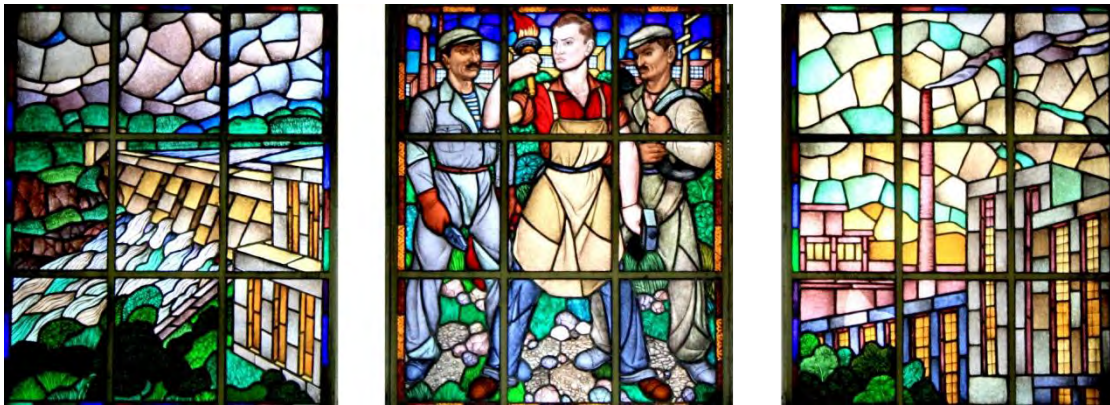University "Union – Nikola Tesla"
School of Engineering Management

Univerzitet „Union – Nikola Tesla"
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CONTENT/SADRŽAJ

A Message from the Editor-in-Chief

Serbian Journal of Engineering Management is a scientific journal, published by School of Engineering Management and Society of Engineering Management of Serbia. The Journal is cathegorized by the Ministry of education, science and technological development of the Republic of Serbia. From 2020, the Journal is indexed in EBSCO databases. This international Journal is dedicated to the wide scope of themes associated to engineering management and industrial engineering and is published semiannualy. The papers are presented in English.

Themes included in the journal are: Engineering management, Industrial engineering, Project management, Strategic Management, Logistics, Operations management, Production systems management, Quality control, Quality management, Entrepreneurship, Risk management, Human resources management, Leadership, Organizational behaviour, Organizational culture, Financial management, Information systems, High technologies management, Environmental management, Waste management, Maintenance management, Creative industries management, Security management, and Marketing.

Editorial board is consisted of distinguished academics from various countries dedicated to establishing the highest academic standards and promoting engineering management principles in Serbia.

Information on the journal in English and Serbian can be found at the journal web page: https://fim.edu.rs/en/serbian-journal-of-engineering-management/.

Prof. Dr. Vladimir Tomašević, FRSA

Reč urednika

Serbian Journal of Engineering Management je naučno-stručni časopis, koji izdaje Fakultet za inženjerski menadžment i Društvo inženjerskog menadžmenta Srbije. Časopis je kategorisan od strane Ministarstva prosvete, nauke i tehnološkog razvoja. Časopis je takođe od 2020. indeksiran u EBSCO bazama. Ovaj međunarodni časopis je posvećen temama povezanim sa inženjerskim menadžmentom i industrijskim inženjerstvom i izlazi dva puta godišnje (u januaru i julu). Zastupljeni jezik za članke je engleski.

Teme zastupljene u časopisu su: inženjerski menadžment, industrijsko inženjerstvo, upravljanje projektima, strategijski menadžment, logistika, menadžment operacija, menadžment proizvodnih sistema, kontrola kvaliteta, upravljanje kvalitetom, preduzetništvo, upravljanje rizikom, upravljanje ljudskim resursima, liderstvo, organizaciono ponašanje, organizaciona kultura, finansijski menadžment, informacioni sistemi, menadžment u visokotehnološkim industrijama, menadžment životne sredine, upravljanje otpadom, menadžment održavanja, menadžment kreativnih industrija, bezbednosni menadžment i marketing.

Uredništvo časopisa čine istaknuti naučnici iz različitih zemalja sveta koji su posvećeni postavljanju visokog akademskog standarda i promocije principa inženjerskog menadžmenta u Srbiji.

Informacije o časopisu i poziv za autore, na srpskom i engleskom jeziku, nalaze se na web stranici časopisa: https://fim.edu.rs/istrazivanje-i-saradnja/naucno-strucni-casopis/.

Prof. dr Vladimir Tomašević, FRSA

Sistematski pregled rizika po zdravlje ljudi povezanih sa izloženošću fluidima za obradu metala

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Apstrakt: Fluid za obradu metala (engl. *Metalworking fluid* - MWF) naziv je za niz ulja, emulzija i drugih fluida koji se koriste u procesima obrade metala radi smanjenja trenja, toplote, rđe i evakuacije opiljaka. Međutim, većina ovih fluida zasniva se na ograničenom resursu - mineralnom ulju i sadrži biocide što predstavlja opasnost po životnu sredinu u svakoj fazi životnog ciklusa, počevši od ekstrakcije resursa pa sve do odlaganja. Osnovni metodološki pristup ovog istraživanja zasnovan je na sistematskom pregledu relevantne akademske literature u oblasti zdravstvenih rizika povezanih sa primenom MWF. Akademskom elektronskom izvoru literature poslati su upiti za odgovarajuće termine, dok je pretraživač podešen da sortira rezultate opadajućim redosledom, prema relevantnosti. Na osnovu sistematskog pregleda literature, ova studija je identifikovala i zabeležila 31 izveštaj iz recenziranih naučnih časopisa, relevantan za rizike po zdravlje ljudi povezane sa izloženošću MWF. Većina ovih studija su studije serije slučajeva i kros-sekcijske studije od kojih je 13 ustanovilo povezanost izloženosti MWF sa malignim bolestima; 7 sa respiratornim bolestima; 6 kožnim bolestima ili alergijama, i 7 sa patogenim mikrobnim kontaminatima. Najznačajnije studije identifikovale su povećanu incidenciju malignih oboljenja, uključujući rak pluća, jetre, kože, pankreasa i ždrela kod kohorti radnika izloženih MWF. Uz to, uspostavljena je i jaka povezanost sa astmom i hipersenzitivnim pneumonitisom. Istraživanje nije vršilo kategorizaciju rezultata prema formulaciji MWF, kao ni prema načinu primene.

Ključne reči: MWF, fluidi za obradu metala, biocidi, zdravstveni rizici, opasnost na radu.

A Systematic Review of Human Health Risks Associated with Metalworking Fluids Exposure

Abstract: Metalworking fluid (MWF) is the name given to a range of oils, emulsions and other fluid used in metalworking processes to reduce friction, heat, rust, and evacuate swarf. However, most of these fluids are based on finite resource - mineral oil and contain biocides, thus representing an environmental threat at each life cycle stage from resource extraction to disposal. The basic methodological approach of this research was based on the systematic review of relevant academic literature in the field of health issues caused by MWF application. An academic electronic reference source was queried for the related terms while search engine was set to sort the results by relevance. Based on the systematic literature review, this study has identified and noted 31 reports in the peer reviewed literature directly relevant to human health risks associated with MWF exposure effects. The majority of these studies were case series and cross-sectional studies of which 13 addressed malignant diseases; 7 respiratory effects; 6 skin effects or allergies; and 7 pathogenic microbial contaminants.
The major studies identified excess malignant diseases including lung, liver, skin, pancreatic, and laryngeal cancer in cohorts exposed to MWF. In addition, a strong association has been established with asthma and hypersensitivity pneumonitis. The research did not categorise the results according to the MWF formulation, nor according to the method of application.

Keywords: MWF, metalworking fluids, biocides, biocide-free, health risks, occupational hazard.

1. Introduction

Metalworking fluids (MWFs) are fluids used in several industrial metalworking processes such as forming (Bay, 2010), cutting (Weinert et al., 2004), and grinding (Brinksmeier et al., 1999). On account of their beneficial tribological characteristics, MWFs help in dissipation and conduction of heat, and in reduction of temperature in metalworking processes by reducing friction between tool and workpiece. This paper regards metalworking fluids as liquids supplied to a manufacturing process in a way that allows for increased productivity based on lubricating and cooling effects (Brinksmeier et al. 2015). MWFs are formulated as either straight-oils (mineral oils), synthetic (without oils), or as a soluble (mineral oil emulsions), combined with surfactants and other additives (Skerlos et al., 2008). Over 2 billion litres of oil-emulsion and straight-oil MWFs are used each year worldwide in manufacturing processes (Skerlos et al., 2008). Two major application methods in machining processes are either by pouring on the workpiece, as a liquid that leaks slightly, or in the form of a spray, which is more efficient. When sprayed, part of MWF becomes aerosolised, generating airborne particulate matter (PM) at concentrations up to two orders of magnitude higher than allowable by e.g., the US ambient air pollution standard (Costello et al., 2020). Today, the primacy in industrial use holds emulsions consisting of mineral oil, *aqua* and additives (Fig. 1).
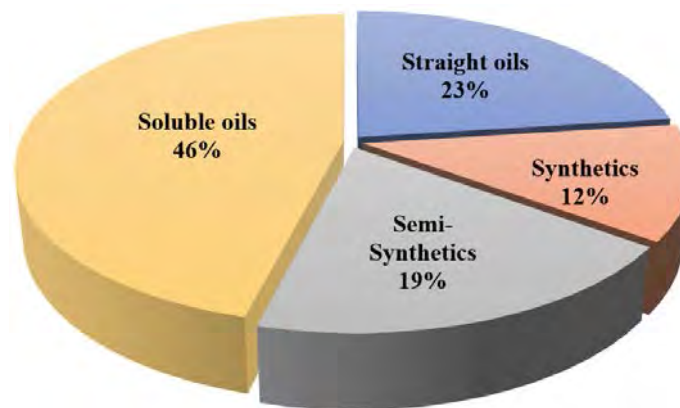
Figure 1. MWF market share by type of formulation (Bhattacharya & Senapati, 2017)

These emulsions are prone to biological infestation and thus have to be preserved by the addition of biocides harmful to health by causing numerous health issues. Some MWF constituents are carcinogenic in animals, including N-nitrosamines found in water-based synthetic fluids, and some polycyclic aromatic hydrocarbons (PAH) found in the oil-based fluids. Efforts to reduce exposures to these potentially carcinogenic MWF have been ongoing for decades (Costelo et al., 2020). There are many epidemiological studies associating MWFs with numerous human health concerns such as respiratory and skin diseases for workers (Geier et al., 2004; Suuronen et al., 2007), malignant diseases (Costello et al., 2011), and other health issues. Furthermore, oil-based MWFs have to be viewed critically not only from the perspective of being hazardous towards the human health, but also from the environmental perspective. They are based on finite resource – crude oil, and represent an environmental threat at each life cycle stage from resource extraction to disposal. This is a serious issue that has to be addressed with due care (Latinović, 2019; Garaplija, 2020).

Based on the systematic literature review, this paper examines and summarises the most significant research on human health risks associated with MWF occupational exposure and classifies them into four main groups based on the established risks. The aim of this research is to raise risk awareness and encourage current employers and employees to pay due attention to the observance of prescribed procedures and safety measures, as well as to encourage manufacturers and producers to understand competitive advantages of "green marketing" (Ćalasan et al., 2021), thus to develop and resort to alternative MWFs such as e.g., glycerol-based MWF (Latinović 2021).

2. Methods

The basic methodological approach of this research is based on the systematic review of relevant academic literature in the field of health effects caused by MWFs application. Google Scholar

academic electronic reference source was queried for the terms 'metalworking fluids', 'machining fluids', 'cutting fluids', 'cutting oils', 'MWF' combined with the term 'health'. The search engine was set to sort the results by relevance. This manuscript reviewed results of 10 consecutive result pages per query. Items returned were reviewed for relevance to MWFs health risks on human. The relevant literature was classified based on the established risk to human health, while documented risks were divided into four main groups, namely: malignant disease, respiratory diseases, skin diseases and allergies, and microbial-induced risks, presented in the Table 1, 2, 3, 4 respectively. The review noted 31 reports in the peer reviewed literature directly relevant to MWF exposure effects. Of these, 13 addressed malignant diseases; 7 respiratory effects; 6 skin effects or allergies; and 7 microbial contaminants. It should be noted that although malignant melanoma e.g., belongs also to skin diseases, on account on its malignancy it was classified in malignant diseases. Several papers established corelation of MWF application with several health issues such as respiratory and skin diseases, thus were presented both in Table 2 and Table 3.

3. Results

The tables 1, 2, 3, and 4 present the key findings on the health risks associated with MWF exposure such as malignant diseases, respiratory diseases, skin diseases and allergies, and microbial-induced health risks, respectively.

Table 1. The relevant literature on malignant diseases associated with MWFs exposure, in ascending order by date

Reference	Health risk
Park et al. (1988)	Stomach cancer, rectal cancer
Silverstein et al. (1988)	Gastrointestinal malignancies, pancreatic cancer
Eisen et al. (1992)	Skin and laryngeal carcinoma
Calvert et al. (1998)	Larynx, rectum, pancreas, skin, scrotum, and bladder cancer associated with at least some MWFs used prior to the mid-1970s.
Mirer (2003)	Elevated risk ratios for stomach cancer, and cancer at other sites
Savitz (2003)	Rectal cancer, laryngeal cancer
Agalliu et al. (2005)	Prostate cancer
Thompson et al. (2005)	Female breast cancer
Malloy et al. (2006)	Rectal cancer
Betenia et al. (2012)	Cervical cancer
Costelo et al. (2011)	Malignant melanoma
Shrestha et al. (2016)	Renal cell carcinoma
Park (2018)	Larynx, esophagus, brain, female breast, and uterine cervix cancer
Costello et al. (2020)	Most notably skin and breast cancer, but also esophageal, liver, pancreatic, and prostate cancer

Table 1 presented the findings on the corelation between MWF exposure and malignant diseases. The least recent of these studies, by Park et al. (1988), identified digestive cancer excesses among workers in a ball bearing plant exposed to cutting fluids. Standardized proportional mortality and mortality odds ratio studies were carried out, and cause of death and work histories were obtained for 702 of 768 hourly employees with ten or more years' service who died between 1969 and 1982. The major findings were significant excesses in proportional mortality ratios (PMR) from stomach cancer (PMR = 2.0) and rectal cancer (PMR = 3.1) among white men. After control for age at death, there was a significant association between stomach cancer and precision grinding exposures, consisting primarily of direct contact with water-based cutting fluids (usually emulsified oils) and their aerosols. The pattern of stomach cancer was consistent and suggested an association with the soluble oil cutting fluids (Park et al., 1988).

In the same year, another epidemiological study (Silverstein et al., 1988) also reported associations between gastrointestinal cancer mortality and exposure to cutting fluids and abrasives in metal machining and precision grinding operations. This study reported similar findings in a third and larger population. Cause of death and work histories were determined for 1,766 bearing plant workers who died between Jan 1, 1950 and June 30, 1982. Mortality odds ratios (SMOR) and proportional mortality ratios (PMR) revealed significant excesses of gastrointestinal malignancies (Silverstein et al., 1988). The authors concluded that their study have confirmed previous evidence that grinding operations using water-based cutting fluids increase the risk for stomach cancer and provides moderate evidence that exposures to straight oil-cutting fluids increase the risk for cancer of the pancreas (Silverstein et al., 1988).

Based on the magnitude and precision of results, and the monotonic exposure-response gradient, Savitz (2003) found strong evidences for association between exposure to straight metalworking fluid and rectal cancer, with a relative risk of 2.0 in the uppermost exposure category. A much weaker association was found with soluble metalworking fluids and essentially no indication of an association with synthetic metalworking fluids (Savitz, 2003). It should be noted that the author also found that the risk for rectal cancer was greatest for workers hired before 1970, and suggested that most probably changes in the constituents of straight metalworking fluids subsequent to that time, changed the association with rectal cancer (Savitz, 2003).

In the research by Betenia et al. (2011), a cohort of 4374 female autoworkers was followed from 1985-2004 for cancer diagnosis. Based on an elevated standardized incidence rate (SIR), the authors focused on cervical cancer in an internal analysis. Results based on 40 cases, the SIR was statistically significantly elevated for both race specific subgroups: 3.30 and 2.43, respectively for Caucasian and African American women. The standard mortality ratio (SMR) was also statistically significantly elevated for Caucasian women (3.44) based on seven observed deaths. Relative risks for soluble and synthetic MWF and nitrosamines were modestly elevated but not statistically significant and there was no association with oil-based straight fluid, thus the authors concluded that water-based MWF may play a role in the aetiology of cervical cancer (Betenia et al., 2011).

Costelo et al. (2011) followed a cohort of autoworkers from 1985 through 2004 for cancer incidence. The authors estimated hazard ratios in Cox models for cumulative exposure to total particulate of straight fluid (neat oil), soluble fluid (oil emulsified in water), and synthetic fluid (no oil). On the basis of 76 incident cases of malignant melanoma in the cohort of 14,139 white males, the results showed hazard ratios of 1.99 (95% confidence interval = 1.00—3.96) for the highest category of straight fluid. Risk was greatest in the most recent time window. Penalized splines suggested a linear exposure-response over the full range of exposure. Results for soluble fluid were more modest. There was no association with synthetic fluid. The results provided evidence, based on quantitative measures of metalworking fluid, that oil-based fluid, particularly straight mineral oils are associated with the incidence of malignant melanoma (Costelo et al., 2011).

Table 2 addresses another major MWF associated occupational health hazards, namely respiratory diseases, such as hypersensitivity pneumonitis, asthma etc.

Table 2. The relevant literature on respiratory diseases associated with MWFs exposure, in ascending order by date

Reference	Health risk
Gupta & Rosenman (2006)	Hypersensitivity pneumonitis
Rosenman (2009)	Asthma, hypersensitivity pneumonitis
Burton et al. (2012)	Asthma, bronchitis, breathing difficulties, irritations, hypersensitivity pneumonitis, impaired lung function
Fornander et al. (2013)	Upper airway symptoms caused by airborne irritants
Barber et al. (2014)	Hypersensitivity pneumonitis
Park (2019)	Asthma and hypersensitivity pneumonitis
Nett et al. (2020)	Asthma and hypersensitivity pneumonitis

In the most recent research by Nett et al. (2020), five cases of a severe and previously unrecognized lung disease characterized by B-cell bronchiolitis and alveolar ductitis with emphysema (BADE) were identified among workers at a machining facility that used MWFs, although MWF exposure could not be confirmed as the aetiology. In the United Kingdom e.g., MWF is now the predominant cause of occupational hypersensitivity pneumonitis (HP) (Gupta & Rosenman, 2006; Rosenman, 2009; Barber et al., 2014; Nett et al., 2020).

Under continuous conditions associated with respiratory disease outbreaks, over a working lifetime of 45 years, workers exposed to MWF at 0.1 mg/m3 are estimated to have a 45.3% risk of acquiring HP or occupational asthma under outbreak conditions and a 3.0% risk assuming outbreak conditions exist in 5% of MWF environments.

In addition to respiratory outcomes, skin diseases such as allergic and irritant contact dermatitis (Table 3) persist as frequent causes of occupational disease following MWF exposure.

Table 3. The relevant literature on skin diseases and allergies associated with MWFs exposure, in ascending order by date

Reference	Health risk
De Boer et al. (1983)	Contact dermatitis
Geier et al. (2004)	Contact dermatitis
Suuronen et al. (2007)	Contact dermatitis
Henriks-Eckerman et al. (2008)	Presence of allergens in MWFs
Hannu et al. (2012)	Allergic contact dermatitis, irritant contact dermatitis
Nett et al. (2020)	allergic and irritant contact dermatitis

Skin diseases and allergies are the most frequent causes of occupational health issues associated with MWF exposure (Nett et al., 2020). Fortunately, the consequences are not as severe as is the case with malignant diseases.

Finally, the last category addresses microbial contaminants found in MWFs (Table 4) on account of their potential pathogenicity.

Table 4. The relevant literature on microbial contaminants found in MWFs, in ascending order by date

Reference	Microbial species and health risks
Wallace et al. (2002)	Mycobacterium immunogenum associated with hypersensitivity pneumonitis
Awosika-Olumo (2004)	Enterobacteriaceae, Flavimonas, Gram-positive rods, and Sphigomonas
Bakalova et al. (2007)	Stenotrophomonas sp., Micrococcus sp., Agrobacterium sp., Bacillus sp.
Cyprowski et al. (2007)	Shewanella putrefaciens, Bacillus sp., Staphylococcus warneri, Acremonium butyri, Acremonium strictum and others
Tillie-Leblond et al. (2010)	Mycobacterium immunogenum
Perkins & Angenent (2010)	Alcaligenes faecalis, Ochrobactrum anthropi, Pseudochrobactrum asaccharolyticum, Brevundimonas diminuta, Wautersiella falsenii, Morganella morganii
Murat et al. (2011)	Mycobacterium immunogenum
Kapoor & Yadav (2012)	Mycobacterium abscessus

Epidemiological and clinical studies suggest that both chemical ingredients and microbiological contaminants in MWF may also cause various respiratory symptoms and diseases (Suuronen et al.,

2007; Henricks-Eckerman et al., 2008). A microbial contaminant, namely Nontuberculous mycobacteria (NTM) have been associated with hypersensitivity pneumonitis in machinists. Mycobacterium immunogenum and Mycobacterium chelonae, have been reported thus far to have the ability to colonize contaminated MWFs (Falkinham, 2002). In the research by Kapoor & Yadav (2012), the third species was isolated, namely Mycobacterium abscessus. It is a species distantly related to the ones that cause tuberculosis and leprosy, part of a group known as rapidly growing mycobacteria and is found in water, soil, and dust (CDC, 2021). It has been known to contaminate medications and products, including medical devices. When skin is infected with M. Abscessus, it usually exhibits classic inflammatory symptoms such as *rubor, tumor,* and *dolor.* Infected areas can also develop boils or pus-filled vesicles. Other signs of M. abscessus infection are fever, chills, muscle aches, and a general feeling of illness (CDC, 2021).

Other microbiological contaminants referenced in the Table 4 also cause a variety of health problems, some of which are less dangerous and some potentially fatal.

4. Discussion

4.1 Principal findings

This study has identified and noted 31 reports in the peer reviewed literature directly relevant to MWF exposure effects, from which the most notable studies were also summarised. The majority of these studies were case series and cross-sectional studies from the USA, and UK, of which 13 addressed malignant diseases; 7 respiratory effects; 6 skin effects or allergies; and 7 microbial contaminants. The most commonly affected workplaces were large car-manufacturing plants, ball-bearing plants and other plants where metal machining is one of the main technological processes. Health risks associated with MWF exposure were identified with several types of MWFs, mostly straight oil, and soluble water-based oil emulsions. Risks and health problems range from mild to potentially fatal. Potentially fatal health problems include some high-probability fatal ones, such as most malignancies. Microbial contamination with bacteria, opportunistic mycobacteria, and fungi was also included because prevention of these contaminants is the main and only reason why biocides are a constituent of almost all commercial MWFs.

However, stabilizing biocide concentration due to water evaporation is also challenging, while different species react specifically to different biocides. Finally, adding biocides helps in prevention of microbial contamination but on the other hand, induces elevated risks of other health hazards presented in tables 1, 2, and 3, some of which are malignant. Furthermore, spraying method of applying MWFs on working piece increased efficacy and reduced its consumption, but on the other hand, induced elevated risks of respiratory diseases by creating aerosolised mist. This is a *circulus vitiosus* which has to be broken in order to provide workers with a healthier working environment.

4.2 Recommendations for further research

Metal machining is an indispensable set of technological processes in a large number of industries, wherein at the current stage of the technology used, MWFs are necessary. Environmental health & safety departments are responsible for standard operating procedures and management of fluids, and the transfer of information regarding policy and procedure to their employees. However, not all shops have the resources required to develop and implement the proper standard operating procedure, nor all the employees adhere to them. Furthermore, MWF represent an environmental threat at each life cycle stage from resource extraction to disposal, making metal swarf recycling economically unfeasible, while increasing workpiece cleaning expenses. Thus, it is necessary to find sustainable MWF formulations, which implies using renewable feedstock with less or no harm towards the environment or human health. Although this might seem as a distant goal, several researchers proposed and examined potential MWF alternatives, from which the most promising is a glycerol-based MWF (Winter et al., 2012; Wichmann et al., 2013; Latinović, 2021).

Glycerol-based MWFs have several advantages over oil-based MWFs. Firstly, they are made of renewable resource – vegetable glycerol, the main by-product of biodiesel production, eliminating the need for finite resource – crude oil. Moreover, glycerol is virtually non-toxic, water soluble compound (Tan et al., 2013), which facilitates workpiece cleaning after processing and enables metal swarf recycling. Furthermore, glycerol-based MWFs exhibited adequate tribological and corrosion inhibition

characteristics in the machining phase, although further research is still needed (Latinović, 2021). Finally, probably the most important advantage is the biostatic property of glycerol. If glycerol concentration is sufficient (>40%) in the MWF solution, no additional biocides are needed (Winter et al., 2012; Wichmann, 2013).

4.3 General limitations of the review

Given the comprehensive nature of the search terms and the search strategy employed, it is possible that reports from other investigations could have been missed. Furthermore, the review did not take into account the change in MWF production technology over time nor did it divide the results according to the type of MWF whose use was associated with increased health risks. The relevancy of some studies is such that they were taken into account and presented in the research; beside they are dating from 1988. Although their main focus was on straight mineral oil, which today does not have the major market share (Fig. 1), the chosen methodological approach for this research was based on the relevancy so they had to be included.

Due to the types of studies summarized in this review, the evidence is mostly correlative and based on epidemiological studies, and reflects the constraints placed on reactive health investigations as opposed to planned research studies. The findings from this literature review are predominantly from cross-sectional surveys of workplaces and case series of workers with disease, with little data from case–control studies. It is possible therefore that some of the cross-sectional outbreak studies may have underestimated, by studying a survivor population, or overestimated the size of the problem.

5. Conclusion

Exposure to MWF represents a significant health risk for the employees who deal with the daily tasks involving metal machining and MWFs. Based on the findings, four major health risk groups were established, namely: malignant diseases; respiratory diseases; skin diseases and allergies, and microbial contaminants with pathogenic potential.

Three major studies identified excess cancer including lung, liver, pancreatic, laryngeal, and leukaemia associated with MWF exposures. Reports also strengthened associations of asthma and hypersensitivity pneumonitis with recent exposure to MWF. Skin diseases, allergies as well as pathogenic microbiota are also associated with MWFs. Nevertheless, these fluids are as dynamic as the formulations themselves (complex & dynamic). This paper did not quantify the risks depending on the type of MWF, the method of use, and the type and time of exposure.

The aim of the paper was to raise awareness of the existence of the health and environmental problem and provide a basis for further research, especially in the direction of finding alternative MWFs. However, until the widespread use of commercially viable and sustainable MWFs is achieved, it is crucial that awareness of proper standard operating procedures is shared with everyone involved with MWF use in order to provide proper MWF management and reduce human health and environmental risks.

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Bezbednosni aspekti na aerodromima i spremnost putnika da putuje u inostranstvo tokom pandemije virusa COVID-19

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Apstrakt: Izbijanje pandemije COVID-19 koronavirusa i odgovarajuće mere predostrožnosti radi ograničavanja njegovog širenja imaju jasne uticaje na mobilnost ljudi na globalnom nivou. To je izazvalo smanjenje domaćeg i međunarodnog obima vazdušnog putničkog saobraćaja i spremnost putnika da se odluči na putovanje u inostrane zemlje. Zbog globalne krize u vezi sa koronavirusom, većina zemalja je uvela restriktivne mere kako bi ograničila pandemiju i ograničila broj žrtava. Među restriktivnim merama je upravo i obustava vazdušnog saobraćaja kao efikasna mera u smanjenju mobilnosti na globalnom nivou u kratkom roku, što za posledicu ima visok socio-ekonomski dizbalans kako dugoročno tako i kratkoročno. Ovaj rad se bavi ispitivanjem poznavanja i primenom mera predostrožnosti na aerodromima, sigurnosti i spremnosti putnika da putuje i njihovim iskustvima.

Ključne reči: COVID-19, bezbednost, aerodromi, putovanje

Security Aspects at Airports and the Willingness of Passengers to Travel abroad during a Pandemic of the COVID-19 Virus

Abstract: The outbreak of COVID-19 coronavirus and appropriate precautionsmeasures to limit its spread have clear impacts on human mobility globally. This has caused a reduction in the domestic and international volume of air passenger traffic and the readiness of passengers to decide to travel to foreign countries. Due to the global coronavirus crisis, most countries have introduced restrictive measures to limit the pandemic and limit the number of victims. Among the restrictive measures is the suspension of air traffic as an effective measure in reducing mobility at the global level in the short term, which results in a high socio-economic imbalance in both the long and short term. This paper deals with the examination of knowledge and application of precautionary measures at airports, safety and readiness of passengers to travel and their travel experiences.

Keywords: COVID-19, security, airports, travel

1. Introduction

Hardly anyone expected that the COVID-19 epidemic would have such a big impact on the functioning of the air traffic system. Preliminary scientific research conducted by virologists has indicated the need to introduce distance between people (Bezerra & Gomes, 2012). In March 2020, when large European clusters of COVID-19 cases were identified, first border crossing restrictions were introduced, followed by international and intercontinental flights (Europe - USA). It has become clear that it is only a matter of time before additional restrictions are introduced in air traffic. However, no one expected that air traffic would be practically stopped because it was reduced by more than 80%. Before the outbreak, about 30,000 planes took off every day, and in March, April and May, there were only 2,500 take-offs (Bruno & Genovese, 2012).

The resumption of air traffic depends on several factors: government restrictions and guidelines on air traffic, demand for air services, and ticket prices. However, a key aspect that airport managers and airline executives will have to face is how to ensure passenger safety and persuade them to reuse air transport in an epidemiological situation. There are general regulatory guidelines for passenger transport services at airports (Byrne, 2010). Mandatory temperature control for passengers at the entrance to the passenger terminal and appropriate distancing have been introduced.

One of the systems in which hygiene and social distance are difficult to fulfill is the security checkpoint. According to research, this process is one of the more stressful service processes (Bezerra & Gomes, 2012). Maintaining appropriate rules of distancing and hygiene (e.g. disinfection of hands and X-ray carriers) is crucial for the safe application of the safety control process.

The infrastructure of the existing safety control systems (e.g. length of the conveyor, number of technical devices) guaranteed adequate performance under the assumption that there is no distance and other requirements for epidemics (Fan Yi et al., 2016). The application of social distance has resulted in a significantly reduced number of passengers in each area of the safety control strip. Kierzkowski and Kisiel made an analysis that directly showed that this factor has a key impact on reducing system performance. Corrective actions must be taken to maintain a high performance security control system in the event of an epidemic (Easa, pp.1-28). Two solutions can be introduced. The first is that passengers will arrive at airports much earlier, but then the number of people in the queue will not decrease, where COVID-19 transmissions can occur. Another solution is to try to increase the performance of the system in an epidemic. This paper examines the readiness of passengers to travel to foreign countries due to a pandemic and their knowledge of preventive measures.

2. Literature overview in the field of social responsibility in the application of integrated marketing communication

Modeling of airport processes has a long history. However, the first models were quickly identified as useless (Braojos et al., 2012). It can be seen that the primary focus was on modeling systems in terms of assessing their performance. An overview of such models was developed by Wu and Mengersen (Hair et al., 2011). The history of modeling service processes at airports can be successfully traced there (Eilon, 2015).

De Lange proposes a model that allows estimating the maximum passenger delay. The authors performed theoretical considerations on a simple model consisting of a subsystem for control and safety control in order to verify the proposed procedure. It was then applied practically at the airport terminal in Atlanta. The analysis of the profiles of reported arrivals at the place of services for passengers when the air traffic was the densest was performed. In the epidemic aspect, it could be useful to assess this indicator due to system disturbances.

However, this model did not take into account the state of the epidemic. Passengers did not keep enough distance (De Lange, De Vos, 2018). Kobza and Jacobson presented an alternative solution suitable for conducting a wider range of analyzes. The model refers to the service of arriving passengers. Model assumptions allow consideration of different scenarios, e.g. allocating appropriate resources to the number of passengers arriving in a particular aircraft, dynamically moving resources according to specific strategies. This is a quasi-stochastic model. Some of the data are given by probability distributions based on actual data at New York airports. Some processes are described by a determined transition time between individual service subsystems.

Therefore, this model may be useful in the epidemic aspect. However, it must be known how much the efficiency of individual processes will decrease. This data can then be updated in the model and the distorted performance can be checked (ICAO, Kobza, Leone, 2015).

Based on Kobza and Jacobson, a similar model was developed, which includes reporting passengers departing from a particular airport. He is represented by Jim and Chang. The model is extended with additional graph vertices that include additional services, i.e. Restaura.nts, information points, etc. The model implements service time characteristics in individual subsystems. Therefore, there are already

models that allow the reproduction of the trajectory of passengers in microscopic terms. This can allow the assessment of the most sensitive zones for the spread of epidemiological risk (Jim & Chang, 1998).

Hsu et al. considered the dynamic distribution of control points using a stochastic simulation model (HSU et al., 2012). In this case, the function of the goal was to minimize the resources used, assuming that certain requirements regarding the waiting time of passengers for the service were met. The model was used at an airport in Taiwan for China Airline. This model could be used to dynamically change the number of seats to reduce queues for flights with more passengers, which significantly reduces contact between passengers in long rows. Bruno and Govense also see the possibility of improving the system in dynamic management. The mathematical model has been developed and previously verified. However, the paper does not provide details that show the extent of the benefits gained (Bruno & Genovese, 2012).

Due to the possibility of conducting safety control procedures in accordance with different procedures, using different control methods, studies on the performance analysis of this phase of passenger transport services mainly focus on the development of models on a microscopic scale. Van Boekhold et al. (2014) present a simulation model used to analyze the sensitivity of the security control process to changes in staff performance, initial control, random alarm index, activated alarm, and number of luggage items. Leone (2002) based on the completed simulation experiments, shows the relationship between the number of activated alarms and the performance of the safety control point. These models can be useful if the control procedure changes due to an epidemic. If this affects the number of operators or the number of alerts, this model will estimate the change in performance. After all, in the history of aviation, security screening procedures have already changed. Leone and Liu (2016) assessed the actual performance of the hand luggage control process after the introduction of regulations requiring the use of ETD control. The results are compared with the theoretical values of equipment performance.

Lee et al. (2018) used computer simulation to compare six different queue structures in queues before security controls. The Monte-Carlo analysis was performed in terms of determining the structure with the highest performance. The analysis takes into account the factor of whether the passenger has hand luggage, which also affects the time spent waiting. In addition, it was assumed that passengers could choose a queue according to three different rules: random, shortest queue and shortest waiting time. As a result of the analysis, it was found that different passenger waiting structures were suitable for different passenger preferences in terms of order selection strategies. Importantly, in terms of social distance in an epidemic state, it can be difficult to apply certain types of waiting. This model could be useful for analyzing this fact.

However, in this case, it may be better to use regular rows. This allows passengers to stay out of the waiting system while waiting for the safety control procedure. A simulation experiment was performed, which, in addition to shortening the waiting time, also showed the possibility of limiting the resources needed to perform the security control process.

The way a passenger goes through a phase in a security control system also has a significant impact on system performance. Kierzkowski and Kisiel modeled passenger flow to compare two variants of the safety lane configuration - single and double. Subsequently, a simulation model was used for the Kierzkowski and Kisiel (2015) models - checkpoint for double lane. The capacity of individual protection line zones is crucial. The epidemic, which introduced the need for social distance, reduced the capacity of these zones. So far, the impact of changes in handling procedures related to the epidemic has not been analyzed. In particular, the influence of social distance on process characteristics has not been studied.

3. Methodology

Systematic review protocol

The methodological basis of this paper is based on a combination of several different methods. In order to satisfy the methodological procedures (generality, reliability, objectivity and systematicity), various scientific research methods were used. An exploratory research method, ie the use of existing literature and electronic sources, was used to determine the current state and development trends. Adequate research will use the classification method to identify the basic factors that affect the degree of its

implementation. In the further development of the paper we will use the method of analysis, as well as a comparative method.

The exploratory method will help to determine the current positions in the field of air traveling and its application in the current pandemic situation and restrictions that occured, and the classification method will identify differences and compare current, ruling trends in the field of social responsibility. In further analysis of the paper and the obtained results, the statistical SPSS method will be used. A complex methodological approach and the application of several scientific methods is necessary due to the complexity of the problem that is the subject of research in this scientific paper. The survey was conducted in June 2020 and had 100 respondents.

In accordance with the defined research tasks, the following hypotheses were set:

- HYPOTHESIS 1: There are statistically significant differences in the knowledge of prevention measures in relation to age.
- HYPOTHESIS 2: There is a statistically significant difference in the knowledge of prevention measures in relation to the country from which the respondents travel.
- HYPOTHESIS 3: There is a statistically significant difference in the sense of security in the country they come from in terms of coronavirus compared to the country from which the respondents travel.
- HYPOTHESIS 4: There is a statistically significant difference in staying in Serbia in relation to the country from which the respondents travel.
- HYPOTHESIS 5: There is a statistically significant difference in the choice of the country from which the respondents travel in relation to the feeling of security in the country they come from regarding the coronavirus.

4. Results

We first sorted the database so that the variables could be used for statistical analysis and defined each variable (Table 1).

Table 1. Classification of variables

Variable	Way of expressing values
Age	Continuous
Question 1	Categorical
Question 2	Categorical
Question 3	Categorical
Question 4	Categorical
Question 5	Categorical
Question 6	Categorical
Question 7	Categorical
Question 8	Categorical

Source: Authors' calculations

We observed whether there are statistically significant differences in knowledge of prevention measures in relation to the age of the respondents. T - test of independent samples was used to examine differences in relation to age (Tables 2 and 3).

Table 2. Descriptive statistics

Group Statistics					
	Are you familiar with prevention measures?	N	Mean	Std. Deviation	Std. Error Mean
AGE	YES	53	41.13	14.334	1.969
	NO	47	41.94	14.115	2.059

Source: Authors' calculations

From the table we see that the total number of respondents is 100, of which 53 respondents are familiar with prevention measures while 47 respondents are not familiar with prevention measures. The table also shows the mean values and standard deviation for each group separately.

Table 3. T-test of independent samples

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
Independent Samples Test										
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AGE	Equal variances assumed	.223	.638	-.282	98	.779	-.804	2.851	-6.463	4.855
	Equal variances not assumed			-.282	96.910	.778	-.804	2.849	-6.458	4.850

Source: Authors' calculations

By T-test of independent samples, we observed whether there are statistically significant differences in the knowledge of prevention measures in relation to the age of the respondents (Table 3). In our example, the assumption of equality of variance is not violated because the significance level of Levine's test is p = 0.638 (which is higher than the significance threshold of 0.05), based on which we conclude that our sample is homogeneous and we observe the results from the first order ("Equal variance assumed"). The level of significance of the t-test is p = 0.779, which is higher than the significance threshold (0.05), based on which we conclude that there are no significant statistical differences in the mean value between the age of the respondents in relation to the knowledge of prevention measures.

We then calculated the magnitude of the impact in the t-test of the independent samples. The magnitude of the impact is estimated based on the eta squares. This square determines the magnitude of the impact, which indicates the magnitude of the difference between the groups, and not just whether the difference is random or not. This square is equal to 0.0008, which represents an extremely small influence, which confirms that there is no statistically significant difference in the mean value between the observed groups.

Descriptive statistics were then applied to examine whether preventive measures for coronavirus at the airport were followed (Tables 4 and 5). Based on Table 5, we can see that only 1 respondent believes that appropriate preventive measures have been taken at the airport while 99 respondents believe the opposite (Graph 1).

Table 4. Descriptive statistics

Statistics		
Whether appropriate preventive measures for Corona virus are covered at the airport?		
N	Valid	100
	Missing	0
Std. Deviation		.100
Minimum		0
Maximum		1

Source: Authors' calculations

Table 5. Respondents' responses on appropriate preventive measures for corona virus at airports

Whether appropriate preventive measures for Corona virus are covered at the airport?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	1	1.0	1.0	1.0
	NO	99	99.0	99.0	100.0
	Total	100	100.0	100.0	

Source: Authors' calculations

We observed whether there were statistically significant differences in knowledge of prevention measures in relation to the country from which respondents travel. A t-test of independent samples was used to examine the differences in relation to the country from which the respondents travel (Tables 6 and 7). T-test of independent samples is used to compare the mean in relation to two different groups that are arranged according to whether they are familiar with prevention measures.

Table 6. Descriptive statistics

Group Statistics					
	Are you familiar with prevention measures?	N	Mean	Std. Deviation	Std. Error Mean
Where are you travelling from?	yes	53	3.57	2.144	.294
	no	47	5.02	2.090	.305

Source: Authors' calculations

The group information is checked first (Table 6). From the table we see that the total number of respondents is 100, of which 53 respondents are familiar with prevention measures while 47 respondents are not familiar with prevention measures.

The table also shows the mean values and standard deviation for each group separately. By T-test of independent samples, we observed whether there are statistically significant differences in the knowledge of prevention measures in relation to the country from which the respondents travel (Table 7, Graph 2).

In our example, the assumption of equality of variance is not violated because the significance level of Levine's test is p = 0.583 (which is higher than the significance threshold of 0.05) on the basis of which we conclude that our sample is homogeneous and the results are observed from the first order.).

The level of significance of the t-test is p = 0.001, which is less than the significance threshold (0.05), on the basis of which we conclude that there is a significant statistical difference in the mean values in relation to the knowledge of prevention measures.

We then calculated the magnitude of the impact in the t-test of the independent samples. The magnitude of the impact is estimated based on the eta squares. This square determines the magnitude of the impact, which indicates the magnitude of the difference between the groups, and not just whether the difference is random or not.

This square is equal to 0.107, which represents the mean influence, which confirms that there is a statistically significant difference in the mean value between the observed groups.

Table 7. T-test of independent samples

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
							Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)			Lower	Upper
Where are you travelling from?	Equal variances assumed	.303	.583	-3.428	98	.001	-1.455	.425	-2.298	-.613
	Equal variances not assumed			-3.433	97.103	.001	-1.455	.424	-2.297	-.614

Source: Authors' calculations

Graph 2. Knowledge of prevention measures in relation to the country from which the respondents travel
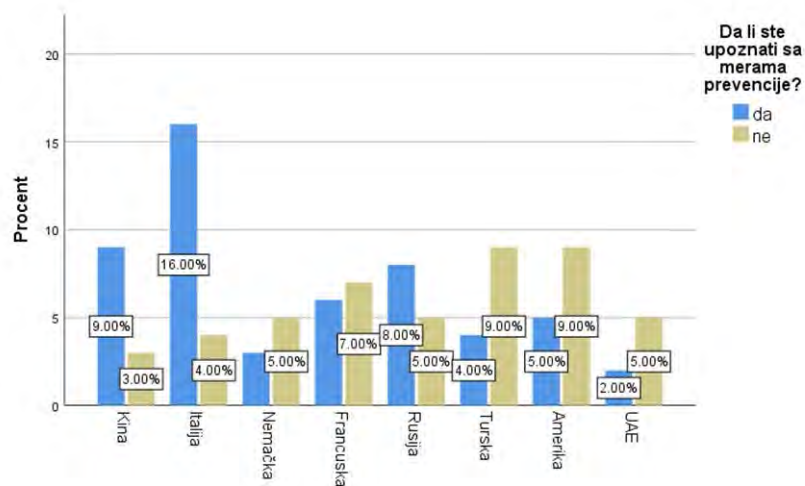
Source: Authors' calculations

We then examined whether travelers felt safe in the country they came from in terms of coronavirus. Respondents' responses are shown in Table 8 and the expected responses for each country are also shown. From Table 8 we see that most respondents felt safe in Germany, France, Russia, Turkey, America, and the United Arab Emirates, while half half were in China and in Italy they did not feel safe.

Table 8. Have you felt safe in the country you come from regarding coronavirus

From which country are you traveling * did you feel safe in the country you are coming from regarding Corona Crosstabulation virus?					
			Have you felt safe in the country you come from regarding the Corona virus		
			yes	no	Total
Where are you travelling from?	China	Count	6	6	12
		Expected Count	8.5	3.5	12.0
	Italy	Count	8	12	20
		Expected Count	14.2	5.8	20.0
	Germany	Count	5	3	8
		Expected Count	5.7	2.3	8.0
	France	Count	7	6	13
		Expected Count	9.2	3.8	13.0
	Russia	Count	13	0	13
		Expected Count	9.2	3.8	13.0
	Turkey	Count	13	0	13
		Expected Count	9.2	3.8	13.0
	USA	Count	12	2	14
		Expected Count	9.9	4.1	14.0
	UAE	Count	7	0	7
		Expected Count	5.0	2.0	7.0
Total		Count	71	29	100
		Expected Count	71.0	29.0	100.0

Source: Authors' calculations

We observed whether there were statistically significant differences in the sense of security in the country they came from in terms of coronavirus compared to the country from which the respondents traveled.

A t-test of independent samples was used to examine the differences in relation to the country from which the respondents travel (Tables 9 and 10). The T-test of independent samples is used to compare the mean in relation to two different groups that are arranged according to whether they felt safe in the country they come from.

Table 9. Descriptive statistics

Group Statistics					
	Have you felt safe in the country you come from regarding the Corona virus	N	Mean	Std. Deviation	Std. Error Mean
Where are you travelling from?	yes	71	4.90	2.132	.253
	no	29	2.66	1.587	.295

Source: Authors' calculations

The group information is checked first (Table 9). We can see from the table that the total number of respondents is 100, of which 71 respondents felt safe in the country from which they travel, while 29 respondents did not feel safe in the country from which they travel. The table also shows the mean values and standard deviation for each group separately.

Table 10. T-test of independent samples

Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means					
								95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Where are you travelling from?	Equal variances assumed	4.542	.036	5.117	98	.000	2.246	.439	1.375	3.117
	Equal variances not assumed			5.782	69.408	.000	2.246	.389	1.471	3.021

Source: Authors' calculations

By T-test of independent samples, we observed whether there are statistically significant differences in the sense of security in relation to the country from which the respondents travel (Table 10,. In our example, the assumption of equality of variance is violated because the significance level of Levine's test is p = 0.036 (which is less than the significance threshold of 0.05), on the basis of which we conclude that our sample is heterogeneous and we observe the results from the second order. "). The significance level of the t-test is p <0.005, which is less than the significance threshold (0.05), based on which we conclude that there is a significant statistical difference in the mean values in relation to the sense of security in relation to the country they come from. We then calculated the magnitude of the impact in the t-test of the independent samples. The magnitude of the impact is estimated based on the eta squares. This square determines the magnitude of the impact, which indicates the magnitude of the difference between the groups, and not just whether the difference is random or not. This square is equal to 0.254, which is an extremely large influence, which confirms that there is a statistically significant difference in the mean value between the observed groups.

We observed whether there are statistically significant differences in staying in Serbia in relation to the country from which the respondents travel. A t-test of independent samples was used to examine the differences in relation to the country from which the respondents travel (Tables 11 and 12). The T-test of independent samples is used to compare the mean value in relation to two different groups that are distributed according to how long they remain in Serbia.

Table 11. Descriptive statistics

Group Statistics					
	For how long are you staying in Serbia	N	Mean	Std. Deviation	Std. Error Mean
Where are you travelling from?	1-5	47	4.13	1.941	.283
	6 and on	53	4.36	2.474	.340

Source: Authors' calculations

The group information is checked first (Table 11). From the table we see that the total number of respondents is 100 of which 47 respondents stay 1 to 5 days while 29 respondents stay longer. The table also shows the mean values and standard deviation for each group separately.

Table 12. T-test of independent samples

Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means					
							Mean Differenc	Std. Error	95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	e	Difference	Lower	Upper
Where are you travelling from?	Equal variances assumed	5.688	.019	-.514	98	.608	-.231	.449	-1.121	.660
	Equal variances not assumed			-.522	96.617	.603	-.231	.442	-1.109	.647

Source: Authors' calculations

By T-test of independent samples, we observed whether there are statistically significant differences in residence in Serbia in relation to the country from which the respondents come (Table 12 and Graph 4).

In our example, the assumption of equality of variance is violated because the significance level of Levine's test is p = 0.019 (which is less than the significance threshold of 0.05), based on which we conclude that our sample is heterogeneous and the results are observed from the second order. "). The level of significance of the t-test is p = 0.608, which is higher than the threshold of significance (0.05), based on which we conclude that there is no significant statistical difference in the mean values in relation to the stay of respondents in Serbia.

We then calculated the magnitude of the impact in the t-test of the independent samples. The magnitude of the impact is estimated based on the eta squares. This square determines the magnitude of the impact, which indicates the magnitude of the difference between the groups, and not just whether the difference is random or not. This square is equal to 0.0026, which represents an extremely small influence, which confirms that there is no statistically significant difference in the mean value between the observed groups.

We observed whether there were statistically significant differences in the country from which the respondents came in relation to the sense of security in the country they came from regarding the coronavirus. One-factor ANOVA of independent samples was used to examine differences in relation to the sense of security in the country from which the respondents travel. A one-factor ANOVA of independent samples is used to compare the mean with respect to three or more different groups distributed according to which country the respondents come from.

Table 13. Descriptive statistics

Descriptives								
Have you felt safe in the country you come from regarding the Corona virus?								
					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
China	12	.50	.522	.151	.17	.83	0	1
Italy	20	.60	.503	.112	.36	.84	0	1
Germany	8	.38	.518	.183	-.06	.81	0	1
France	13	.46	.519	.144	.15	.78	0	1
Russia	13	.00	.000	.000	.00	.00	0	0
Turkey	13	.00	.000	.000	.00	.00	0	0
USA	14	.14	.363	.097	-.07	.35	0	1
UAE	7	.00	.000	.000	.00	.00	0	0
Total	100	.29	.456	.046	.20	.38	0	1

Source: Authors' calculations

The group information is checked first (Table 13). From the table we see that the total number of respondents is 100, of which the most respondents come from Italy (20) and then from the United States (14) while the least number of respondents come from the UAE (7). The table also shows the mean values and standard deviation, minimum and maximum for each group separately.

Table 14. Homogeneity test of variance

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Have you felt safe in the country you come from regarding the Corona virus?	Based on Mean	53.178	7	92	.000
	Based on Median	4.671	7	92	.000
	Based on Median and with adjusted df	4.671	7	48.039	.000
	Based on trimmed mean	43.239	7	92	.000

Source: Authors' calculations

We then examined the homogeneity of variance and in our example the assumption of equality of variance was violated because the significance level of the Levine test was $p < 0.0005$ (which is less than the significance threshold of 0.05) on the basis of which we conclude that our sample is heterogeneous (Table 14).

Table 15. One-factor Anova of independent samples

ANOVA					
Have you felt safe in the country you come from regarding the Corona virus?					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.970	7	.853	5.367	.000
Within Groups	14.620	92	.159		
Total	20.590	99			

Source: Authors' calculations

The level of significance of one-factor ANOVA is $p < 0.005$, which is less than the significance threshold (0.05), based on which we conclude that there is a significant statistical difference in the mean values in relation to the country from which the respondents come (Table 15). We then calculated the magnitude of the effects in the one-factor ANOVs of the independent samples. The magnitude of the impact is estimated based on the eta squares. This square determines the magnitude of the impact, which indicates the magnitude of the difference between the groups, and not just whether the difference is random or not. This square is equal to 0.289, which is an extremely large influence, which confirms that there is a statistically significant difference in the mean value between the observed groups.

Table 16. Comparison between which groups there is a statistically significant difference

Multiple Comparisons						
Dependent Variable: Have you felt safe in the country you come from regarding the Corona virus						
Tukey HSD						
(I) Where are you travelling from?	(J) Where are you travelling from	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
China	Italy	-.100	.146	.997	-.55	.35
	Germany	.125	.182	.997	-.44	.69
	France	.038	.160	1.000	-.46	.53
	Russia	.500*	.160	.046	.01	.99
	Turkey	.500*	.160	.046	.01	.99
	USA	.357	.157	.317	-.13	.84
	UAE	.500	.190	.156	-.09	1.09
Italy	China	.100	.146	.997	-.35	.55
	Germany	.225	.167	.877	-.29	.74
	France	.138	.142	.977	-.30	.58
	Russia	.600*	.142	.001	.16	1.04
	Turkey	.600*	.142	.001	.16	1.04
	USA	.457*	.139	.030	.03	.89
	UAE	.600*	.175	.020	.06	1.14
Germany	China	-.125	.182	.997	-.69	.44
	Italy	-.225	.167	.877	-.74	.29
	France	-.087	.179	1.000	-.64	.47
	Russia	.375	.179	.427	-.18	.93
	Turkey	.375	.179	.427	-.18	.93
	USA	.232	.177	.891	-.32	.78
	UAE	.375	.206	.610	-.26	1.01
France	China	-.038	.160	1.000	-.53	.46
	Italy	-.138	.142	.977	-.58	.30

	Germany	.087	.179	1.000	-.47	.64
	Russia	.462	.156	.074	-.02	.95
	Turkey	.462	.156	.074	-.02	.95
	USA	.319	.154	.438	-.16	.79
	UAE	.462	.187	.222	-.12	1.04
Russia	China	-.500*	.160	.046	-.99	-.01
	Italy	-.600*	.142	.001	-1.04	-.16
	Germany	-.375	.179	.427	-.93	.18
	France	-.462	.156	.074	-.95	.02
	Turska	.000	.156	1.000	-.48	.48
	USA	-.143	.154	.982	-.62	.33
	UAE	.000	.187	1.000	-.58	.58
Turkey	China	-.500*	.160	.046	-.99	-.01
	Italy	-.600*	.142	.001	-1.04	-.16
	Germany	-.375	.179	.427	-.93	.18
	France	-.462	.156	.074	-.95	.02
	Russia	.000	.156	1.000	-.48	.48
	USA	-.143	.154	.982	-.62	.33
	UAE	.000	.187	1.000	-.58	.58
USA	China	-.357	.157	.317	-.84	.13
	Italy	-.457*	.139	.030	-.89	-.03
	Germany	-.232	.177	.891	-.78	.32
	France	-.319	.154	.438	-.79	.16
	Russia	.143	.154	.982	-.33	.62
	Turkey	.143	.154	.982	-.33	.62
	UAE	.143	.185	.994	-.43	.72
UAE	China	-.500	.190	.156	-1.09	.09
	Italy	-.600*	.175	.020	-1.14	-.06
	Germany	-.375	.206	.610	-1.01	.26
	France	-.462	.187	.222	-1.04	.12
	Russia	.000	.187	1.000	-.58	.58
	Turkey	.000	.187	1.000	-.58	.58
	USA	-.143	.185	.994	-.72	.43
*. The mean difference is significant at the 0.05 level.						

Source: Authors' calculations

One-factor ANOVA found that there was a statistically significant difference between the observed groups but not which groups, which is why we applied a post hoc test to determine which groups there is a statistically significant difference. There is a statistically significant difference between China and Russia, China and Turkey, Italy and Russia, Italy and Turkey, Italy and America, Italy and the UAE.

5. Conclusion

The research examined the knowledge of preventive measures and readiness to travel due to the corona virus epidemic. Based on the conducted research, it was determined that age does not affect the knowledge of prevention measures, ie younger and older people are equally familiar. The survey found that 99% of respondents believe that appropriate preventive measures related to the protection of coronavirus transmission at the airport have not been implemented. Based on these results, we can conclude that the volume of airport traffic has been reduced because people are afraid of getting infected, which is why they cancel scheduled trips. Based on the research, we can conclude that there are statistically significant differences in knowledge of prevention measures depending on the country from which the respondent travels, which leads us to the conclusion that not every country is in the same way introduced to preventive measures.

The feeling of security also varies in relation to the country from which they travel and it can be concluded that the respondents feel less safe in relation to the countries where there are many infected with the corona virus and where a state of emergency has been imposed. As for the time the respondents spend in Serbia, it does not depend on the country from which the respondents travel. Respondents were also found to feel safest in Russia, Turkey, and the UAE. Travel restrictions are especially useful in the early stages of an outbreak. However, travel restrictions may be less effective once the epidemic has spread around the world. The combination of interventions carried out in China has apparently been successful in mitigating the spread and reducing local transmission of COVID-19.

Much further and more detailed work is needed to determine how to optimally balance the expected positive effect on public health with the negative impact on freedom of movement, the economy and

society in general. Understanding the epidemiology and dynamics of transmission of this virus is the key to successful epidemic control. As the COVID-19 pandemic continues to spread rapidly and threaten the health of the population, there is an urgent need for more rigorous research focused on virus mitigation and control strategies.

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Grafovske strukture za vizuelizaciju podataka

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Apstrakt: Mreže su svuda oko nas. Strukture grafova su uspostavljene u jezgru svakog mrežnog sistema, pa se pretpostavlja da se grafovi shvataju kao objekti za vizuelizaciju podataka. Ti objekti rastu od apstraktnih matematičkih paradigmi do informacionih uvida i kanala povezivanja. Izračunate su bitne metrike u grafovima kao što su centralnost stepena (degree centrality), centralnost bliskosti (closeness centrality), centralnost između centralnosti (betweenness centrality) i centralnost ranga stranice i u svima njima opisuju komunikaciju unutar sistema grafa. Osnovni cilj ovog istraživanja je sagledavanje metoda vizuelizacije preko postojećih velikih podataka i predstavljanje novih pristupa i rešenja za trenutno stanje vizuelizacije velikih podataka. Ovaj rad daje klasifikaciju postojećih tipova podataka, analitičkih metoda, tehnika i alata za vizuelizaciju, sa posebnim akcentom na istraživanje evolucije metodologije vizuelizacije poslednjih godina. Na osnovu dobijenih rezultata uočavaju se nedostaci postojećih metoda vizuelizacije.

Ključne reči: graf, veliki podaci, vizuelizacija, mrežna analiza

Graph Structures for Data Visualizations

Abstract: Networks are all around us. Graph structures are established in the core of every network system therefore it is assumed to be understood as graphs as data visualization objects. Those objects grow from abstract mathematical paradigms up to information insights and connection channels. Essential metrics in graphs were calculated such as degree centrality, closeness centrality, betweenness centrality and page rank centrality and in all of them describe communication inside the graph system. The main goal of this research is to look at the methods of visualization over the existing Big data and to present new approaches and solutions for the current state of Big data visualization. This paper provides a classification of existing data types, analytical methods, techniques and visualization tools, with special emphasis on researching the evolution of visualization methodology in recent years. Based on the obtained results, the shortcomings of the existing visualization methods can be noticed.

Keywords: graph, Big data, visualization, network analysis

1.   Introduction

Graph is visually represented and it is sensitive to creative interventions in the art perspective. Graph form is unpredictable enough from the aspect of visual forms, but from the point of big data it is very simple to represent it (Benzi et al., 2015; Diestel, 2000). We considered that the basic characteristic of data is information and that the basic property of this visualization is communication. Schulz et al. stated that there are two main representations: network and hierarchy. Graph drawing is focusing on optimized layouts for node-link-representations of networks, but "information visualization" prefers to work on hierarchies focusing on very large structures, different views and interactivity (Schulz and Schumann, 2006; Vitter, 2001).

Data set that was used for calculation is telecommunication data. We research relations and communications between vertices in graphs and calculate main centralities. Vertices are specific objects such as customers and edges are weighted metrics between them.

Graph theory studies mathematical structures called graphs. The graph is represented by ordered pair G = (V;E), where V is is a finite, non-empty set of vertices (tops, nodes), and E is a set of two-element subsets of set V, i.e. a set of edges (arcs, branches) (Pardalos and Du, 1999). Examples of graphs are

zero graph, trivial graph, simple graph, undirected graph, directed graph, complete graph, connected graph, K-partite graph, disconnected graph, weighted graph, regular graph, cyclic graph, acyclic graph, star graph, multigraph, planar graph, etc.

Graph representations on a computer are different, and each of them depends on the nature of the problem being solved and the computer resources at its disposal (Pardalos and Du, 1999).

1. The adjacency matrix (Figure 1) represents the elements that provide information about whether there are edges in between vertices corresponding to the indices of these elements. Formally, the neighborhood matrix of dimension nxn of G is written as:

$$A_G = \left(a_{\{ij\}}\right)_{(i,j) \in VxV} \qquad (1)$$

Figure 1: *Adjacency matrix*

$$\begin{bmatrix} 0 & 1 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

2. A graph can be represented by a list of neighbors such that each of the vertices of the graph is an element to which a list is formed in which the neighbors of that vertex are placed in the graph.

The concept of Big Data was created in order to solve the problem of a large amount of data that is increasing exponentially in our time. Big data characteristics are commonly represented as "3Vs" and refer to volume, velocity and variety, as a significant feature of big data different from traditional data. Volume refers to the size of the dataset. Velocity, where high velocity is meant, refers to the fact that data should be collected and analyzed quickly as well as in a timely manner. Variety refers to different types of big data that include structured, semi-structured, and unstructured data (Ahmed and Ismail, 2020; Hukkeri et al., 2019).

In addition, the National Institute of Standards and Technology (NIST) added the variability feature and introduced it as "4Vs", which represents changes on the three other features that impact data processing. Then NIST also introduced NIST big data reference architecture (NBDRA). NBDRA consists of five main roles: system orchestrator, data provider, big data application provider, big data framework provider and data consumer. Application provider is responsible for data collection, preparation, analysis, visualization, and access. The framework provider provides the infrastructure and data storage and processing platform (Gao et al., 2020; Levin et al., 2015).

Research related to the Big Data concept, which implies increasing availability of huge amounts of data, in the field of scientific approaches, techniques and visualization tools, is very important. The aim of this research was to look at the visualization methods over the existing Big data and to present new approaches and solutions for the current state of Big data visualization. Existing data types, analytical methods, as well as visualization techniques and tools are classified, with special emphasis on the evolution of visualization methodology in recent years.

In addition to the development of technology, the participation of people with the qualities of logical thinking and reasoning is an important factor in processes involving Big Data. Significant human limitations in the process itself are also immediately apparent. Therefore, the concepts of Augmented Reality and Virtual Reality are considered here so that they can be applied in the process of visualizing Big data. What is most important is the placement of the most important data in the central area of the human visual field. In addition, for the visualization process, it is important to obtain significant information in the shortest possible time and without significant data loss due to human perceptual problems.

2.   Graph in data science

A graph is an exceptional object located in different fields of creation - it basically comes from discrete mathematics and combinatorics, and goes to mathematical programming and operational research. It represents the data that form the keystone for machine learning and artificial intelligence.

In addition to representing the connections between vertices in graph, there is one important issue of graphs that is widely applied in science and industry. The issue address important question about what are the central vertices in graph and consequently, what are most important vertices in graph. Area where is applied researching of most important vertices is centrality measures graph area. Centrality measures have found their role in various applications such as social network analysis, web mining and biology networks.

The most widely centrality measures applications could be established in social network analysis (SNA) where it is explored social structures through relations between people. In SNA people are vertices and relation between people are edges therefore graph of social network is DAG type of graph. Such graph is sparse, oriented and it is obtained on the basis of big data concepts. There are many different centrality measures, but most important are Degree, Closeness, Betweeness, Page Rank, Eigenvector and all they are trying to research what is the most important vertex in graph or subgraph. Researching of the question of visualization according to graph and most important vertices, it is found that visual representation of centrality measures are most significant for big data insights. It is proposed in literature that if it is strong subpattern around vertex, than the vertex is more central in the graph. Measures such as Degree and Betweeness considers subpatterns like edges, paths and cliques (Riveros and Salas, 2020). Value of centrality measures depend on the fact if the graph is weighted and specifically, if the weight is vertex weighted or edge weighted established. All prominent metrics are generalized for weighted case as well as unweighted case.

Formalization of the centralities established Freeman (1978) according to several features that validate for any vertex in graph. These features are number of edges, possibility to reach all the other vertices quickly, and controlling the flow between other vertices.

Degree is the most used of the vertex centrality measure which is using local structure around vertices. In standard graph the degree is the number of edges a vertex has. In an oriented graph, a vertex may have a different number of outgoing and incoming edges, and therefore, degree is split into out-degree and in-degree, respectively.

Closeness is defined as the sum of distances to all other vertices. The intent behind this measure was to identify the vertices which could reach other vertices quickly. A main limitation of closeness is the lack of applicability to networks with disconnected components: two vertices that belong to different components do not have a finite distance between them. Thus, closeness is generally restricted to nodes within the largest component of a network.

Betweenness measure calculates transactions between other vertices. It is calculated under the shortest paths from vertex and it is scaled with the number of pairs of vertices by summation indices. Considering weighted graph edges are labeled in proportion to their capacity, influence, frequency, or similar characteristic, which adds another dimension of heterogeneity within the graph. Strong vertex in a weighted graph is given by the sum of the weights of its adjacent edges.

Page Rank centrality measure is using successfully according to web graph researching. It is created and implemented by Google and it is based on web nature and edge structure as an indicator of each page value. Google proposed a link from page A to page B as a vote, by page A, for page B. But, Google seeks at more than the absolute volume of votes, or links a page receives.

Eigenvector centrality is a measure of the influence of a vertex in a network. It is an extension of degree centrality, but in Eigenvector there are assigned relative scores to all vertices. It is based on the concept of connections to high scoring vertices to the score of the vertex. A high Eigenvector score means that a vertex is connected to many vertices who themselves have high scores.

There are many types of visualization such as bars, line graphs, charts, plots, etc. They could be classified into 2D and 3D structures (Klein , 2010; Olshannikova et al., 2016). The main advantages of

the applied visualizations are complexity in terms of big data, pattern recognition and information retrieval from the point of visualization. It is important to highlight visual structures in the data and present the most important information.

Graph visualizations reveal the connections between finite representation and large so-called infinite data. It is possible to consider big data as divergent structures that aspire to infinite series of information. The graph as a combinatorial object that approximates continuity since it is a visualization structure that provides all important information points. Big data information is modelling through machine learning algorithms, and the best optimization algorithms are graph based algorithms. Popular graph algorithms are: maximal clique, independent set, dominating set, k coloring, depth first search, breadth first search, etc. (Simonetto et al., 2020; Tsouliaset al., 2020).

The relationship between the finite and the infinite in terms of data is only seen through the visual structures that can best be represented by graphs, since other forms of visual graphs and diagrams mainly evoke aggregation data and reporting results. However, raw data cannot be clearly seen using bar charts, scatter plots, histogram charts, box plots, and other available visual forms, Figure 2 (a), (b). Comparation between those charts and graph representation imply that graph visualization is only possible for row Big data (Figure 2 (c)).

Figure 2: Bar chart (a), scatter plot (b) and graph visualization (c)

(a)   (b)   (c)
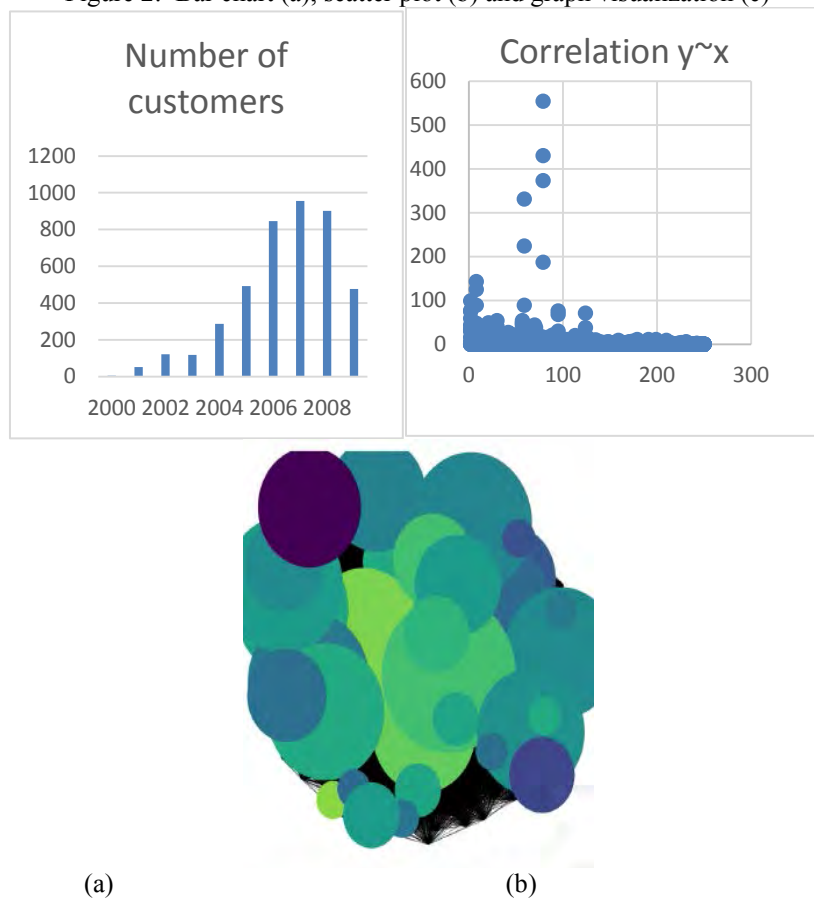
Source: Authors

3. Visual information

In this research we used a Telco data set, which is a population of 2.5 million users of telecommunications services that are connected by edges in relation to the use of voice, sms and gprs services (Figure 3 (a)). The visualization was created in Python 3.6, in a Jupyter notebook. In the case of big telecommunications data, it helps to see the connections as well as the type of graphs that are obtained when changing the user sample. By changing the sample in the population, the visualization changes (Figure 3 (b), (c)).

Figure 3: Graph visualization on total population (a), graph visualization on huge sample (b), graph visualization on small sample (c)

| (a) | (b) | (c) |
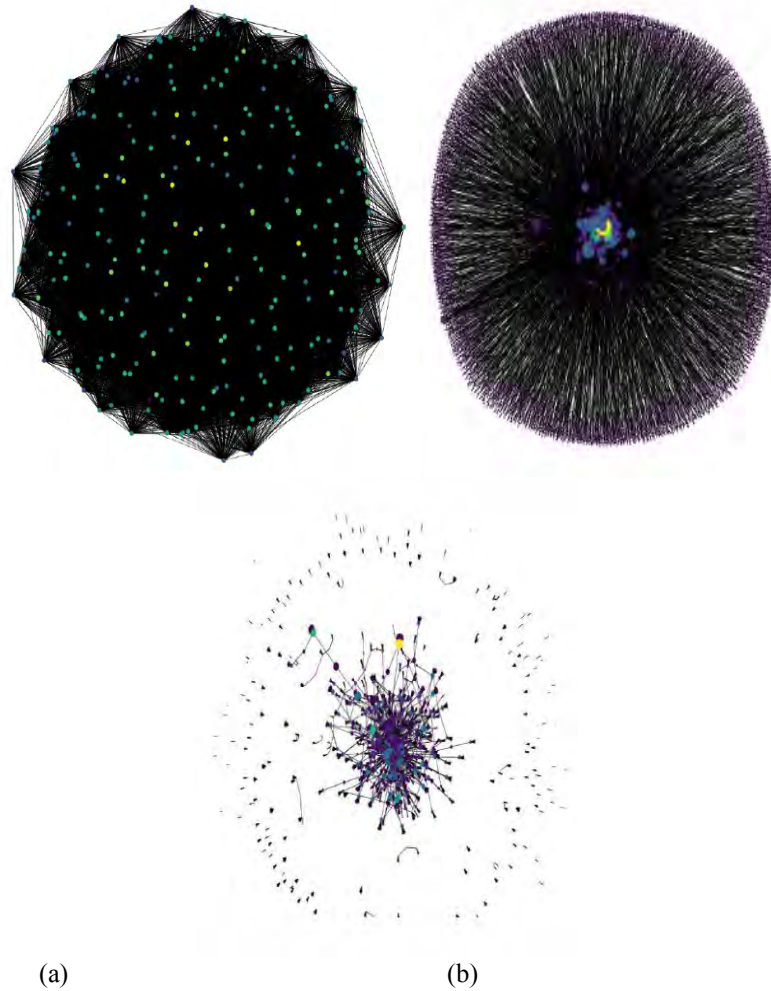
Source: Authors

We give an example of telecommunication based graphs Telco data set where users are connected to each other based on the metrics centrality Pagerank, Degree, Closeness and Betweenness (Diestel, 2000).

PageRank centrality is an algorithm that counts the number and quality of links to a page to determine a rough estimate of how important the website is. It means that more important websites are likely to receive more links from other websites. In Telco data set it assumed that users are similar to web pages, so, the more important user is, he would receive more links from other users (Figure 4).

Figure 4**:** PageRank centrality
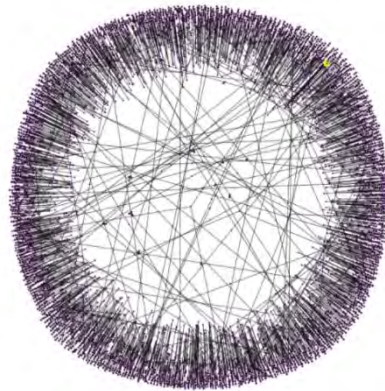
Source: Authors

Degree centrality of a vertex in a graph is the number of edges that are incident to the vertex. In the case of Telco data set which is directed graph, we usually define two separate measures of degree centrality, namely indegree and outdegree (Figure 5).

Figure 5: Degree centrality
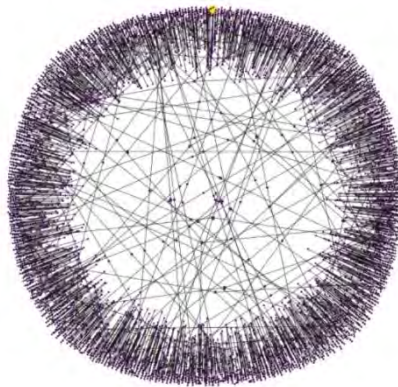
Source: Authors

Betweenness centrality is a measure that present considering of an arbitrary vertex in the path of other vertices. In the case of Telco data set vertices with high Betweenness are influencers in graph control information retrieval (Figure 6).

Figure 6: Betweenness centrality
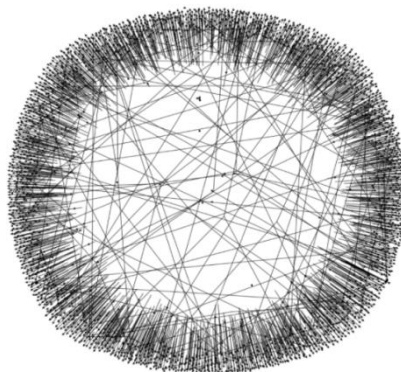
Source: Authors

Closeness centrality present how close a vertex is to all other nodes in the graph. In the case of Telco data set it is calculated as the average of the shortest path length from the vertex to every other vertex in the graph (Figure 7).

Figure 7: *Closeness centrality*

Source: Authors

Significant vertices with their connections present information that are hidden in a big data graph but these information are crucially important for patterns retrieval (Figures 8 (a), (b)).

Figure 8: Pattern retrieval from huge sample (a) and from small sample (b)

(a)   (b)
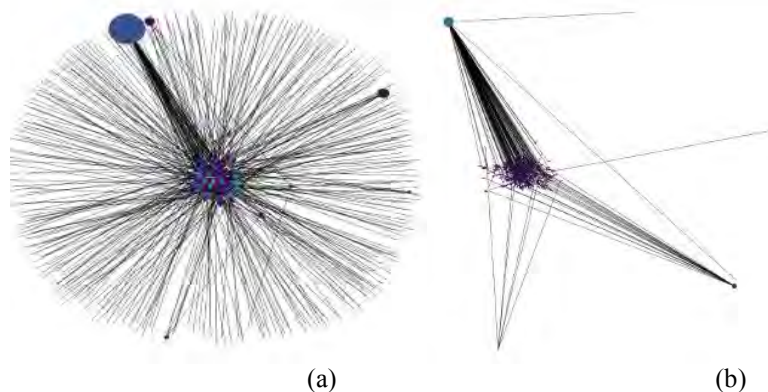
Source: Authors

Predictive decisions about vertex locations and about edge directions from a visual perspective are achieved according to a rough and unprocessed data set.

4.   Summary and Conclusions

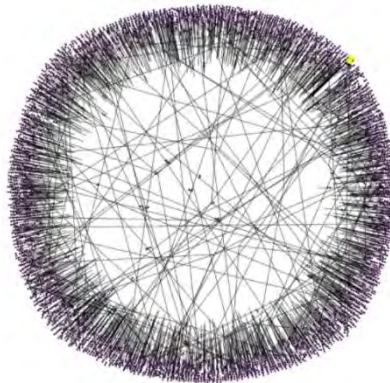The data science algorithms could be established through different models of graphs that involve information within itself and, like the most intelligent algorithm, processes it. The graph algorithm learns from data, finds patterns and predicts decisions depending on the interaction between vertices. Using graph visual applications helps in advance in investigation of data patterns and data structures. In this paper we present specific view of graph visualization such as visualization of calculated graph metrics. This includes calculation of four centrality measures and presentation in visual form. It is considered that this is meaningful and useful visualization for row data metrics and proposal for exploratory view of pattern from metrics.

This research points recognition challenges for the Big data presentation and visualization. Future investigations will go further into connections calculations and materia understanding of unseen Big data. The next steps of our work will be to predict possible visualizations with machine learning algorithms according to prediction of calculated metrics.

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Mogućnosti održivog razvoja malih gradova

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Apstrakt: Početak koncepta održivog razvoja u skladu sa lokalnim ekonomskim razvojem javlja se 70 – tih godina 20. veka kada su lokalne vlasti zapadih zemalja uvidele da njihove lokalne zajednice napušta mobilni kapital, te da se sužavaju njihovi ekonomski potencijali i prostor za zapošljavanje građana. To je stvorilo potrebu da se prvi put krene u ozbiljnu analizu lokalnih ekonomskih potencijala i utvrđivanje načina na koji se oni najbolje mogu iskoristiti, zadržati i razviti, ali i prepreka koje stoje na tom putu, kako bi se ostvario održivi razvoj lokalne sredine. Lokalni ekonomski razvoj posmatramo i kao proces određenih promena, gde se u borbi tržišta, privrede i države sada uključuju i lokalne samouprave, gde se i one kao najniži organ državne uprave prepoznaju kao konkurenti na tržištu i u saradnji sa privrednim sektorom nastoje da budu inovativniji i konkurentiji među sobom.

Ključne reči: lokalni ekonomski razvoj, radna mesta, lokalna samouprava, preduslovi, resursi.

Small-town Sustainable Development Opportunities

Abstract: The notion of sustainable development in a line with local economic development emerged in the seventies of the 20th century when local authorities in the western countries realized that their local communities had begun abandoning mobile capital, which resulted in limiting their economic potentials and opportunities for citizens' employment. This necessitated both a detailed study of the local economic potentials, the determination of best ways to use, maintain and develop them, and a thorough examination of the impediments to the local community's economic development. Local economic development is also seen as a process of certain changes, where, in the competition for the market, economic and country dominance, local governments, despite their status as the lowest level of public administration, are recognized as competitors in the market and, in collaboration with the economic sector, try to be more innovative and more competitive among them.

Key words: local economic development, jobs, local government, prerequisites, resources

1.   Introduction

Many different economic scientists, professional groups, and institutions have attempted to construct a universal definition of local economic development by studying and defining it, but even today there isn't one, which indicates the topic's complexity. The development process and the acceptance of innovations are characterized by complexity, dynamism and uncertainty. The innovation process involves a large number of factors that are again influenced by other factors, so the process is very complex. The dynamics of this process is reflected in the interaction of factors and their changes over time (Silvestre and Țîrcă, 2019).

We can describe the process of local economic development as collaboration between individuals from small and large cities and municipalities, as well as public figures from the business and nongovernmental sectors, to improve economic development circumstances and create new job opportunities. They develop and maintain a dynamic entrepreneur culture in this way, as well as a new community and business climate, to enhance the quality of life in a local community. Today, cities are complex entities characterized by an increasing number of people, companies, various modes of transport, services, etc. Also, this growth is accompanied by increased technical, social, economic and organizational problems, which directly affect sustainable development (Neirotti et al., 2014). The

following thesis (characteristics) of local economic development mentioned in the text above is as follows:

- Local economic development is a process (a change on a local level).
- The goal of the economic development is to increase employment rate and income per capita, where local economic development represents the same but on a local level of self-government.
- Collaboration between the private and public sectors can help to accelerate economic development.

Local economic development requires a strategic plan as well as specialized resources.

2. Local economic development (LED) and local sef-goverments in Serbia

The concept of local economic development became popular in Serbia after the so-called fifth November changes, but more significant shifts in this field occurred after the global economic crisis in Serbia took place and when it became apparent that all social potentials must engage in order to stabilize economic growth, while the main problems of the citizens were unemployment (43%) and poor living standards (20%). Another important event in recent Serbian history is the change of the Law of Financing Local Government, from 2011, where the percentage of taxes increased and incomes that were left for the local government went from 40% to 80% (excluding the city of Belgrade), which gave the local governments big means compared to the previous period, but also motivation to work towards increasing the number of employed in their municipality (Begović et al., 2006).

However, not even then, did all local governments in Serbia start to work on their economic development and competition. Some local governments had begun putting those ideas into practice much earlier and, as a result, they were more successful during the transition period, being classified as local governments of the first and second categories by the Ministry of Public Administration and Local Self Government of the Republic of Serbia (Stojković, 2017). Then, other governments began considering means and the methods for alluring investors and creating job opportunities, but some still haven't tackled the issue, and today those fall into the fourth and fifth category of the local self-governments, i.e. they are underdeveloped and destroyed municipalities.

However, the local government's initiative is not the most important aspect or the only factor that influences the success or failure of self-government; there are other factors that influence the development of a municipality, and they are as follows:

- Geographical location, i.e., where the local self-government is located (practice has shown that municipalities that rely on a highway or have an airport nearby, ports, railways, or other transportation stations have far more progressive growth than municipalities that do not.
- Natural resources on the territory of the local government.
- The inherited economical and infrastructural conditions from the preceding period

Local authorities consider neighborly activism key source information on political opportunities. In this way, mayors have an insight into the public opinion of the local community (Einstein et al., 2019). Apart from the factors over which local governments have very little control over, there are certain specific conditions that management can influence directly or indirectly (Kalač et al., 2017):

- The private sector does not restrain the public sector (public sector with timely reactions encourages the development of the private sector and entrepreneurship).
- Proactive and entrepreneurial public sector (the establishment of business incubators, industrial parks/zones, the encouragement of public-private partnerships with the local government).
- A larger group of actively engaged human resources to promote local economic development
- The establishment of a separate organization within local government devoted only to economic development.

Along with all of the factors and conditions that affect local government, we should mention that the size of the local government is indirectly linked to a municipality's financial capacity, which is also

linked to the size of city administration, i.e. human resources that can be involved in economic developmental work in the way that there are a number of segments that more or less affect the development (Živković, 2018).

In conclusion, the aforementioned statement emphasizes how complicated local economic development is and how many variables must be considered in order to come up with a solution as to how to improve the quality of life of its residents (Begović et. al., 2006).

2.1 The municipality of Opovo

2.1.1 The main characteristics of the local government

Physical features - geographical characteristics: the Municipality of Opovo is one of the smaller municipalities in both the Autonomous Province of Vojvodina and the Republic of Serbia. The municipality consists of four populated areas: Opovo, Sakule, Baranda, and Sefkerin, and it covers a total area of 203km^2, out of which 16,772 hectares are agricultural land and 1,313 hectares (10% of the total surface area) are woods. When it comes to the agricultural land, chernozem (the black soil), i.e. the first-class soil for agricultural farming prevails (64%). In addition, there are also alluvial plains along the Tamis River's shore, excellent for olericulture, meadow rich soil, quagmire, and saline soil in the land's composition. The land is suitable for organic agriculture which has been on the rise in the Republic of Serbia during the the last decade (Kranjac & Tomić, 2017; Ilić-Kosanović, et al., 2019).

The municipality belongs to the moderate continental climatic zone, with an average annual air temperature of 11 degrees (average temperature in January is - 1, in July 22.7 degrees). Kosava as the dominating wind, and an average rainfall of 610mm, with the most rainfall in May and June, and the least in September (Roljević et al., 2017).When it comes to the hydrological features, there is a 29km long river Tamis, which circulates through the municipality.

Furthermore, there are artificial lakes and canals. The lakes were built to meet the needs and demands of fishponds that take up a total surface area of 1.005 hectares out of which 560 hectares belong to the area of Sakule, 270 to Baranda, and 175 to Opovo (Strategija lokalnog održivog razvoja, 2015).

Another important fact is that Opovo is situated in close proximity to the city of Belgrade (32 km), Pancevo (28 km), and even Zrenjanin (40 km) and Novi Sad (77 km). The municipality relies on the state route of order 13 (IB 13) Zrenjanin- Beograd, and by having built the Pupin Bridge, it is possible to arrive from Nikola Tesla airport to the motorway (E75) in less than an hour.

Demographic characteristics: The local population is the major driving force behind the territory's development and the cause for the creation of all strategical courses of actions of a local government (Zakon o lokalnoj samoupravi, 129/07, 83/14). This is why it is essential to examine the population from both quantitative and qualitative aspects (characteristics, structure, etc.). According to the census, all four inhabited areas of the municipality are experiencing a population decline. However, the decrease is moderate, as it is typical of municipalities in the Vojvodina Autonomous Province (Romer, 1996).

Table 1: The municipality of Opovo's population

Naselje	1991	2002	2011
Opovo	4717	4693	4.527
Baranda	1660	1648	1.544
Sakule	2188	2048	1.847
Sefkerin	2705	2627	2.522
Total:	11270	11016	10.440

Source: Republic Statistical Office

Table 2. The population according to census and the average population growth rate

The settlement	Year of census							Average growth rate	
	1948	1953	1961	1971	1981	1991	2002	1948/02	1981/02
Baranda	1917	1934	1841	1671	1656	1690	1648	-0,28	-0,02
Opovo	4396	4415	4254	4482	4769	4781	4693	0,12	-0,08
Sakule	2908	2822	2725	2525	2280	2206	2048	-0,65	-0,51
Sefkerin	3035	3134	3028	2837	2836	2711	2627	-0,27	-0,37
Total	12256	12305	11848	11515	11541	11388	11016	-0,20	-0,22

Source: Local sustainable development strategy of the municipality of Opovo

Regard educational background in relation to gender qualification, it can be stated that a percentage of both men and women lack elementary education. When compared to males, more women have a high level of education, yet this number is still unsatisfactory when it comes to emancipation. The primary causes of this condition, which must be addressed in the future, are the existing traditional system of values, male and female job divisions, poor material status, and the effect of agriculture.

According to the National Employment Service, there are more unemployed women than unemployed males in the municipality of Opovo. Even though they have the same educational background and professional skills as their male colleagues, women tend to take longer to get jobs and have a harder time climbing the social ladder. One of the reasons why it is difficult for women to pursue a profession and why they are not regarded equally in society is the aforementioned social heritage in the form of traditional values and conventions, are still present (Statut opštine Opovo, 2012). As a result, it is vital to encourage women to be ready to make their own decisions and thus stop being driven by old social norms, while also acting on behalf of the entire local government to eliminate existing gender stereotypes.

Table 3: The unemployed in the municipality of Opovo

Professional qualifications level	Total	Men	Women
NK-I	904	380	520
PK-II	88	35	58
KV-III	495	286	208
SSS-IV	350	130	220
VKV-V	15	8	7
VSS-VI	27	12	15
VSS-VII	21	14	7
Total	1,900	865	1,035

Source: Local sustainable development strategy of the municipality of Opovo

Women's contingent work ranges from 15 to 54 years old, while men's ranges from 15 to 69 years old, which makes 63.3% of the population. The overall number of active people is 5,270, with a general rate of activity of 47.8%. The total contingency work utilization rate is 75.6%.

According to the most recent census, 27.7% of the population is agricultural population, out of which 59.6% is actually active in the industry. Based on everything, we can infer that the general demographic situation on the territory of the municipality of Opovo is rather unfavorable. It is imperative that all social classes participate in initiating demographic processes because the analysis has shown that the current situation is unfavorable, as evidenced by depopulation in all inhabited areas, negative population growth, an unfavorable age structure, a high aging index, and youth migrations in recent years, particularly among those with a high level of education (Stojanov et. al., 2011).

2.1.2 Institutions on the territory of the municipality of Opovo

2.1.2.1 Healthcare institutions

A number of healthcare institutions are located in the municipality of Opovo. In 2015, the World Health Organization published data that over 10 million deaths a year could be avoided if health interventions were performed in a timely manner (Guo et al., 2017). The health center Opovo provides basic medical care to the municipality's 10 440 residents. There are health centers in all populated localities (Opovo, Sefkerin, Baranda, Sakule) that include a general medicine treatment center, a general dental clinic, and a pharmacy. In Opovo, there is a 24-hour emergency care service as well as specialised services (pediatricians, internists, x-ray services, and a laboratory). When compared to the normal services provided by the Health Insurance Fund, all of the aforementioned services are highly equipped and offer a greater variety of utilities. When faced with life threatening cases, the ambulances immediately transport patients to the hospital of Pancevo, or Belgrade Emergency Clinic, which is 35 kilometres away from Opovo. A new information system was introduced in the health centre Opovo, which enabled better management of medical records and better monitoring of the statistical indicators of community health (Stojanović et al., 2017).

The health center Opovo has 85 employees, including 69 unspecified-duration workers, 16 fixed-duration workers, and 7 pharmacy workers, who completely meet the needs of the municipality's users.The health centre Opovo is largely funded by the Health Insurance Fund, as well as the local self government's budget, and it is also an indirect consumer of the autonomous province's healthcare secretariat. When it comes to the local government's budget, the health centre creates a financial plan that it then submits to the city administration, which takes the matter into consideration and makes the decision.The local budget's resources are typically utilized for material expenses, like regular repairs and maintenance, as well as the acquisition of modern equipment, to ensure that the health center's working conditions and services are thorough and of high quality.

2.1.2.2 Education

Education can be considered the starting point of economic growth of a country, city and local communities. Education eliminates poverty and can be considered a socio-economic category (Liu et al., 2021). Also, education is creating human capital, which is also a determinant of cultural characteristics.

When it comes to the learning facilities on the municipality of Opovo's territory, there is an elementary school, *Dositej Obradovic*, as well as a preschool educational institution, *Bambi*, with separate sections in Sakule, Sefkerin, and Baranda. There are no high schools or colleges in the area.

Table 4: The number of pupils in the elementary school *Dositej Obradovic*

Settlement	Level								
	I	II	III	IV	V	VI	VII	VIII	Total
Opovo	40	53	38	43	49	49	54	62	388
Baranda	28	14	23	15	22	25	23	16	166
Sakule	21	15	20	17	18	23	19	21	154
Sefkerin	32	22	32	36	26	34	30	26	238
Total	121	104	113	111	115	131	126	125	946

Source: Elementary school "DositejObradović" Opovo

The elementary school in Opovo was built in 1982 and has 13 classrooms with equipped rooms, an editorial office, canteen, library with study hall, adequate teaching staff, utility workers, the principal, secretary, pedagogue, counselors, dental clinic, boiler room with related heating equipment, and two community work rooms. The school has a total of 4.462 m^2 of surface area. The school in Baranda, built in 1982, contains 8 classrooms, a multimedia library, a staff room, and a secretary's office. The boiler room and preschool have their separate sections in the building. The overall size of the property is 1,443m^2.

Sakule's school building was built in 1961 and renovated in 1988. It has nine classrooms as well as rooms for the secretary, employees, and utility personnel. The boiler room is located in the basement of the school building, and the kindergarten occupies a part of the school's building. A library is also present. 1618m^2 is the total surface area. The Sefkerin's school building was built in the middle of the nineteenth century and was upgraded in 1964. It contains ten classrooms, a recently built gym hall for physical education classes, a utility workers' room, a staff room, and a secretary office, with the heating furnace in a separate building. The overall dimensions of the property are 1,113m^2.

The fact that all schools have informatics classrooms with full computer equipment, as well as gym halls with locker rooms supplied with sports requisites is worth noting. All four schools' bathrooms have recently been renovated to meet current standards, and new features such as additional classrooms for specialized topics, libraries and classrooms for the students' parliaments have been added. Between 2011 and 2015, thermal insulators were installed in three out of four schools with the help of the local government and sponsors. This budget also assisted in the conversion of all four schools' heating systems to pellet heating, which allowed the municipality to save a considerable amount of money. The schools are funded by the Ministry of Education and also by the support of the local government in the areas of material and current costs, equipment, construction works, etc.

Preschool teaching methods and education have a long history, and children are almost completely familiar with the curriculum before entering elementary school, whereas day-long stays at institutions have been practiced since 1987. In Opovo, there is a building that was constructed particularly to correspond to the content of preschool teaching education methods. The educational program is carried out in four classrooms, and the building includes a central heating system with a separate boiler room. Preschool education is generally provided in objects that are connected to or in close proximity of elementary school buildings.

2.1.2.3 Social Politics

On November 1, 2006, the Opovo Municipality's Center for Social Activity began its autonomous work. Countries around the world differ in their development and concept of primary protection. The reasons are many; there are differences in wealth, politics, culture, etc. In this regard, the state of social health insurance is characterized by insufficient availability and continuity of primary care (Kringos et al., 2013). Among the social staff are a psychologist, a pedagogue, a social worker, and administrative workers. Their work includes the payment of benefits to socially endangered families, the placement of neglected children in orphanages, the placement of the elderly in nursing homes, the payment of benefits and complete coverage of socially endangered citizens' requests, the adoption of children into foster families, the resolution of broken family relationships, domestic violence, and juvenile delinquency.

2.1.2.4 Humanitarian organizations

The Red Cross is a municipality-run organization with one employee dedicated to assisting refugees and internally displaced persons. According to the 2005 census, there are 219 refugees and exiled people on the territory of the municipality of Opovo that come from the Socialist Federal Republic of Yugoslavia former republics, as well as 73 displaced people from the territory of Kosovo and Metohija. The aid mainly comes from the local government's residents in terms of clothing and food for long term needs, as well as from the financial support of the Commissariat for Refugees and Migration.Apart from that, the Red Cross organizes voluntary blood donation campaigns (four times a year) in all four populated areas, offers assistance for the new born babies and conducts other thematic and educational activities.

2.1.2.5 Communal activities

The Mladost Opovo Public Utility Enterprise serves the whole Opovo Municipality, including Opovo, Sakule, Baranda, and Sefkerin. The participation of women in community decision-making processes can be observed through civic activities. Based on the views of the women participants in the Regenerated Freirean Literacy through Empowering Community Techniques) study, it is concluded that the implementation of the REFLECT project in the local community resulted in the empowerment of women, but not in all spheres of society, such as politics (Akkas, 2014). PUE Mladost is a municipal company responsible for water production and distribution, as well as utility services such as the

maintenance of parks and cemeteries, winter parking areas, bus stations and stops, and street light control system in all four populated areas. These communal activities are managed by a team of 28 people.

3. Economic characteristics and infrastructure

The first thing worth mentioning is that the degree of economic development of a certain area is determined by a number of factors, one of which is an individual's gross earning.

Table 5: Gross national income per capita in dinars

	National per capita income in dinars					
	2002	level2002 PC=100	2003	level2003 PC=100	2004	level2004 PC=100
Republic of Serbia	76349	100.0	88283	100,0	118947	100,0
Province of Vojvodina	89738	117.5	100854	114,2	132625	111,5
South Banat District	98607	129.2	142923	161,9	156928	131,9
Opovo	60467	79.2	67023	75,9	113447	95,4

Source: Local sustainable development strategy of the municipality of Opovo

In terms of overall revenue earned per capita, the South Banat District, which includes the municipality of Opovo, is classed as underdeveloped. The question is: is the current pattern of production applicable and sustainable for an industry that favors insufficient domestic knowledge and prevents research at the local level in favor of the rapid expansion of internationally integrated production (Cimoli and Katz, 2003)? Opovo is ranked sixth out of the district's eight municipalities (Stojanov et. al., 2011). According to this indicator, The Municipality of Opovo falls under the districts which are considerably below average when compared to the other inhabited areas of the South Banat District, AP Vojvodina and the Republic of Serbia (Naled, 2018). In many underdeveloped communities, the informal sector has emerged as a key factor leading to underdevelopment. This obstacle to economic progress is reflected in the acquisition of assets and the impact on structural changes in production and industry (Cimoli and Dosi, 1995).

Two criteria are used to illustrate the economic structure of the municipality of Opovo: national income as a macroeconomic measure of progress and the number of people employed in certain fields. Fiscal expansions are linked to public debt but nevertheless allow for an improvement in the dynamics of real GDP, labor productivity and employment (Caiani et al., 2018). The national gross income represents the newly realized value of money during the year, and the statement relies on the concept of material production where the enterprise data is collected via annual financial reports. Special field researches are used to make statements on private agricultural ownerships and private activities (Lokalni ekonomski razvoj, 2001).

Table 6. National gross income measured by sectors

	000 din	%
Total	1255179	100
Agriculture and Forestry	731013	58.24
Fisheries	1158	0.09
Manufacturing industry	186573	14.86
Production and distribution of water, gas and electricity	151885	12.10
Construction	4198	0.33
Trade	71329	5.68
Hospitality management	5036	0.40
The transportation and storage services sector	93011	7.41
Real estate	10976	0.87

Source: Local sustainable development strategy of the municipality of Opovo

By looking at the table, we can conclude that agriculture earned more than 58% of the total national gross income, followed by the manufacturing industry with around 15%, and after which comes the

production and distribution of electrical energy, gas and water. Construction, fishing, hotels, restaurants, and other businesses account for a minor portion of revenue throughout that time period (Molnar, 2016). The structure of the workforce in specific sectors may be used as one of the indications of the municipality's economic structure.

Table 7. The employed according to different sectors

TOTAL	1214	100.0%
Women out of the total number	470	38.7%
Employed by companies, institutions, organizations	819	67.5%
Women employed by companies, institutions, organizations	311	25.6%
Economy	571	47.0%
Non-economic activities	248	20.4%
Agriculture and forestry	272	22.4%
Fisheries	40	3.3%
Manufacturing industry	131	10.8%
The production and distribution of electrical energy, gas and water	30	2.5%
Wholesaling and retail trade	57	4.7%
The transportation and storage services activities	22	1.8%
Financial intermediation	16	1.3%
Real estate activities and intermediation	4	0.3%
Public administration and social security	48	4.0%
Education	102	8.4%
Health and social care work	93	7.7%
Other communal activities	6	0.5%
Independent entrepreneurship	395	32.5%
Employed women in the aforementioned sector	159	13.1%

Source: Local sustainable development strategy of the municipality of Opovo

Also, the majority of the employed people are small business owners who usually work in the secondary and tertiary sectors (Paunović, 2017). Despite that, an unfavorable state prevails in the terms of the complete absence of industrial production or manufacturing, which is the powerhouse of every municipality. In the last few years there have been significant positive changes on the territory of the municipality when it comes to the economic domain. Company Agros d.o.o. which has been successfully operating for a decade in the municipality is beginning to branch out, dairy factory Maestro located in Sakule is slowly beginning to move out of the business blockade and renew its production plants. The local government recognizes the potential of the local economic development and it is starting to work on forming industrial zone Opovo - Baranda.

The business/industrial zone Baranda is being built alongside the state road 124. The overall surface area of the complex is 15.4642 hectares. The complex is divided into two halves by a canal that flows through the middle. Immediately after the work zone is established, two investors (firms Niba woods and ADC Plast d.o.o.) will begin their activities, employing about 100 employees. However, an approach to the industrial zone visualization was just introduced at the beginning of 2016, and clear parameters for future investment in the complex to attract investors were established.With this concept, which incorporates a river canal that runs through the middle of the industrial zone, two bridges will be built to connect two main roadways, providing access to all of the parcels (Stojanović et. al., 2017.). A walking route and a stretch of greenery will be built alongside the canal, while long-term parking lots will be built along the key transit lines. Every parcel will be fenced, and there are plans to construct ramps at each entry.

When it comes to commercial production facilities, there are plans for a distribution-logistics center, fruit and vegetable preparation facility with a warehouse, silos, wooden furniture manufacturing, textile manufacturing, a plant for paper production, and an auto components factory. In addition to business facilities, the project also includes the construction of an electrical substation in the complex, as well as an anti-hail rocket station and wastewater treatment plants all of which would be built on public construction property as a local self-government investment in future investors.

Furthermore, a special project developed a conceptual technical solution to connect the settlements of Opovo and Baranda with a pedestrian and bicycle trail, given that the distance between these two places is only 3 kilometers which would allow fellow citizens from the municipality of Opovo to reach the industrial zone by bicycle or on foot as they do even now.

Figure 1. Industrial zone Baranda

Source: Department of Construction, Urban Planning and Environmental Protection of the Municipal Administration of Opovo

Only through such projects can the municipality of Opovo compete with other local governments, as it strives to use the geostrategic potential of nearby urban centers as well as good transportation connections (Ubavić, 2015).

4. Cultural and social characteristics

The Jovan Popovic Gallery is one of the most memorable features of the municipality of Opovo. In 1970, the gallery was built as a specialized facility for the display of both famous and infamous artists' work. Throughout the year, the gallery hosts a variety of shows, ranging from museum exhibits to contemporary art. The gallery also hosts art colonies, which were dubbed *the most massive assembly of both foreign and national* artists in 2016. More than 300 works of art are on display at the gallery.

The municipality's public library has 4 separate branches in every municipality's inhabited area and it has a total fond of 46,250 books, out of which 36,233 are for adults and 9,927 for kids. There is an architectural inheritance which is an old school building more famous as Villa Helena.The building is more than 100 years old, and it is adequate for being invested in in the sense of opening a museum, a cultural center or something similar (Rapaić, 2017).

On the territory between Opovo and Sefkerin there is an archaeological site, where some objects made of fired clay were discovered (a figurine, altars, bowls) dating from 2500 B.C These objects are presently in the depot of the museum in Pancevo, although there is an intention to have them exhibited in an adequate place in Opovo, in that exact part of the old school building ie the Villa Miss Helena. There are quite a few local manifestations out of which the most frequently visited ones are *Fijakerijad*a which typically takes place during the month of May in Opovo, then rock festival also taking place in Opovo, *the Shepards days* in Sakule, *Gulasijada* contest in Baranda and many more similar manifestations with different themes ranging from traditional to modern, sports and recreational, and urban. We should mention that the initiators of almost all social activities in the municipality are citizens' committee, while the funding comes from the local government. However, the territory has pretty diverse social and cultural activities during the year.

5. Conclusion

When we consider the potentials, resources, and objects, Opovo, while being one of the smallest towns, has all of the requirements for steady and relatively strong economic development. It is situated at an excellent geo - strategic location, near to major cities and roads, and the river Tamis' waterway provides opportunities for both economic and tourist development. Since the municipality's industry isn't developed or intense, the environment is ecologically well preserved because there isn't a large source of potential great pollution. Institutionally local self-government is effective in a way that it covers health protection, primary education, and utility work. It is ensured that social protection and functionalities are protected. It is advisable to intensify actions on promoting the work zones even

though the prerequisites for attracting investors have already been established as well as for starting operations and entrepreneurship which are bound to result in a greater rate of employment. Cultural objects and ongoing events should follow the interests and needs of their inhabitants (cinematic projections, theater, concerts, exhibitions, book promotions).

The importance of local economic development is recognized by the local government, and it is being worked on through:

- the development of small and midsize enterprises,
- the development of villages and agriculture,
- the development of tourism,
- attracting direct investors,
- improving the quality of life for its residents.

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Percepcija *eko mode* profesora, administracije i Studenata na visokoškolskim ustanovama – Slučaj Fakulteta za inženjerski menadžment

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Apstrakt: Modna industrija je postala globalizovana, sa pojavom tzv. *brze* mode (brza hiperprodukcija i brza potrošnja). Ovaj trend brze mode ima dubok negativan uticaj na životnu sredinu (zagađenje vode i zemljišta, nedostatak reciklaže, itd.). Drugo ozbiljno pitanje vezano za modnu industriju su uslovi rada (prisilni i dečiji rad). Međutim, pojavljuju se novi trendovi kao što su *održiva moda*, *spora moda*, *eko moda* i etička moda koji pokušavaju da započnu da rešavaju te probleme. U ovom radu analizirana je percepcija nastavnog osoblja, administracije i studenata o *eko modi* na primeru Fakulteta za inženjerski menadžment, Beograd, Srbija. Statistička ANOVA analiza je sprovedena korišćenjem softverskog paketa SPSS18 za istraživanje percepcije različitih aktera visokog obrazovanja o *eko modi*. Rezultati pokazuju da ne postoji statistički značajna razlika u percepciji eko mode kod različitih grupa. Završni deo rada iznosi mišljenja prikupljena kroz intervjue. o najvažnijim elementima *eko mode* koji doprinose odlukama potrošača za kupovinu *eko* odeće.

Ključne reči: eko moda, održiva moda, percepcija, visokoškolske ustanove, nastavno osoblje, administracija i studenti

Higher education Faculty, Administration, and Students' Perceptions of *eco fashion* – Case of the School of Engineering Management

Abstract: Fashion industry has become globalized, with the emergence of so called *fast* fashion (*fast* overproduction and *fast* consumption). This ongoing *fast fashion* trend has profound negative impact on the environment (water and land pollution, lack of recycling, etc.). The other serious issue connected to the fashion industry are labour conditions (forced and child labour). However, the new trends are emerging such are *sustainable fashion, slow fashion*, *eco fashion*, and *ethical fashion* that are trying to start solving those problems. In this paper faculty, administration, and students' perception on *eco fashion* is surveyed on the example of the School of Engineering Management, Belgrade, Serbia. The statistical ANOVA analysis has been implemented by using software SPSS18 package to explore the perceptions of various higher education stakeholders of *eco fashion*. The results show that there is no statistically significant difference in the perceptions of different groups of *eco fashion*. The final part of the paper presents opinions on the most important elements of *eco fashion* for the consumers' purchasing decisions collected through the interviews.

Keywords: eco fashion, sustainable fashion, perceptions, higher education institutions, faculty, administration and students

1. Introduction

Circular economy has been defined as the economic space "where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized" (EC, 2015). *Sustainability* can be defined as a "balance of what is taken from the environment and what is renewed" (Gordon and Hill, 2015), and sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own

needs" (UNESCO; 2021), the concept was first recognized by UN in 1972 (Dong, et al., 2014). This is an important issue especially for the fashion industry with growing of so called *fast (*Fung, et al., 2018; Heekang and Hyun-Hwa, 2018) production and consumption trends that have substantial negative impact on the environment (like water and soil pollution). The expression *sustainable fashion* has emerged exploring the possibilities of transforming fashion industry through saving the environment and becoming more ethical from design stage to production and sales (Gordon and Hill, 2015), including eco design, waste management (especially *zero waste* concept), carbon emissions reduction, and job creation (Bocken, at al., 2016; Valenzuela and Böhm, 2017).

Fashion industry is one of the fastest growing industries in last decades together with automobile and high technologies industries (House of Commons, 2019), and is adding more than $2 trillion to the global economy every year, with outsourcing model of producing that creates the profit margin larger than ever before (Cimatti, 2017). Nevertheless, it loses about $500,000,000 each year because of poor disposal and inadequate recycling (UN, 2021). Even though some big fashion brands are more dedicated to clothes recycling, there are still huge difficulties in recycling process of mixed materials that make it almost impossible at this point (London College of Fashion, n.d.).

As the industry employs (mostly female) workforce of more than 86 million (UN, 2021) or even 300 million (McKinsey; 2019), the other important topic is emerging – working conditions of vulnerable groups mostly employed in this industry (including children).

In researching fashion industry, apart from environmental issues and working conditions, one of the major factor in transforming fashion industry to a more sustainable production are the consumers and willingness for behavioural changes in buying habits (especially overconsumption) is the topic that is increasingly interesting for the researchers (Strähle, et al. 2015), same as the perceptions and attitudes regarding sustainability and sustainable fashion (Harris, et al., 2016).

This paper examines literature on the emerging trends like *sustainable fashion*, *slow fashion*, *eco fashion*, and *ethical fashion* (both production and consumption). The empirical part analyses faculty, administration, and students' perceptions on *eco fashion* on the example of the School of Engineering Management, Belgrade, Serbia with the implementation of statistical ANOVA analysis using the software package SPSS18 in order to explore the perceptions of various higher education stakeholders of *eco fashion*. The final part of the paper presents opinions collected through the interviews on the most important elements of *eco fashion* that are influencing consumers' decisions.

2. Literature review

During the last hundred years, fashion has changed immensely, as it is not anymore exclusive to the upper classes. It has become more approachable to lower strata of society, as mass production brought size standardization and emergence of inexpensive clothing that is both fine-looking and durable. Last couple of decades produced new trend *fast fashion* - reasonably priced clothes, with various levels of quality and durability, in it's appearance matching high fashion styles. That trend, which is worth billions of dollars, is enabled by globalized production, globalized market, and stretched supply chains (Cimatti, 2017; Janićijević, et al., 2018). The clothing and other fashion products are made in low income countries like Bangladesh, and are available in big retail chains all over the world almost immediately after similar high fashion is shown at design and fashion weeks. Some of these clothes last longer, some don't, nevertheless, very soon, they become "unfashionable" (Bick, et al., 2018; Popescu, 2015; McGrath, 2012) or even waste (Cimatti, 2017), which is in particular characteristic for the special occasion clothes that is worn usually only once (London College of Fashion, n.d.). The most popular brands like Swedish H&M or members of Spanish Inditex (Zara, Bershka, Stradivarius, Pull&Bear on a cheaper side" and "higher end" Massimo Dutti) present new apparel in short cycles giving the other brands a task to follow that pace. Fashion industry consumers are driven by desire for expression of personal or group identity, novelty, or by the need for adapting to social requirements (Hedtjärn Wester, 2017; Hedtjärn Wester, et al., 2017; Annamma, et al., 2012).

Traditional production process includes natural resources, processing, creating final or semi-finished goods, distribution, usage of products and, at the end, disposal, which is called the "linear model of the economy", that is usually presented as the take - make/use - dispose sequence (Jörgensen and Pedersen, 2018). This linear system is especially observed in fashion industry that predominantly utilizes non-renewable resources (Niinimäki, 2018), it is responsible for 8-10% of total greenhouse gas

emissions and creates 20% of total world industrial wastewater pollution (UN, 2021). Environmental aspect is very significant because the industry exploits water resources in producing fabrics from natural materials (London College of Fashion, n.d; Gwozdz, et al., 2015) and utilizes chemicals, thus eqally polluting water and land. For example cotton, the most popular natural clothing material, uses vast amount of insecticides and pesticides (Mašić, 2018). On the other hand, synthetic clothes uses non-renewable resources like petroleum (House of Commons, 2019), and pollutes the oceans with microplastic (Fung, et al., 2021).

Fashion industry life cycle includes following steps (Whitty, 2015):
1. Raw material extraction;
2. Design and material selection;
3. Clothing manufacture;
4. Packaging and distribution;
5. Sales (shops);
6. Product use and maintenance;
7. Final disposal.

This sequence can include one important step before final disposal – recycling and reusing.

Other than environmental issues, regarding the fashion industry, the working conditions are becoming focus of researchers' attention, particularly after the accident in Bangladesh in 2013, in which hundreds of female workforce lost their lives in a factory building collapse (Bick, et al., 2018; Popescu, 2015; Popescu, 2015b; Strähle, et al., 2015); Pedersen and Andersen, 2015), or various reports on working conditions in China, especially Guangdong province (Ditty, 2015), or reports on using child and slave labour through subcontractors (House of Commons, 2019).

There are more calls in academia, professional research and the activities of the so called *green* movements for the fashion industry to adopt new production philosophies, to become more *sustainable.* However, terms *fashion* and *sustainable* clash in their meaning - *something that goes in and out of style* vs. *something that is capable of continuation in a longer period of time* (Cambridge dictionary, n. d.). At the present, there is a significant question still unanswered, how to close serious and broad gap between these two opposing concepts? Some answers may lay in new emerging concepts like *eco fashion*, *sustainable fashion*, *ethical fashion*, and *slow fashion.*

- *Eco fashion* concept is promoting organic raw materials, and elimination of pesticides or *eco-design* (Wachholz and Pinheiro, 2017; Kobayashi, 2005; Morais, et al., 2015; Morais and Figueiredo, 2015; Pedersen, et al., 2014), with the emergence of *eco-fashion* companies (D'Souza, 2015; Bick, et al., 2018) completely dedicated to the concept. *Sustainable fashion* similarly calls for transformation of production methods into the processes that include designers, manufacturers, marketers, but, also, transformation of the consumers and their needs (KPMG, 2019; Brandão and Gonçalves Da Costa, 2021). As the first step it is proposing using environmentally friendly materials, reduced use or discontinuation of the use of pesticides and promoting and building recycling initiatives (Pedersen, 2019; Henninger, 2016; Reiley and Delong, 2011; Albouy and Olabisi, 2018). Some of the available research is proposing generating a *sustainability model* for fashion industry, established on zero-waste philosophy (Aakko and Niinimäki, 2014; Gharfalkar, et al. 2015).
- The other new concept is so called *slow fashion* that promotes sustainable, ethical, and eco-friendly practices in the fashion industry, emphasising the quality and sustainability of, equally, production process and a product (Wachholz and Pinheiro, 2017; Jung and Jin, 2017) taking into the account the environment and working conditions.
- Also, one of the new concepts is *ethical fashion*, as the ground for making choices in the sustainable design and manufacturing (Niinimäki, 2015), which takes into the account both environmental and social issues (da Graça Guedes, 2011; Wachholz and Pinheiro, 2017), considering both production workforce and the consumers. Some companies from the high end Stella McCartney, over Monsoon, to H&M are starting to adapt the concepts of ethical product design, production, and marketing (Kaikobad, et al. 2015; Candeloro; 2020).

In obtaining clothing and accessories, in making purchasing decisions, consumers are motivated by price, quality, and style, with the price identified as the most important factor. Even though the consumers are often aware of often inadequate working conditions and using the child labour in fashion industry all over the world, low price is still the most important element in shaping a decision on

buying (Harris, et al., 2016). Many researchers are focusing on finding the approaches of involving the consumers in sustainable fashion concept while having in mind their desire to have inexpensive and durable, fine looking clothes (Pedersen, et al., 2014; Petersson McIntyre, 2019; Brandão and da Costa, 2021). Fashion choices are driven by emotions and they have to be taken into account in promoting concepts like eco or slow fashion (McGrath, 2012), especially for the younger consumers (Annamma, et al., 2012; Gazzola et al., 2020). One of the proposed solutions is creating awareness through better informing the younger generations on organic, or eco fashion (Cervellon et al., 2010; Brandão and da Costa, 2021). Today, the youth often makes purchasing choices on the influence of social media, celebrities, and bloggers and vloggers (Kim, et al., 2020), so social media (like Instagram) can be a powerful tool in promoting sustainable fashion (Sponder Testa et al., 2021). Other than age, it is considered that gender is very important factor for sustainable fashion initiatives, as some research has shown that more than 80% of purchasing decisions regarding clothing is made by women (OECD, 2008), so many of those initiatives can target female consumers.

3. Materials and methods

Objectives and survey design

The research has been done at the School of Engineering Management, a private higher education institution in Belgrade, Republic of Serbia, which is a part of the "University Union – Nikola Tesla". The School has several accredited undergraduate programs (*Engineering Management* and *Management),* graduate - master programs *Project Management and Industry 4.0*, *Engineering and Management of Security Information Systems*, *Economics and Management of Energy*, and a PhD program *Waste Management*.

The objective of this study is to explore faculty, administration, and students' perceptions on *eco fashion*. Second part of the study presents opinions collected through the interviews of the selected subgroup on the most important elements of *eco fashion* that are influencing consumers' purchasing decisions.

Initially, the survey has been organized from March 8th to 12th, and the series of short interviews with the subgroup has been organized from April 12th to 16th through short, in-person or Zoom based, semi-structured interviews. The participants have been asked to express their perceptions on whether ecologically acceptable (eco) clothing is available for buying in Serbia; is eco clothing of good quality; is eco clothing reasonably priced; is eco clothing durable; and are there enough options for clothing recycling.

Five-point Likert scale (coded: 1 – I disagree completely; 2 – I disagree; 3 – I am neutral; 4 – I agree; 5 – I agree completely) has been used to assess the answers to main research questions. The constructed scale has been subjected to the test of reliability and it has shown good (0.729) Cronbach's Alpha value as shown at Table 1.

Table 1. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.729	.730	5

Source: (Authors)

It is assumed (H_1) that there is statistically significant difference in perceptions of eco fashion between faculty, administrative staff and students with several sub hypotheses, stating that there is statistically significant difference in perceptions of eco fashion between faculty, administrative staff and students with the following subhypotheses:
- H_{1a}: Ecologically acceptable (eco) clothing is available for buyers in Serbia;
- H_{1b}: Available eco clothing is of good quality;
- H_{1c}: Available eco clothing is reasonably priced;
- H_{1d}: Available eco clothing is durable;
- H_{1e}: There are enough options for clothing recycling.

Null Hypotheisi (H_0) states that there is no statistically significant difference in perceptions of eco fashion between faculty, administrative staff and students.

Statistical analysis has been performed by using statistical package SPSS v. 18.

Description of the sample

Participants have been contacted by E-mail. Total sample size has been 93 (N=93), among them 29 (31.2%) have been undergraduate students, 23 (24.7%) graduate students, 25 (26.9%) academic staff (faculty), and 15 (17.2%) administrative and support staff (as presented at Table 2).

Table 2. Survey Demographics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undergraduate students	29	31.2	31.2	31.2
	Graduate students	23	24.7	24.7	55.9
	Academic staff	25	26.9	26.9	82.8
	Administration and support	16	17.2	17.2	100.0
	Total	93	100.0	100.0	

Source: (Authors)

Regarding the gender, 53.8% (N=50) of participants have been female and 46.2% (N=43) male, as presented at Table 3.

Table 3. Participants' gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	50	53.8	53.8	53.8
	Male	43	46.2	46.2	100.0
	Total	93	100.0	100.0	

Source: (Authors)

For the interviews, participants have been randomly chosen to represent each year of undergraduate, master and PhD studies among the students, and to represent each teaching rank among faculty: teaching associates, teaching assistants, languages professors, assistant professors, associate professors, and full professors; same as representatives of various administrative and support units.

Demography of the interviewees' is presented at Table 4.

Table 4. Demographic of interviewees

Code	Profile	Age	Gender (F/M)
P1	Student, I year, undergraduate studies	19	F
P2	Student, II year, undergraduate studies	20	M
P3	Student, III year, undergraduate studies	22	M
P4	Student, IV year, undergraduate studies	22	M
P5	Master student	25	F
P6	Teaching associate	29	M
P7	Teaching assistant	32	F
P8	Languages teacher	43	F
P9	Assistant professor	46	F
P10	Associate professor	53	M
P11	Full professor	44	M
P12	Students' services associate	43	F
P13	Financial services associate	51	F
P14	Legal office associate	51	F
P15	Library associate	44	F

Source: (Authors)

4. Results and discussion

The one-way analysis of variance (*One-way ANOVA*) is used to determine whether there are any statistically significant differences between the means of three four groups of participants, and to test our hypothesis and sub-hypotheses. *Alpha,* or *significance level,* is *set* to 0.05 (5%).

Descriptive statistics is shown at Table 5.

Table 5. Descriptive statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Availability of eco clothing	Undergraduate students	29	3.24	.912	.169	2.89	3.59	2	5
	Graduate students	23	3.22	1.242	.259	2.68	3.75	1	5
	Academic staff	25	2.76	1.165	.233	2.28	3.24	1	5
	Administration and support	16	3.00	1.033	.258	2.45	3.55	1	5
	Total	93	3.06	1.092	.113	2.84	3.29	1	5
Quality of eco clothing	Undergraduate students	29	2.97	1.085	.201	2.55	3.38	1	5
	Graduate students	23	3.04	1.107	.231	2.56	3.52	1	5
	Academic staff	25	2.52	1.122	.224	2.06	2.98	1	5
	Administration and support	16	2.56	.814	.203	2.13	3.00	1	4
	Total	93	2.80	1.069	.111	2.58	3.02	1	5
Reasonable price of eco clothing	Undergraduate students	29	2.72	.922	.171	2.37	3.07	1	5
	Graduate students	23	2.87	1.100	.229	2.39	3.35	1	5
	Academic staff	25	2.84	1.068	.214	2.40	3.28	1	5
	Administration and support	16	2.69	1.014	.254	2.15	3.23	1	5
	Total	93	2.78	1.009	.105	2.58	2.99	1	5
Durability of eco clothing	Undergraduate students	29	2.69	.930	.173	2.34	3.04	1	4
	Graduate students	23	2.91	1.083	.226	2.44	3.38	1	5
	Academic staff	25	2.64	1.114	.223	2.18	3.10	1	5
	Administration and support	16	2.44	1.153	.288	1.82	3.05	1	5
	Total	93	2.69	1.053	.109	2.47	2.90	1	5
Recycling options	Undergraduate students	29	3.00	.845	.157	2.68	3.32	2	4
	Graduate students	23	3.00	1.168	.243	2.50	3.50	1	5
	Academic staff	25	2.56	1.193	.239	2.07	3.05	1	5
	Administration and support	16	2.38	1.088	.272	1.80	2.95	1	5
	Total	93	2.77	1.085	.112	2.55	3.00	1	5

Source: (Authors)

Before starting *One-way ANOVA* analysis, a number of assumptions need to be met, and one of the main assumptions is that there must be equality of variance among the different categories under consideration. Levene's test for equality of variance has been conducted as a measure of the homogeneity of variance among different categories. The results are shown at Table 6.

Table 6. Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Availability of eco clothing	1.575	3	89	.201
Quality of eco clothing	.742	3	89	.530
Reasonable price of eco clothing	.189	3	89	.904
Durability of eco clothing	.209	3	89	.890
Recycling options	1.349	3	89	.264

Source: (Authors)

As *Sig* (*p*) values less than 0.05 indicate that the variance among the various categories is the same for all research questions, *One way ANOVA* can be used. The results can be seen at Table 7.

Table 7. One way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Availability of eco clothing	Between Groups	3.830	3	1.277	1.074	.364
	Within Groups	105.783	89	1.189		
	Total	109.613	92			
Quality eco clothing	Between Groups	5.019	3	1.673	1.487	.223
	Within Groups	100.100	89	1.125		
	Total	105.118	92			
Reasonable price of eco clothing	Between Groups	.500	3	.167	.159	.924
	Within Groups	93.199	89	1.047		
	Total	93.699	92			
Durability of eco clothing	Between Groups	2.227	3	.742	.662	.577
	Within Groups	99.730	89	1.121		
	Total	101.957	92			
Recycling options	Between Groups	6.348	3	2.116	1.848	.144
	Within Groups	101.910	89	1.145		
	Total	108.258	92			

Source: (Authors)

As the Sig (*p*) values are above 0.05, the main research hypothesis (H₁) that *there is statistically significant difference in perceptions of eco fashion between faculty, administration, and students* is not accepted and there is no reason to reject null *hypothesis*. It takes into the account all sub hypotheses: ecologically acceptable (eco) clothing is available for buyers in Serbia; available eco clothing is of good quality; available eco clothing is reasonably priced; available eco clothing is durable; there are enough options for clothing recycling

Further interviews of the selected subgroup developed around the idea of indetifying the most important elements of *eco fashion* that are influencing consumers' decisions on buying eco clothing. Participants have identified various noteworthy characteristics of *eco clothing* that could influence their choice of clothes:
- affordability (reasonably priced),
- uniqueness (shows individuality),
- durability (is not wearing out too quickly),
- modern design (*trendy*, *hip*, *cool*),
- stylishness (smartness, elegance), and
- availability (offered in Belgrade stores).

Table 8 shows main three characteristics of *eco fashion* significant for each subgroup's purchasing decisions: students, faculty, and administration based on subsequent interviews.

Table 8. Elements of eco fashion influencing consumers' purchasing decisions

Students' perspective	Teachers' perspective	Administration's perspective
Trendy	Smart	Affordable
Affordable	Affordable	Durable
Unique	Durable	Available

Source: (Authors based on interviews)

5. **Limitations and scope for further research**

As a study of one higher education institution, this research has major limitations in terms of methodology and scope of data. For further research it is needed to initiate analysing data collected from various higher educational institutions on national, regional or international level.

6. Conclusion

Fast fashion trend is overwhelming global clothing market and have profound influence on consumers' decisions on buying low priced, good quality, and smart clothing. This trend increases threats to the environment (water and land pollution, lack of recycling, etc.) both in producing materials from natural fibres like cotton and producing materials from synthetic fabrics.

The awareness of dangers that are increasing for the environment, new trends are emerging such are *sustainable fashion, slow fashion*, *eco fashion*, and *ethical fashion*.

On the example of the School of Engineering Management, Belgrade, Serbia, perceptions on eco fashion have been explored using statistical *One way ANOVA* analysis. The results show that there is no statistically significant difference in the perceptions of different groups of *eco fashion* in terms of availability, price, quality, durability, and possibilities for recycling. Participants who have been interviewed also emphasised main drivers for choosing eco clothing: modern design (*trendy*), affordability, uniqueness, durability, stylishness, and availability.

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Uticaj dimenzija kvaliteta usluge, zadovoljstva korisnika i namera ponašanja na odgovarajuće konstrukcije u poslovanju sa stanovništvom: kontekst Bliskog istoka

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Apstrakt: Sadašnje konkurentsko okruženje učinilo je da organizacije danas mere i prate kvalitet usluga, zadovoljstvo korisnika i namere ponašanja. Istraživanja su potrebna da bi se menadžerima u praksi pomoglo da naprave odgovarajuće organizacione strategije za zadržavanje kupaca i organizacionu izvrsnost. Ovaj rad ima za cilj proučavanje uticaja dimenzija na odgovarajuće konstrukcije u oblasti bankarskog poslovanja sa stanovništvom kako bi se dobio uvid u formulisanje strategije koja može da pomogne u optimizaciji korišćenja ograničenih resursa dostupnih za primenu. Korišćena je robusna procedura da se razvije skala za tri konstrukta koja bi bila prikladna za kulturu i kontekst zemlje. Dobijena skala se sastojala od 7 dimenzija za kvalitet usluge i zadovoljstvo korisnika i 3 dimenzije za namere ponašanja. Analiza podataka dobijenih iz 373 popunjena upitnika pokazala je da su bezbednost i druge dimenzije „ishoda" najvažnije u pogledu kvaliteta usluge i zadovoljstva korisnika. U namerama ponašanja, lojalnost se pokazala kao najvažnija.

Ključne reči: kvalitet usluge, zadovoljstvo korisnika, namere ponašanja, bankarsko poslovanje sa stanovništvom, Bliskoistočni kontekst, Sultanat Oman

Influence of the Dimensions of Service Quality, Customer Satisfaction and Behavioural Intentions on the Respective Constructs in Retail Banking: the Middle East Context

Abstract: Present competitive environment has made it necessary for organizations today to measure and monitoring service quality, customer satisfaction and behavioural intentions. Research is required to provide input to practicing managers to make appropriate organizational strategies towards customer retention and organizational excellence. This paper aims to study the influence of the dimensions on the respective constructs in the retail banking industry to get insights for strategy formulation that can help optimize utilization of the limited resources available for deployment. A robust procedure was used to develop the scale for the three constructs which would be appropriate for the culture and the country context. The scale obtained consisted of 7 dimensions for service quality and customer satisfaction, and 3 dimensions for behavioural intentions. The analysis of the data obtained from 373 usable questionnaires revealed that security and the other 'outcome' dimensions are the most important regarding service quality and customer satisfaction. In behavioural intentions, Loyalty was found to be the most important.

Keywords: Service quality, customer satisfaction, behavioural intentions, retail banking, Middle East context, Sultanate of Oman.

1. Introduction

To improve business performance, strengthen core competencies, and gain a better strategic position in the marketplace, service providers aim to assess service quality and other related constructs (Cronin and Taylor 1992; Jain and Gupta 2004). Bank managers today encounter a very dynamic environment coupled with globalization and its challenges, and a major part of their job involves formulating strategies to make their organization not only effective but also efficient to ensure profitability. They

are expected to achieve these goals by working through service quality and customer satisfaction leading to favourable behavioural intentions within the ubiquitous scenario of resource constraints. This warrants not only the identification of the dimensions contributing to these constructs in the specific context but also their order of influence to deploy scarce resources effectively for optimum results.

This paper attempts to determine the relative influence of various dimensions of service quality, customer satisfaction and behavioural intentions in the context of retail banking in the Sultanate of Oman.

2. Literature Review

Service quality is of strategic importance for service sector organizations (Lewis and Mitchell, 1990). Service quality has been accorded high priority in service organizations due to its relationship to customer satisfaction (Bolton and Drew, 1991; Cronin and Taylor, 1992; Boulding, Kalra, Staelin and Zeithaml, 1993, Shemwell, Yavas and Bilgin, 1998 etc.), and customer retention (Boshoff, 1997; Hocutt, 1998). Competitive advantage is achieved by ensuring high customer satisfaction which in-turn requires high level of service quality (Lewis and Mitchell, 1990; Meuter et al, 2000).

Radon (1987) reported that 40% of those customers switching financial institutions in the USA did so because of service problems. Poor service was also cited as the reason for leaving the financial service provider by 50% of the respondents of the study by Allred and Addams (2000). These revelations warrant investigations into the constructs related to this customer behaviour.

Relationship banking literature acknowledges the important contribution of service quality to the development of banking relationships (Chaston, 2000; Turnbull and Moustakatos, 1996). In the different studies, service quality and the other constructs have been measured using the generic scales and those developed for the specific service settings (see Bahia and Nantel, 2000; Gronroos, 1990). SERVQUAL, developed by Parasuraman, Zeithaml and Berry (1985, 1988), has been the most popular instrument and banks and academicians have used original as well as adapted versions of SERVQUAL for a variety of studies (Bahia and Nantel, 2000).

The study by Jaya Sangeetha and Mahalingam (2011) has drawn attention to the fact that, in studies on service quality all over the world, certain dimensions are common across different models. However, the different cultural contexts might bring about the need for adapting certain items or their operationalization. Measurement of service quality using a generic scale or even one specifically developed for banking may not be appropriate. Therefore, it is necessary to develop a customized scale for measuring service quality and related constructs. The study further emphasizes that the influence or importance of the dimensions also varies with the context of the study and needs to be assessed in every study.

From the perspective of a practicing manager, identifying and knowing the dimensions or factors contributing to the critical factors is vital. Moreover, the knowledge of the degree of influence of each of them would lend itself to devising strategies for managing and delivering the same effectively and efficiently.

2.1 Banking and the Middle East

Service quality and customer satisfaction have been studied across the Middle East in Islamic banking (Rehman, 2012; Al-Tamimi and Al-Amiri, 2003) and commercial banks (Jamal and Naser, 2002; Hossain and Leo, 2009; Jabnoun and Al-Tamimi 2003; Mohammad and Alhamdani, 2011). These studies focus predominantly on developing and testing the measurement instrument based on SERVQUAL for service quality (Jabnoun and Al-Tamimi, 2003), evaluating service quality and customer satisfaction (Hossain and Leo, 2009), and evaluating the effect of service quality on customer satisfaction (Mohammad and Alhamdani, 2011). There is an absence of studies that have attempted to establish the influence of the various dimensions for the unique context of the Middle East using customized measurement scales. This study endeavours to fill this gap.

2.2 Research Questions

Based on the gaps identified in the literature, this paper aims to investigate the following three research questions:

- What is the order of influence of the dimensions of service quality on the construct?
- What is the order of influence of the dimensions of customer satisfaction on the construct?
- What is the order of influence of the dimensions of behavioural intentions on the construct?

The methodology adopted for identification of relevant dimensions by developing customized scales for service quality, customer satisfaction and behavioural intentions is established in Section 3, followed by testing the influence of the contributing dimensions. The discussion of the results and the conclusion are provided in Sections 4 and 5, respectively. Section 6 deals with the limitations and scope for future research.

3. Methodology

In view of the above-mentioned summary, it becomes imperative to test the influence of the dimensions of the three constructs on each of them respectively. However, this has to be done after establishing a valid and reliable customized scale involving the relevant dimensions (Jaya Sangeetha and Mahalingam, 2011).

3.1 Development of customized instrument

For the development of the customized instrument for the study, the procedure suggested by Churchill (1979) was used. Furthermore, the confirmation of the psychometric properties of each scale was undertaken.

Jaya Sangeetha (2017) describes the stages leading to the development of the instruments. Firstly, in a qualitative study, the universal dimensions of service quality, customer satisfaction and behavioural intentions were identified from the myriad studies conducted all over the world. Furthermore, to include the context specific factors as suggested by Caruana (2002), structured interviews were conducted with several managers of leading banks and customers. The qualitative stage resulted in 13 dimensions for service quality and 5 dimensions for behavioural intentions. As suggested by Sureshchander et al. (2002), the dimensions identified for service quality were also used to operationalize customer satisfaction. A pilot study consisting of 60 respondents was conducted in the second stage. The psychometric properties of the developed instrument were found to be robust. The results obtained from the factor analysis performed on the data from the pilot study, lead to the following seven dimensions for both service quality and customer satisfaction. They accounted for 79.89% variance.

- Core service/ service product (8 items),
- Tangibles and systematization (9 items),
- Credibility (3 items),
- Empathy (7 items),
- Security (3 items),
- Assurance (3 items), and
- Responsiveness (5 items).

The behavioural intentions scale was found to involve three dimensions, and these accounted for 69.8% variance.

- loyalty (5 items),
- price sensitivity (5 items) and
- response to problem (3 items).

Considering the response from the pre-test stage, the decision was taken to translate the questionnaire into Arabic. The Arabic version was back-translated to check for clarity and suitability. The resultant measurement instruments were of high predictive and diagnostic value since they were customized to the local setting.

The resultant scales which consisted of closed questions, were administered to 605 retail banking customers based on the market share of the major commercial banks in Oman. 373 usable questionnaires were obtained. The psychometric properties were checked again to confirm the reliability and validity of the collected data.

3.2 Degree of Influence of dimensions

Services literature highlights the multidimensionality of service quality and related constructs and, in doing so, has led to the revelation that the dimensions of service quality, satisfaction and behavioural intentions have varying influences on the respective constructs. Changes in the order of importance or the degree of influence of the dimensions have been reported in different countries (Parasuraman et al., 1988; Kwan and Hee, 1994; Dotchin and Oakland, 1994; Newman and Cowling, 1996; Yavas, Bilgin, Shemwell, 1997; Yavas, Benkenstein and Stuhldreier, 2004; Angur, Nataraajan and Jahera, 1999; Lasser, Manolis and Winsor, 2000). To study the same in the context of Oman, the following hypotheses are proposed.

H_1 Influence of the dimensions of service quality on the construct is different.
The hypothesis can be modelled by

$$SQ = \beta_0 + \beta_1 CORE + \beta_2 TANSYS + \beta_3 EMP + \beta_4 RESP + \beta_5 CRED + \beta_6 ASSU + \beta_7 SECU + \dots..(1)$$

H_2 Influence of the dimensions of satisfaction on the construct is different.
The hypothesis can be modelled by

$$CS = \beta_0 + \beta_8 CORE + \beta_9 TANSYS + \beta_{10} EMP + \beta_{11} RESP + \beta_{12} CRED + \beta_{13} ASSU + \beta_{14} SECU + \dots\dots(2)$$

Where CORE is Core Service or Service Product; TANSYS is Tangibles and Systematization; EMP is Empathy; RESP is Responsiveness; CRED is Credibility; ASSU is Assurance; SECU is Security.

H_3 Influence of the dimensions of behavioural intentions on the construct is different.
The hypothesis can be modelled by

$$BI = \beta_0 + \beta_{15} LOY + \beta_{16} PS + \beta_{17} RESPTOPR + \dots\dots(3)$$

Where LOY is Loyalty; PS is Price Sensitivity; RESPTOPR is Response to Problem.
Multiple regression analysis was performed on the data collected from the 373 usable questionnaires. In the next section, the data analysis and the discussion of findings is presented.

4. Data Analysis and Discussion

4.1 Influence of the dimensions of service quality on the construct

The model proposed is -

$$SQ = \beta_0 + \beta_1 CORE + \beta_2 TANSYS + \beta_3 EMP + \beta_4 RESP + \beta_5 CRED + \beta_6 ASSU + \beta_7 SECU + \dots..(1)$$

Multiple regression analysis was performed with weighted service quality as the dependent variable and the seven dimensions of service quality as independent variables. The influence of the seven factors on weighted service quality is concluded by comparing the beta values, which are found to be as follows:

Table 1. Results of Regression Analysis of the influence of the Dimensions of Service Quality on the construct

S. No.	Factor/Dimension	Co efficient	beta value
1	Security	β_7	0.660*
2	Core Service or Service Product	β_1	0.569*
3	Empathy	β_3	0.514*
4	Systematization and Tangibles	β_2	0.484*
5	Credibility	β_5	0.476*
6	Assurance	β_6	0.436*
7	Responsiveness	β_4	0.378*

Note: * Significant at 1% level

The assessment of the order of influence of the seven dimensions of service quality (as per Table 1) indicates that Security has the highest influence on service quality perceptions followed by Core Service or Service Product, Empathy, Systematization and Tangibles, Credibility, Assurance, and Responsiveness.

The analysis reveals that the Outcome dimension, consisting of Security and Core Service or service product, is most important to customers followed by the Physical evidence, or Servicescapes, reflected by Tangibles and Systematization along with Credibility, and the last is the Service Delivery factor, namely Assurance and Responsiveness. The findings convey to the management of banks that if they endeavour to improve the perceptions of service quality, the effort and investment must be allocated in the same order so as to result in optimum utilization of resources.

The utmost importance of the Outcome dimension of service quality signifies that the bank management must make sure that things are done right the first time. Management has to identify appropriate strategies to improve the service basics such as privacy and security policies, on-time delivery, service variety, innovation, service failure prevention measures, and recovery, if they do occur. Since internet security is always a matter of concern, banks must work towards enhancing perceptions of safety, reliability and security.

Servicescapes encompassing Tangibles and Systematization and Credibility have been found to be second in line regarding importance. The importance given to Servicescapes can also be connected to the culture of the region. Based on Hofstede's dimensions, Middle East culture is identified for low individualism but high on power distance, masculinity, uncertainty avoidance, short-term orientation and indulgence (hofstede-insights.com/country-comparison/saudi-arabia/). This provides valuable insights to bank management that creating and maintaining high levels of external appearances of their physical facilities, equipment, personnel and communication materials, along with innovative technology and meaningful alliances, can be vital to the favourable perceptions of service quality (Bitner, 1990).

Regarding Service Delivery, which comes next in importance, bank management has to make sure that the employees are properly trained so that they are not only courteous, attentive, and willing to help customers but are also experts in their field capable of understanding specific customer needs. They must ensure that the promises made are kept in terms of service delivery.

The importance of front-line personnel in establishing and maintaining a competitive position for their institution needs to be appreciated by bank management. These frontline employees should be recruited with care, trained appropriately, and motivated and supported throughout their employment through recognition and incentive schemes. Customer contact personnel must reduce customer uncertainty, give reassurance that customers have made the right decision, and reduce dissonance by promoting the reputation of the organization, among other tasks.

4.2 Influence of the dimensions of satisfaction on the construct

The hypothesis has been modelled by

$$CS = \beta_0 + \beta_8 CORE + \beta_9 TANSYS + \beta_{10} EMP + \beta_{11} RESP + \beta_{12} CRED + \beta_{13} ASSU + \beta_{14} SECU + \dots (2)$$

Multiple regression analysis conducted with weighted satisfaction as predicted variable and the seven dimensions of satisfaction– Core Service or Service Product, Tangibles and Systematization, Credibility, Empathy, Security, Assurance and Responsiveness- as predictor variables, gave the results as shown in Table 2.

The obtained beta values have been used to interpret the influence of the seven factors on weighted satisfaction.

Table 2. Results of Regression Analysis of the influence of the Dimensions of Satisfaction on the construct

S. No.	Factor/Dimension	Co efficient	Beta value
1	Security	B_{14}	0.500*
2	Credibility	$_{12}$	0.411*
3	Core Service or Service Product	B_8	0.402*
4	Empathy	$_{10}$	0.366*
5	Assurance	$_{13}$	0.344*
6	Systematization and Tangibles	B_9	0.336*
7	Responsiveness	$_{11}$	0.284*

Note: * Significant at 1% level

Table 2 indicates that out of the seven factors, Security has the highest influence on satisfaction with banks followed by Credibility, Core Service or service product, Empathy, Assurance, Systematization and Tangibles, and Responsiveness.

The inference that emerges from the analysis is that, to customers in credence services such as financial institutions where the customers are highly involved, the Outcome dimension - consisting of Security, Credibility in terms of reputation and image, and Core Service or service product, are most critical for satisfaction. The Service Delivery dimensions including Empathy and Assurance come next, followed by the Physical evidence, involving Tangibles and Systematization. The finding conveys to the management of banks that if they endeavour to improve the satisfaction with services, they must invest primarily in measures to build security systems and branding to reassure customers about the safety of their funds. This reflects the common concern of uncertainty among customers of developing economies (Hawkins and Mihaljek, 2020).

Regarding Service Delivery aspect, employees must provide services empathetically and professionally. The service delivered should at least match the service promised and ensure speedy recovery in the event of service failure. This will ensure high satisfaction and retention, expand zone of customer tolerance in case of service failures, increase customer recommendations and loyalty, and contribute to other favourable behavioural intentions (Rod, Ashill and Gibbs, 2016).

Good service delivery could also provide the competitive edge over other banks given the nature of the banking industry, which is high involvement, high contact and high-level service situation. This implies that the management must provide adequate and appropriate training to the staff to help them perform to the satisfaction of the customer. This also makes it important to establish systems to track employee satisfaction as it has been found to influence the customer service, and hence their satisfaction, strongly (Heskett, Sasser and Schlesinger, 1994). The marketing orientation of the employees at various levels needs to be updated using the continuous process of socialization at various stages of the employee's tenure (Castro, Armario, Sanchez del Rio, 2005).

The least importance of Physical cues such as Tangibles and Systematization drives the point that the customers have started taking this dimension for granted or that it is being considered a hygiene factor; that is, the dimension being satisfactory does not affect satisfaction but, if it is found to be unsatisfactory or if a problem is encountered, it could be a reason for unfavourably affecting the satisfaction of the customers. Hence, the management must establish measures to prevent problems, and if they do occur, must take steps to address them within the minimum possible time.

4.3 Influence of the dimensions of behavioural intentions on the construct

The hypothesis can be modelled by
$$BI = {}_0 + {}_{15}LOY + {}_{16}PS + {}_{17}RESPTOPR + \quad \dots (3)$$
Where LOY is Loyalty; PS is Price Sensitivity and RESPTOPR is Response to Problem.

The hypothesis has been tested using multiple regression analysis with behavioural intentions as the dependent variable and the 3 dimensions– Loyalty, Price Sensitivity and Response to problem - as the independent variables. The results are provided in Table 3.

The influence of the three factors on behavioural intentions is concluded by comparing the beta values.

Table 2. Results of Regression Analysis of the influence of the Dimensions of Behavioural Intentions on the construct

S. No.	Factor/Dimension	Co efficient	v alue
1	Loyalty	15	0.565*
2	Price Sensitivity	16	0.269*
3	Response to problem	17	0.527*

Note: * Significant at 1% level

Table 3 indicates that out of the three factors, Loyalty has the highest influence on behavioural intentions followed by Response to problem, and finally Price Sensitivity.

The findings indicate that Loyalty is the most dominant intention among the various behavioural intentions, followed by complaining and switching intentions, and Price Sensitivity is the least likely intention. This leads us to believe that the retail customers of commercial banks would prefer to exhibit loyalty if they are satisfied with the services offered; Complaining and Switching intentions come close behind and Price Sensitivity are the least intended, which could probably be due to the service offerings and the interests and charges being perceived to be largely uniform among the banks in the region. The results could help the management to prioritize the action areas.

Firstly, bank management could identify and introduce a Loyalty program and monitor it using Customer Relationship Management (CRM) tools. The loyalty programmes should be customer focused and the banks would be required to examine the relationships sought by customers, develop conditions conducive to the formation of appropriate relationships, and understand the factors important for quality relationships.
Secondly, considering the important influence of Response to Problems, the managers should attempt to "get things right the first time". When customers complain, satisfactory problem recovery should be ensured to maintain satisfaction and prevent an increase in dissatisfaction and defection. The banks should set up on-line and branch level grievance cells like the call centres and monitor and control their performance to the desired level. Bank management needs to ensure that customer complaints are recorded, addressed within a reasonable timeframe and follow-up measures are undertaken to estimate the satisfaction with the recovery efforts. This will be important if the objective is customer retention and, thereby, it will enhance profitability and organizational performance.

5. Limitations and scope for future research

The scale has only been validated for one service sector, retail banking. Hence, the influence of the dimensions is also relevant only to the retail banking context. The instrument and the degree of influence of the dimensions need to be tested for the other areas in banking, namely corporate banking and to other service sectors, in order to assess validity.

The scale could be tested in the other countries in the region to further validate its predictive value.

6. Conclusion

This study was undertaken to identify the degree of influence of the dimensions of the various constructs of service quality, customer satisfaction and behavioural intentions in the context of the banking industry in the Middle East. This information is vital considering that the influence of the dimensions of each of the constructs, is found to be culture and context dependent.

Regarding service quality, Security is found to have the highest influence on service quality perceptions followed by Core Service or Service Product, Empathy, Systematization and Tangibles, Credibility, Assurance and Responsiveness. The order indicates that 'Outcome dimensions' need to be focussed on the most followed by the 'physical facilities and systems', and finally the 'service delivery' aspect. In case of the satisfaction construct, although Outcome dimension again takes priority with security as one of its primary components, 'service delivery 'seems to be the next in importance, and 'physical aspects' are found to be the least important.

Out of the three factors for Behavioural Intentions, Loyalty has the highest influence on behavioural intentions followed by Response to problem, and finally Price Sensitivity. The order indicates that loyalty programs, CRM solutions and systems for addressing grievances should be put in place.

Regulations by the Central Bank of Oman (CBO), which leads to uniform products and rates across all commercial banks, accounts for the low influence of Price Sensitivity.

The findings of the research can lead practitioners to suitable organizational strategies and to the appropriate allocation of scarce organizational resources, thereby achieving optimum results.

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Mediji kroz prizmu društvenih promena i poslovnih odluka

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Apstrakt: Medijska manipulacija zasniva se na razlici između percepcije i stvarnosti. Ljudima je uglavnom lakše i brže da usvoje, reprodukuju i distribuiraju kratke sadržaje iz novinskih članaka i različitih nepouzdanih internet blogova, nego iz naučno utemeljenih istraživanja i obimnih studija. Imajući u vidu široku dostupnost jednih i manju dostupnost drugih izvora lako je zaključiti čije izveštavanje će naići na masovniji prijem i omogućiti da nestvarno postaje stvarno. Objektivnost izveštavanja savremenih medija otežavaju napadi na ekonomsku održivost njihovog poslovanja, nepošteni izvori informacija, nerealni rokovi, kvote za pregled stranica, netačne informacije, pohlepni izdavači, loša obuka medijskih radnika, zahtevi publike i još mnogo toga. Uz svakodnevne promene u društvenom okruženju, procena situacije je važna za bilo koju vrstu odlučivanja, posebno prilikom poslovanja. Kroz pregled postojeće literature i analizu podataka, u radu će se sagledati moć medija koja utiče na javno mnjenje, kreiranje društvene stvarnosti, prihvatanje promena i donošenje poslovnih odluka.

Nove komunikacione tehnologije pružile su mogućnost i za nove načine persuazivnog delovanja i uticaja na formiranje stavova. S tim u vezi razmatraju se tehnike manipulacije i značaj medijske pismenosti. Akcenat je na prepoznavanju, čitanju i odgovoru na aktuelne društvene promene i tehnološke inovacije. Ukazuje se na značaj sposobnosti prilagođavanja u poslovnom svetu, kako pronaći sklad između društvenih potreba i poslovnog interesa.

Ključne reči: masovni mediji, komunikacija, manipulacija, objektivnost, poslovne odluke

Media through the Prism of Social Change and Business Decisions

Abstract: Media manipulation is based on the difference between perception and reality. It is generally easier and faster for people to adopt, reproduce and distribute short content from newspaper articles and various unreliable internet blogs, than from scientifically based research and extensive studies. Given the wide availability of some and the less availability of other sources, it is easy to conclude whose reporting will meet with more mass reception and enable the unreal to become real. The objectivity of modern media reporting is hampered by attacks on the economic viability of their business, unfair sources of information, unrealistic deadlines, page review quotas, incorrect information, greedy publishers, poor training of media workers, audience demands and so much more. With daily changes in social environment, assessment of the situation is important for any type of decision-making, especially when doing business. Through a review of the existing literature and data analysis, the paper will look at the power of the media, which influences public opinion, creating social reality, accepting change and making business decisions.

New communication technologies have provided an opportunity for new ways of persuasive action and influence on the formation of attitudes. In this regard, manipulation techniques and the importance of media literacy are discussed. The emphasis is on recognizing, reading and responding to current social changes and technological innovations. The importance of the ability to adapt in the business world, how to find harmony between social needs and business interest, is pointed out.

Key words: mass media, communication, manipulation, objectivity, business decisions

1. Introduction

Communication is one of the most complex, comprehensive and certainly the most dynamic activities in human society. The three basic levels in which it is used are expression, information and persuasion (Breton, 2000). With the development of human society, various persuasion skills also developed. These skills gained momentum only with the advent of the media, which have long been a reliable source of information for the public. Today, the situation is different and the media are no longer so reliable. However, old perceptions remain present in society for a long time, even when it comes to the media.

Searching for the truth, public opinion relies on the objectivity of the sources that provide it. The informativity of the mass media is achieved through current, timely, true, objective and complete messages (Radojković, Miletić, 2006). This requires payment for reliable information in one form or another, because quality and verified information needs to be obtained on time. The creators of information are often conditioned by deadlines, so it is sometimes more important to have any information at the same time, than reliable information after a while.

The mass media are an unavoidable factor of changes in society, which, on the other hand, are gradually changing the role of the media. Media content contributes to an individual determining himself and his behavior in relation to others - according to how they are presented in the media, because most content in modern circumstances cannot be directly verified. Thus, the media help the individual to position and determine himself in relation to the environment and to orient himself better in real social situations. In other words, the way in which we will play our social role and in which we realize ourselves, depends in part on the scope and content of the information we receive from the media.

Today's media content, which is marketed mostly online, is constantly exposed to exaggeration, distortion, fabrications and simplifications. In all this, the media make people think about different topics, and even make certain decisions based on that. The objectivity of modern media reporting is hampered by attacks on the economic viability of their business, unfair sources of information, unrealistic deadlines, page review quotas, inaccurate information, greedy publishers, poor training of media workers, audience demands and so much more. The question that arises is whether the media themselves are socially neutral, or, often non-transparently funded by certain social elites, they serve only certain parts of society that are constantly striving to control them.

2. Mass media and communication

Mass media means all media that are designed to attract a wide audience that is considered to have a common interest. Mass media is also a subset of a broader concept, mass communication. One of the widely accepted explanations of mass communication was given by sociologist John Thompson of the University of Cambridge (Thompson, 1995) who identified five characteristics of mass communication:

- Contains technical and institutional methods of production and distribution - this is evident throughout the history of mass media, from print to the internet, each suitable for commercial use.
- Includes "commodification[1] of symbolic forms" - because the production of material relies on its ability to produce and sell large quantities of work, just as radio stations rely on their time sold for commercials, so newspapers rely on their space for the same reasons.
- Separate contexts between production and reception of information.
- Range to those far away in time and space, compared to manufacturers.
- Information distribution - a form of "one to many" communication, where information is mass-produced and distributed to a large audience.

The main feature of the mass media is that they strongly influence the formation of a "mass consumer society" which is in great opposition to independent decision-making. Massive global media emerged

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[1]Commodification in the capitalist economic system means the transformation of goods, services, ideas, nature, personal data and people into goods or objects of trade.

long after the emergence of local and national ones. In Europe, the first mass media were newspapers that dominated the nineteenth century. From the very beginning, the development of mass media was hesitant, newspapers and magazines were written for domestic readers, the language barrier made it difficult to export. In essence, the media function in a way that reflects the common interests of powerful social groups that are able to distribute social resources. Despite these limitations, the media play a key role in all modern societies. Moreover, if society is more open to everyone's voice, the role of the media is more important, that openness lasts longer. Mass media includes a combination of print, radio, film, television, electronic and internet communication that is capable of transmitting information locally, nationally and globally. The basic means of mass communication is that it achieves coverage of the majority of the public audience. In simple words, mass communication refers to the act of disseminating information to a mass audience, while mass media refers to the media or methods used to disseminate this information.

2.1. Dysfunctional properties of mass media

The term mass media initially referred to the "masses" and described people living in Western developed countries. The term has negative connotations in media theory, because it refers to an undefined group of people with low individuality that passively accept what is placed before them and are not critical of media content and messages. The dysfunctional consequences of the mass media are supported by the fact that there are no guarantees that the interpretations of media commentators and the so-called expert accurate and valid. Therefore, there is a real danger that an individual over a certain period of time will start to rely too much on the views in the media and lose his critical ability. Uncritical acceptance of what the media places on us is easier than forming our own opinion, but it can lead to a dysfunctional situation in which an individual becomes passive and leaves others to think about him (Rabiu, 2010).

In addition to information, the media today have an educational character, which means a certain power to influence the consciousness of young people. Due to the relentless race for profit, some large and influential companies and media houses decide to show light content that targets the lowest human emotions. In this way, the media manage to significantly influence the categories most susceptible to influence - young people, and more and more often the elderly. In many underdeveloped countries, content originating from developed western countries is broadcast and refers to the entertainment of certain, wealthier social strata. Following such content by less affluent social strata creates either resentment or a noticeable disproportion between desires and possibilities. The media collects and analyzes current information. Individuals, social organizations and companies have recently increasingly relied on the mass media to inform themselves about events in the country and the world in general, the mass media have become a vital link in the information system. The fact that the mass media are a vital link between government and ordinary citizens, which contribute to political life and the general character of society, implies that they are not neutral in their work (Herman and McChesney, 2004).

Some authors look at the development of the media with trepidation and are afraid that the media will contribute to the disappearance of traditional society, which will result in moral disorder. Author Kevin Williams (2003) cites five negative effects of media action:

- The mass media are a negative and disruptive force in society and should be controlled;
- Mass media have the power to directly influence the attitudes and behavior of ordinary people;
- People are vulnerable to the power of the mass media because they are isolated and alienated from traditional social institutions that have protected them from propaganda and manipulation;
- Social changes caused by the disruptive influence of the mass media will result in the emergence of more authoritarian and centrally controlled societies;
- Mass media also lead to a decline in cultural standards and values by promoting trivial and degrading ideas and activities that threaten civilized behavior.

One of the ubiquitous media tendencies is that they often unjustifiably pay significant media attention to certain groups of people and individuals. In that way, a certain number of people, although they did almost nothing for the benefit of the community, became recognizable in the world of media, and thus gained a certain influence and power in society. On that occasion, the impression of his popularity and greater acceptance in society is created among the broad masses. The media granting of status to

individual people is functional if they receive a status that is proven to be deserved and socially productive. In other cases, it is dysfunctional and based on profit interests. It is evident that more media space is occupied by pop and sports stars, and even people from the criminal milieu, while socially productive categories such as scientists and inventors are far less represented in the media, although they are more socially productive.

2.2. Media literacy

Media literacy was defined at the National Leadreship Conference on Media Literacy (1992) as "the ability to access, analyze, evaluate and send messages through the media" (Aufderheide, 1992). Media literacy implies critical and creative skills, how to ask questions and recognize the right answers, identify misconceptions that are the foundation of intellectual freedoms (Medijska pismenost, n.d.).

The Media Coalition, with the assistance of USAID, launched a 15-month project Media Literacy Campaign in August 2013. The research - Media literacy in Serbia, was conducted for the Media Coalition by the BIRODI organization, on a sample of more than 3200 high school students, professors of civic education, journalism students and journalists. Main conclusions were (Medijska pismenost, n.d.):

- There is a false impression about the level of media literacy among the respondents;
- Education on general media literacy of all actors is necessary;
- Education about new media and social networks is especially important;
- Raising awareness about the power of consumers is necessary - all participants in the research stated that the media do not have quality, but also that they do not have the impression that they can do something about it;
- The media (as a content producer) must be involved in media literacy education;
- Research has shown that high school students use the internet and social networks more than other media. Also, young people say that they can recognize media manipulations and the ways in which the media affect their environment, but they say that they themselves are immune to such influence (which is why one task of the Media Literacy Campaign is to get them to reconsider the real extent their immunity);
- Students were not entirely convinced that they should participate in workshops on the role of the media;
- Civic education teachers were not very interested to participate in research.

From all the above, it can be concluded that media literacy should be worked on in order to spread awareness, especially among young consumers about the need for critical access to information and responsible production of media content.

According to the concept of the message as a mirror of reality, five questions should be asked: who, where, what, when and how. However, the message is always a part of more complex content units, so for objectivity it is necessary to ask the sixth question: why? - What is the deeper meaning of a comprehensive interpretation of reality? In reality, a media message is a product of professional media organizations with certain criteria. The answer to the question why (exactly that message, in that form and at that moment) can diminish the significance of the previous five answers, when persuasion is a priority, the informative value of the message is lower (Radojković, Miletić, 2006).

3. Media manipulation

Media manipulation, in relation to the etymology of the words media and manipulation can be defined as the control of systems and the organization of communications for one's own benefit. While media manipulations are interpreted in different ways, the official legal definition of this term in the USA is certainly one of the most precise: "Media manipulation refers to the act of creating an image or argument that favors someone's special interests" (US Legal, n.d.). This includes using logical fallacies and propaganda techniques, suppressing information or views by suppressing them, forcing other people or groups of people to stop listening to certain arguments, or simply diverting attention elsewhere. Furthermore, media manipulation includes the use of employed news specialists, stand-alone manuals, programmed appearances, and positive and negative reinforcement in working with

journalists and news media. It is often used as a powerful tool for manipulating the masses with the help of modern technologies (US Legal, n.d.).

3.1. Media manipulation strategies

Media manipulations have been dealt with by many authors explaining the different principles by which they are implemented. One of the most prominent authors in this field is certainly Noam Chomsky (n.d.), who defined 10 strategies for manipulating the population through the media:

- Distraction strategy - a distraction strategy that should divert the public's attention from important issues and changes identified by political and economic elites, using the technique of flooding irrelevant information. This strategy is essential to prevent the public interest in fundamental knowledge in the fields of science, economics, psychology, neurobiology and cybernetics.
- Create problems and then offer solutions - This method is also called "problem-reaction-solution". It is necessary to create a problem that provokes the reaction of the audience, ie the public. For example: let urban violence intensify to make it easier for the public to accept restrictions on freedom. An adequate example would be the creation of an economic crisis for the public to accept the abolition of social rights and public services.
- Gradual strategy - changes whose implementation in a short period of time could cause strong resistance, it is necessary to implement gradually, step by step. An adequate example of this would be the acceptance of the rights of the LGBT population. At one time, homosexuality in Serbia was treated by criminal law, and then by fierce violence of right-wing organizations against members of the mentioned population, in order to significantly popularize its promotion over time.
- Postponement strategy - another way to accept an unpopular decision is to present it as "painful and necessary" and to announce it much earlier, in advance. This way, people do not feel all the weight of change at once, because they get used to the very idea of change beforehand. In addition, the "common hope for a better future" facilitates their acceptance, although the necessary sacrifice cannot be avoided.
- The use of children's language in public speeches - when we address adults as we speak to children, we achieve two useful effects: the public suppresses its critical awareness and the message has a stronger effect on people. This suggestive mechanism is also widely used in advertising.
- Use the emotional side more than thinking - the so-called. the technique of causing a short circuit on the rational analysis and critical feeling of an individual. Critical consciousness is replaced by emotional impulses (anger, fear, etc.), while the use of the emotional register enables access to the unconscious, so it is later possible to provoke certain behaviors, implement ideas, desires, worries, fears or coercion.
- Keep the public in ignorance and mediocrity - making the public incapable of understanding the technologies and methods used for control and enslavement. "The quality of education given to the lower social classes must be poor and mediocre, so that the gap between the education of the upper and lower classes would remain insurmountable."
- Encourage the public to be content with mediocrity - encourage the public to believe that it is fashionable to be stupid, vulgar and uneducated. At the same time, it is necessary to provoke resistance to culture and science.– Instilling guilt - to convince individuals that they are solely and exclusively to blame for their misfortune, due to the failure of their intelligence, limited abilities or insufficient effort. Such an insecure and underestimated individual, burdened with a sense of guilt, will give up looking for the real causes of his position and rebellion against the system.
- Getting to know individuals better than they know - in the past 50 years, advances in accelerated science have created a large gap between public knowledge and the knowledge available and managed by dominant elites. Thanks to biology, neurobiology, and applied psychology, the system has enjoyed a sophisticated understanding of human beings, both physically and psychologically. The system got to know an ordinary person better than he knows himself, which certainly reflects on greater control over individuals.

3.2. Techniques and specifics of media manipulations

Along with the accelerated development of the media and technological achievements, the possibilities and techniques of media manipulation increased. Although nowadays the techniques of media manipulation are very numerous, there is no officially adopted definition or division that would cover all the ways in which it is manipulated through the media. The reason lies in the era of the internet and digitalization, faster flow, easier placement and reception, or greater availability of information that has completely liberated human creativity, and thus created new opportunities for manipulation. For example, authors who dealt with media manipulation techniques in the last century did not mention, nor could they predict media manipulation techniques such as clickbait, modern video manipulation, use of bots, gamers, trolls, influencers and others that have found their application in 21 century.

However, the most well-known media manipulations are those that are based on the following principles: paying media attention only to certain personalities, selection of topics, interlocutors and sources of information, publishing debatably conducted surveys (without adequate survey methodology), concealment of facts and placement of misinformation, tendentious selection of news and information, diversion of attention, increasing or decreasing the number of actors in an event, marginalization and moral condemnation of individuals and groups, glorification of certain events, personalities and their significance, creating the impression that the participants of an event do not know what they really want, presentation of statements of "accidental" passers-by who condemn (or praise) a phenomenon, forcing only a certain opinion, "overlooking" undesirable arguments, silence and downplaying the significance of adverse events, framing persons with a conspicuously "sympathetic" or "unsympathetic" character, asking suggestive questions, etc.

The knowledge that one fact can be manipulatively presented in the media in as many as seven different ways contributes to a wide range of media manipulations. Each of these ways affects the different formation of images, attitudes, beliefs, attitudes, emotions, etc. according to one and the same fact. We can present this fact: positively, negatively, passing over it in silence, increasing or decreasing its significance, approving or disapproving it (Volkov, 2001). The following techniques stand out as increasingly present techniques of media manipulation that are conditioned by the existence of mass media:

Astroturfing is the practice of disguising the sponsor of a message or organization (e.g. religious or political) to make it appear to come from local participants who support it. In political science, it is defined as the process of seeking electoral victory, helping political actors gain the sympathy of the public, that is, it is designed to create the image of public consensus where it does not exist (Howard, 2005).

Clickbait is an expression of a pejorative character that refers to the sensationalist headlines of online newspapers that allegedly offer unusual, exclusive or even completely fictional content. He uses people's natural curiosity to make people "click" on certain titles such as "shocking", "you won't believe" and the like. Clickbait is mainly used to generate revenue (more clicks bring more money for ads) or to promote certain personalities (most often from the world of pop, sports or politics) (pcchip, n.d.).

Spinning is a technique by which a certain story or information is "twisted" in order to turn the public to the side that corresponds to the interests of those in whose interest the information is placed. In public relations and politics, spinning is a form of propaganda that is achieved through the conscious provision of a biased interpretation of events or a campaign to influence public opinion about an organization or public figure. Although traditional public relations and advertising can govern their presentation of facts, spinning often involves the use of infamous, deceptive, and manipulative tactics (Safire, 1996).

Spinning is the method most used by marketing agencies, which, when ordered, in this way divert people's attention from serious and essential problems.

Social bots are not covered by a special and unique definition, but it is a generally accepted mocking term for people who are "programmed" to perform specific tasks on the internet, not including a personal critical review of the placed content. They are used for political reasons, to exaggerate the number of supporters a politician has, to spread propaganda, and to subtly influence political discourse.

Bots often attack political dissidents and manipulate facts about an issue. This is especially true of sensitive, contested political events such as national elections or referendums on important national issues[2].

3.3. The role of media manipulation in creating moral panic

The term moral panic means a social situation in which, based on individual cases (real or imaginary) or sensationally interpreted statistics, a belief is created that the community and its value system are in (mortal) danger, which can usually be avoided only by radical or repressive measures. The phenomenon of moral panic has existed for centuries, in all social communities that the younger generations criticize as potentially immoral because they deviate from generally accepted social norms and lifestyles. The very term moral panic was introduced by the British sociologist and criminologist Stanley Cohen, who states that societies are occasionally subjected to periods of moral panic and that the mass media act as a means of exaggerating deviance: "It appears that a condition, period, individual or group of people is defined as a threat to social values and interests; its nature is presented in a stylized and stereotypical manner by the mass media; moral barricades are regulated by editors, politicians and other right-wing leaders; socially accredited experts pronounce their diagnoses and solutions; ways of dealing with them are developed or resorted to; then the condition disappears, sinks, worsens, and becomes more visible. Sometimes the object of panic is completely new, and other times it is something that has existed long enough, but suddenly appears in the center of attention" (Cohen, 2002).

When a threat is identified, then panic is created and intensified through the media, and then demands are imposed that something must be done regarding the identified threat. At the same time, public figures, people in positions are included in the whole story, and as a final result, certain rules mostly appear, the non-observance of which implies sanctioning the so-called socially unacceptable behavior. In the whole process, it is the mass media that provide information about the events themselves and at the same time establish patterns of deviance.

British sociologist Kenneth Thompson states that moral panic is present in every culture and civilization, but that today's speed of information circulation has led to the multiplication of cases of moral panic and the impression that we live in an age of moral panic. Although we live in the safest and most comfortable time in human history, we are scared, anxious and upset like never before. Newspaper contents warn us every day of new dangers arising from weakened morale, and then the same contents are repeated in sensationalist television shows. Thompson states that the media are not the ones who cause moral panic, but that they are significantly involved in the process of causing it, on the basis of which he concludes that today it has almost happened that every phenomenon can cause panic (Thomson, 2003).

In sociology, there is an unresolved debate about whether the media consciously creates moral panic in order to divert attention from important events to marginal ones. Media analysts do not have a dilemma about whether the media influence the attitudes, opinions, lifestyle and behavior of the audience, but to what extent and in what form they do so and under what conditions this process takes place (Džinić, Bačević, 1977).

According to Cohen, there are five key stages in building moral panic (Cohen, 2002):

- Someone, something or group is defined as a threat to social norms or community interests;
- Then the threat is presented in a simple and recognizable symbol/form by the media;
- The display of this symbol is of concern to the public;
- There is a response from government and policy makers;
- Moral panic due to problems results in social changes in the community.

The impact of media manipulations through these phases can currently be monitored in many countries on the example of the current problem with the Kovid-19 virus and the problem of increasing the number of migrants in European countries. Considering that diametrically different perceptions (positive /negative, increased /decreased importance, approved/disapproved) can be observed for both

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[2] Political bots spread misinformation during U.S. campaign https://www.cbc.ca/news/technology/political-bots-misinformation-1.3840300

treated problems in the media of opposite orientation, it is indisputable that certain social elites in this case perform media manipulations. The fact is that both problems have theoretically entered "Cohen's" phase 5 and that some social changes in the community have already occurred. It remains to be seen in the coming period who will benefit from certain decisions at the level of the manipulated individual and the community on the one hand and the social elites who presented these problems in ways that suit them.

3.4. Media: a tool for making proactive decisions

Business decisions are made in order to achieve the planned goals. Accurate, relevant and timely information for action is needed when making decisions. In addition, the prerequisites are appropriate competencies, experience and assessments of the decision maker, as well as the ability to separate problems from opportunities. The problem when deciding is that inconsistencies can occur due to bias and interference (noise) in communication (Ekonomski fakultet, 2014). For the best possible decisions, it is necessary to make maximum use of resources and avoid restrictions (Janićijević, 2008).

Decision making is important for all organizations; however, the approaches used to make the decision differ. Accordingly, many books on decision making have been written, due to their importance for business and organizational functioning. The decision-making process exists in all management processes: when planning, organizing, leading and controlling (FON, 2014). Decision making is time limited, decision review is a a limited process that also requires a lot of time. This begs the question: do social media support a particular decision-making approach, to what extent is the role of social media in decision-making related to the decision-making approach?

Nedeljković (2017) discusses how corporations make decisions in relation to social demands and accordingly states the following activities: obstruction or denial of responsibility, defense or justification, acceptance of social responsibility and proactivity or recognition of social interest in accordance with business decisions.

From the point of view of business decision-making, social media can be seen as a tool for making decisions for the future. Organizations that, based on the reactions of public opinion, recognize social needs and find business interest in accordance with them, see the media as a tool and make proactive decisions. During the Covid pandemic, obvious examples are pharmaceutical companies, but also educational institutions that organize classes through online platforms, companies that provide home delivery, online ordering etc. On the contrary, insufficient information leads to bad decisions and socially irresponsible behavior, as in the case of tourist carriers that did not provide the promised return to tourists, due to stricter rules for crossing the border.

Decision-making requires the identification of patterns, and these patterns are led by individuals, especially at the time of formation they are immanent to their views. Social media is a tool that can use patterns and improve the decision making process, which requires media literacy and a focus on social needs.

4. Conclusion

One way to understand the importance of media in our lives is to imagine life without media. The media play a significant role in today's society by providing, in a variety of ways, a wide range of information. They strongly influence attitudes in the community, beliefs and behaviors, play a vital role in politics, economics and social practice, and as such penetrate all spheres of society. For a long time, the media are not just intermediaries who transmit some content, but they form a social environment. They affect individual attitudes, social relations and actions. Most of what we say about the media is primarily about ourselves. What intrigues us at the end of the paper are the questions: why the media have a great impact on people's lives in modern society; what can affect moral panic? The message of moral panic is more than clear: such behavior should not be tolerated; the media can play a socially positive role in illuminating reality. They show social reality, provide information, knowledge, entertainment, socializing, etc. With their real strength, they manage to typify social relations, shape identity, model lifestyles and values, stimulate cognitive and emotional processes, participate in socialization and the process of education, create social consensus, but also create stereotypes - while having an impact on social reality and human behavior (Prodović, 2015).

Social media is a tool that can use patterns and improve the decision-making process, which requires media literacy and a focus on social needs. Based on the reactions of public opinion, organizations that recognize social needs and find business interest in accordance with them, see the media as a tool and are able to make proactive decisions for the future.

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Menadžment vanredne situacije tokom epidemije KOVID-19 u Republici Srbiji

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Apstrakt: Prvi put u istoriji čovečanstva svet se susreo sa globalnom vanrednom situacijom koja je pokazala sve slabosti menadžmenta vanrendih situacija i nespremost država da adekvatno reaguju na taj izazov. Evidentno je da su se države u kojima je zdravstveni sistem u državnom vlasništvu lakše prilagodile epidemiji, takođe bilo je vidljivo da je menadžment vanredne situacije praktično bio na lokalnim samoupravama, ali i da su države koje imaju jasno definisan zakonski okvir, kao i uspostavljene sisteme upravljanja vanrednim situacijama lakše nose sa ovakvom vanrednom situacijom. U Republici Srbiji postoji zakonima propisana procedura za delovanje u epidemijama koja je dovoljan osnov za angažovanje menadžmenta vanrendih situacija. Organizacioni izazovi epidemije su praktično odgovornost jedinica lokalne samouprave i do sada, iako epidemija još uvek traje, prema dostupnim podacima, čini se da adekvatno odgovaraju na taj izazov. Ovaj rad je zasnovan na analizi zakonskog okvira za uvođenje vanrednog stanja i vanredne situacije, kao i na praktičnom istraživanju angažovanja jedinica lokalne samouprave tokom epidemije.

Ključne reči: vanredna situacija, menadžment, epidemija, jedinice lokalne samouprave, Kovid-19

Emergency Management in the Republic of Serbia during the Covid-19 Epidemic

Abstract: For the first time in the history of humanity, the world encountered a global emergency that showed all the weaknesses of emergency management and the unwillingness of states to respond to that challenge adequately. Although it is evident that the governments in which the state-owned health care system adapted more quickly to the epidemic, it was also apparent that the emergency management was practically on local governments, but also that the states with a clearly defined legal framework and established management systems emergencies are easier to deal with such an emergency. In the Republic of Serbia, there is a legally prescribed procedure for acting in epidemics, which is a sufficient basis for engaging emergency management. The organizational challenges of the epidemic are practically the responsibility of local self-government units, and so far, although the epidemic is still ongoing, according to available data, it seems that they are adequately responding to that challenge. This paper is based on the legal framework analysis for introducing the state of emergency and the practical research of the engagement of local self-governments during the epidemic.

Keywords: emergency, management, epidemic, local self-governments, Covid-19

1. Introduction

Coronavirus Disease 2019 (COVID-19) caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) was identified in December 2019 in China, Hubei province - the city of Wuhan. The news on the virus has been globally spread from the beginning of January 2020. The virus has spread from China to other Asian countries (Japan, South Korea, Singapore), the United States, Western, Eastern Europe, and South America. World Health Organization (WHO) declared a pandemic on March 11. The Republic of Serbia was not an exception, and the first official case was confirmed on March 6, 2020 (Ilic-Kosanovic, 2021).

The COVID-19 pandemic is a crisis that has not happened to such an extent so far, had a powerful impact on the world, humanity, the economy and society. World Governments could not do their jobs normally, so they had to find a solution in some way to survive. Furthermore, there was a significant impact on the world population in all aspects of life, particularly in healthcare systems. Because of lockdown, people could not leave their homes, and thus, crisis management systems in all countries should be activated. In many countries, civilian emergency management has been starting. As an example, many EU countries, including Italy, activated the Civil Protection system. In Italy, the devised forecasts have been primarily based on a purely data-driven approach by fitting and extrapolating open data on the epidemic evolution collected by the Italian Civil Protection Center (Paggi, 2020).

The Italian Department of Civil Protection (CP) encourages the participation of volunteer organizations in civil activities and emergency responses. They include psychosocial activities; social welfare activities, as assistance to the most vulnerable people (young people, the elderly, the sick, the disabled); the garrison of the territory; logistics and organizational support in case of natural or human-caused disasters, administrative and secretarial activities; prevention and an active fight against forest and interface fires; non-specialist site restoration activities and preparation and administration of meals; driving special vehicles; activities in the field of radio and telecommunications; diving activity; canine activities, etc.). More than one million people throughout Italy and more than 5000 organizations are registered on the National Civil Protection Department list (Roncone et al., 2021).

The global COVID-19 pandemic, and the subsequent measures taken by governments across the world, have had an equally severe impact on the Western Balkan states. With border checks initially being imposed, shortly followed by unilateral border closures, cancelled international flights, states of emergency (both official and de facto) and broader economic crises across the whole region, citizens were placed under lockdown to alleviate the deadly threat posed by the pandemic. In these uncertain times, the measures introduced in an attempt to stop the spread of the coronavirus, including quarantine regulations, were one of the crucial epidemiological barriers. Moreover, the lockdown seriously curbed the fundamental human right of free movement for individuals within a state, and in the longer term, the full effects of the severe downturn in economic output are yet to be seen (Šantić & Antić, 2020).

Management of the outbreak in the Republic of Serbia is mainly based on laws that cover emergencies. This concept over 2020 had good results, specifically on the local self-governments level. The concept and classification of emergencies are determined primarily by different types of hazards, which endanger safety and which, caused by the action of nature or the activity of the human factor, can lead to an emergency in a specific territory. Therefore, when regular activities (preventive, operational and other) cannot prevent and eliminate the consequences caused by dangers, then the risk states acquire the character of an emergency. The phrase civil protection has gradually come into use worldwide as a term that describes activities that protect the civil population against incidents and disasters (Alexander, 2002).

The basis for the prompt reaction to epidemic laying in the definition of emergencies, "An emergency is a situation when the risks and threats or consequences of catastrophes, crises and other dangers to the population, environment and material goods are of such scope and intensity that their occurrence or consequences cannot be prevented or eliminated by regular action of competent bodies and services. To mitigate and eliminate them, it necessary is to use extraordinary measures, forces and means with an intensified work regime. But, regardless of the different emergencies, they have a common consequence - enormous human casualties and material destruction" (Zakon o vanrednim situacijama, ("Sl. glasnik RS", br. 111/2009, 92/2011 i 93/2012).

It is challenging to formulate a unique, comprehensive and precise definition of an emergency, which would include all its characteristics and specifics. So, for these, and above all practical reasons, different defining of emergencies is usually done according to specific needs. The United Nations, for example, treats a state of emergency (other than war) as a consequence of a catastrophe and defines it as "a serious breakdown of society, causing human, material or environmental losses, making it impossible for a country to use its resources to survive." According to the above definition, not all fires, earthquakes, epidemics or industrial accidents are catastrophes, but only those that exceed the ability of society to react adequately and therefore seek the help of others. Such was the case with the pandemic caused by the COVID-19 virus. In the current circumstances assistance, in the event of an emergency caused either by natural or man-made causes, is the most critical activity to be carried out by society.

Good organization and efficient functioning of institutions and services and other participants in emergency situations, especially international cooperation and joint action, can be vital for the civilian population's survival and for resolving the consequences of emergencies in peace (Strbac, 2021).

2. State of Emergency in the Republic of Serbia - Constitutional and legal determination and action in the function of suppressing the epidemic COVID 19

According to Article 87 of the Law on Defense, when the National Assembly, based on a joint proposal of the President of the Republic and the Government, determines that the conditions have been met, it shall declare a state of emergency. The joint proposal for reporting a state of emergency is determined based on risk assessment and threats to the security of the Republic and its citizens. The evaluation, which the Minister of Defense submits to the President of the Republic and the Prime Minister at the same time, contains an assessment of the threat and the consequences that have occurred or may occur as a result.

The declaration of a state of emergency may also be proposed on the part of the territory of the Republic of Serbia. In this case, a state of emergency was declared on the entire territory of the Republic of Serbia. Furthermore, in addition to the Constitution of the Republic of Serbia, there are special laws that implement measures in the field of public health, which is taken on the occasion of declaring an epidemic of infectious diseases, as during the outbreak COVID-19. These are the Law on Public Health, the Law on Health Care and the Law on Protection of the Population from Infectious Diseases.

In the Republic of Serbia, due to the COVID19 epidemic, a state of emergency was declared on the entire territory on March 15, 2020, at 8 pm, and it lasted until May 6 of the same year. Although it is within the competence of the National Assembly as the highest body of legislative power in the Republic of Serbia, the declaration of a state of emergency, in conditions when the public danger endangers the survival of the state and citizens, was declared a state of emergency due to specific circumstances. The state of emergency may last for a maximum of 90 days unless the National Assembly decides on the extension for another 90 days. A majority decides on the state of emergency of the total number of deputies. In cases when the National Assembly is unable to meet, a state of emergency may be declared jointly by the President of the Republic of Serbia, the President of the National Assembly and the Prime Minister, in the same manner as the National Assembly. The National Assembly meets during a state of emergency without a special invitation and cannot be dissolved. By declaring a state of emergency, measures may be taken to derogate from human and minority rights guaranteed by the Constitution.

Also, when the National Assembly cannot meet, measures can be adopted by the Government, by decree, with the consent of the President of the Republic of Serbia. For example, if the National Assembly does not declare a state of emergency, it must be confirmed within 48 hours or when the National Assembly can meet for the first time. If that does not happen, the provider ceases to be valid at the end of the first session of the National Assembly. The same is the case with the adoption of measures that are not following the Constitution guaranteed human and minority rights provided that these measures cease to be valid 24 hours after the non-confirmation of the steps by the National Assembly. Measures of deviation from human and minority rights are prescribed by Article 202 of the Constitution of the Republic of Serbia. Derogation measures must not lead to discrimination based on race, colour, language, nationality, religion, or social origin. Therefore, these measures ceased to be valid on May 6, 2021. It is, however, often pointed out that Serbia introduced some of the most authoritarian measures, shutting down the country in an intentionally porous lockdown and thus managing to slow the rate of coronavirus infections. Regardless of heavy demand, difficulties and shortcomings, the Serbian health system – with universal health coverage – succeeded in reducing the peak and reversing the spread of COVID-19. The public health system, which was well-developed and comprehensive during the Socialist period, reinforced by EU donations and loans over the past two decades, managed to avoid many significant weaknesses observed in other countries (Šantić & Antić, 2020).

3. Emergency in the function of resolving the COVID 19 epidemic

Medic aid donations from China, Russia, and the European Union at the local self-government level were much easier to manage the outbreak, including the Healthcare system in the Republic of Serbia. EU helped the Republic of Serbia based on the EU's commitment to establishing a single crisis management system:

- the interest of EU member states in strengthening the international role and influence of the EU in protecting their interests in the world;
- the interest of the members and the EU in preserving international peace, security, spreading democracy, respect for human rights, freedom of movement of people, goods and capital in Europe and the world (Štrbac, et al., 2021).

Despite high-level political commitment from the EU, the ongoing spread of covid-19 exposes significant obstacles to developing a comprehensive European response to infectious disease outbreaks (Anderson, 2020). Still, the European Union was not prepared for an emergency such pandemic is. The EU's contribution to fighting COVID-19 was initially limited because member states wanted it so. From a treaty article on public health that carefully limits EU competencies, to legislation that avoids authorizing forceful EU action, to a budget that puts little money into health and has no health emergencies line at all, the EU's member states have made it clear that they want the EU to be a limited actor (Di Lorenzo et al., 2020).

Additionally, under the union civil protection mechanism, the EU has new possibilities to strengthen cooperation between the EU Member States and six Participating States in the field of civil protection, to improve prevention, preparedness, and response to disasters (Goniewicz, et al., 2020). RescEU, the improved civil protection scheme that launched in 2019, is essentially a matchmaker between the Member States with spare resources and Member States with needs (Di Lorenzo et al., 2020). EU need to start planning for an escalation in our response to new coronavirus infections and a surge in demand across the health and social care sector; the expectation must be that our unscheduled care services and the wider NHS, which are already stretched, will be severely challenged even by a modest increase in cases (Watkins, 2020).

After the end of the total lockdown, almost all local self-government units declared a state of emergency on their territory, based on Article 38, paragraph 1 and Article 39, paragraph 1, item 3 of the Law on Disaster Risk Reduction and Emergency Management. The main goal of enacting this Law was to legally regulate the system of disaster risk reduction and emergency management, establish adequate preventive action to reduce disaster risk, respond effectively in case of disasters, and effectively eliminate the consequences. Therefore, it was acceptable to local self-government units to refer to him in declaring a state of emergency due to the COVID 19 epidemic. Indeed, following the Law, at the moment of declaring first a state of emergency and then a local state of emergency, the priority is to preserve the population's health and prevent the consequences of the epidemic. In the past period, it is evident that coordination and cross-sectoral cooperation has been of great importance. Local governments, which have a leading role in resolving any emergency, whether natural disasters or epidemics or technical and technological disasters, has been thoroughly reaffirmed.

In the protection and rescue system, the key elements are the state from the Government of the Republic of Serbia, then the provincial and local self-government bodies. Primarily, funds from the territory of local self-government are used, and in cases when due to the extent of the accident, the available capabilities from the region of local self-government are not sufficient, the competent authority ensures the use of overall capabilities and funds from the broader territory of the Republic of Serbia. The higher preparedness level of local community and state was perceived by those with high school and junior college degrees, respectively, and women for both. These findings could be the result of frequent television monitoring for respondents with high school degrees and higher levels of trust among women towards experts addressed to the public daily (Cetkovic et al., 2020).

During the COVID 19 epidemic, the disaster risk reduction and emergency management system in the Republic of Serbia primarily took all necessary actions to keep the outbreak under control and eliminate the consequences whenever possible, bearing in mind the unpredictable picture of the emergency itself.

In addition to the Law on Disaster Risk Reduction and Emergency Management, other laws also cover emergency response caused by disease epidemics. Article 11 of the Law on Public Health deals with public health in an emergency where local self-government units are also responsible for implementing public health on their territory. According to the Law on Protection of the Population from Infectious Diseases, the competence of all local self-government units is to respect the recommendations of the Republic Institute for Public Health and take care of preventing the spread of infectious diseases on their territory.

The Republic of Serbia has 29 administrative districts, the City of Belgrade and 174 local self-government. Bearing in mind that the COVID 19 epidemic without exception affected the entire territory of the Republic of Serbia and that after the lifting of the state of emergency, the population had to be protected from infectious diseases, the Emergency Headquarters proposed declaring a state of emergency, which was 80% of local governments and accepted.

Figure 1. State of emergency declared in local self-governments 2020.
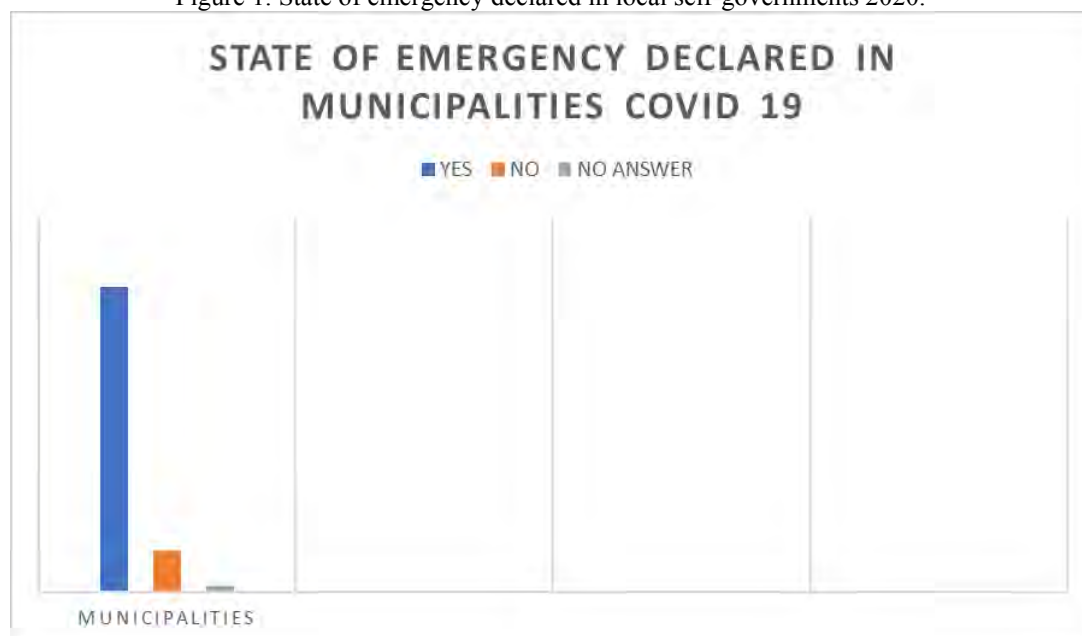
(Source: Ministry for human and minority rights and social dialogue, 2021)

According to a survey conducted by the Ministry of Human and Minority Rights and Social Dialogue to assess the state of functioning of local self-government units, 100% of them by the Law on Disaster Risk Reduction and Emergency Management have established Emergency teams.

The primary role of Emergency teams is to manage and coordinate the work of the subjects of disaster risk reduction and emergency management on the implementation of designated tasks, manage and coordinate the implementation of measures and functions of civil protection, order the use of disaster risk reduction and emergency management, assistance and other means used in emergencies, it takes care of regular informing and informing the population about risks and dangers and measures taken and implements other measures of interest to the people in its territory.

Figure 2. Establishment of the headquarters in the local self-governments for emergencies 2020
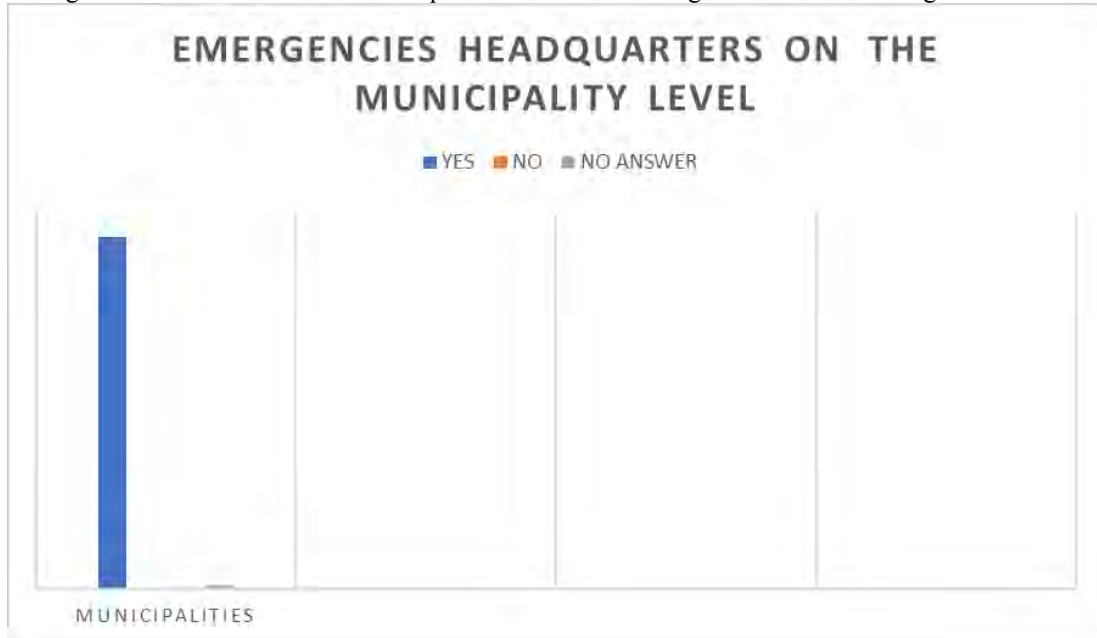
(Source: Ministry for human and minority rights and social dialogue, 2021)

Also, the formation of civil protection units is vital for resolving emergencies at the level of local self-government units.

Figure 3. Civil protection units formed on a local self-governments level
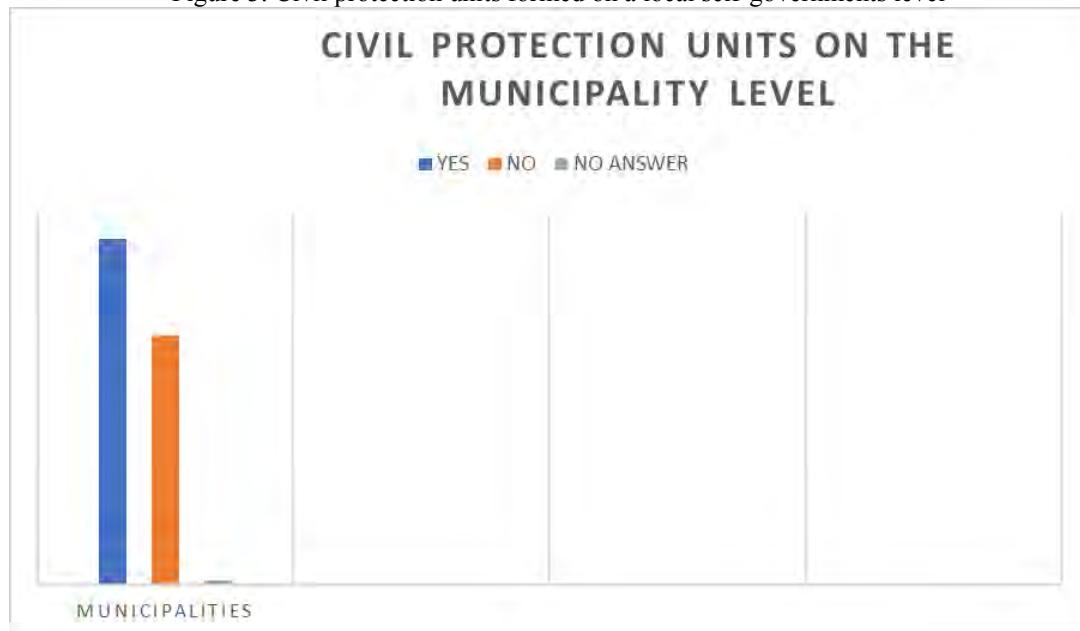
(Source: Ministry for human and minority rights and social dialogue, 2021)

In a specific situation such as the COVID 19 epidemic, when part of the population could not move, civil protection personnel were invaluable to assist that population.

Figure 4. Engagement of civil protection units on a local self-governments level 2020
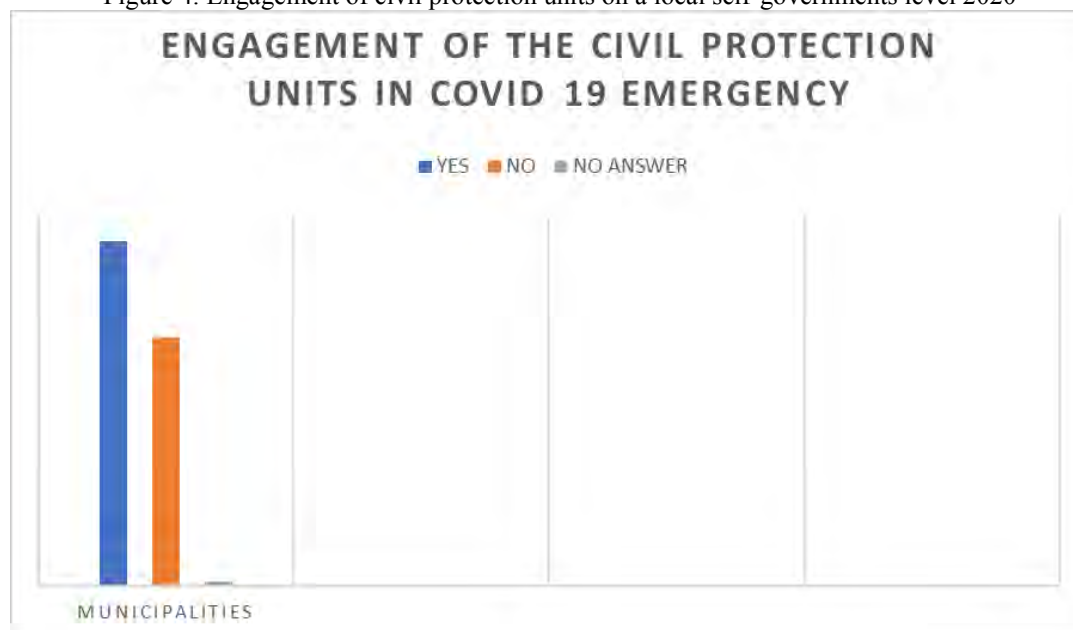
(Source: Ministry for human and minority rights and social dialogue, 2021)

4. Conclusion

The pandemic caused by the COVID-19 virus suddenly hit the world in early 2020. and in a short time, it has managed to bring the health systems and economies of many countries practically to collapse. Recovery forecasts for 2021: they are essentially not optimistic, and it is not easy to talk about longer-term effects. In complex circumstances such as a pandemic, greater involvement of supranational organizations is expected, which have shown their weaknesses in this case. Italy was the most affected by the pandemic in the EU, which caused the activation of civil protection, which proved to be a significant capacity of the state in the fight against the pandemic. The experience of the Republic Italy, especially in the engagement of civil protection management, should be applied in other European countries as well.

The Republic of Serbia, without controversy, nevertheless reacted adequately in the initial stage of the pandemic. However, there is an impression that local governments need to make more use of civil protection management, even in pandemics. However, based on the declared state of emergency, it is evident that it helped survive the population. After the declaration of the epidemic and the introduction of the state of emergency, the engagement of local self-government institutions was vital, having in mind the coordinated activities that had to be carried out in their territories. Under the decisions of the Crisis Staff, a state of emergency was declared in most of the local self-government units, and the Emergency Situations Headquarters were activated.

Although civil protection management could be the most critical mechanism for mitigating the emergency, some local self-government units were not formed. The local self-governments that have created civil protection management used these units during the emergency to alleviate the epidemic, which should be an example of good practice in the future.

For future similar crises, the Republic of Serbia government should consider using civil protection management more. Helping the elderly population also might be a part of civil protection management in local self-governments. The role of civil protection units is priceless in all emergencies, and experience from this epidemic has shown us the necessity of establishing and improve civil protection management.

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Trocki kao proizvod specifičnog vremena - strategija, liderstvo i kulturalizacija

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Apstrakt: Cilj rada je da se ispita reputacija Lava Trockog kao vođe strategije koja je nastala tokom turbulentnih godina ruske revolucije. Sa specifičnim rukovodstvom, bio je proizvod specifične epohe, vršio je uticaj na ključne istorijske i kulturne događaje i kao takav bio je predmet istraživanja više od pola veka. Bez njegovih odličnih strateških veština, boljševici možda nikada ne bi došli na vlast. Na kraju je Staljin pobedio Trockog, koji je, zarobljen sopstvenim principima, imao malo političkih veština. Do 1927. isključen iz Partije, do 1929. iz same Rusije, Trocki je izbledeo sa ruske scene. Prognan, konačno je našao podršku u Meksiku, radio je tamo, uticao na Kardenasa i nadrealističke umetnike, napisao mnoge odlične članke, dao ogroman doprinos umetnosti, ali nije mogao da izbegne Staljinovu represiju, završio je ubijen. Rad se prvenstveno zasniva na delima Trockog, njegovih bibliografa kao što su: Ernes, Dimitri, teorija trockizma i nadrealističke kritike. Mapiranjem najznačajnijih teorija pokušali smo da predstavimo ideologiju tog vremena i njen uticaj na politiku i umetnost, kao i na percepciju liderstva. Hipoteza ovog rada je da je Trocki zaista bio proizvod određenog vremena i pozadine, ali da su ga odneli događaji kojima je pomogao da se oslobodi, koji su imali ogroman uticaj na različita polja kulture, doprineli ogromnoj kulturalizaciji.

Ključne reči: Trocki, strategija, vođstvo, kultura, umetnost

Trotsky as a Product of Specific Time - Strategy, Leadership and Culturalization

Abstract: The aim of the paper is to examine Leon Trotsky's reputation as a strategy leader forged during the turbulent years of the Russian Revolution. Having specific leadership, he was a product of specific era, exerted an influence on the key historic and cultural events, and as such, subject of research for more than half a century. Without his excellent strategic skills, the Bolsheviks might never have come to power. Eventually, Stalin defeated Trotsky, who, trapped by his own principles, had few political skills. By 1927 expelled from the Party, by 1929 from Russia itself, Trotsky faded from the Russian scene. Exiled, he found support finally in Mexico, worked there, influenced Cardenas and surrealistic artists, wrote many excellent articles, made enormous contribution to art, but couldn't avoid Stalin repression, ended up murdered.

The paper is primarily based on Trotsky's own writings, his bibliographers like: Ernes, Dimitri, Trotskyism theory and surrealistic critiques. By mapping the most significant theories, we tried to present the ideology of that time and its impact on politics and art, same as perception of leadership. The hypothesis of the paper is that Trotsky was indeed a product of specific time and background, but was swept away by events he helped unleash, having a huge impact on various cultural fields, contributed to huge culturalization.

Key words: Trotsky, strategy, leadership, culture, art

1. Trotsky's background, socialistic insights, and contributions to the Bolshevik Revolution

Trotsky's background and socialistic insights

As Trotsky (1973) himself used to say "it is not possible to live outside of politics, without politics, any more than one can live without air" (p. 282), he entered politics in his youth, long before he established himself as an immortal leadership icon. Even though his family was decently well off, his extraordinary love for all human beings, and his particular socialistic insights brought him to Marxism. Furthermore, his unique and creative leadership was the last straw that made Bolsheviks prevail and take over the rotting Russian Empire.

Lev Bronstein[3] was born in a remote Jewish-majority village in modern-day Ukraine in 1879. Although coming from a Jewish background, his family spoke a mixture of Russian and Ukrainian language and were not devoted Jews. They were wealthy thus they could afford Lev's pursuit of good education. At an early age of eight, he was sent to Odessa, a major cosmopolitan city at the time. Due to strong influence of both houses of Hapsburg and of Saxe-Coburg, many of Odessa's best schools were taught wide general knowledge, where young Lev learnt French, English, and German. However, the most important part of his stay in Odessa was meeting numerous foreign sailors, merchants, and other labourers. They introduced him to more in-depth Marxism insights, which he opposed at first. By the year 1899, the revolutionary fire burned in him, resulting dropping his pursuit of mathematics degree and he joined the Worker's Union.

The following year the most prominent members of the Union, including him, were arrested. The popular narrative is that Bronstein adapted the surname Trotsky from a jailer that astonished him during his stay in Odessa prison. After having been moved to Moscow prison, his second important strategic stage started as he came into close contact with other revolutionaries and read almost all Lenin's books. Later in 1899, Trotsky was sentenced to exile in Siberia where he became aware how split the Communist party was; one side was just for improvement of workers' situation, other, his side, for *total revolution*[4] and overthrowing the Tsarist government.

After three years Trotsky escaped to Berlin, further developing his ideas about leadership there, then moved to London and joined *Iskra* editors (*Spark* in English) with Lenin and Plekhanov as the most important for his leadership skills development. After quickly demonstrating his immense writing skills, he shortly became one of the papers' leading writers. While Trotsky solely focused on supporting and spreading the revolution, Lenin wanted to utilize his competence in order to gain power over the old guard of *Iskra* and promote him to a full member of the board, an action which Plekhanov fiercely opposed. That moment foreshadows the future where Lenin will showcase better political knowledge and manipulation, while Trotsky is motivated solely by his revolution. The party's Second Congress convened in London in 1903, but shortly after, the pro-*Iskra* delegates split into two fractions: Lenin's Bolsheviks, highly strategically organized and disciplined and Martov's Mensheviks, less disciplined party. Initially Trotsky supported Martov and fell out with Lenin.

However, he quickly left Mensheviks and was non-aligned for many years since he had his own strategic vision and did not want to sacrifice it for any power. Lenin utilized the fact that Trotsky was of Jewish origin to ruin his popularity, calling him *Judas*. In 1905 Russian Empire's internal problems culminated, and the first revolution started. Emancipated peasants were in a poor situation, labour unions and strikes were banned; Russians knowing about freer life in the West wanted a change. Trotsky stated (1973) that he had became head of the Petrograd Soviet after secretly returned to Russia believing that "the power is one social relation between social forces" (p. 59). Using his excellent managing skills, he mobilized the whole middle class against the bourgeoisie. However, people were not ready for the regime change yet and the revolution failed, although it served as a rehearsal for the revolution of 1917.

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[3]Lev Davidovich Bronstein (7 November (26 October 1879 – 21 August 1940) Originally Jewish family given name, later changed to Trotsky by himself.
[4]Jayaprakash Narayan (1902-1979), the great Gandhian socialist raised his famous slogan, *Sampoorn Kranti (Total Revolution)*, in a speech at a huge rally in Patna on June 5, 1974. Many theories and books followed his insight.

Trotsky' contributions to the Bolshevik Revolution and Trotsky as military genius

As a consequence of a failed revolution, Trotsky and other Soviet leaders were trailed (Hutley, 1937) and sentenced again to exile in Siberia, but his military expertise helped him escape during the transportation. After that Trotsky became incredibly popular, showed his talent, well elaborated leadership, and became wildly renowned and read. From 1908 he was *Pravda* editor in chief (*Truth* in English). Lenin agreed to approve financing the paper if a Bolshevik could be added to the editorial board, as he recognized that Trotsky would be a valuable asset for a future revolution.

The Great War erupted suddenly in 1914 (assassinations in Sarajevo, attack on Serbia). No one expected such a massive conflict to become a reality, nor himself as a now world renown leader. For Lenin, Trotsky and all other socialists, the war meant a chance for united struggle. Due to furious anti-war speeches, Trotsky ended up being deported first to Spain, and then to the United States. Eventually he reached Russia again in May 1917 agreed with Bolshevik position and was elected chairman of the Petrograd Soviet in October 1917. In November he personally led the efforts of overthrowing the Provisional Government lead by Kerensky. Even Stalin (1937) noted that "all practical work of the uprising was done under Trotsky" (p. 34). Trotsky led the attack on the Winter Castle, utilizing extreme cruelty towards his enemy because he believed that "smashing, breaking up, and demoralizing enemy forces" (Dmitri, 1997:78) was the only way to ensure victory. Such successes undeniably brought him to be the second man in the party, just after Lenin. In his detailed study Ernest (1979) underlined that after overtaking the government, Trotsky became the chief negotiator in talks with the German Empire, trying to delay negotiations as much as possible, hoping that German and other western workers would rebel themselves. After signing the Peace Treaty, Trotsky resigned as the Commissar for Foreign Affairs and was appointed as the People's Commissar of the Army and Navy Affairs, effectively making him the Head of the Red Army. He identified that current Soviet Army lacked coordination, discipline, and subordination.

Hence, during the whole Civil War Trotsky was transforming the army from many small independent detachments into a larger, homogenous one. Having incredible military skills, previously elaborated, and studied, "Trotsky held discipline highly with compulsory obedience, introduced forced conscription and officers being chosen by the party leadership, not by rank" (Ernest, 1967: 73). The sheer size of Russia and enormous number of armies and combatants tested his organizational skills. He successfully mobilized close to a million men in May - October 1918 believing that death is not scary, especially when it is supported by the history and the base that held the army together was the belief in the revolution. Trotsky managed to overcome the difficulties and win the war through immense strategic military skills.

However, his political advisories, particularly Stalin, just waited for any misstep that came during the Soviet-Polish war. Even though the loss came partly because Stalin refused to obey and Trotsky himself was against the war, wide critique spread. Overall, the Bolsheviks won over in the Civil war because Trotsky introduced numerous new ideas and policies to the red army, such as suppressed political opponents, concentration and labour camps and managing the work of old Tsarist military specialists.

Resuming Trotsky life and career he is typical product of a specific man in one specific time. Immensely intelligent, educated, typically, was a loner, and was not a great team player. After Lenin death in 1924, Stalin utilized such weaknesses and successfully overtook the party and expelled him by 1929. Trotsky believed into ideas of worldwide socialism, while Stalin's ideas were more focused on *Socialism in one country*, an attitude of national self-sufficiency and self-centeredness. The two were not compatible and therefore one had to go. Firstly, Trotsky and his family were exiled to Turkey, soon lost Soviet citizenships, and were forbidden to enter the Soviet Union. Trotsky was dangerous and non-communist countries did not want to accept him out of fear of the revolution in their country. Eventually he managed to go to France and ended up in Mexico. On his journey, Trotsky (1939) observed that revolutions in most of the countries died out because money "transformed their leaders into political agents of the bourgeoisie and of its state" (p. 70).

Although unsurpassed as an academic and military strategic organizer, Trotsky had few political skills. Hence, when Lenin died, he failed to consolidate his power, he was Lenin's intended successor, but was also trapped by his own principles. As a Marxist-Leninist, he believed in the need for collective decision-making in the Party; did not see himself as Russia's paramount leader. Instead of destroying

Stalin when he had the chance, Trotsky debated him on matters of policy and ideology, and was defeated on every front. By 1927 he had been expelled from the Party and by 1929 from Russia itself. Trotsky now faded from the scene and played only a marginal role in the history of his country. Specific time, specific man, specific leadership skills, unique Soviet revolution, great possibility, and great loss. What a powerful Trotskyism thought, what a lack of united managed skills!

2. Leon Trotsky strategic thoughts about culture and art

Trotsky's theory of culture

 Leon Trotsky had exceptional range and diversity of the cultural and artistic interest. His contribution (1973) to the theory of culture is highly remarkable, stating that culture is the sum of all knowledge and skills amassed by mankind throughout all its preceding history. "Culture is everything that has been created, built, learned, conquered by man in the course of his entire history, in distinction from what nature has given" (p. 227).

There are two aspects of culture according to Trotsky (1923): material culture and spiritual culture. The first comprises material achievements like tools, machinery, buildings, monuments, includes methods, skills, welcome acquired abilities. Thus, technology is a valuable part of material culture. Spiritual culture as inherited from the past comprises religion, philosophy, science, social sciences, and art. Both forms of culture have passed through a long process of evolution. Class structure of society has inevitably shaped its culture.

Concerning his political writings, the most belong to the period before 1929 and are not available in print now. The available ones belonging to the period 1929-1940 are remarkable for their depth and insight. Three of them (2005, 1965, 1981): *The Permanent Revolution, The Revolution Betrayed* and *In Defence of Marxism* constitute the proletarian revolutionaries' theory all over the world. *The History of the Russian Revolution* (2008) written in three volumes is an indispensable account of the event as well as an illustration of the communist method of writing history.

Trotsky (1973) stated that the road to Cultural Revolution was long and hard. "The cultural revolution must not be understood in a superficially idealistic way or something which is an affair for small study groups. It is a question of changing the conditions of life, the methods of work and the everyday habits of a great nation, of a whole family of nations" (p. 246). Cultural Revolution means development of higher morals, too. Therefore, the work of culturizing was a fundamental revolutionary task to him and one of his main strategic points in achieving his goal. He pointed out (Trotsky, 1973) that it was simply impossible to abstract the cultural work from the national and international politics. Proceeding from that stand, he took up: philosophy, library work, religion, social and individual psychology, literature, the role of cinema, the position and prospects of women and the purification of speech, as an instrument of mass initiative. He emphasized that "Socialism, after all, does not consist only in the abolition of the exploiters, but also demands a system of material prosperity, general security, and all-round cultured existence" (1973:85).

Trotsky (1973) noted that no book was useful for everyone arguing that "there must be a correlation between the reader's personal experience, general level of development, and abilities" (p. 295). He stressed that elementary steps in the education of the deprived classes are the eradication of illiteracy, alcoholism, and superstition. Besides, formal educational institutions, newspapers, libraries, worker's clubs and cinema could become the instruments of enlightenment. He (1973) viewed the newspaper not as an "organ telling us about this and that, but as the worker's instrument of education, as a weapon of knowledge, a direct, daily, practical expression of a political and economic activity" (p. 149). He expected the library worker to play the role of a social worker stressing "that library worker is not a library worker of a socialist country if he is simply in charge of a shelf of books" (p. 153). He suggested that the cinema can prove the most powerful and the most democratic instrument in this respect.

Trotsky thoughts (1973) about link of culture and alcoholism are more than unique and a part of an obvious strategic roles that are showing his specific leadership lessons. "For the working masses the struggle against alcoholism is a struggle for physical and spiritual. On daily life of the worker, alcohol snatches a large share of wage earnings and in this way undercuts the advance of culture" (p. 174).

To sum it up, due Trotsky, cultural progress begins with education continues with art and literature, or culture as a strategy. To promote them, it is desirable to permit them freedom as the remedy lies not in the negation but in giving the satisfaction of this desire a higher artistic reality, at the same time making amusement a weapon of collective education. "It can be supplanted by new forms of life, new amusements, new and more cultured theatres" (p. 35).

Mexico's leadership period: Trotsky, Rivera, and Surrealist artists

Trotsky influenced Cardenas's Mexico and Cardenas himself, who was socialist president, highly sympathetic to Trotsky's ideas and under his influence nationalized all important oil industry. Hence Mexico, key nation in that time in American hemisphere, offered a chance for renewed Fourth International, efforts that aimed to rid of Stalinist elements to return it to its original Lenin path.

Ernest Mandel (1979) underlined it was clear that that Soviet Communist Party wanted to sell its own proletariat as to form alliances with the capitalist bureaucracies of Europe and it was him, Trotsky, who realized that reform was no longer possible and that entirely new organization needed to be built. Trotsky saw the key problem in the XX century as "the crisis of mankind is the crisis of the revolutionary leadership of the proletariat" (p.115).

In his essay *Nationalized Industry and Workers' Management* Trotsky (1939) warned that although the Mexican government had made certain concessions toward the proletariat, it was by no means a workers' state free of the heavy pressures of private foreign capital. He argued it remained tied to capitalism, thus, the danger, if any government - union collaboration lay in tendency of union leaders to be swayed by the "apparatus of state capitalism against the interests of their own constituency, transforming those leaders into political agents of the bourgeoisie and of its state" (p.70). In that text he focuses intently on the nature of the Mexican proletariat in relation with Cardenas' government and examines various strategies for creating and maintaining a revolutionary vanguard leadership that would link the Mexican struggle to their international proletarian movements. Offering day to day political strategies, he criticizes Mexico having been stymied in the bourgeoisie phase of its revolution. But the most crucial areas of interest and late critiques are those about culture and agrarian strategies. Trotsky (1939) recognizes that agrarian reform is "the main question in Mexico" (p.76) although he ignored the fact that the Mexican peasantry, not the proletariat, was the historically revolutionary class. He fell into trap for which Gramsci (1971) criticized him of disregarding national differences in the revolutionary potential of various oppressed groups and of homogenizing the international working class. This is the point at which the issue of culture arises. They are not only political and economic specificities that determine differences, but cultural factors as well!

Helena Lewis (1988) underlined that Andre Breton was introduced to the great revolutionary by Diego Rivera, the flamboyant communist leader of Mexican Mural Movement. They drafted together the famous manifest *For an Independent Revolutionary Art* (1938), forming the cultural milieu in which Surrealism and Trotskyism came together. Focus was internationalist under particular scrutiny on both political and cultural levels. It raised questions about subsequent surrealist attitudes toward other cultures. Despite their effort to find a common platform, one that would combine theory and practice, surged fundamental differences in their basic conceptions of imperialistic capitalism and how to combat it to set up a socialistic state. What the manifesto purports to offer, therefore, is in means of judging social freedom by thinking about conditions of artistic production. On the surface, this produced a landmark collaboration between two of the most powerful and innovate interwar schools of thought on social revolution.

For surrealist, the most important thing was that Trotsky was anti-Stalinist and that his 1924 published book *Literature and revolution* (Trotsky, 2008) advocated freedom of cultural expression as necessary to any true proletarian state. Andre Breton restated Trotsky famous dictum "art, must, above all, be judged by its own laws, that is to say the laws of art" when he wrote in 1937. *The Declaration on the Second Moscow Trial,* Breton clearly came around supporting Trotsky against Stalin (Hutley, 1937). He recapitulates Trotsky's analysis of Moscow as a Bonapartist political regime, one that promises to represent the revolutionary energy of the proletariat but in the end concentrates power in a state bureaucracy "determined at all costs to prevent a new revolutionary wave from breaking on the world" (Hutley, 1937: 318-25).

Nevertheless Trotsky (1973) persistently opinions that culture is ultimately a subsidiary issue, while Breton and surrealist conceptualized it as central. Trotsky (1938) argued in *Manifesto for An Independent Revolutionary Art* for centralized socialism in the realm of "productive material forces", but for anarchism as a theory of cultural production. "No authority, no dictation, not the least trace of orders from above" (p. 185). This sedition marks it clearly that Trotsky could not reconcile Marxism's commitment to collectivity whit that he thought to be artistic production's individualist nature. Trotsky focused almost exclusively on the purportedly objective problem of economic exploration, giving little thought exactly how culture or individual agency might actively be incorporated into Marxist's theory. Trotsky's Marxism was and remained very orthodox. On the other hand, Breton and Surrealism formed part of a western Marxist tradition that saw true revolution as occurring on the level of culture as much as any other.

Still working closely and influencing mutually, Trotsky organized and managed *IV International* in Mexico, congress took place in Paris, just after Breton returned there and elaborated his essay *Souvenir du Mexico* (1939) with a help of Trotsky. Visibly under his influence Breton wrote "there is at least one country in the world where the wind of liberation has not fallen" (p. 31).[5] Even they edited together manifesto *For an Independent Revolutionary Art* it is obvious that it was elaborated by Breton and edited by Trotsky (Gramsci, 1971).

At the end, collaborative failure between Mexicans and Surrealist was deeply formed not because Surrealism did not conform to a Trotskyist program, but more because surrealism despite its adamant anti-colonialist stance, slid close to a Eurocentric attitude toward culture and social change with respect to Mexico. It soon became clear that Breton's agenda in addressing Mexican culture and society is quite different than Trotsky's. Over the time Breton dropped into poetic prose that conceptualized historical time. He privileged Mexican culture over European. On almost all levels, Trotsky's tactics and approaches differ considerably from Breton's. Trotsky's materialism opposes Breton's reformulated Hegelian dialectics. The insights differ substantially between the two. Trotsky's rationalism of matter of facts, almost scientific political discourses, insistent focus on the immediate present were getting away from international surrealistic and local Mexican artists point of view.

Trotsky - Tragic hero

Trotsky was classical tragic hero as his biography and work show. His primary tragic insights are visible in his theory about *Permanent revolution* (2005) as well during his journeys thru Europe, like tragic figure Odyssey, wandering around, forced to live that way, escaping from danger. In his earlier mentioned here texts, evidently, consistent struggle one should embrace, inner and strategic, is seen on a greatest scale. Already tragic figure, Trotsky produced in 1923 two renowned books: *The problems of Everyday life and The Literature and the Revolution* (1973, 2008). Critical analysis shows that he was big reader and writer, reading and writing in libraries and prison. Sentence "No better product than one well written book on a whole civilization" (p. 48) is evoking his main attitude. *My life* (1973), is written in Turkey while exiled, as well as *History of the Russian Revolution*.

Evidently Trotsky is one of the most valuable historical figures of XX century, but very tragic hero, the typical one representative as it used to say old saying" The Revolutions eat their own children." Trotsky himself did not believe on predestination, although he faced historic drama without precedents. Hence being such a tragic figure and one of the most eminent XX century erudite, he influenced many artistic works, essays, articles, predominated tragedy genre. His contribution is visible in surrealistic work of Breton and Mexican poet Octavio Paz[6], in which work tragedy insight can be noted in depth. Guillermo Cabrera Infante[7] (1981) said in *Tres Tristes Tigres* that he was "prophet of one heretic religion: messiah and heretic in one unique entity" (p. 77). He lived in the midnight of XX century, during dark time as Hannah Arendt (1951) called 1930's of XX century. Another important contribution is made by modern Cuban writer Leonardo Padura Fuentes (2013) who wrote a novel named *The man who loved the dogs,* based on Trotsky life, translated over the world.

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[5]Betrayed revolutions: Soviet Union, Germany, China, and Spain.
[6]Octavio Paz (1914-1998) was a Mexican poet and diplomat. For his body of work, he was awarded the 1981 Miguel de Cervantes Prize, the 1982 Neustadt International Prize for Literature, and the 1990 Nobel Prize in Literature.
[7]Guillermo Cabrera Infante (1929- 2005) was a Cuban exiled erudite novelist, essayist, translator, screenwriter, and critic.

Even so tragic, Trotsky's texts shed light, offering one optimistic attitude toward the future, in terms of history, although only one small part of the world intellectuals assumed it. Today, from every corner of the world they admire him, exiled tragic Jewish erudite, as he wrote decans of books and hundreds of articles offering the most valuable clues to comprehend that present history. Trotsky was speaking more than 5 languages. His international vision, his cosmopolitans culture, analysis of coming fascism in Germany, tragedy of Spanish revolution involved in Civil war, decadency of British imperialism, bureaucratization of Soviet Union in *Where does Russia go*? (Trotsky, 1927), Chinese communism, and many more, made him eternal figure.

Conclusion

Trotsky was undoubtedly the foremost brilliant intellect propelled to prominence by the Russian Revolution, outdistancing Lenin, and other theoreticians both within his leadership style, the range of his interests and within the imaginativeness of his perceptions. He was an indefatigable worker, a rousing orator, and a decisive administrator. On the opposite hand, Trotsky was not successful as a pacesetter of men, partly because he allowed his brilliance and arrogance to antagonize the lesser lights within the communist movement. Maybe he lethally undermined himself when he turned into a Bolshevik in 1917, subjecting himself to Lenin's authority and tolerating the strategies for fascism that he had subsequently denounced. Had Trotsky won the battle to succeed Lenin, the character of the Soviet system would more likely be different, especially in strategy, social arrangement, and consequently in the degree of terroristic suppression. Trotsky's failure, however, seemed to be almost predictable, considering his own qualities and therefore the conditions of authoritarian rule by the Communist Party organization.

Resuming Trotsky figure could be stated that being politically defeated by Stalin is the clue to the Socialistic tragedy of the XX century. It was not typical political dispute, discussion, it was chasing and torturing him, and their direct, strategic and academic fight, was the key role of antagonism in terms of understanding the socialistic process. Trotsky murdered by worse but stronger character, and Russia became isolated, is something even previously seen in Marxist theory, as per Isaac Deutcher (2015). Although, in return, his personality, figure, and brilliant mind are still alive. His books now are even more read, reedited, and translated as he became the epic political reference for a new generation of leaders and political science. His global vision of capitalism, his cosmopolitan conception of culture, his diverse dialogues with distinguished avant-garde schools in Soviet Union around 20's XX century (Russian formalism, constructivism, futurism), with psychoanalysis, surrealist, made him eternal key role of leader and writer (Dmitri, 1997).

It was the biggest clash of the theory and real life. After Trotsky's life, *norm* and *reality* even turned out more drastically. Continuation of XX century did not look like even at the smallest scale as Trotsky could imagine: final solution, atomic bomb, new world order made in Yalta… IV International failed, with the new, not envisioned, reality after Second World War. We hardly can imagine what Trotsky could contribute with his erudite insight and unique leadership skills.

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Guidelines for the Preparation of Papers for Publication in the Serbian Journal of Engineering Management

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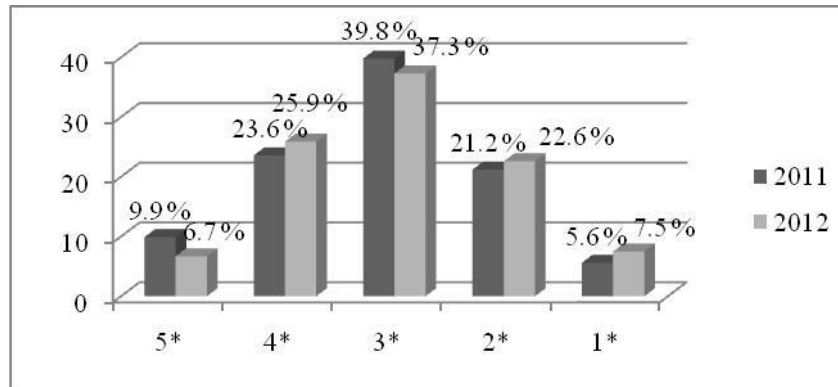
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Table 1: Accommodation units according to the structure of hotel capacities in 2011 and 2012, written in the form of percentage

Category	2011	2012	Number of accommodation units (2011)	Number of accommodation units (2012)
5*	9,9	6,7	1452	990
4*	23,6	25,9	3486	3911
3*	39,8	37,3	5895	5636
2*	21,2	22,6	3102	3420
1*	5,6	7,5	1133	1132
total	100	100	15068	15089

Source: (The Ministry of Finance and Economy, 2013)

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$$PV_0 = \frac{FV_n}{(1+i)^n} \tag{1}$$

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A book which was translated from a foreign language:
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Obrazac za pripremu radova za objavljivanje u časopisu
Serbian Journal of Engineering Management

Naslov rada na srpskom jeziku

Ime Prezime[8]*, Ime Prezime[2], Ime Prezime[3] [ostavite u ovoj verziji prazno za potrebe recenzije]

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Ključne reči: 3-5 ključnih reči za indeksiranje i pretraživanje

Title of Paper in English

Abstract: This document presents a template for preparing the print-ready papers that will be included in the Serbian Journal of Engineering Managment. The abstract briefly summarizes the article and gives the reader the opportunity to assess it's relevancy. The authors should elaborate the goals of the research or state their reason (reasons) for writing the paper. It is additionally required for them to describe the methods used during the research and give a brief description of the results and conclusions of the research. The abstract should be between 100 and 250 words in lenght.

Keywords: 3-5 keywords

1. Uvod

Rad pisati koristeći MS Word za Windows (tastatura za srpsku ćirilicu, latinicu ili engleski jezik - UK). Dužina rada treba da bude najviše 10 strana uključujući tekst, slike, tabele, literaturu i ostale priloge. Format stranice je **A4.** Koristite **2 cm** za donju i gornju marginu, a **2,5 cm** za levu i desnu marginu. Razmak između redova u okviru jednog pasusa je jedan, dok je razmak između paragrafa dvostruki. Za formatiranje teksta preporučuje se korišćenje fonta **Times New Roman.**

2. Struktura rada

U prvom redu na prvoj strani treba napisati naslov rada na srpskom jeziku (16 pt). Ispod naslova rada treba ostaviti mesto za navođenje ime(na) autora, nazive institucija autora onako kako je naznačeno u ovom Obrascu. Nakon institucije poslednjeg autora, ostaviti jedan prazan red i u sledećem napisati kratak sažetak (10 pt). Nakon sažetka sledi pregled ključnih reči. Nakon prikazanog naslova rada, sažetka i ključnih reči na srpskom jeziku, potrebno je i na engleskom jeziku naznačiti prethodno navedeno.

Numerisane podnaslove prvog nivoa treba formatirati korišćenjem fonta 12 pt boldovano, a podnaslove drugog nivoa 10 pt boldovano. Tekst, kao i spisak literature treba formatirati korišćenjem fonta 10 pt.

3. Grafički i tabelarni prikazi i formule

Sve ilustracije, bez obzira da li su dijagrami, fotografije, grafikoni nazivaju se slike. Naziv i broj slike treba prikazati na sredini reda iznad slike.

Slika 1: Procentualno učešće smeštajnih jedinica u strukturi hotelskih kapaciteta u 2011. i 2012. godini
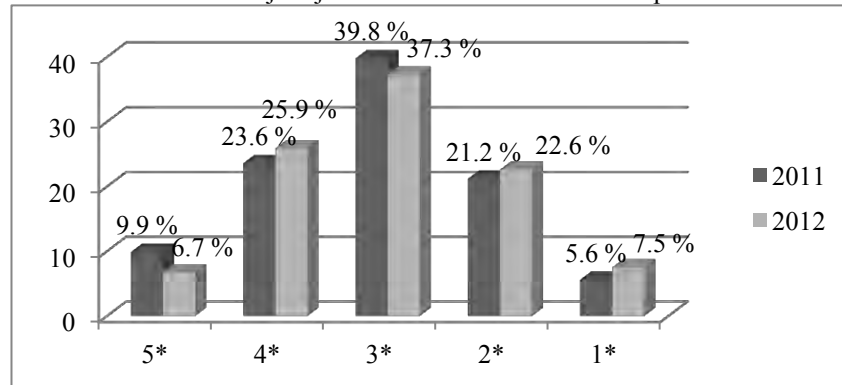
Izvor: (Ministarstvo finansija i privrede, 2013)

Naziv i broj tabele treba prikazati iznad tabele na sredini reda.

Tabela 1: Procentualno učešće smeštajnih jedinica u strukturi hotelskih kapaciteta u 2011. i 2012. godini

Kategorija	2011.	2012.	Broj smeštajnih jedinica (2011)	Broj smeštajnih jedinica (2012)
5*	9,9	6,7	1452	990
4*	23,6	25,9	3486	3911
3*	39,8	37,3	5895	5636
2*	21,2	22,6	3102	3420
1*	5,6	7,5	1133	1132
ukupno	100	100	15068	15089

Izvor: (Ministarstvo finansija i privrede, 2013)

Pošaljite svoj rad, uključujući tabele, slike itd, kao jednu datoteku. Pored toga, treba dostaviti sve slike i tabele (koje se unose u crno-beloj tehnici) kao posebne fajlove u JPF ili TIFF formatu sa najmanje 300dpi rezolucije.

Formule treba centrirati na stranici sa numeracijom, kao u narednom primeru. Preporučuje se formatiranje redova sa formulama u Microsoft Word-u (MathType).

$$PVo = \frac{FVn}{(1+i)^n} \qquad (1)$$

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U zaključku autori treba da sumiraju rezultate do kojih su došli u istraživanju.

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Prilikom navođenja literature, treba se pridržavati uputstva APA sistema navođenja literature. Za više informacija pogledajte *Publication Manual of the American Psychological Association* (6th ed.).

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Rad u časopisu sa jednim autorom:
Primer: Harish, R. (2008). Brand Architecture and its Application in Strategic Marketing. *The Icfai University Journal of Brand Management,* 7(2), 39-51.

Rad u časopisu sa dva autora:
Ako članak na koji se pozivate ima DOI broj, treba ga dodati referenci.

Primer: Tew, C. & Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. *Tourism Management,* 33(6), 215-224. doi:10.1016/j.tourman.2011.02.005

Rad u časopisu sa više od dva autora:
Primer: Luque-Martinez, T., Castaneda-Garcia, J. A., Frias-Jamilena, D. M., Munoz-Leiva, F. & Rodriguez-Molina, M. A. (2007). Determinants of the Use of the Internet as a Tourist Information Source. *The Service Industries Journal,* 27(7), 881-891. doi: 10.1080/02642060701570586

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Uređivački odbor je zaključio ovaj broj 16. jula 2021.