinas I Dubái 🎌 🌜 Tha Ħ Q 0 2

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ANNEX 1: SCREENSHOTS OF IG PROFILES

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ANALYSIS OF CATALONIAN-SPANISH CONFLICT IN SOCIAL MEDIA ENVIRONMENT FROM SYSTEMIC PERSPETIVE

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ABSTRACT

The conflict between the region of Catalonia and the country of Spain is not a recent issue, however its consequences in social media scene are new. The main goal of this research is to evaluate the impact of the recent conflict in social media: Twitter, YouTube, Instagram, Facebook based on historical data from the period of the Referendum (September 3 – October 18 2017). First of all, we have seen during this paper that social media have played and continue playing an important role in Catalonia conflict. Secondly, one surprising result that we obtained is that today's most popular hashtag is from people against independence. Thirdly, comment that although other sources such as Facebook and WhatsApp were not evaluated as they were used in a private way, they played an important role as they created more debates and discussions that surely increase the conflict.

KEYWORDS

Spain, Catalonia, Crisis, Social Media

INTRODUCTION

The kingdom of Spain is a country situated in the south of Occidental Europe. It is divided into 17 autonomous communities, among which is Catalonia that has its own regional government.

The conflict between the region of Catalonia and the country of Spain is not a recent issue, as it has a long history. However, we are not going to enter into historical details as it is not the goal of this paper. We are going to focus our attention on the last year events, concretely during the period of September-October of 2017. Just before to explain what happened during that time, we are going to introduce a little bit the situation in Catalonia.

As anyone can intuitively deduce, in this region there are different types of opinions: people who want the independence, people against it or people who does not care. The typical argument in favor of Independence is that Catalonia pays too much taxes compared to the rest of the regions. Also, the feeling of past history played an important role in older people. Obviously, there are more arguments, but we do not want to discuss all of them as it is enough with presenting the most relevant ones.

On October 1st of 2017, Carles Puigdemont who is a Catalan leader tried to establish an independent Catalan state by promoting an *illegal Referendum*. In that day, lots of people who wanted to vote were injured by police. The images of the fights were immediately distributed in social media and a big

conflict was generated. A few days after, the politicians and activists who helped to carry out the Referendum went to the prison. All those events had their consequences as people expressed their opinion in social media in favor or against the Independence of Catalonia.

In this way, the aim of this paper is to answer the following question: *how did "el procés"¹ developed in the social media? Is it still popular?*

The structure of the paper is the following one: first of all, we are going to explain how we conducted our research in the *Methodology;* secondly, all the *results* will be presented with their corresponding analysis; thirdly, a brief *conclusion* in order to summarize all the ideas will be made; finally, all the *references* used to carry out the paper will be exposed.

METODOLOGY

The main goal of this research is to evaluate the impact of the recent conflict in social media: Twitter, YouTube, Instagram, Facebook... One important thing to comment is that Twitter was the social network most used during that event. However, it was economically impossible to do our own research of twitter's historical data as they asked us a minimum amount of $200 \in$ to obtain the results. Then, what did we do?

We have found one study of historical data made during the period of the Referendum (September 3 - October 18 2017). In this way, first we will briefly summarize the results obtained by them in graphs and after that we will be able to do *our research*: investigate about today's impact of the same hashtags and accounts to see how the number of mentions and interactions have evolved.

We have used a several number of tools in order to evaluate Twitter's data, but the most relevant ones are *Keyhole* and *Tweet Binder*. Both of them allow us to obtain the statistics about any hashtag or account during the last 14 days. It is true that Keyhole provides a more accurate analysis, but with this tool we were able only to create three projects (i.e. analyse three hashtags/accounts).

Additionally, apart from analyzing Twitter, we will present a general overview about people's interest on the Referendum. In order to do that we have used *Google Trends* tool as it provides us all the information about the trend "Referéndum" in Spain during the last five years.

Although Twitter is the social network that has generated the most reaction, YouTube played also an important role with the publication of a video called: *Help Catalonia. Save Europe*. We have used *Vidlog* tool as it provided us the total number of visits; the number of comments, reactions and shares in Facebook; and some examples of the mentions that the video is receiving today's in Twitter.

The last part of the results consists of the evaluation of other social media that were less popular during the Referendum (i.e. Instagram, Facebook and WhatsApp). We will provide a comparison between the number of mentions of the hashtags in Twitter and in Instagram. To obtain this information, we have used *Instagram* tool.

Finally, in order to conclude our research, a brief discussion of the results is going to be made.

RESULTS AND ANALYSIS

¹ The term el "el procés" is used by the Catalans to refer the process of Independence of the region from the Spain kingdom in 2017.

In this section, all the results with the corresponding analysis are going to be presented. The structure is the following one: firstly a general evaluation of the interest on the Referendum in Spain, secondly Twitter's analysis, thirdly YouTube's investigation and finally other social networks such as Instagram and Facebook.

GENERAL OVERVIEW

First of all, we want to carry out a general study of people's interest in Spain about the *Referendum*. In order to do that, we use Google Trends tool to analyze the popularity of the search *Referendum* in Spain during the last five years. The results are presented in Figure 1 and we can remark two aspects. The first one is that every year we can see a tendency to increase the search of *Referendum* word. However, as we have expected, the period with the most interest was September-October of 2017. The second one is that, as anyone could expect, most of the searches are conducted in Catalonia, followed by Balearic Islands and Madrid.



Figure 1. Google Trends of "Referéndum"

TWITTER ANALYSIS

In this section, we are going to briefly summarize the results of the study made by Lewis (2017's data of Twitter) with graphs and then we will be able to present our research on today's data.

Results Lewis' Study (historical data)

First of all, the event of Referendum generated 3.4 Million of impressions in Twitter. Furthermore, in Figure 2 we can see that the number of mentions on twitter was more or less the same for both parties.



Figure 2. Graph mentions on Twitter

Secondly, it is important to evaluate the hashtags used. We can see the most used ones in Figure 3 accompanied by the number of mentions each one had. Concretely, the hashtags used by the party against Independence of Catalonia are orange and the hashtags that are blue correspond to people in

favor of Independence. We can clearly see that the most used one is #Votarem, followed by #RecuperemElSeny. Another interesting thing is that hashtags used for non-independence people were less popular.



Figure 3. Number of mentions for each hashtag

Finally, in the next table (Figure 4) we can see the keywords used by each party, as well as the accounts that interacted most.

IN FAVOR OF INDEPENDENCE	AGAINST INDEPENDENCE
1oct, Democracia, Rajoydimisión, 3oct,	España, Legalidad, Manipulación
Catalanreferendum, Votarem, Parlem,	Constitución, Golpe
Derecho a Decidir, Referendum	@guardiacivil
@krls (Puigdemont's account)	@policia

Figure 4. Keywords and accounts used by each party

OUR RESEARCH (CUREENT DATA)

We can only track three projects in Keyhole, so we analyze the hashtag **#Votarem**, which was the most used; Puigdemont's twitter account (@**krls**) who was the person who carried out the illegal Referendum; and the keyword **loct** that was the day when illegal Referendum took place and lots of people were injured by police.

First of all, let's analyze #Votarem. The results that we obtained are summarized in Figure 5. We can see that in the last 14 days, the total posts using this hashtag is 169, the number of users is 152 and it generates an engagement (likes + retweets) of 148. One conclusion that we can extract is that as we expected the popularity of this hashtag has declined over time. Another aspect to remark is observing the tendency of the graph: we can clearly see that on weekends the number of posts is increased.



Figure 5. Real-time tracking of #Votarem using Keyhole

Secondly, let's evaluate Puigdemont's account. In figure 6 we can see a brief summary of his activity on Twitter: the total posts, followers as well as the average number of likes, retweets...



Figure 6. Summary of Puigdemont's account using Keyhole

In the second graph (Figure 7), is it possible to see the number of posts and the average engagement that the account has during the last two weeks. It is possible to observe that although that Carles is not so active in Twitter, he achieves a considerable engagement (likes + retweets).



Figure 7. Number of posts per day and the total average engagement using Keyhole

As we have seen during this paper, the analysis of hashtags is too important. In this way, we can observe in Figure 8 the hashtags used by @krls during the last month that have generated higher average engagement. Three of them are related to Catalonia Independence: #9n2014, #1oct and #freetothom. None of them are the ones that were used last year (#Votarem, #RecuperemElSeny...)



Figure 8. Hashtags with average engagement using Keyhole

Thirdly, we want to see if the keyword *loct* continues to have its popularity after more than one year. We can see in Figure 9 that in only one week, the number posts are 703 and the engagement is 8,122. What we can conclude with these numbers is that Catalan people do not forget and are constantly remembering the damages they suffered that day.



Figure 9. Real-time tracking of keyword 1oct using Keyhole

Finally, we are going to use *Tweet Binder* in order to see the number of mentions that hashtags analyzed in the study of Lewis have today. We can see the results in Figure 10 and, as we have expected, the popularity of all of them have declined. Moreover, now the most used one is #Orgullososdeserespañoles that is from people against Independence. Also, the hashtag most used by independent people is #LlibertatJordis.



Figure 10. Number of mentions of hashtags in 2018 using Tweet Binder

YouTube

On 16th October 2017, Omnia Cultural published a video on YouTube where they explained the situation that was taking place in Catalonia showing the images of police hitting people and they asked for help rest of Europe. The video, which is available in the following to the link: https://www.youtube.com/watch?v=wouNL14tAks, became too popular as we can see in Figure 11: neither more nor less than 2.05Million people saw it. It is important to highlight that the channel is not so popular as today it only has 13.91K subscribers. Furthermore, the video was popular also in Facebook reaching nowadays an engagement of 134.53K, 66.59K reactions, 42.19K shares and 25.75K of comments.

Overview	10	Tags
THE SA		1055
END M O		* 🗈
Social		155 Q help catalonia #1 Q omnium cultural #2 Q
66.59 K 134.53 K 42	.19 K	save europe #12 Q 1-o Q omnium Q catalunya Q
A DEC N		catalonia Q democràcia Q democracy Q referendum Q
Channel Stats	-	
13.91 K 🔬 5.37 M		freedom q drets humans q derechos humanos q
508 (D. 28.08 K		human rights Q votar Q Ilibertat Q 1 d'octubre Q

Figure 11. Statistics of Help Catalonia. Save Europe Video in YouTube

In the same figure, we can also observe the most popular tags related to the video and some of them are the same that we have seen in Twitter analysis: referendum, llibertat, votar, democràcia...

Additionally, the following image (Figure 12) shows us that after a year of the publication of the video, it is still popular in Twitter as people continue sharing it on their social network.



Figure 12. Recent shares in Twitter using Vidlog

OTHERS

In this last part of the results we are going to evaluate other social media channels less popular in our research such as: Instagram, Facebook and WhatsApp.

On the one hand, Instagram has remained quite far from the Catalan conflict. In order to prove that we have used Instagram and we evaluated the number of mentions of the hashtag analyzed in Twitter. In Figure 13 we can see the results compared to the ones with Twitter. The most popular one in both social networks is #Votarem but in Instagram only has 64.500 mentions compared to 407.426 in Twitter.



Figure 13. Number of mentions of the hashtags in Twitter and Instagram

On the other hand, Facebook and WhatsApp role has been limited, as people has only used them in a private way. In other words, there were a lot of discussions and debates, but we cannot analyze them because they stay in the private sphere.

DISCUSSION

In order to conclude our research, we are going to summarize the important findings and also comment some limitations that we obtained doing it.

First of all, we have seen during this paper that social media played and continue playing an important role in Catalonia conflict. It is true that the interactions during last year were too high, but this is because people tend to share their opinion when they are living the event. However, we have seen with our research that people are still interested in the Catalan Referendum. What is more, we have observed that they do not forget and continue publishing content about the events that happened on 1st October 2017. Also, other hashtag that is now popular is #LlibertatJordis and this is because nowadays people are fighting to get the freedom of political prisoners.

Secondly, one surprising result that we obtained is that today's most popular hashtag is from people against independence. However, it is true that we only evaluate hashtags that were popular in 2017 and it is possible that now there are other popular ones. So, it should be interesting to consider this in order to carry out future researches.

Thirdly, comment that although other sources such as Facebook and WhatsApp were not evaluated as they were used in a private way, they played an important role as they created more debates and discussions that surely increase the conflict.

In conclusion, the research made was very interesting and what we should consider is that nowadays social media play an important role in our lives, and people can be easily influenced by them. The problem appears when people trust in all the information they see on Twitter. For example, a recent new posted in *Última Hora* Newspaper explained that part of the content shared on Twitter during "el procés" was posted by robots.

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SYSTEMIC APPROACH TO VOICE USER INTERFACE (VUI) AND ITS CONSEQUENCES

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ABSTRACT

The paper describes partial problem of the decision-making method, the Analytic Hierarchy Process (AHP), constructing the matrix of pair-wise comparison and calculation of the eigenvector of the pair-wise matrix. The article is focusing to the consistency of the pair-wise matrix and one of known method to increase the its consistency.

KEY WORDS

Voice user interface, consequences, system approach

INTRODUCTION

Conversational agents became mainstream with Siri in the Iphone 4 in 2010. But since then the technology has developed. The business model is different across the different suppliers (Portela & Granell-Canutt, 2017). Nearly every major tech company has invested in the VUI development. Amazon is offering their users the conversational agent Amazon Echo, that is addressed by its users with Alexa. Apple offers Siri to the customers. Google delivers their users their services with the Google Assistant. Windows has the Cortona helping the users to navigate through the system. (Miner, et al., 2016) All of them receive voice inputs from their customers. They are supposed to execute tasks for them, without having to type in a command manually. This offers the users a certain degree of convenience and the provider gets in return closer insides into their consumers behavior. But how is the technology involved in the daily life of the users? How do they interact with the device? Are they even capable to use them to their full extent? Luger and Sellen (2016) study the motivational factors of the users and where there might be space for improvement. To find out, they conducted interviews with 14 active users of a conversational agent. They concluded, that the participants use the CA mainly to let them do simple tasks for them. Also, they found out that there is a major gap between the users experience and the actual functionality. Since their study has been conducted in between the end of 2014 and 2015, it would be interesting to investigate potential changes in the behavior and motivations of the end users. I conducted a qualitative study with on the one hand similar questions to their survey to update their results and on the other hand additional questions to find out more about the consumers' needs and expectations. Finally, I compared the results and found out, that the consumer's behavior and attitude stayed quite similar, though their concerns for privacy issues seemed to become a bigger issue.

CONVERSATIONAL AGENTS

"Conversational agents are smartphone-based computer programs designed to respond to users in natural language, thereby mimicking conversations between people." (Miner, et al., 2016) Moreover, Conversational Agents are the interface between the device and the user. They receive voice inputs by their users. The most famous ones are Siri, Google Assistant and Alexa. They act as a virtual butler for the user (Porcheron, Fischer, Reeves & Sharples' (2018)), that carries out certain tasks for their user.

METHODS

With this paper I want to update the information gained in Luger and Sellens (2016) work by conducting an interview adopting the questions used and enrich them with additional questions. Since the interviews from Luger and Sellen's took place between end of 2014 and the beginning of 2015, it is interesting to research how the participants' answers may vary. I conducted the interviews in November 2018.

Luger & Sellen (2016) conducted during the years 2014 and 2015 interviews with 14 persons, that stated that they are using a CA on a regular basis. The participants were between the age of 25 and 60. The core motivation of the questionnaire was to find out which are the factors that motivate or limit users from using the CA. 10 out of 14 interviewees use Siri, 4 used Google Now (today: Google Assistant) and 1 participant uses Cortana. Luger and Sellen's (2016) "Interview questions sought to elicit participants' technical knowledge, the broad frequency and duration of CA use, type of use, most/least complex tasks, use location, manner of use and emotions elicited by the experience, personal preferences, and perceived benefits/limitations in respect of their specific CA product. Participants were also prompted to describe at least one example in detail; 'describe step by step the way in which you [user-defined example]". I adopted questions about the participants' technical knowledge, the kind of used CA and the used device, their frequency and type of use. And if they preferred to use it alone or in public. The technical knowledge is asked with four ordinal variables: "IT Pro", "IT friend", "IT user" or "IT Newbie". To describe the frequency of use, the participants can choose between "daily", "few times a week", "weekly" or "monthly". The questionnaire contains also whether the participants could think of activities, they couldn't image using the CA for or if there are some for which they could image using it in the future, but they are not realizing now. The participants were also asked to rate the success in the interaction and an overall rating with the CA. The ratings were asked with a Likert Scale from one to six; where one equals very good to six meaning very bad. Using an even number of the Likert Scale should prevent the tendency of the middle. They were also asked to describe the interaction with the CA in detail. Also, how they address the CA and why they do it that way. Furthermore, they should describe how they react if the interaction was not successful. Finally, they were asked of potential dangers that come with using a CA and recommendations for improvement.

Name	IT	CA type	Age	Nationality	Role
	knowledge				
Karamjit	IT user	None	19-20	English	Bachelor
					student
Alexis	IT friend	Google	21-22	French	Master
		Assistant			Student
Markus	IT friend	Alexa, Siri,	29-30	German	Master
		Cortona			absolvent
Alexander	IT pro	Siri	29-30	German	PhD student

Berit	IT user	Siri	21-22	German	Bachelor
					student
Katrin	IT friend	Alexa	25-26	German	Consultant in
					a bank
Arun	IT user	None	25-26	German	Logistics
					employee
Nikolai	IT friend	Google	23-24	German	Master
		Assistant			student
Hannes	IT Pro	None	23-24	German	Master
					student

Table 1. Participants

The interviews were performed via Skype or telephone calls or in person. For my questionnaire I conducted interviews with 9 persons. The participants were between 19 and 30 years old. There were 2 female and 7 male participants. 7 German participants, 1 French and 1 from England. There was not such a prerequisite, that they should have been user of a CA. Because even if they weren't, the motivation was to find out, what their general opinion about CA is, what use case they could image, what general threat they see and what further recommendations they could give for the development of the CA for the future. Additionally, the questionnaire contains the question, how they would rate their first and their current interaction in general with the CA. Furthermore, they were asked, how they would react if the CA wouldn't react in the intended way. The interview questions, if not mentioned otherwise, were open.

FINDINGS

Like in Luger and Sellen's (2016) work, most of the participants used Siri. Those four participants use it on their smartphones and only Alexander accesses it also on his Ipad. Two of the participants use Google Assistant on their smartphones and two use Amazon Echo. One participant used Google Home additionally to Google Assistant and one used Cortana on his desktop computer. Four participants call themselves "IT friend", three as "IT user" and two as "IT pros". Amazon Echo entered the market in Germany at October 2016, so it couldn't be part of the questionnaire of Luger and Sellen.

OPINIONS ON THE CA

For a general introduction the participants were asked about their general opinion on the CA. The participants' opinion was between "it's a very useful and convenient tool" (Markus) and concerned utterances "but I'm really worried because of the privacy effects." Alexander and Arun mentioned that the technology wouldn't be far enough. Alex mentioned in detail "It really lacks functionality, when it comes to syntax and semantic. For example, you cannot send the same message to another person again. Or if you ask Siri for a good restaurant it will purpose you good restaurants, but not necessarily in the same country. What is kind of annoying." In total, it seems to be a nice-to-have tool, but not a necessity for the participants.

The rating of the interaction with the conversational agents reached on average a 2.167, what is a good result, whereas the overall rating of the different CA only got on an average a 2.625. In detail, Siri received a rather average to bad rating (3 and 4) from participants, categorizing themselves as IT friend or IT pro, and a very good (-1) from an IT User. This can be explained by the different expectations they have from the CA.

Main use cases and the general frequency of usage were of interest. Five of the seven users stated they would use the CA to play music at home. Markus, for example, said: "It has become such a normal thing for me that the first thing I do by coming home is to tell Alexa so put some music on. I think it's so convenient, because she simply continues to play the playlist, I have stopped the last time. On that way I don't have to think about what kind of music I want to listen to, it just works fine for me." Alexis uses his Google Home Assistant in similarly. It substitutes his normal speakers. The second most popular use case is setting timers or an alarm with the CA. "It's so practical if you're for example busy with cooking to just tell the CA to set an alarm." (Alexis) Berit says: "It's saves me a few clicks on the smartphone, if I just tell Siri to set a timer."

There were also activities the participants couldn't think of using the CA for. It was sometimes combined with a perceived threat. "I couldn't image using Alexa for banking purposes. I just don't want her to know my credit card number. That feels strange. Well, she probably knows anyway. I don't want to buy something with the Alexa. I prefer to do this manually, so that I can be sure, what I'm buying. Yeah, you don't know if someone else with a similar voice like mine, would use it then to buy something.", says Katrin on the question for what activity she wouldn't use the CA for. By looking at the answers of the participants, its clear, that the participants see the main use cases of their conversational agent on executing simple tasks that doesn't exceed everyday purposes. They couldn't image buying things with the CA. Additional, the participants utter concerns about their privacy in combination with the question, what they couldn't image using the CA for. This concern was also reflected on the question after potential threats with using an CA. They were concerned that the CA listens to their private life too much and would create a personality profile out of their behavior at home. Hannes mentioned, that if he would use an CA he would be surveilled all the time and that he is worried that the company offering the CA "would use my data without me benefiting from it."

Most of the participants, that use the CA, only use the CA, when they are alone and/or at home, but not when they are surrounded by strangers. Nikolai says "It would be strange to talk to my mobile phone in public. I don't want other people to listen to how I communicate with the CA." This reflects the comments of the other participants as well. Katrin says: "I like to use Alexa, if I have some guests. It's always a nice ice breaker, because people are curious about the functionality of Alexa." However, the conversation with the CA were not seen as a conversation between humans. Therefore, the term *conversational agent* is misleading. (Luger & Sellen, 2016)

The active users of the CA address the CA by giving clear and simple commands. They see the CA clearly as a machine and don't see a reason to address it in a personal way. (Alexander) Alexis says: "By addressing my Google Assistant with simple, precise commands, I have experienced the best results." Nikolai also adds on this with his commend: "I only tell the Google Assistant the essential keywords. Everything else would be a waste of time." The interaction between the users and the machine are very functional.

If the machine is working in the intended way, the participants agree on repeating the command again and then to either reformulate the request or giving up and just doing it manually. 3 of the active users react annoyed if the request still doesn't work after the second try. Whereas the others react calmly and try it with again with a different command. More frequent users and users that describe themselves either as "IT pro" or "IT friend" react more patient with the CA, whereas the users with less frequently usage and rater considering themselves as "IT user" or "IT friend" react with refusing giving it further tries.

Markus hopes that "the control of different smart home device can be combined in a single application. Now there is for every device a single app!"

Katrin hopes that the technology will be used in a way that brings the humanity a true added value. For example, for their safety. She proposed it could be added in a car to control the music or to write messages. Or to help disabled people. 5 of the 7 active users could image using the CA in the future for controlling their smart home devices. Markus mentioned he could also image using it for simple tasks like "open excel!" to be able to open the program faster. Arun, that is working as a logistic employee, could image to use a CA at work. "I would use it to communicate with the inventory management system."

RECOMMENDATIONS FOR FURTHER RESEARCH AND LIMITATIONS

It would be necessary to deepen the research, since the participants were mainly in the age between 21-24. It would be interesting to interview the digital native generation, that grew up with VUI technology. The result could vary again substantially. Unfortunately, it was due to the short time frame to enlarge the research.

DISCUSSION

The results from my survey and the ones from Luger and Sellen (2016) are concurring. The majority of the "users viewed their CA principally as a simple task-based system" and the "principle use-case of the CA was 'hands free', meaning that an alternative primary task, rather than the conversation, was the focus of attention".

While in Luger and Sellen's study the main use case of the CA was, when "the activity was not only hands free but required a level of visual attention", the participants in my study rather used it as a good side effect to have a more convenient way to control their device, e.g. for playing music without having to turn the player on.

Apparently, the attitude towards the way of interaction with the CA has changed. As in the survey conducted from Luger and Sellen "For all except three participants, Conversational Agents (CA) were considered an entertaining/gimmicky addition to their device rather than a key application", the users in my survey no langer saw the CA as a gimmick, rather as a convenient and functional alternative to control their devices in a "request/ response design". This is also seen in Porcheron, Fischer, Reeves & Sharples' (2018) study.

The biggest issue is the privacy concern. By evaluating the participants answers, this was always a present problem, that seemed to stop them from adopting the CA also for more complex tasks. Thus, there should be more work done on trust and transparency. Also, the technology is still nascent. There are a lot of functionalities that must be improved.

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GDPR IMPLEMENTATION PITFALLS

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ABSTRACT

On the May 25th, 2018 the General Data Protection Regulation (GDPR) was applied. The goal of the regulation is to protect the fundamental rights and freedoms of natural persons and in particular their right to the protection of personal data. A processing of personal data means any operation or set of operations which is performed on personal data or on sets of personal data. The GDPR mainly goes for all companies on digital area including for example travel agencies with e-services and other companies in the field of tourism and services. In the paper, the authors discuss the prerequisites, objectives, risks and impacts of the new regulation, and show the most important relations.

KEY WORDS

GDPR, Directive 95/46/EC, Regulation (EU) 2016/679, personal data, data processes, GDPR Objectives, GDPR open themes, travel agency case study, data as a commodity

INTRODUCTION

On the May 25th, 2018 the GDPR regulation - REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) - was applied. The new regulation significantly changes processes of personal data handling. The goal of the regulation is to protect the fundamental rights and freedoms of natural persons and in particular their right to the protection of personal data. The regulation lays down rules relating to the protection of natural persons with regard to the processing of personal data wholly or partly by automated means and the processing other than by automated means of personal data which form part of a filing system.

Personal Data

As a 'personal data', the regulation recognizes any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person. Furthermore, the regulation denominates some special groups of personal data as an extra sensitive data. These data include 'biometric data' (personal data resulting from specific technical processing relating to the physical, physiological or behavioural characteristics of a natural person, which allow or confirm the unique identification of that natural person, such as facial images or dactyloscopic data), 'genetic data' (personal data relating to the

inherited or acquired genetic characteristics of a natural person which give unique information about the physiology or the health of that natural person and which result, in particular, from an analysis of a biological sample from the natural person in question) and 'data concerning health' (personal data related to the physical or mental health of a natural person, including the provision of health care services, which reveal information about his or her health status).

Processing of Personal Data

A processing of personal data means any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction. The processing shall be recognized as a lawful if the data subject has given consent to the processing of his or her personal data for one or more specific purposes, or in case that the processing is necessary for the performance of a contract to which the data subject is party or in order to take steps at the request of the data subject prior to entering into a contract, the processing is necessary for compliance with a legal obligation to which the controller is subject, the processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller, or in other enumerated cases.

The regulation, therefore, specifies in detail the procedures to be followed in the processing of personal data and establishes requirements for their data processors across all sectors. As in other areas, businesses in the tourism sector will have to reflect the new regulation. All existing procedures which are inconsistent with this regulation should be harmonised with the GDRP regulation in time.

CASE STUDY: TRAVEL AGENCY WITH E-SHOP

The operator of a small travel agency with an e-service service will have to analyse in several areas:

- Systems (custom / outsourced) and roles
 - Applications
 - Role Options Represented system approaches and managed data manipulation
 - Input/Output system options
 - Procedures and process flow
- People and processes
 - Access to data
 - Purpose (defined by processes)
 - Processing and storage conditions
 - Terms of transmission
- Data
 - Data Lifecycle Management (DLM)

- Importance, usability and protection
- Logging, reporting, alerts and protection
- Third-party systems ("GDPR ready partners")

The basic prerequisite for the successful implementation of GDPR is mapping the systems we use (tailored, boxed, cloud-based). Further, the data, which are stored and distributed in systems. Integral parts are the processes that use the data to manage individual agendas. The processes are accessible to different people with different entitlements at different times.

The main question is: Do we need personal data (see GDPR definition)? If so, what are the required range and minimum time to save it? Are the data secure enough?

The main objective is: How to prevent the loss of sensitive data from attacks, the lack of security, the protection of sensitive information, and the anonymisation of information that allows it (logs, approaches, aggregated data, etc.). Additional security features, such as alerts for suspicious events, auditing and reporting logs, help protect you. Data misuse is forbidden for purposes other than those for which the trustee was entrusted.

The directives are therefore based on the assumption of the risk of working with personal data, while at the same time emphasising the responsibility for this handling of personal data that must be effective. The aim is to protect the consumer (**data subject**).

Author: This is also applied to a paper-based documentation of personal data.

In the case of this e-shop we will deal mainly with:

- Offer dates CK / CA with the right to publish
- Client Database (Internal CRM)
- Database of invoices, orders and realised trades
- Database for marketing purposes

The main risks are the applications. Expensive upgrades, software changes and new contracts require time to analyse and provide a strategic decision. The benefits are in the possibility to buy know-how and best practices in GDPR.

For example, Google Enterprise for Business "G Suite for Business" lets you set rules to keep all communications containing personal information from your clients. Microsoft Office 365 for Business also has similar features.

In the **case of invoices**, the situation is more simple - billing information contains many personal data, but the law this thing solved separately. Of course, this does not mean that anyone should have access to the invoices. We still have to treat the invoice as a special document with a limited (or controlled) approach.

In the **client database**, it will be necessary to examine the individual data types and their retention time. At the same time, the new directive should be taken into account in the data collected for marketing communication.

If the prior consent does not comply with the directive, it must be obtained again. The most frequent issue of prior consents was their conditionality, not volition, which is in direct contradiction with the GDPR. Another most common case is to tie multiple consents together (for example, marketing purposes and general terms).

The administratormust document all personal data breaches that lead to the accidental or targeted loss, destruction, alteration, or unauthorised transmission or access of personal data. Individual examples are:

- Loss/theft of a computer or data storage, backups with personal data
- Loss of paper documents (contracts, invoices, etc.)
- The long-term failure of systems to prevent access to personal data
- Unauthorized disclosure or unauthorised deletion of your personal information e.g., bulk email.

The main reasons for the solution are the following: **violation of the law** and subsequent **legal remedies** (fines, limitations of activity, etc.) associated with it.

Employees must be trained in the processing of personal data, and the company must have a mapped situation where are the data needed, in which systems are protected and who has access to the data.

RESULTS

As a citizen, we see positive steps. Education, thinking people over the information they provide and create. So far, we have been worried about the possibilities of "transferring data to third parties" that are in every contract today, and you have no choice but to sign or use the service. GDPR removes this pressure. It also changes the data-handling policy that should minimise the possibility of leakage and misuse of data by both employees and potential attackers.

Citizens receive GDPR guarantees of the same protection of data within and outside the EU. Legislation protects consumers regardless of where the service is provided.

GDPR professionalises data processing and moves IT forward. The first framework for the definition of the treatment of personal data was the Act No. 101/2000 Coll (in the Czech Republic), on the protection of personal data, which already provided in 2000 a basic definition of need and targeted use of individual data.

Almost 20 years later, there is another tightening of data work legislation that reflects changes in the IT world. At this time, we have unlimited possibilities for data storage, processing and recognition, opening up a completely new information market. **Data becomes a commodity**.

Can you imagine what happens if someone connects your data from bank accounts and credit card details, business records and insurance companies or even social networks? It's the way to instantly find out everything about you - financial circumstances, popular interests, places you visit, including the frequency and the circle of people. Your privacy will be a taboo and the ability to defend zero.

Most businesses, both local and global, handle personal data in a variety of ways. Similarly, they do not use the standards and processes they use as inefficient for company management. This leads us to a non-systematic way of accessing personal data, often at the level of logs (unsecured, uncontrolled, easily abusive).

What does it mean in practice? Companies often have no central security policy to access personal data. We can start with single sign-on (SSO) and global data policy.

However, the mapping of GDPR issues, system modifications, changing applications are a major change. This change in IT is changing more than it can seem at first glance.

DISCUSION

Deleting data, in general, it is a big problem today - data exists in test, development and production systems. In addition, they are backed up multiple times by various technologies. Some systems are so-called "incremental" and data can not be deleted, so if we want to make anonymity while having the development of visitor orders over the past ten years, we will need to make changes at the level of collecting and archiving necessary data.

Data transfer to third parties will require explicit consent, but it is a question of how we verify the possible overthrow of such withdrawal. Min. we get into interesting situations when you have to keep the min. Information that the consent has been withdrawn for later erasure of the data. At the same time, we can not guarantee such an act, or problems can still arise with regard to the speed and ability to review such an act.

In the case of data hosting, it is necessary to verify that the provider is "GDPR ready", and to ensure by himself, who has access to systems at the application level (who, where, why, how).

Empty places in databases, for example, after deleting the contribution from the discussion, may not only be a technical problem but also regarding the meaning of the whole content. For example, user reviews may stop making sense if they contain feedback from other users. For example, if someone, for example, subverts a request for the deletion of personal information, it may also damage the data subject, whether it is a competitor or targeted third party attack. The result may be very contradictory to the original good intention.

CONCLUSION

The new regulation – the General Data Protection Regulation (GDPR) – which was applied on the May 25th, 2018, defines the rules of personal data processing in more details than the previous regulation. Regardless the goal of the regulation is clear and fully understandable, the implementation of the rules brings new challenges and has serious difficulties, which has to be solved. The main aim of the paper was to point out these contexts.

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