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Research Articles

POSSIBILITIES FOR DATA COLLECTION AND EXAMPLES OF VISUALISATION OF ENVIRONMENTAL ACTIVITIES OF BUSINESSES IN THE SOLOMO ENVIRONMENT

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Abstract

The presented paper clarifies the current state of environmental activities of business entities in context of data visualization within the SoLoMo environment. The main goal of this paper is to clarify the state of the domestic environment in the implementation of specific environmental activities and then evaluate the possibilities of visualization using mobile applications in the SoLoMo environment. Data are collected from 129 representatives of business entities and analyzed through descriptive statistics and the significance of the relationship using Cramer's V. Conclusions are formed through analysis and evaluation of individual responses to quantitative research. The conclusions suggest that the philosophy of sustainability is implemented in the domestic environment within business entities. This is followed by a significant relationship with the implementation of environmental activities externally, which is also implemented by business entities predominantly and defining the possibilities of data

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visualization of environmental activities in accordance with the SoLoMo environment. The limitation is the sample, which, despite being made by available selection, meets the broad spectrum focus and identification of a diverse number of subjects. The presented paper emphasizes the need to apply visualization in data that result from the environmental activities of business entities. In the previous period, there was no extensive research within the domestic environment, so it is very important to continue researching the issue.

Keywords*: Data from Environmental Activities, Visualisation of Environmental Data, Displaying Data in SoLoMo Environment, Marketing Data.*

1. INTRODUCTION

The presented work deals with a research topic in the form of the implementation of environmental activities of companies. The current trend, which is used within the business sphere, is precisely in the implementation of environmental activities and sustainability. The author Masko also dealt with this topic, who developed accounting and analytical support for the environmental activities of business entities. (Mask, 2020) Based on the presented analysis, it is possible to obtain information about the environmental activities of organizations. On the other hand, there is a law that addresses and regulates part of the environmental self-control of business entities (Sharaievska and Slepchenko, 2019). In the Czech Republic, the authors Kunz and Hronova (Kunz and Hronova, 2017) investigated the implementation of environmental activities of a wide range of business activities. On the other hand, there are customers, this broader analysis was performed by Jotanovic et al. (Jotanovic et al., 2017). The conclusions led to differences in the perception of environmental activities by customers across countries. As confirmed by Palacios-Florencio and colleagues, there is a link between environmental activities and some part of corporate responsibility (Palacios-Florencio et al., 2016). Another important element that is currently mentioned is SoLoMo, which was first created by the author John Doer in 2010. Doer as an investor and an entrepreneur believed in the future and the potential of three elements (Kurtovic, 2012). One year later, this term was described by Loïc Le Meur at the LeWeb conference 2011. His conference speech was dedicated to this concept. It led other theoreticians and authors to further development of this concept (Domenget, 2012). Data collection and visualisation was dealt with by many authors. Let's have a closer look at this topic. Evolution of IT technologies in the 90s initiated the creation of databases and large data processing (Parsaye and Chignell, 1993). Another milestone was reported in 2001 when Shaw et al. defined the data mining process in the form of analysis, collection and visualisation of data (Shaw et al., 2001). Data visualisation was mainly defined by the authors Patel and Lisoa in 2004 (Lisboa and Patel, 2004) as well as by Bouquin and Epstein in 2015 (Bouquin and Epstein, 2015). Data visualisation has also been discussed by Zhang and Shu (Zhang and Shu, 2019) as well as by Ha, Hana and Lee who specialised in artificial intelligence and visualisation (Ha et al., 2020). We will base our study of SoLoMo and data visualisation on the above authors. Zaušková and Rezníčková dealt with the connection of SoLoMo and environmental activities in the home environment, where it was a direct connection of SoLoMo and environmental activities (Rezníčková and Zaušková, 2019; Zaušková and Rezníčková,

2020) and also Čábyová (2018). Within the presented topic we define a research problem in the form of the share of companies engaged in environmental activities of business entities, specifically environmental activities performed by business entities in our territory in connection with SoLoMo environment, which is currently a major topic and completes the data display, by which evaluation is facilitated. The following research questions emerged through the research questions, which are further addressed in the research implementation.

Q1: How many companies are taking the path of environmental responsibility?

Q2: How many companies externally carry out these environmental activities?

Q3: What specific activities are they?

The paper presents a qualitative and quantitative examination. The research of theoretical background was used mainly to examine professional sources in the form of articles in leading journals. In the part for finding out the research essence of the mentioned questions focused on the implementation of environmental activities, a quantitative questionnaire survey was used, in which 129 business entities across the domestic environment participated. The research sample was carried out by available selection and evaluated by descriptive analysis. The presented paper clarified that the vast majority of companies in the domestic environment follow the path of social responsibility and also implement environmental activities. Specific activities are most often wastesorting, energysaving, compliance with standards, use of eco-packaging, introduction of eco-innovation. The following lines are intended to summarize the research so far. Specifically, it is a SoLoMo principle, as well as the individual components Social, Local and Mobile are defined. Subsequently, the present article contains links with data collection, which in the end result in visualization techniques that help users or data in a better perception on the part of recipients.

2. LITERATURE REVIEW

The following sectionswill define theoretical bases for the given matter while clarifying the SoLoMo concept, data within the segment that can be collected, analysed and visualised. Particular emphasis will be placed on the final theoretical part of data visualisation. Before introducing the given topic, let's define the SoLoMo concept itself.

2.1. Conceptualizing SoLoMo

SoLoMo concept consists of three aspects - So, Lo and Mo. These aspects are interlinked and co-create a harmonic composition. One of the above aspects is So (Social) referring to social media. Follows Lo (Local) as a local aspect involving local marketing often referred to as location technologies. Another concept is Mo (Mobile) covering mobile applications (Papakonstantinidis, 2017). Based on the research of many scholars (Papakonstantinidis, 2017), SoLoMo concept represents a driving force of today's marketing because a high percentage of people have a smartphone, are permanently online or browse a web or a social media application. Location services have become part of this philosophy. Upon interaction of these elements, we may obtain a solid combination providing relevant results for a user anytime and anywhere (SoLoMo je buzzem roku, 2012). There are three questions defined by Heinemann and Gaiser in their paper Social, Local, Mobile that are noteworthy. The first question relates to Mobile. What can mobile marketing offer to us and how can we improve interaction with our online consumers or potential customers? The second question is linked to location technologies of Local, notably how can they help local sellers and brick and mortar stores to localise their customers? The last element Social asks about platforms where consumers and prospective customers are located and what expectations they have in relation to retailers (Heinemann and Gaiser, 2015). SoLoMo concept has a considerable impact on consumer behaviour because it is always present when a user needs it (Yang and Lin, 2017). SoLoMo concept overrides traditional business goals and interferes with the environmental practice. Within this area, SoLoMo concept enables us to solve environmental issues (Zaušková and Rezníčková, 2020). The aspect Social covers social media. According to Scott, social media are defined as a specific place for sharing ideas, thoughts, contents and creating online relationships. The platform is a certain online location centre where people are able to meet virtually (Scott, 2015). Last year, people globally spent 2 hours and 23 minutes online a day. When comparing it to a year before, there is only a one-minute increase. According to statistics by Hutchinson, the main driving force for users is being informed of up-to-date news and events (Hutchinson, 2019). This is also supported by the research into the FOMO syndrome (fear of missing out) referring to a brand new trend spreading among the young generation. The young may feel worried of missing any particular content or a piece of information shared through social media (Hunt et al., 2018). Facebook with its 2.6 billion active users is the most popular social medium of today, followed by YouTube with 2 billion active user and WhatsApp with 2 billion active users occupying the

third position. Further growth is forecast in the years to come (Clement, 2020a). Social media are undergoing a continuous update of functionalities and environment in order to stay optimised and effective for the benefit of their users (Hutchinson, 2020). Mobile devices and the Internet have lately become a part of people's everyday life. Mobile devices had undergone major modifications, they used to be completely different yet nowadays they may even involve certain location modules (Han and Cho, 2016). There are 3.5 billion active smartphone users worldwide with this number growing each single year. Last year we saw an increase by 300 million users with the forecasts speaking about another 300 million users next year (O'Dea, 2020a). From this point of view, SoLoMo concept has occupied a rather stable position in marketing as well as other segments. Mobile devices keep their position across the globe and generations (O'Dea, 2020b). Another fact that is worth noting is that a user spends the majority of his day online. According to the latest statistics from 2020, it is exactly 143 minutes on a mobile device connected to the Internet. Compared to last year, this is an 11-minute increase with further growth by 12 minutes to be forecast for the next year. In contrast to a computer, this is four times more. Yet back in 2013 people used to be more active on a computer (Clement, 2020b). The indices predict a growing potential of mobile devices, which predefines the future evolution in this field. At the same time, SoLoMo concept occupies a dominant position within this area. Mobile devices offer various mobile applications via an app store built in the devices. People are also able to browse websites. Leading authors categorise mobile applications into mobile web applications, hybrid web applications and native web applications (Kaufman et al., 2015). They differ in their technological production process and use of mobile applications. The local aspect refers to geolocation services. This mainly speaks about reception and transmission of user's location (Hsieh, 2018). A user needs to activate and have access to certain modules in his device to be able to use these services. As stated by Križo et al., these technologies include IP address, Beacon, Bluetooth, RFID or GPS (Križo et al., 2018). The local aspect is significant for those companies operating on a local market. However, this is not only the advantage for retailers, but also for brick and mortar stores and large corporations. Social media and web browsers defined the basis for the functionality concept dominated by a geolocation element. Functionality of these tools is fully automated. Ruiz points out that a high number of users of mobile devices use modules connected to geolocation (Ruiz, 2012). This element has a great potential when it comes to targeting a user by a personalised advertisement, solving a problem or meeting user's needs.

2.2. Possibilities for Data Collection within The SoLoMo Concept

As stated before, SoLoMo concept consists of the aspects Social and Mobile. A great deal of data are created through this process. The aspect Social involves data collection often referred to as social data mining. We know various techniques available for data analysis, processing and visualisation, e.g. keyword extraction, sentiment analysis, market and trend analysis (Hengtee, 2020). Social media can be an important source of information. For instance, if we look at the discussions on social channels, we see customers communicate with a company and post various comments, reactions and sharing. Segal (2017) speaks about clicks. In videos, pictures and posts, we observe opening/playing after a click. These data can tell us a lot about what a visitor as a prospective customer or consumer requires. We can refer to specific sharing, conversions, reactions through emoticons - graphic visualisation of our emotions, comments, notes and impressions (Segal, 2017). A large amount of data can also be collected on mobile platforms through the Mobile aspect. On websites, we can analyse their traffic in the form of the number of sessions. Specific setting may measure particular clicks on the website button (Chlebus and Brazier, 2007). Furthermore, we may observe the share of new and returning website users or specific channels they came from. This metric is crucial for launching specific campaigns. Other possibilities include Bounce Rate which serves for measuring the instant leaving of users from our website (Plaza, 2009). A conversion rate is based upon predetermined goals. Engagement, i.e. the more the content is shared and commented, the higher is the chance to be seen by a higher number of users (Svátek, 2019). The web content or the most frequently visited websites, except for other metrics than Bounce Rate, say what content we should or should not create. Eventually we are able to find flaws and errors on specific webpages. Dividing users into mobile, desktop and tablet users is another significant metric (Plaza, 2009). The preferred device can consequently be optimised. As far as SoLoMo is concerned, we notably follow the Mobile aspect. Follows the landing page or the initial webpage where we should adjust transfer from search engines and follow functionality of marketing campaigns (Johnson and Seeling, 2015). Finally, there is an exit page the users left, i.e. thank you page in case of e-commerce. Measuring metrics and optimising either campaigns or websites is of the utmost importance and may save funds or increase revenues (Top 10 Website Analytics You Should Be Measuring and Learning From, 2020). Mobile also includes other mobile applications. Data collection from mobile applications is a bit different from websites. Downloading and installations play a key role. At the same time, we can follow the uninstall

rate of a mobile app or the data collection metric, e.g. App Acquisition. The metric can suggest what channel a user came from during the installation process. When analysing the current position of a mobile application, we can measure the number of active users. This metric is calculated since the opening of a mobile application and its active use. It mostly applies two key metrics and these are Daily Active Users (DAU) and Monthly Active Users (MAU) (Olteanu et al., 2013). Stickiness describes the rate of recurring users of a mobile application. This is the proportion of daily active users and monthly active users which is multiplied by 100. The results are expressed in percentage and are compared in time. Follows the average daily number of relations, i.e. use of an application per a daily active user (Per/DAU). Session refers to an average length of traffic. It is often calculated how much time a specific user spends in one opening of an application until its closing. We can also measure so-called Screen Flow, which refers to the sequence of particular screens - where a user started, what screens he went through and what screen he left (Chi et al., 2018). Another type of information we may collect is called Retention Rate. This is the value portraying how many users return to a mobil app after a certain time. This is a very important metric as it dictates whether users repetitively visit a mobile app. We can easily observe whether new updates are fully functioning because users are enabled to reuse an app. The Churn Rate specifies the opposite. It says how many users did not return and stopped using a mobile app. The above possibilities for data collection mainly describe consumer behaviour (Perro, 2018). Certain marketing data may also be used to measure profitability. The first metric is Average Revenue Per User (ARPU) defining the average revenue per user. It refers to the subscription form, purchases within an application, paid clicks, advertising clicks or any other ways how an app may be used (Liao et al., 2015). It is calculated as the proportion of the total revenue from an app in time and the number of user at that time. Follows the metric called cost per acquisition (CPA). This refers to the share of costs for the campaign and the total acquisition or conversion, e.g. the number of installations. This is an important metric when it comes to measuring costs per user and campaign effectivity. Return on investments (ROI) represents one of the key business formulas. It refers to the profit share from the investment minus investment costs and all divided by investment costs. Return on investment is expressed in percentage and is multiplied by 100 (Cutts, 2013). Lifetime Value (LTV) describes application vitality, i.e. the value of an application presented by each customer. A specific target group is regarded as a variable (Khloyan, 2020). It is calculated from the average value of conversion multiplied by the average number of conversions and the

customer's average life expectancy. Customer's life expectancy can be limited by 18 to 24 years old, for instance. When the age of the target group rises, the new target group arrives or a mobile application automatically adjusts. Finally comes the most important metric in terms of evaluation and comments in an app store. It says what customers like or not (Oragui, 2018). Google Analytics is the most successful tool for measuring websites as well as mobile phones - Google Analytics for Mobile (Russell, 2017). In addition, thereto, as specified by Krum, other data that can be collected, analysed and visualised include budgets for future periods, business data and profitability data. Various processes within a company may create data. They can enable us to measure and improve processes as well as company effectivity and strategies, e.g company strategic planning (Krum, 2014).

2.3. Data Visualisation within The SoLoMo Concept

The proces of data collection, analysis and interpretation should include proper visualisation since data processing can show the signs of complex perception. After thorough processing, data can show the signs of complex perception. That might be the reason why the capacity of data mining could not be attained. These days our decisions should be based upon data because the resultants of data may lead to better or more effective decision making. Across the whole spectrum, data might be rather difficult to be extracted and properly analysed in order to provide answers to questions we would like to find out. In this respect, we may be assisted by artificial intelligence and automation (Casey, 2020). Mobile devices as well as digital devices in general produce enormous amounts of data which are often referred to as big data. Analysing and interpreting such data might appear to be rather complex. As stated by two acclaimed authors, we might use various visual elements such as graphs, infographic, etc. (Koponen and Hildén, 2019). Börner et al. declares the same. They say that various data as variables require specific graphic visualisation for various devices. A smaller, more compact and minimalistic view is more suitable for mobile phones. On the other hand, large presentations or banners ask for more information (Börner et al., 2019). Highly acclaimed authors agree on heterogeneity of graphic elements which enable encrypting of information for its recipient. Data are then transformed into easily comprehensible messages. These examples include a bar chart, a pie chart, a cone chart and a tree map. Computerised programme solutions offer various possibilities, yet such visualisation appears to be a bit complex and clumsy (P'ng et al., 2019). Kirk dealt with visualisation of a rich data spectrum for various devices. Eventually he assumes proper visual presentation makes understanding much easier. Therefore a recipient

finds a message much clearer and concise. Data can be visualised in a number of ways: a point map, a polar graph, an alignment chart, an instance graph, an accord diagram, a line graph, a surface graph, a matrix graph, a symbol map, a dot map, a development map, a histogram, a waffle chart, a dendrogram and many others (Kirk, 2019). Data visualisation may be applied to specific examples. For the purpose of this paper, it is important to clarify that visual heterogeneity and similar orientation to data groups are the most typical for a group bar chart, a pie chart, a cone chart and a tree map. From the visual point of view, these elements vary whereas the base for their subtraction remains the same. A pie chart is the most comprehensible from all, which can also be confirmed by the acclaimed author Krum. In his opinion, a pie chart is an ideal way for selection or collection of specific data. A cone chart is created in a similar method as a pie chart, but tends to be centre-oriented with the values to the side, thus changing its structure. The less frequent variables take the largest line. A tree map can take different forms changing in their size or colour. The base remains the same. They are hierarchically grouped by colours and sizes into particular folders. Each partial variable represents a rectangle. All rectangles form one single large rectangle (Krum, 2014).

3. RESEARCH METHOD

Research methods consist of observing primary as well as secondary sources. The introduction is formed by description of the subject matter. Consequently, the theoretical part includes a carefully selected basis of experts from the scientific databases. Follows the analysis of knowledge by experts from the practice. The main goal of this paper is to clarify the state of the domestic environment in the implementation of specific environmental activities. And then evaluate the possibilities of visualization using mobile applications in the SoLoMo environment. The resultant is also emphasised by the outcome from the expert literature. It is especially comparison and deduction that appear quite often. The authors of the paper have carefully selected the data on the basis of key words and requests within the above subject matter. Based upon the parameters, we declare the subject matter duly examined in respect of research timeliness. The other part contains our own quantitative research into the primary sources. It is derived from the research questionnaire having been converted into a print form. The questionnaire provides us information about the current state of the subject matter by giving answers to the research questions. As introduction, the printed questionnaire asked the respondents to provide basic information followed with 36 questions. As a result, we selected three specific questions to reach the given objective. The target group consisted of companies

or entrepreneurs represented by authorised employees and managers with discretionary powers to process and evaluate data. As for the geography, these businesses operate in Slovakia, in the Western, Central and Eastern Slovakia, covering all of its regions. When analysing respondents demographically, the age gap ranged from 20 to 67 years, the majority represented by men accounting for 69.76% (90 respondents) in contrast to women with 30.23% (39 respondents). The total time allocation was accomplished within three months, i.e. from March 9, 2020 to June 9, 2020. 129 entrepreneurs were studied in total. The given sample group was randomly selected. Selection of entrepreneurs by their size from the smallest to the largest ones was the main asset of the paper with the emphasis on environmental activities and SoLoMo marketing. The following will be the main hypothesis, which reflects the confirmation of the relationship between the two variables.

H: The fact that companies that follow the philosophy of environmental responsibility carry out environmental activities is related to the fact that they practice environmental activities externally.

As part of the questionnaire appeared three questions that have been redesigned to variables. The first change was to indicate whether business entities have environmental responsibility in their philosophy. The given variable was of nominal type with a positive or negative result. The following variable clarified whether environmental activities are carried out externally within the company. The result was also of a nominal nature with a positive or negative result. And the last question was additional in the previous, what specific activities do you carry out. The question was open-ended. The result was analyzed qualitatively.

The above questionnaire is evaluated by means of a statistical description. The point it to specify description of variable objects created by results containing the resultant of a given piece of information. The resultant is attained by using a final frequency with nominal variables as well as by a qualitative analysis with a higher frequency of a certain result. The summary is derived from the studied sample group. The resultant of value frequency is expressed in a frequency chart. Afterwards, the analysis is done by means of a univariate frequency analysis defining specific variables which serve for visualising the incidence of nominal variables. As a matter of conclusion, frequency is presented as a percentage of one numeral from the other one:

$$(1) \ p\% = A/B.100\%$$

Two numerals defined as A and B are reciprocally divided and multiplied by 100. The test is suitable for evaluating nominal variables.

We used Cramer's V to verify the association between the qualitative variables of the normal character. The higher the tightness value, the tighter is the relationship. The essence of the calculation is based on a crosstab and the difference between real and expected frequencies.

$$\Phi c = \sqrt{\frac{x^2}{N(k-1)}}$$

Φc = Cramer's V,

x^2 = Pearson chi-square statistic from the aforementioned test,

N = sample size involved in the test and,

k = lesser number of categories of either variable.

Afterwards, we carried out the research into mobile applications market where we extracted the possibilities of use of mobile applications in connection with the SoLoMo concept. We eventually obtained the summary of successful applications within the given segment.

4. ANALYSIS

The following part is dedicated to interpretation of specific research questions and description of particular outcomes from which the final conclusion has been drawn. Interpretation of results from a univariate frequency analysis is complemented by text description. In total, we obtained 129 valid results (100%).

Table 1. Frequencies for "Is your company taking the path of environmental responsibility?"

Is your company taking the path of environmental responsibility?		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Yes	119	92.2	92.2	92.2
	No	10	7.8	7.8	100.0
	Total	129	100.0	100.0	

Source: Own Research

The results of the frequency analysis of variable answers in Table 1 are as follows: 129 respondents answered the question (100%), the full sample size. From all the valid answers, "Yes" was the most common with 119 answers (92.2%). The second answer "No" was represented by 10 respondents (7.8%). As a result, we have shown that a large number of researched business entities in the domestic environment hold an environmentally responsible way of doing business.

Table 2. Frequencies for "Is your company carrying out environmental actives on the outside? "

Is your company carrying out environmental activities on the outside?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Yes	95	73.6	73.6	73.6
	No	34	26.4	26.4	100.0
	Total	129	100.0	100.0	

Source: Own Research

The results of the frequency analysis of variable answers in Table 2 define variables as nominals taking the form of "Yes" answers and "No" answers. 129 respondents answered the question (100%), which is the full sample size. Out of these valid answers, "Yes" was the most common one with the frequency of 95 answers (73.6%) followed by "No" answer represented by 34 respondents (26.4%). As a result, we have shown that a large number of researched business entities in the domestic environment perform environmental activities.

Picture 1. Frequencies for "If so, do you implement specifically within the company?"

Source: Own Research

Results of the question "If so, do you implement specifically within the company?" were verbal. The question was open to respondents. The most common response was "waste sorting, energy saving, compliance with standards, use of eco-packaging, introduction of eco-innovation". Only respondents who answered in the affirmative in the previous questions could answer the question.

Table 3. Cramer's V between the variables on the implementation of environmental activities outside and the environmental responsibility of business companies

		Value	Approx. Sig.
Nominal by Nominal	Phi	,323	,001
	Cramer's V	,323	,001
N of ValidCases		129	

Source: Own Research

The hypothesis was verified by calculating the Cramer V coefficient with a result of V = 0.323; Sig. <0.001, based on which we interpret the relationship as significant. There is a significant relationship of medium tightness between the variable environmental responsibility of business entities and the variable implementation of environmental activities externally. We accept the hypothesis.

The following part introduces the examples of successful applications combining the SoLoMo concept and the environment and existing in both the domestic as well as foreign background.

5. ELWIS

Elwis is an innovative solution for waste management in a complex home environment. It is a transparent system bringing an order into waste management. The SoLoMo application can be used within a town, a village, a waste collection company or any other businesses. It provides information about real amounts of the waste that is produced as well as disposed by households and entrepreneurs within a municipality.

6. TRASHOUT

A mobile application that has been developed as a charitable environmental project mapping illegal landfills across the globe for the purpose of boosting recycling. Thanks to this application, users can tag a landfill or help with its removal. All mechanics and conception of

this application comply with the SoLoMo concept. It has been designed for the large spectrum of target audience.

7. WATERPRINT

A mobile application designed for calculating a user's water footprint. It enables the target group, users or businesses, to understand how much water can be saved. The application indicates how much water has been spent on various activities. Therefore, users are able to reduce their water footprint and save water and eventually help the environmental sphere.

8. IRECYCLE

This is a mobile application complying with the SoLoMo concept helping its users find recycling opportunities within their proximity for anything that can be currently recycled, such as batteries, old electronics, glass, chemicals, paper, metal, etc. Recycling is an important step in the environmental education. The application motivates its users to take up this activity.

There are many applications containing the SoLoMo concept. We have only selected those that are worth noting as they are likely to change users' behaviour. As a matter of fact, we might also get a chance to inspire businesses to develop new mobile applications dealing with the given subject matter.

9. DISCUSSION

The theoretical basis leads to conclusions in the form of a precise definition of the SoLoMo concept, which describes each part separately. It is an element of social, local and mobile. As we know, the SoLoMo concept is currently a trend (Zaušková and Rezníčková, 2020). Defining a concept talks about the possibility of preparing a concept mix at your discretion. As this is currently a very widespread concept, it is important to follow the rules for other possibilities of implementing mobile applications across different segments. An important criterion in data collection, analysis and visualization is the decision to collect specific data. (P'ng et al., 2019) Environmental activities are in the interest of businesses, mainly because society requires it. Entities must be oriented prosocially. (Trivellas et al., 2019) Complementing this part is the primary survey, which clarifies the environmental activities suitable for measurement, as they are carried out by business entities. It is important to look at measurement options when developing systems that analyze and visualize data, as these often involve different types of data according to the examples examined. The results clearly show that

businesses are moving towards environmental activities, which is complemented by factual secondary sources. Through discussion and results, we clarified the research questions. The authors Kunz and Hronova (Kunz and Hronova, 2017) in the Czech Republic dealt with a similar topic where the results are relatively similar. The forecast remains not only a deeper orientation towards environmental activities, but also a more numerous increased use of the SoLoMo concept, mainly in the form of spending time on mobile devices. Therefore, the future should be focused on the preparation of systems and applications within the SoLoMo concept for research and visualization of data in the internal and external environment of the company. Measurability is very important in this regard so that businesses can make the right decisions and have the right information.

10. CONCLUSION

Our examination has helped us to clarify the subject matter in the domestic environment. The resultants will serve as a fundamental basis for further research in the field of environmental data visualisation from the part of businesses. Secondary sources have provided us information on the significance of data visualisation and what is more, they were a driving force engaging us into the practical part of the paper. The theoretical part has concluded that businesses in the domestic environment were mostly environmentally orientated with over two-thirds of them demonstrating it on the outside. The most common answers involved waste sorting, energy saving, compliance with standards, use of eco-packaging, introduction of eco-innovation. The above results will serve as a basis for proposing theoretical as well as practical outcomes in data measurement and visualisation. The final part of the analysis consists of describing specific applications within the SoLoMo concept and environmental data visualisation. As part of the verification of the hypothesis, we came to the conclusion that companies' responsibility for responsible behaviour is related to the implementation of environmental activities externally. Therefore, research objectives are declared accomplished. Any other research is requested in order to attain proper visualisation and data collection across all environmental activities. The research might only be limited by a smaller sample and representation of randomly selected businesses as well as the choice of applications within the SoLoMo environment. The results could have been affected by those respondents who were likely to show off and wanted to be portrayed in a good light.

11. ACKNOWLEDGEMENTS

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INCORPORATING THE FUNDAMENTAL ANALYSIS INTO THE ROBUST MEAN – VARIANCE ANALYSIS: AN APPLICATION ON THE TURKISH BANKING STOCKS

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Abstract

Robust optimization is an important tool to deal with the uncertainty of parameters. However, due to the worst-case orientation, the existing robust mean – variance (MV) models ignore the plausible portfolio choices, backed by additional criteria or subjective judgements. Thus, we propose a way to incorporate the fundamental analysis into the robust MV analysis under the assumption that the risk-free asset and short positioning are allowed. After laying down the theoretical points, we give an explanatory example by using the real data set of six banking stocks trading on the Borsa Istanbul (BIST).

Keywords: *Portfolio Selection, Fundamental Analysis, Principal Components Analysis, Robust Optimization, Mean - Variance Model.*

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1. INTRODUCTION

The mean - variance (MV) model introduced in (Markowitz, 1952), has had a profound influence on the portfolio management theoretically (Goldfarb and Iyengar, 2003). However, it is not generally used in the practice due to the statistical errors in the estimation of its parameters (Breuer, 2006; De Miguel et al., 2009). The mean vector's estimation is harder and thus a more important problem (De Miguel et al., 2009; Garlappi et al., 2006). Furthermore, this vector may change in the future because of the market shocks (Berkowitz, 2000). Recently, Goktas and Duran (2020) introduce a new robust MV model to overcome these problems. The new robust MV model may be preferred to the other robust MV models for several reasons such as the ease of use. However, this model, which depends on the Principal Components Analysis (PCA), may not be suitable for the non-conservative investors. Because the worst-case situation is not very likely to occur and there is a cost of to be more conservative than necessary (Huang et al., 2010).

Portfolio selection based on the fundamental analysis is another alternative for the investors. The Analytical Hierarchy Process (AHP) or its fuzzy extensions can be used in bringing the information about the stocks together and then determining the optimal portfolio allocation (Saaty et al., 1980; Tiryaki and Ahlatcioglu, 2009). We believe that it is a valuable approach since it enables to consider the important concepts such as the profitability of the companies and the cheapness of the stocks. However, it is an appropriate alternative only when the short positioning is not allowed by the regulators or not preferred by the investors.

To fill in the gaps as mentioned above, we propose a way to incorporate the fundamental analysis into the robust MV analysis, which provides the flexibility to the investors unlike the classical MV analysis. To be more specific, we use the priority vector found with AHP in picking a fundamentally backed solution from the infinitely many plausible solutions obtained with the robust MV analysis. This fundamentally backed solution (FBS) simply corresponds to the portfolio that maximize the investor's utility function under the assumption that the utility function is linear and the utility vector of the stocks is equal to the priority vector found with AHP. The major shortcoming of the proposed approach is that it is applicable only when the risk-free asset and short positioning are allowed.

The rest of paper is organized as follows. In Section 2, we give the theory of the proposed approach. In Section 3, we give an explanatory example to illustrate our approach.

Here, we use a real data set of all banking stocks listed on the BIST 30 where the training and testing periods covers the complete year of 2016 and the first quarter of 2017 respectively. We conclude the paper with Section 4.

2. THE THEORY OF THE PROPOSED APPROACH

In this paper, we take the initial values of the portfolios as 1 for simplicity where the weight of the risk-free asset and the total weight of the stocks sum to 1. We also ignore the extra cost of short positioning. We prefer the excess logarithmic return vector of the stocks (r) to their simple return vector because the logarithmic returns are summable. This choice also brings us several advantages empirically and theoretically (Levy and Robinson, 2016). We show its mean vector and positive definite[1] covariance matrix with μ and $\sum$ respectively.

We assume that the covariance matrix of r is equal to the sample covariance matrix of r. Then, the principal components vector (x) is defined as below. Here, Λ is a diagonal matrix[2] of which its positive eigenvalues given in the ascending order and V is an orthogonal matrix[3], of which i[th] column is the corresponding orthonormal eigenvector to the ith eigenvalue (Johnson and Wichern, 2007; Jolliffe, 2002).

$$\Sigma = V\Lambda V^{T} \mapsto x := V^{T} r \qquad (1)$$

PCA is an orthogonal coordinate transformation. The linearized profit function $p(r)$ is expressed on the new orthogonal coordinate system as below where w is the weight vector of the stocks and $\tilde{w}$ is the weight vector of the principal components.

$$f(x) = \tilde{w}^{T} x = \left(V^{T} w\right)^{T} x = w^{T} (Vx) = w^{T} r = p(r) \qquad (2)$$

Remark: $\Lambda_{i,i}$ is the ith eigenvalue of the sample covariance matrix or equivalently the sample variance of the ith principal component. $\widehat{\mu}_{x} = V^{T} \widehat{\mu}$ is the sample mean vector of x where $\widehat{\mu}$ is the sample mean vector of r.

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[1] A symmetric matrix is positive definite if all of its eigenvalues are positive.
[2] Its non-diagonal elements are equal to 0.
[3] Its inverse is equal to its transpose, which is shown with V^{T}.

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Remark: We assume that the eigenvalues of the sample covariance matrix are distinct as in our case to provide that our robust MV analysis is well-defined**.** They are distinct with probability 1 if its entries have a joint probability density (Girko, 1998).

The uncertainty set of the mean vector of x can be determined as the following box type set where z_τ is the τ quantile of the standard normal distribution and m is the number of the return data per stock (Goktas and Duran, 2020).

$$U = \left\{ \mu_x \mid \mu_{x,i}^L := \hat{\mu}_{x,i} - \frac{z_{(1+\tau)/2}}{\sqrt{m}}\sqrt{\Lambda_{i,i}} \le \mu_{x,i} \le \mu_{x,i}^U := \hat{\mu}_{x,i} + \frac{z_{(1+\tau)/2}}{\sqrt{m}}\sqrt{\Lambda_{i,i}}, \forall i \right\} \quad \textbf{(3)}$$

The robust MV model is formulated with the following MaksMin problem where η is the nonnegative coefficient of risk aversion (Goktas and Duran, 2020).

$$\underset{\tilde{w}\in\square^n}{\text{maks}}\ \underset{\mu_x\in U}{\min}\ \tilde{w}^T \mu_x - 0.5\eta\left(\tilde{w}^T \Lambda \tilde{w}\right) \quad \textbf{(4)}$$

Under certain assumptions, the robust MV analysis is independent from the duration of the testing period. Furthermore, the solution of (4) for the ith principal component is uniquely found as below where sgn () shows the signum function[4] (Goktas and Duran, 2020). Then, the worst-case solution (WCS) is found as $V\tilde{w}_R^*(\eta,\tau)$.

$$\tilde{w}_{R,i}^*(\eta,\tau) = \begin{cases} \dfrac{\mu_{x,i}^L}{\eta\Lambda_{i,i}}, \text{sgn}\left(\mu_{x,i}^L\right) = \text{sgn}\left(\mu_{x,i}^U\right) = 1 \\[3mm] \dfrac{\mu_{x,i}^U}{\eta\Lambda_{i,i}}, \text{sgn}\left(\mu_{x,i}^L\right) = \text{sgn}\left(\mu_{x,i}^U\right) = -1 \quad \textbf{(5)} \\[3mm] 0, \text{sgn}\left(\mu_{x,i}^L\mu_{x,i}^U\right) \le 0 \end{cases}$$

Since the ith principal component's mean is interval-valued as in (3), its robust MV optimal weight set is found as below.

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[4] Signum function takes the value 1 for positive values, -1 for negative values and 0 for 0. Clearly, worst-case orientation brings the ith principal component's optimal weight closer to 0.

$$MPS = \frac{\Sigma^{-1}\widehat{\mu}}{\eta} = \frac{V\Lambda^{-1}V^{T}\widehat{\mu}}{\eta} = V\left(\frac{\Lambda^{-1}\widehat{\mu}_{x}}{\eta}\right) = V\widetilde{w}_{R}^{*}(\eta,0) \quad \textbf{(6)}$$

Since the ith principal component's mean is interval-valued as in (3), its robust MV optimal weight set is found as below

$$\widetilde{w}_{i}^{*}(\eta,\tau) \in \left[\frac{\widehat{\mu}_{x,i}}{\eta\Lambda_{i,i}} - \frac{z_{(1+\tau)/2}}{\eta\sqrt{m\Lambda_{i,i}}}, \frac{\widehat{\mu}_{x,i}}{\eta\Lambda_{i,i}} + \frac{z_{(1+\tau)/2}}{\eta\sqrt{m\Lambda_{i,i}}}\right] \quad \textbf{(7)}$$

. (7) gives infinitely many plausible solutions. In this paper, we use AHP in picking a fundamentally backed solution from them. Here, we determine the criteria as below.

- The return on average equity ratio (C1) as a proxy of the company's profitability.
- The dividend per earnings ratio (C2) as a proxy of the company's investor centeredness.
- The book to market ratio (C3) as a proxy of the stock's cheapness.
- The long-term domestic credit note given by Moody's (C4) as a proxy of the company's credibility.

It is claimed that Saaty's original AHP method has several shortcomings (Buckley at al., 2001). On the other hand, we prefer it to the other (fuzzy) AHP methods for several reasons. First, it is widely accepted and used in many areas (Buckley at al., 2001; Saaty and Vargas, 2012). Second, fuzzifying the judgements is simply a perturbation, which does not improve the overall results (Saaty and Tran, 2007). Third, for each pairwise comparision matrix, its Perron vector[5] should be used in obtaining the priorities to control the inconsistencies in the judgments (Saaty, 2003). Hence, after finding the stocks' priority vector (p) by using this method, we determine the ith principal component's weight as below. Then, fundamentally backed solution (FBS) is equal to $V\widetilde{w}_{F}^{*}(\eta,\tau)$.

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[5] Its Perron vector is equal to the normalized eigenvector corresponding to its maximum eigenvalue. We find the all Perron vectors by using the MATLAB.

$$\tilde{w}_{F,i}^{*}\left(\eta,\tau\right) := \frac{\hat{\mu}_{x,i}}{\eta\Lambda_{i,i}} + \text{sgn}\left(\left(V^{T}p\right)_{i}\right)\frac{z_{(1+\tau)/2}}{\eta\sqrt{m\Lambda_{i,i}}} \quad \textbf{(8)}$$

The priority vector of the alternatives (stocks) can be thought as the utility vector of the alternatives (Malakooti, 2013). Under the linearity assumption, the utility vector of the principal components is found as follows. Then, (8) gives the plausible portfolio that maximizes the utility based on the linearity in (2) and boundaries given in (7). (8) also indicates that when the utility of a principal component is negative (positive), its weight is minimized (maximized).

$$p_{x} = V^{T}p \quad \textbf{(9)}$$

Remark: In practice, the priority vectors can be found with approximations. There are two steps in the mostly used approximation. In the first step, the columns of the pairwise comparison matrix are normalized by using the Manhattan distance. In the final step, the priority vector is found by averaging each row. However, we do not prefer such an approach and make the priority vector equal to the exact Perron vector of the pairwise comparison matrix. Since approximations may lead important problems such as rank reversal (Saaty and Vargas, 2012).

3. AN APPLICATION ON THE TURKISH BANKING STOCKS

The all-banking stocks listed on BIST 30 are GARAN, AKBNK, YKBNK, ISCTR, VAKBN and HALKB. We calculate their logarithmic returns for the 52 weeks in 2016 by using the Friday closing prices. We set the Bloomberg benchmark interest rate at the end of 30.12.2016, which is equal to 0.1063, as the yearly risk-free rate. Then, we obtain the excess logarithmic returns by subtracting the weekly risk-free rate from the logarithmic returns. We give their summary statistics in Table 1 where SSD is the sample standard deviation.

Table 1: The summary statistics.

	Average	SSD	Skewness	Kurtosis	Median	Minimum	Maximum
GARAN	0.000	0.043	-2.240	6.749	0.010	-0.177	0.072
AKBNK	0.001	0.043	-1.876	6.509	0.005	-0.183	0.067
YKBNK	-0.001	0.050	-1.998	7.105	0.006	-0.224	0.086
ISCTR	0.001	0.043	-1.365	4.614	0.002	-0.164	0.083
VAKBN	0.001	0.050	-1.448	5.140	0.004	-0.210	0.090
HALKB	-0.003	0.051	-1.800	6.309	-0.001	-0.223	0.092

We give the positive definite sample linear correlation matrix in the Table 2. Clearly, linear correlations between them are close to 1. The positive definite sample covariance matrix can be obtained by using this matrix and sample standard deviations given in Table 1.

Table 2: The sample linear correlation matrix.

	GARAN	AKBNK	YKBNK	ISCTR	VAKBN	HALKB
GARAN	1	0.926	0.868	0.899	0.822	0.854
AKBNK	0.926	1	0.870	0.894	0.851	0.876
YKBNK	0.868	0.870	1	0.827	0.873	0.816
ISCTR	0.899	0.894	0.827	1	0.862	0.907
VAKBN	0.822	0.851	0.873	0.862	1	0.845
HALKB	0.854	0.876	0.816	0.907	0.845	1

After employing the Principal Components Analysis of the sample covariance matrix, we form the boxplots of the principal components as in the Chart 1 respectively. Here, the plotted whiskers extend to the adjacent values (the extremes of non-outliers) and the principal components are shown with PC1, PC2, PC3, PC4, PC5 and PC6 respectively. We find that the all eigenvalues i.e., the sample variances of the principal components are distinct and the %88.6 of the total variance is result from PC6.
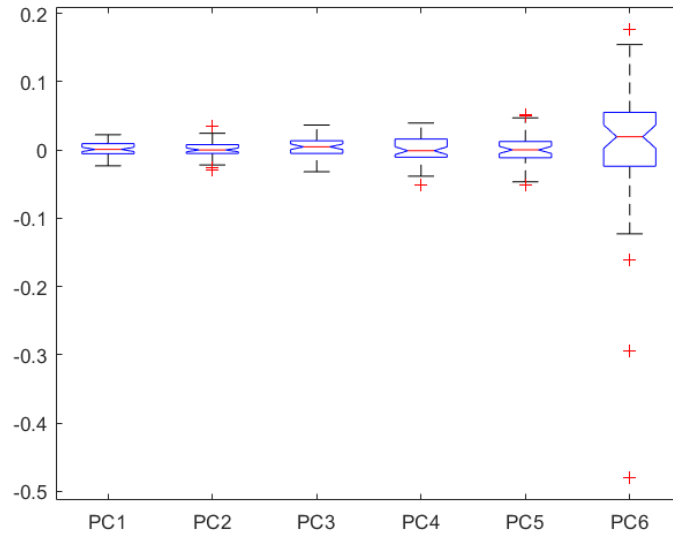
Chart 1: Boxplots.

The evaluation matrix of the alternatives is given in Table 3 under the assumption that the investor correctly foresees the companys' equities with net profits and the stocks' dividends for the year of 2016. Clearly, this assumpiton is very strict but we eliminate most of the human-based errors in this paper with this assumption.

Table 3: The evaluation matrix of the alternatives.

	C1	C2	C3	C4
GARAN	0.154	0.210	0.854	Ba1
AKBNK	0.164	0.199	0.917	Ba1
YKBNK	0.119	0	0.561	Ba1
ISCTR	0.146	0.249	0.598	Ba1
VAKBN	0.156	0.050	0.553	Ba1
HALKB	0.125	0.205	0.535	Ba1

The positive-valued pairwise comparision matrix of the criteria with respect to the goal and its Perron vector are as in the Table 4. We also find that its consistency ratio is lower than 0.10 as in the other cases. Hence, our pairwise comparions are consistent (Saaty and Vargas, 2012).

Table 4: The pairwise comparision matrix of the criteria with respect to the goal.

	C1	C2	C3	C4	Perron vector
C1	1	2	3	3	0.455
C2	1/2	1	2	2	0.263
C3	1/3	1/2	1	1	0.141
C4	1/3	1/2	1	1	0.141

The positive-valued pairwise comparision matrix of the alternatives with respect to C1 and its Perron vector are as in the Table 5.

Table 5: The pairwise comparision matrix of the alternatives with respect to C1.

	GARAN	AKBNK	YKBNK	ISCTR	VAKBN	HALKB	Perron v.
GARAN	1	1	5	2	1	5	0.252
AKBNK	1	1	5	2	1	5	0.252
YKBNK	1/5	1/5	1	1/4	1/5	1	0.047
ISCTR	1/2	1/2	4	1	1/2	4	0.149
VAKBN	1	1	5	2	1	5	0.252
HALKB	1/5	1/5	1	1/4	1/5	1	0.047

The positive-valued pairwise comparision matrix of the alternatives with respect to C2 and its Perron vector are as in the Table 6.

Table 6: The pairwise comparision matrix of the alternatives with respect to C2.

	GARAN	AKBNK	YKBNK	ISCTR	VAKBN	HALKB	Perron v.
GARAN	1	1	7	1/3	5	1	0.173
AKBNK	1	1	7	1/3	5	1	0.173
YKBNK	1/7	1/7	1	1/9	1/2	1/7	0.028
ISCTR	3	3	9	1	7	3	0.410
VAKBN	1/5	1/5	2	1/7	1	1/5	0.042
HALKB	1	1	7	1/3	5	1	0.173

The positive-valued pairwise comparision matrix of the alternatives with respect to C3 and its Perron vector are as in the Table 7.

Table 7: The pairwise comparision matrix of the alternatives with respect to C3.

	GARAN	AKBNK	YKBNK	ISCTR	VAKBN	HALKB	Perron v.
GARAN	1	2	1/8	1/8	1/8	1/8	0.033
AKBNK	1/2	1	1/9	1/9	1/9	1/9	0.024
YKBNK	8	9	1	1	1	1	0.236
ISCTR	8	9	1	1	1	1	0.236
VAKBN	8	9	1	1	1	1	0.236
HALKB	8	9	1	1	1	1	0.236

Since the all elements of the pairwise comparision matrix with respect to C4 is 1, the all elements of the Perron vector found for C4 is equal to 1/6. Then, the priority vector of the alternatives (stocks) are found by taking a simple weighted average of the Perron vectors found for the criteria where the weight vector of the criteria is equal to the Perron vector given in the Table 4.

We determine η and τ as 13.866 and 0.5 respectively. Then, we find the portfolios as in the Chart 2 where the weight vector of AHPS is equal to the priority vector of the stocks. We see that only ISCTR has the positive weight in each portfolio.
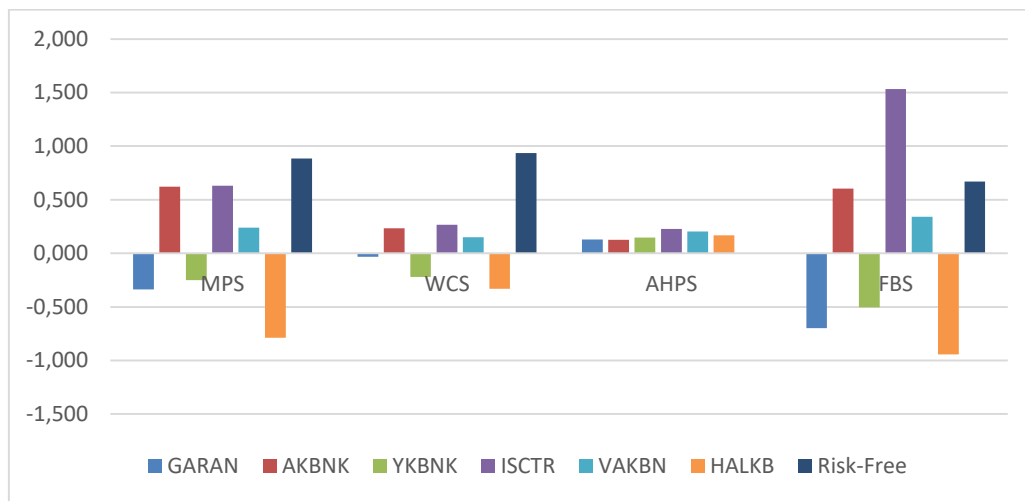

Chart 2: Weight vectors.

Sharpe ratio (SR), defined as the mean or the realized profit per the standard deviation, is a commonly used performance measure. Since, the mean is interval-valued, Sharpe ratio is also interval-valued. Then, we have the following predictions for the first quarter of 2017

based on the square root of time rule[6]. We see that FBS promises the vaguer performance than WCS whereas the predictions about AHPS's performance is not satisfactory.

Table 8: Performance predictions.

	MPS	WCS	AHPS	FBS
Lower Bound of SR	0.342	0.418	-0.386	0.076
Upper Bound of SR	1.439	1.279	0.337	1.460

We find the realized results for the first quarter of 2017 in the Table 9. We see that all portfolios give better performance than the performance predictions due to the better market conditions. We also see that the FBS has the best results in each criterion whereas AHPS has the satisfactory profit but not the performance. WCS is the worst (second best) portfolio in the profitability (performance) criterion whereas MPS is the third one in each criterion.

	MPS	WCS	AHPS	FBS
Realized profit	0.172	0.091	0.202	0.371
Sharpe ratio	2.685	3.009	1.272	3.525

4. CONCLUSION

Although we believe that the worst-case solution is the best choice in the robust MV analysis for the conservative investors or financial institutions, it may not be suitable for the non-conservative investors. Because it may not provide the sufficiently high profit due to the worst-case orientation. On the other hand, the fundamentally backed solution (FBS) provides the best profit and performance in our example. It also conveys more information based on the fundamental analysis of the stocks. Hence, it may be a better choice for the non-conservative investors especially when they want to consider both the quantitative analysis and fundamental analysis in the portfolio selection. On the other hand, it should not be forgotten that proposed approach is applicable under certain conditions. Furthermore, in the real life, it may not give good results due to the human-based errors or inefficient market.

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[6] Under certain assumptions, the mean and variance are the linear function of time. Thus, the standard deviation and Sharpe ratio increase by square root of time.

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THE LOGICS OF ANTI-EFFICIENCY – ON THE NEED OF TECHNOLOGICAL »TRANSLATIONS«

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Abstract

In modern society and economy the principle of efficiency is omnipresent. Even in the discourse of sustainability – which, in many aspects, represents a challenge to modern visions of progress and Western »way of life« – resource and energy efficiency are seen as crucial factors. However, »instrumental reason«, which is underlying efficiency, has not only been criticized by the Frankfurt school (see Horkheimer, 2013 [1947]). There is a long tradition, which ranges from Rousseau (2019 [1750]) to Bataille (1985), which questions the models of progress coupled so closely with efficiency. Today, »commercialization« (see e.g. Hochschild, 2003) and »economization« (see e.g. Murphy, 2016) are prominent lines of discourse which do express similar objections to the efficiency principle. What is more, recent phenomenons of (pandemic) crisis demonstrate that following the path of efficiency may lead to paradoxical effects, in that the ability of the health system to cope with stress was especially poor in the most efficient ones (like in Italy): efficiency thus proofed to be very inefficient in pandemic times (see e.g. Popic, 2020). Likewise, in the past, the effectiveness of the critique of efficiency

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has been very limited. One of the reasons for this disproportion could be that the voices of critique (of efficiency) were unable to manifest in technology which is a major driving force of modern society and economy. Accordingly, the logics of anti-efficiency – i.e. logics of relationship, emotion, innovation, etc. – must not only be formulated theoretically but »translated« into technology in order to become effective.

Keywords: *Efficiency, Anti-Efficiency, Economization, Instrumental Reason, Technology, Technological Translation.*

1. THE NEED FOR ALTERNATIVE CONCEPTS (AND PRACTIES)

I want to start with a quite instructive quote from a recent interview with consultant Burkhard Schwenker, the former CEO of Roland Berger:

> »So, we are just seeing that efficiency has been completely overestimated. The whole economy was geared towards tightest supply chains: everything just in time, as short-term as possible. It would have made sense to invest much more in storage capacity […]

> The current situation shows that it is not about having learned something, it is about learning how to think. Only that will bring you forward. We asked Roland Berger's German-speaking alumni how business administration should develop, towards more practice or more theory. Do you know what the clear majority answered? More theory! « (Burkhard Schwenker in Lübke, 2020 [own translation])

Two things are striking about this quote: 1. the questioning of the efficiency principle from a consultant who in the past played a leading role in the maximization of efficiency, 2. the expressed preference of theory over practice by practicians. At least the first element becomes explicable in regard of the context in which the statement was made: the current pandemic crises (see also section 4) – which seems to have triggered some »cathartic« turns.

What is more, it is well possible that the turn of Schwenker appears to be more blatant than it actually is (meant): He just addresses the often-paradoxical effects of efficiency (see section 3), especially when applied with short time horizons in mind, and does not fundamentally question the efficiency principle. The concept of anti-efficiency, which I will outline here (see section 6), is a more radical approach.

As it seems, the circumstances are, however, in favour of such an effort which will not stop at the critique of instrumental reason (see section 5), but seeks to »sublate« efficiency and to »translate« anti-efficiency into technologies and practices (see section 7). I thus definitely would agree with Schwenker (and the Roland Berger alumni): yes, we need more (alternative) theory. But I would like to add: we also need alternative practices. In order to get there, we, however, must first look into what efficiency actually means and how it became the fetish that it is.

2. EFFICIENCY AS THE FETISH OF ECONOMIZATION

No area of life is excluded from the omnipresent rule of efficiency (see the numerous examples in Kleinmann, 2009). Our time seems obsessed with efficiency. A major driving force

behind this development was the mechanical clock, which not only made the measurement of time much more accurate, but which – since the invention of pocket watches – could also be carried around everywhere as an instrument of timekeeping. This had great influence on both business and private life. Hardly any other object has so persistently shaped the culture of modernity as the watch (see also Landes, 1983). And the more precisely time could be measured, the more efficiently it had to be used. Anything else would ultimately mean a »waste of time«, and to waste is a »sin« – for the early modern Puritan as well as for the modern capitalist. Modern life is thus under the (moral) rule of the clock. In addition, the complexity of modern (big-city) life would hardly be manageable without strict time management (see Simmel, 1903). Even in the age of digitization little has changed in this regard. To the contrary, the possibilities of global synchronization and the (customer) expectation of the availability of services »24/7« have made time regimes even stricter (see Anton, 2009). The discipline of timeliness was not only inscribed into the bodies (see Foucault, 1977 [1975]), but with the increasing social acceleration (see also Virilio, 1986 [1977]), speed, in which the dimensions of time and space meet, becomes a condition of social »functioning«.

This rush of speed, driven by efficiency thinking, even manifests in such rather mundane areas as food consumption and dominates our basic human needs. Accordingly, fast food is still a growing market. Food that can be prepared and consumed ever more quickly is the expression of a globally established culture of efficiency. It is true that global food chains have partially adapted their offerings to local markets, for example by serving kosher food in Israel (see Maynard, 2009). However, the organizational principles aimed at speed and efficiency are the same everywhere. And certain products, such as wraps – that can be eaten with one hand only – are even penetrating markets like Japan, which are otherwise rather critical of »foreign« food products. After all, such foods not only save preparation time but allow other activities to be carried out while eating. This efficiency advantage was explicitly advertised by the supplier of the wraps: »McWrap, newly introduced at McDonald's, is the one-hand-style food item you can bite into with just one hand [...] your other hand is completely free.« (Quoted after ibid.)

Because the entire world is increasingly operating along the lines of the big fast-food chains, George Ritzer (1993) called this process »McDonaldization«. The rationalization of the world, which is still in progress, is no longer oriented to the bureaucratic-legal model, as Max Weber (1922) once postulated, but to the efficiency logics of the fast food restaurants. And even if there is probably a confusion here between cause and effect and between the general and the

particular: it seems evident that the logics of efficiency has become the determining factor. The only questions left are: Why so? And who pockets the immense gains of efficiency driven rationalization? – Well, we may assume that it is mostly the same people (for the same profane reasons) who are generally pocketing the profits: the economic ruling class. The more apt terms for the increasing dominance of efficiency logics might thus be »commercialization« (see e.g. Hochschild, 2003) and »economization« (see e.g. Murphy, 2016). And the model of the *homo oeconomicus*, originally recognized by John Stuart Mill (1844: 144) as a potential problem of political economy, has long since become the universally valid image of man. In consequence, Jürgen Habermas and Jean-François Lyotard could already in the 1980s deplore a »colonization of lifeworld« (Habermas, 1981) and the dominance of economic discourse (see Lyotard, 1988 [1983]).

From a neoliberal perspective, however, such »marketization« is expected to have positive effects: cost reductions, quality improvements, and innovations (see e.g. the contributions in Le Grand and Bartlett, 1993). As far as efficiency is concerned, a distinction is made between productive efficiency – i.e. either minimizing input at a given output (input efficiency) or maximizing output at a given input (output efficiency) – and allocative efficiency, which refers to the optimal use of resources to satisfy demands (see e.g. Duda, 1987: 47f.). Closely related to allocative efficiency are distributive and Pareto efficiency/optimality, which, however, also includes welfare economic considerations. A distribution of resources is Pareto-optimal only if any change would be accompanied by a deterioration at least for parts of the whole group (see Pareto, 2014 [1906]: 179 [Chapter VI-33]).

Huerta De Soto (2020) sets a dynamic efficiency concept against the »static« understanding of efficiency in welfare economics, which is shaped by the idea of Pareto optimum. Not only does Huerta De Soto believe that value judgments are implied in welfare economic thinking. He also criticizes the fact that Pareto optimality presupposes that all factors and resources are known and unchangeable (see ibid.: 29). »The theory of dynamic efficiency, on the other hand, is not so much about avoiding the waste of known and ›given‹ resources [...], but rather about the continuous discovery and creation of new goals and means.« (Ibid.: 33 [own translation]) However, this view obviously also implies value judgments and, quite openly, the entrepreneur is heroized: driven by competition, he/she never rests and thus keeps going a process of creation and knowledge expansion (see ibid.: 31ff.).

What this neoliberal view does not take into account are power structures that can never be separated from issues of allocative and distributive efficiency (see also Duda: op. cit.: 59ff.). The question of power is just as readily faded out by systems theorists who associate economization with an increase in options (see e.g., Nassehi, 2012) – just as neoliberals do. Systems theorists would, however, assert that the created increase of options – due to a lack of »self-restraint« – can become quite problematic (see ibid.: 411ff.). Nonetheless, the »encroachments« and the spread of the economic »code« remain a purely semantic question for them. And some second-order observers (also outside of systems theory) even assert that economization can be read reversely in that »foreign« semantics are increasingly penetrating the field of economics (see e.g., Priddat, 2013: 432).

In order to deconstruct the (potentially fatal) logics of efficiency that underlies economization, one must therefore fall back to other »intellectual resources«. A suitable starting point is the fetish concept, as developed by Marx (1962 [1867]) in his major work »Das Kapital«: In the believe system of certain religious cults things are attributed a life of their own and supernatural powers (which, however, in reality only arise from that very imagination). Much in the same way we tend to understand the value of goods not as resulting from the social and economic conditions, but regard it to be their »natural« property (See ibid.: 85ff.). For Marx, this fetish character of the commodity is an essential element of (market-based) capitalism.

The term »fetish« itself is derived from the Portuguese »feitiço«, which means »spell«. This refers to the original colonial context of use – as a (derogatory) term for object-related cults of »foreign«, non-European cultures. Today, however, »fetish« has a much broader meaning – also as a (pop)cultural phenomenon. Numerous novels and films are dedicated to fetish sexuality, and the fetish scene celebrates its sexual obsessions at events such as fairs and parties. There is even a flourishing trade in fetish objects such as latex clothing or worn shoes and underwear. So, one might note: In modern capitalism the fetish itself becomes a commodity. Accordingly, Hartmut Böhme (2006) comes to the conclusion that fetishism (as materialism and consumerism) is not only latent in the culture of modernity, but modernity has universalized fetishism.

In my opinion, behind this »globalization« of commodity fetishism, there are not only hard economic interests at work, but there is also a magical (objectifying) thinking that has

become entangled in the cult of efficiency (see also Jain, 2019). The logics of efficiency represents an immaterial fetish, so to speak. But why not simply call the fetish of efficiency an »ideology« then? – That would be too simple and miss the quite material core of this cult which manifests in very concrete things such as the above-mentioned clocks (or their current equivalents: cell phones) calling us to use time efficiently. A superordinate level of this materialization are technologies in which the principles of efficiency get incorporated and solidify. These technologies structure and determine not only the »large systems« and our »lifeworld«, but also the framework in which change is possible. If, for example, a transport technology is designed for speed (and thus efficient time-space use), possibilities of slowness and ease disappears. What is more, the logics of efficiency requires measurability: everything must be expressible in numbers. These numbers suggest concreteness, but are in fact (like every number) only abstract entities creating an objectivity illusion which reifies the logics of efficiency. That which cannot be expressed in numbers not only is of no value but disappears from the horizon of perception. Through this reification, the logics of efficiency becomes a limiting reality that objectively and materially blocks the way for other, alternative principles and solutions.

Thus, calling efficiency (logics) a fetish is not only a reference to the obsession with efficiency of modern economy and society but also points to a main self-deception of the advocates of efficiency: that increasing efficiency is the only possible way. Huerta De Soto's reasoning is a typical example of such self-deception. He claims that efficiency – not play nor pleasure – drives creativity. Efficiency is thus attributed a power it does not possess: to change things. In fact, pursuing its logic tends to produce the exact opposite: that things remain as they are. Moreover, a one-sided, blind pursuit of the logics of efficiency is not even efficient along the lines of its own understanding, but may create paradoxical phenomena.

3. THE PARADOXES OF THE LOGICS OF EFFICIENCY AND CONTROL

In order to illustrate the paradoxical effects of the logics of efficiency, I will first take a closer look at the example of »scientific management«, introduced by the engineer Frederick Winslow Taylor (1856–1915) in early 20th century. Taylor (1919 [1911]: 16) criticized the inefficiency of previous business practice, which was based on »rules of thumb« rather than measurement. And he believed that there is *one* best practice for the performance of any task (see ibid.: 25). Taylor's approach in determining this best practice consisted of breaking down

the work process into the smallest possible steps and systematically optimizing each of them. This went as far as to standardize the movements of workers and to set rigid time limits which were checked by using stopwatches (see ibid.).

Of course, Taylor was aware that workers also needed to be offered incentives (such as performance bonuses or reductions in working hours) to make them comply to this strict system. He gives the example of a bicycle factory, where scientific management succeeded in increasing output while at the same time working hours could be cut (see ibid.: 86ff.). Does that mean that the increase in work efficiency was »profitable« for both sides, employers and employees? – Taylor's studies in scientific management only covered a very short period of time. On the employees' side, the »returns« were hardly sustainable – because a higher workload always means negative health consequences (see also Landsberg et al., 1999). The »additional costs« of efficiency improvements were passed on to the workers and society. Moreover, Taylor's method can only be applied to relatively simple, »decomposable« activities. Its relevance to advanced economies is thus limited. And even at the time of Taylor there was considerable resistance, especially from trade unions. Strikes against the rapidly growing popularity of scientific management in state-owned enterprises led to an investigation commissioned by the American Congress and headed by Robert Franklin Hoxie. The so-called »Hoxie Report«, which summarizes the results, lists a large number of points of criticism. The use of stopwatches and performance bonuses was even banned in American factories from 1915 onward because they encouraged overwork, as the report had revealed (see Jehle, 2009: 85ff.). Interestingly, however, the commission also concluded that industrial democracy is threatened by scientific management as it undermines mutual solidarity and increases existing power imbalances between employers and workers (see ibid.: 106f.). In fact, this rather socio-political point was one of the main motivations of trade union to protest against scientific management.

In the effort to increase efficiency, it is all too easy to lose sight of secondary consequences that may have a negative impact on efficiency (such as health consequences). But it is even easier to forget that any measure depends on (social) acceptance in order to be effective (see e.g., Evans, 1994). The effectiveness of a narrowed focus on efficiency is therefore very limited. This insight has become increasingly accepted in business practice since the 1960s/1970s at the latest (see the contributions in Kleinöder et al., 2019). As a result, approaches such as teamwork, which emphasizes personal responsibility and self-organization, came to the fore (see, for example, Sandberg, 1982). However, these concepts are not

unproblematic either. They lead to a »subjectivation of labor« (Moldaschl and Voß, 2002) in which a transformation of external constraints into self-constraints occurs – as one could phase it in reference to Elias' (1939) civilization theory. In the end, the new approaches are equally focussed on increasing productivity, and there is no actual increase in autonomy, but rather a shifting of control towards the subject, which, at the same time, is understood as a »valuable« resource (see e.g., Becker, 1964). The world of work is more and more characterized by a parallel economization of »inner life« and an exaggerated compulsion to affective control (see also Penz and Sauer, 2016: 133ff.). This contradiction gives rise to a variety of burdens (see, for example, Badura and Steinke, 2012), which may even end in »burnout« (see Keupp and Dill, 2010).

But it does not stop there. The attempt to achieve more control is not limited to the level of the subject, but encompasses the entire society. Michael Power (1994a) coined the term »audit society« for this phenomenon. In the course of the popularization of new public management, in which public administration is more and more oriented towards market-economy efficiency, an »audit explosion« occurred (see also Power, 1994b). However, the introduced audit systems not only lack democratic legitimacy but generate certainties that are often illusory (see Power, 1999: 122ff.). Even in economy itself management control systems may lead to a mere fiction of control as some things are difficult or impossible to put into figures. Companies have tried to counteract this shortcoming by the introduction of »balanced scorecards«, which seek to encompass also non-monetary factors (see Kaplan and Norton, 1992).

Empirical experience shows that the instrument of balanced scorecards has had only a very limited effect. In many companies which implemented balanced scorecards, short time after introduction, they lead a largely unnoticed »shadowy existence« (see Jain et al., 2016: 183). But precisely because such instruments are doomed to fail for the very reason that they attempt for the impossible, they are all the stronger the expression of the belief that everything can be quantified and controlled. This results in a control paradox: the false belief in ascertainability prevents the consideration of certain non-quantifiable aspects (such as trust or satisfaction). On the other hand, actual control (of these factors) is not necessary at all, since the principle of control (by means of figures) itself is not questioned by its failure. Even the wrong number provides legitimacy and helps to disguise the exercise of power. The efficiency of the society of control (see also Deleuze, 1992 [1990]) is in fact based on the depersonalization

of power and its self-reproduction within the social system, which is increasingly aligned to economic logics. For this reason, (critical) systems theorists may point to the many dysfunctional aspects of economization (see e.g., Schimank and Volkmann, 2008) without being aware of the *necessity* of the contradiction between the (economic) effectiveness of the system and the (political) effectiveness of control. Efficiency based control systems rather undermine than increase real control. In return, however, control is highly effective in increasing itself.

4. THE CRISIS OF EFFICIENCY: SOME INSIGHTS IN REGARD OF THE CURRENT EPIDEMIC

It is believed that the opportunities that are related to situations of crisis stem precisely from the fact that crisis reveals problems and contradictions that are otherwise hidden – so that one is able to turn them »cathartically«. If that were true we are currently – at a time when the world has switched to epidemic crisis mode – in a »privileged« position of realization. In fact, at least rhetorically, a certain change of direction (against further economization) can be spotted these days, especially in regard of health care. For example, only recently, a study of the Bertelsmann Foundation advocated the closure of more than half of Germany's hospitals in order to make the remaining ones more efficient and improve quality (see Loos et al, 2019). This suggestion received widespread approval from German health policymakers (see Ärzteblatt, 2019). The same experts now praise the (over-)capacity of the German health care system (see Kunkel, 2020) – since the most efficient ones (such as Italy's) quickly proved to be overstretched in the corona crisis for lacking sufficient reserve beds (see Popic, 2020). The »wasteful« use of resources appears to be a favourable factor for the resilience of systems.

In this light one must regard the failure of complete economization of health services in Germany as a lucky circumstance. But, on the other hand, it makes it more difficult to recognize its problems which are rooted in past developments: In general, over time, the German health care system has indeed already become more and more oriented towards economic principles. The process just is not yet fully completed. After the establishment of a welfare state health care system in the 1950s to the 1970s, from the 1980s onwards economization evolved with high pace: from budget ceilings, to case-based flat rates and managed care, which means nothing other than that hospitals and nursing homes are managed according to economic principles and compete with each other (see Molzberger, 2020: 4): »Hospital physicians and nursing staff have

witnessed the advent of a new type of management which is aimed at pushing medical services towards DRG [diagnosis related group] products based on efficiency and profitability [...]« (ibid.: 197 [own translation]) This in fact means an »economic trivialization« (ibid.: 206) of the medical profession – because complex medical considerations are often reduced to cost issues. And, of course, this trivialization is not free of paradoxes either, because a hip operation generating high costs is (if fitting into the hospital budget structure) sometimes easier to obtain (from the national health insurance) than prophylactic movement therapy.

The increasing economization affects all levels of the health care system: the institutional arrangements, the organizations and the actors (see Mohan, 2019: 267). At the latter level, it manifests in an enlarged mutual distance undermining the care principle. Nurses and medical staff are ever more under time pressure and forced to view patients primarily from an economic perspective, for example, generating higher returns by putting people into higher care levels. If care professionals still want to adhere to the principle of care, to a certain extent, they are forced to ignore the guidelines by spending more time on patient interaction than scheduled (see ibid.: 291ff.).

As a reaction to this kind of problems, some approaches in clinical economics attempt to also describe the non-monetary value of health care services in order to counter the efficiency fixation of managed care. However, with these efforts it is a bit similar to the case of balanced scorecards: they a) have little impact in practice (i.e., their results are largely ignored in decision-making), and they b) remain within the logics of economy by trying to evaluate non-monetary factors economically. Moreover, this evaluation naturally can only be done retrospectively, i.e., it records (and thus stabilizes) what is, instead of actively opening the space for alternatives. The retrospective and economizing adoption of other logics is also characteristic of the current crisis situation. Many voices simply suggest as a (universal) remedy that more money should be made available to the health care system (see BR24, 2020) or that nursing staff should be better paid (see kma Online, 2020).

One possible reason for this paradox (of countering economization by means of better financial support) could be that in many cases not only an economistic way of thinking but also a functionalist view of the problem dominates. In systems theory, which is becoming more and more widespread even in everyday discourse, the functional differentiation of social sub-systems is assumed. These are considered to be grounded on different »system logics«. In its

constructivist variant it postulates that the setting of a semantic difference (as a binary code) is even constitutive for all (sub-)systems (see Luhmann, 1980). The health system is (»autopoietically«) created by referring to the distinction between »healthy« and »ill« (see Bauch, 1996). This is the binary logic on which it is operating and there is only a structural coupling with other sub-systems (see in this regard also Luhmann, 1997: 100f.).

One strain of criticism of the economization of (not only) the health system is fed by a – misunderstood – systems theory perspective. The spread of the economic code is interpreted as a »hostile takeover« here (see Schimank, 2006). I am calling it a misunderstood systems theory perspective because a »hostile takeover« can essentially not exist according to its constructivist approach: Where the distinction between »healthy« and »ill« is applied, we are talking about the health system. Where the distinction between »to have« and »not to have« is applied, we are talking about the economic system. At best, therefore, a »true« systems theorist is able to identify a quantitative shift towards the economic system. However, even outside system-theoretical constructivism, one is often drawn to the idea that social sub-systems are separable from one another and each one follows its own logic. In the end, this is the only way that the idea of economization as a hostile takeover or the hope for a better functioning of the health system through better funding makes sense.

This idea of a specific logic (that simply must be followed) »naturalizes« the assumed separations. In regard of the example of the health system it means that health represents a value »for-itself« and »in-itself«. However, this view ignores the fact that health (or what we understand by it) is the result of a historical process in which a certain conception of medicine was enforced. The discovery of health, as opposed to illness, and the construction of the social machines of its »production« were accompanied by a certain image of the human being and how he/she has to fit into the framework of society (and the production of goods). Michel Foucault, for instance, shows with the example of the *»Birth of the Clinic«* (1973 [1963]) in the 18th to 19th century that the view on illness radically changed during this period. Not only did the hospital patients become segregated, but medicine tried to classify diseases and to restore health through scientifically supported therapies. All that was, however, not only about therapy but also about gaining power over the bodies and ensuring their functioning (see also Schäfer, 1981).

Health and its system (as well as all other sub-systems) cannot be meaningfully viewed in isolation from other social processes and their (power) structures, nor can it be viewed in isolation from the subject in which these structures are interlocked. Accordingly, very different logics are »inscribed« into the subjects. These logics can get in conflict with each other and with subjective desire. The current crisis is also the result of such conflict where the »dispositifs« of health and freedom, and likewise of health and prosperity, are clashing. It can currently be observed that health discourse has become »inflationary« and dominates, i.e., pushes back, other discourses (such as the discourse of basic rights). In the course of this process, health is experiencing a semantic charge, too. Its meaning »enriches«, it becomes the central point of reference for »one's own life« and political action. In the name of health, therefore, we accept immense economic »collateral damage«. And, yet, as the foundation of this »proliferation« of the health discourse, there is still the logics of economy at work – not only by promising »healing« through the use of capital, but also in that its principles, such as efficiency, are determining crisis management. Or, to put it in terms of systems theory: at the core of the current crisis is the misuse of economical semantics in the context of the health system (which means nothing else than that the health system becomes part of the economic system) which is mirrored by the misuse of health semantics in all other sub-systems (which means that the sub-system of health »mutates« into a social system differentiated according to the category of »survival«).

So, what can we learn from this crisis? – The (»systematic«) separation of logics creates the danger that some logics may take a life on their own, become dominant and limit and suppress other logics. In order to counter this, one would have to recognize that all logics are valid (even the logics of efficiency in the context of health). At the same time, no logic may claim higher significance than other logics which obviously includes the possibility of a conflict of logics. It would be our task to not only let the contra-dictions articulate but to unfold. Yet, before this can be tackled, it should be understood what distinguishes such an approach of »anti-efficiency« from the (mere) critique of instrumental reason.

5. PRELUDE: THE INSTRUMENTAL REASON OF MODERNIZATION

In *»Dialectic of Enlightenment«* (Horkheimer and Adorno, 1972 [1944]) and *»Eclipse of Reason«* (Horkheimer, 2013 [1947]), a radical critique of the Enlightenment and technological progress is made. In contrast to cultural criticism of the past (see e.g., Rousseau, 2019 [1750]),

the theorists of the »Frankfurt School« came to the conclusion that the modernization of society under the sign of instrumental reason is a path that will finally lead to (self-)annihilation. Max Horkheimer (2013 [1947]) characterized instrumental reason as subjectivistic on the one hand and objectifying on the other, as it refrains from any particularity. But foremost, in the age of instrumental reason, it is true that: »There is no reasonable aim as such, and to discuss the superiority of one aim over another in terms of reason becomes meaningless." (Ibid.: 3) Instrumental reason is empty of any content, purely formal and, therefore, it can easily be used for purposes of domination, instead of offering points of reference (for opposition): »Reason has become an instrument which is completely harnessed to the social process. Its operational value, its role in the domination of men and nature, has been made the sole criterion." (Ibid.: 30) As a result, a coalition between economic interests, technocratic rule, and positivistic science emerged (see ibid.: 63ff.), which makes it appear as if the current economic and social structures correlated to a natural order (see ibid.: 65ff.).

The »tradition« of the critique of instrumental reason is continued by Jürgen Habermas (1981: Vol. 2) in the form of a critique of functionalist reason. Habermas in particular points to the conflict between system and lifeworld, which became acute in the course of the spread of functionalism (see also back to section 1). According to Habermas, this conflict can only be resolved through communicative action which enables a discourse free of domination (see op cit.). But the concept of instrumental reason is also taken up outside the context of the »Frankfurt School«. From the perspective of philosophical anthropology, Michael Landmann (1975), for example, points out that the critique of instrumental reason does not equal irrationalism. This view is based on a false confrontation. The critique of instrumental reason just defends other, non-objectifying forms of reason (see ibid.: 24f.). These »alternative« forms of reason give expression to (often suppressed) moments such as creativity and spontaneity (see ibid.: 31ff.) and thus offer the possibility of overcoming alienation (see ibid.: 234ff.). The sociological criticism of the model of the *homo oeconomicus* (which, so to speak, represents the anthropological equivalent to instrumental reason) points to a similar direction by clarifying that allegedly irrational action patterns often indeed turn out to be quite reasonable, especially in situations of uncertainty (see e.g., Beckert, 1997: 25ff. and 403ff.). However, there are also completely soft-washed and depoliticized takes on the phenomenon of instrumental reason (see e.g., the contributions in Halbig and Henning, 2012), which show that the concept has long since arrived in the mainstream.

What, however, unites almost all continuations of the critique of instrumental reason is the weakening of its radicality which is both the strength and the weakness of the original approach of Horkheimer and Adorno.Especially in the *»Dialectic of Enlightenment«* they show how reason, no more being »objective« and therefore reduced to a pure means, becomes unreasonable and no longer offers any »anchors« (see. op. cit.: 3) so that it can be placed in the service of inhuman destruction (see ibid.: 5). The crucial argument of Horkheimer and Adorno, however, is the combination of instrumental reason with economic interests (see ibid.: 4). Accordingly, the critique of instrumental reason originally not only means a rejection of the dominance of economic logics (and the efficiency principle), but any kind of instrumentality (not only of reason) is dismissed. This twofold rejection arises from the observed historical coincidence of the enforcement of instrumental reason and the evolvement of capitalist economy which results in a perception of inescapability.

Modernization, however, has always been an inherently contradictory process, oscillating between reflexive and deflexive elements (see also Jain, 2000), and it does not follow a straight line. Rather, linearity and unambiguity had to be established by force. The concept of anti-efficiency, which will be explained in more detail in the following, is therefore only to a certain extent in the line of the tradition of the critique of instrumental reason. And a loss of »objective« reason is explicitly not regretted within the concept. Nor is the relevance of the economic logics of efficiency completely denied. Rather, the attempt is made to dialectically »sublate« it (see section 6). And, finally, a harmony between instrumental (efficiency) logics and technical means is not presumed from the outset, but rather it is proposed to view the instruments of technology also as possible means of change (see section 7).

6. POTENTIAL »ANTIDOTES«: THE DIALECTICAL »SUBLATION« OF EFFICIENCY BY THE APPLICATION OF ANTI-EFFICIENCY LOGICS

In ancient understanding dialectics was still primarily an art of dialogue: in speech and counter-speech, question and answer, pseudo-knowledge was to be »deconstructed« (see Plato, 1991a [ca. 390 BCE]: 390c as well as 1991b [ca. 375 BCE]: 533c-d). The great dialectician of modern times is Georg Wilhelm Friedrich Hegel. In his *»Phenomenology of Spirit«* he conceives of dialectics as an immediate way of experience, which arises in the movement of mind: In (dialectical) reflection, the objects of thought are »grasped« by making them – through (determinate) negation – a self-absorbing object of thought. The resulting new »synthetic«

object »contains the nothingness of the first, it is what experience has made it« (Hegel, 1977 [1807]: 55 [no. 86]). This moment of »sublation« (Aufhebung) is preserved in Marx' materialistic understanding of dialectics (see Marx, 1968 [1844]). And it is also an important element in the concept of anti-efficiency, which will be outlined here in its basic features. In concrete terms, this means that anti-efficiency logics not only potentially oppose the logics of efficiency, but that in the moment of »opposition« efficiency logics are (positively) included. Without the »object« of efficiency, anti-efficiency is not conceivable (and realizable) either. In this sense of an oppositional and at the same time »conservative« containment, anti-efficiency does not mean a mere counterposition, but includes the attempt to dialectically suspend efficiency – in order to overcome an economic narrowing of its object(ive)s. Anti-efficiency is thus primarily about anti-*efficiency* and less about *anti*-efficiency (and definitely different from inefficiency).

However, unlike in classical Hegelian dialectics, the sublation of efficiency through anti-efficiency does not mean a simple synthesis. This is also expressed in the term »anti-efficiency«. The contradictions (of different logics) are not synthesized (in order to disappear), but, on the contrary, should be enabled to unfold and to articulate. Approaches of an »open« dialectics, which is understood as a permanent movement of (re)search, point in a similar direction (see Wellmer, 1993: 109). The logics of anti-efficiency are, accordingly, not a (static) expression of objective reason, but the contingent and reflexive manifestation of the idea of equality of different (potentially contradictory) logics. As in all »equality issues«, the negotiation processes in the context of anti-efficiency are not always free of conflict. Therefore, two modes of anti-efficiency can be distinguished:

In the *harmonic mode* of anti-efficiency, efficiency and anti-efficiency logics complement each other. The use of anti-efficiency logics can even lead here to an indirect increase in efficiency or to the avoidance of efficiency paradoxes. This is achieved by the fact that the different logics complement and intensify each other by »resonance«. Anti-efficiency logics can count on general acceptance in these cases and are relatively easy to communicate to representatives of efficiency logics. The improvement of work quality (efficiency logics) through better team relations (anti-efficiency logics of social relations and individual affections) is a good example for that. From the perspective of efficiency logics, the »benefit« of the anti-efficiency logics exceeds the »cost« of their application.

In the *dissonant mode* of anti-efficiency, there is indeed a conflict of logics especially with respect to efficiency logics, but possibly also by contradictory anti-efficiency logics. It may be the case that one or more anti-efficiency logics undermine efficiency logics, or, that anti-efficiency logics get into conflict with each other (see also again Lyotard, 1988 [1983]). The latter is, of course, also possible in addition to the first case, which increases the complexity of the necessary negotiation processes. A simple example of a conflict between efficiency logics and anti-efficiency logics is when measures to enhance the satisfaction of employees (anti-efficiency logics of individual and collective happiness) bring down productivity (efficiency logics). In this case, the »benefit« of anti-efficiency cannot be expressed in economic terms and the pursuit of anti-efficiency logics can presumably meet with little or no general acceptance (in business practice). It becomes, however, even more difficult when individual satisfaction and collective satisfaction cannot be reconciled either. From the perspective of anti-efficiency, the »solution« to this problem cannot be the denial of this conflict, but rather that it is allowed to be »articulated« – for example, by constantly repeated adjustments, shifts and changes in practice. The logics of anti-efficiency thus implies prospecting movement, always reflexively directed towards itself, and not static fixation. The consideration of reflexive dynamics (see also Moldaschl, 2005; Jain, 2011) is therefore highly relevant in dissonant anti-efficiency logics, especially with regard to their inscription in technical systems (see section 7).

But what exactly are anti-efficiency logics? In the examples above, some potential anti-efficiency logics have already been mentioned. It is, however, important to note that it is not possible to simply list (and characterize) anti-efficiency logics, since they always result from the specific context. The answer therefore is: It is necessary to investigate the resistances to and the silencing in the practices of efficiency. And it must again and again be asked: What has not been articulated, what had no chance of being articulated and thus of becoming effective in the future due to the determinations made? This may be difficult to find out. While the questions of efficiency are pre-formulated – in »terms« of organizational, knowledge and power structures, (capital) interests, technological dependencies, etc. – anti-efficiency logics are endangered to remain overlooked and neglected due to the »momentum« and »gravity« of efficiency. It therefore requires *targeted and conscious* efforts to perceive oppositions to efficiency logics and to open up spaces for the articulation of the logics of anti-efficiency. And we should be aware that the noticeability of anti-efficiency logics might differ immensely in regard to their degree of discord to efficiency and with respect to their articulability (which is

coupled to their concreteness).

Despite of these problems and the context-dependence of anti-efficiency logics, some generally relevant logics can be named, which all too easily »get under the wheels« of efficiency and which, therefore, should be paid special attention to: innovation, relationship, and emotion logics as well the logics of desire, happiness and satisfaction. The logics of innovation is perhaps the closest to the logics of efficiency – as far as it contributes to increasing efficiency in the future. However, the logics of innovation may also conflict with efficiency logics. Neither can the »efficiency benefit« of innovations be assured beforehand, nor is every innovation aimed at increasing efficiency. This applies in particular to social innovations, which are often oriented towards relationship logics. For their part, the logics of relationship can certainly have an effect on efficiency (where cooperation is concerned). However, relationships undoubtedly follow a logic of their own, which is not always congruent with utilization interests but strongly linked to emotions.

The special significance of the logics of emotion was emphasized with the term »affective turn« (Clough and Halley, 2007). In this context, the material aspects of »feelings« are particularly stressed (see ibid.: 2). In my opinion, however, the element of »embodiment« is better addressed with the logics of desire. Desire is, on the one hand, a foundation of economic »drive«, but at the same time it is also an uncontrollable, excessive element that is opposed to the limiting logics of economy (see also Bataille, 1985). And when we are talking here about the logics of emotion, it is rather in the sense of the affective »constitution« of subjects. Their emotional life is not only socially transformed and shaped by the striving for control, but is also increasingly seen as an economic resource, as an »affective capital« (see Penz and Sauer, 2016). However, the subjective logics of emotion is, of course, as »unreliable« as that of relationship and thus probably more oriented towards the logics of satisfaction and happiness than to efficiency. The logics of satisfaction and happiness in turn are closely related to each other and yet can be distinguished: satisfaction expresses rather a passive »well-being« while happiness is a »good« which – in real life – rarely is simply »won« by luck. One must actively »perceive« and »capture« it (see also Machiavelli, 1985 [1513]: 15). Happiness thus, in a certain sense, wants to be »worked for« and is »productive«, but in quite a different sense as efficiency or technology, which, as a pure means, however, can and should also be »abused« for the ends of happiness.

7. SUBVERSIVE ANTI-EFFICIENCY TECHNOLOGIES: THE INSCRIPTION OF ANTI-EFFICIENCY LOGICS IN MACHINES AND SYSTEMS

One such »abuse« is the instrumentalization of the instrumental for the articulation of anti-efficiency logics. Anti-efficiency is not supposed to remain on the level of theory and discourse, but to become effective in practice. For this to happen, its logics must materialize. However, anti-efficancy is confronted with a stronghold of materialized efficiency in the form of systemic structures and technology, in which the economic principle of efficiency is reproduced. It is therefore all the more important that anti-efficiency logics also embody themselves in technology and systems – and thus »creep« into practice in order to spread.

»Instrumentalization of the instrumental« in this context means that the technical instruments must (again) become tools that not only serve efficiency but also those (anti-efficiency) logics which are potentially directed against it. It is thus necessary to develop subversive »counter-technologies« which are more than efficient generators of economic surplus: in which the logics of relationship, happiness, desire and all other (differing) logics are »taken into account«. One may hope that such counter-technologies will spread because people desire them as they are »tired« of the dominance of the limiting logics of efficiency. Technologies of anti-efficiency would consequently be »desirable« machines of happiness, which represent, so to speak, the opposite of »desiring machines« (cf. Deleuze/Guattari, 1977 [1972]). While desiring machines (fuelled economically) keep people functioning through their (consumer) desires, machines of happiness that follow the logics of anti-efficiency attempt at making technology an instrument of the human good again.

Obviously, this is a rather naive enterprise. Not only will some deny that the existing (social, economic and technological) machines do not serve the happiness of people. Unfortunately, one must above all doubt that it is even possible to construct anti-efficient yet effective machines of happiness. Every translation process is inevitably afflicted with (semantic) losses. If one translates anti-efficiency logics technologically, this may render them meaningless. It can be assumed that the translation process will especially cause the dissonant elements of anti-efficiency to fall by the wayside as one will tend to ignore those parts which are in explicit contradiction to technological logics (which is currently coupled so closely to efficiency logics). But at least one thing is encouraging: the logics of efficiency is not immanent in the field of technology either. It is not actually the technology but its economic mission which

dictates that technical solutions must be efficient. Therefore, if it has been possible to translate economic logics (in the sense of efficiency) into technology so successfully that it reproduces itself almost independently, then it may also be possible to anchor and spread anti-efficiency logics in technology. For reaching this target it will be necessary to integrate anti-efficiency logics already into the process of technical construction and not in a second step as is the case today – if it happens at all. And one will, again and again, have to bring into mind that it is precisely the dissonant parts that are at risk – in order to defend them against attempts of »emptying«. Without an anchoring also in the »technological base« of society, it will, however, be almost impossible to make anti-efficiency logics effective. Technology, perhaps even more so than economics, has become a determining factor in what can be »realized«. It is therefore more important than ever to create »machines« in which the logics of efficiency *and* anti-efficiency are »mediated«.

We have started a first attempt of such »mediation« in the joint project »The Logics of Anti-Efficiency: Reflexive and Sustainable Perspectives on Interactive Work With the Example of Care«. Thanks to funding from the German Federal Ministry of Education and Research and the European Social Fund, we are able to develop and test technical solutions in the field of care that take account of anti-efficiency logics. In the care sector, particularly relationship and emotion logics are of high relevance. In order to support them we designed and test three technical translations: 1. A reflexive and sustainable care logistics system is developed fed by mutual sympathy evaluations. 2. Emotion logics will be supported by an app based emotion recognition. 3. General awareness of anti-efficiency logics will be promoted at the management level by a decision-making support tool which also puts anti-efficient alternatives/arguments in focus. We are still at the beginning. Or successes (and failures) will have to be reported elsewhere. However, we strongly encourage everybody to start a translation process in order to embed other logics than efficiency in technology – and thus »make them work«. Only by technological »embodiment« the logics of anti-efficiency can become effective and practical and gain momentum.

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THE EFFECT OF MARKETING MIX ON CUSTOMER BEHAVIOUR

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Abstract

Any business aiming to increase the selling process which is obviously very hard, thus, managers use marketing in order to motivate consumers to buy the products or the service. In order to study the impact of marketing mix on sales, this research paper studied a number of researches about the marketing mix and its effect on customer behaviour, considering a specific type of procedure and method in order to guarantee valid research, thus, the criteria of eligibility includes the studies assessing the phenomenon of the effect of marketing on sales that written in English languages, published in a scholarly peer-reviewed journal, and studies that publication date between the '90s and 2021. While the excluded studies that were not published in a peer-reviewed journal, the unpublished thesis and dissertation, and studies that are a single case. Following the previous procedures, 20 eligible empirical studies were included after omitting a further 2121 studies because they were duplicates (n =623) and only had an abstract (n = 22). Consequently, a total of 38 studies were selected for the eligibility phase. The present paper carried out a systematic review of available literature using Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines.

Keywords: *Marketing. Sales, Personal-Selling, Promotion, Advertising, Public-Relations, Consumer.*

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1. INTRODUCTION

The market has a special nature that explains its response to the market mix which is a very important issue beside its theoretical and practical significance, all it should be learned which make the marketers pay more attention to the communications regularity with its sales and expenses (Woretaw et al., 2021). The most obvious aspect of marketing seems to be that promoting a product is the basis of any selling process per se marketing function which requires the use of advertising, personal selling, and others, in other words, potential buyers need to be motivated by promotion that makes them believe in their desire of the product (Okyere et al., 2011).

A simple "master formula" is what the marketing vision depends on, that it ought to focus on polarizing the attention, interest, and desire of the potential consumers, accordingly, the first mission for marketing is polarizing the consumer's attention (Palmer, 2005). To achieve the point of marketing it's important to use the target audience's vocabulary so they are easily attracted to it and convene evidence that encourages the customer that a particular brand is the best choice. Furthermore, one of the most difficult missions in the marketing process is to create a desire for consumers to buy a product and convince the customers that they need the product in order to achieve the final requirement which is getting the prospect's action (Churchill and Peter, 1998).

The academics and specialists in marketing very long ago have been aware of the effect of knowing the aspects that lead consumers to buy a product and how much of it. Product assortments continuously influence shoppers' store selection decisions, placing third in the significance after convenient locations and low costs as a factor. The core theory of store choice, the rule of gravity, states that the likelihood of choosing a store is depending on its size while its distance from their houses affects badly on choosing it. Being markets consist of the same products in general, choosing the market will depend on its assortments of products (Briesch, 2009). Providing various kinds of information that many buyers need to make decisions which increase the appeal of products and services and getting it to be more active. In other words, shedding light on the audience's needs by deep research is very central in obtaining more accurate results to depend on in the marketing process (Arens, 1999).

Most companies' success and long-term growth depend on raising awareness of their product(s) and eventual purchase. One of the most significant challenges that most trading

organizations have is determining how to assess and estimate how much their marketing methods are affecting the trade success, and according to Chadwick et al. (2005), Fahy et al. (2004), and Stotlar (2004) the previous evaluating process is the most difficult in the marketing field. The main question is whether the companies involved in these operations are getting the requisite returns on their large financial investments. One of the things that make firms produce genuineness marketing adverts is their use of communication-media along with developing products and services harmony. Even while companies are anticipated to keep working on product developments, true competitive differentiation will only be achieved through targeted marketing strategy and campaign management. Brands and communication are invariably the links between a firm and its customers, allowing the latter to differentiate one brand from another. These are individuals, families, or businesses that a marketer believes have the potential to become clients (Eberhard et al., 2006).

However, the author of this paper has noticed that marketing mix plays a main role in sales. Consequently, the present paper aims to collect the available literature in this field utilizing the Preferred Reporting Items for Systematic Reviews and Meta guidelines.

2. METHOD

This study was conducted by reviewing many certified researches, studies and projects that studied the effect of marketing mix on customer behaviour, moreover, the reliability of marketing mix information and its impact on customer behaviour was confirmed by taking researches, studies and projects from reliable resources around the world. As the research is dependent on other researchers' projects, it is necessary to follow strict ethical principles. every quotation had been referenced, also, for every borrowing from any project. In addition, we have used the results of the research without misrepresentation.

This research paper demands a specific type of procedure and method in order to guarantee valid research, accordingly, the researcher of this paper has included the following:

2.1. Eligibility Criteria

All studies assessing the phenomenon of the effect of marketing on sales were eligible for review, with the following inclusion criteria: a) studies that were written in English languages and, b) studies that were published in a scholarly peer-reviewed journal and, c) studies that publication date between the '90s and 2021. While the excluded criteria were the following: a)

studies that were not published in a peer-reviewed journal, b) the unpublished thesis and dissertation and, c) studies that are a single case.

2.2. Information Sources and Search

A literature search was conducted via the following academic databases: Web of Science, SAGEpub, HeinOnline, Ingenta connect, ScienceDirect, and Wiley Online Library. During December 2021, Sundry searches in the specified databases were performed using the following search terms: (Marketing and sale, Effect of marketing communication, Effect of marketing on sale, and Marketing mix).

2.3. Study Selection and Data Collection Processes

Following the initial literature searches, each study's title and abstract were inspected, and possibly relevant studies were then further evaluated for eligibility. The PRISMA flow diagram contains thorough information on the study selection process (Fig. 1).

3. RESULTS

3.1. Study Selection

A total of 2,121 studies (ScienceDirect, n=762; Web of Science, n= 320; Ingenta connect, n=420; HeinOnline, n=512; Wiley Online Library, n=63; and SAGEpub, n=35) were identified via the initial search process. After the title and abstract of each study were examined, 1498 studies were omitted because they were unsuitable for the present review. A further 2121 studies were omitted because they were a duplicate (n =623) and only having an abstract (n = 22). Consequently, a total of 38 studies were selected for the eligibility phase. Of these, a total of five studies were omitted due to language issues (n = 33), being unpublished thesis (n = 21), and not published in a peer-reviewed journal (n= 12). Following these procedures, 20 eligible experimental studies were included in the present review.
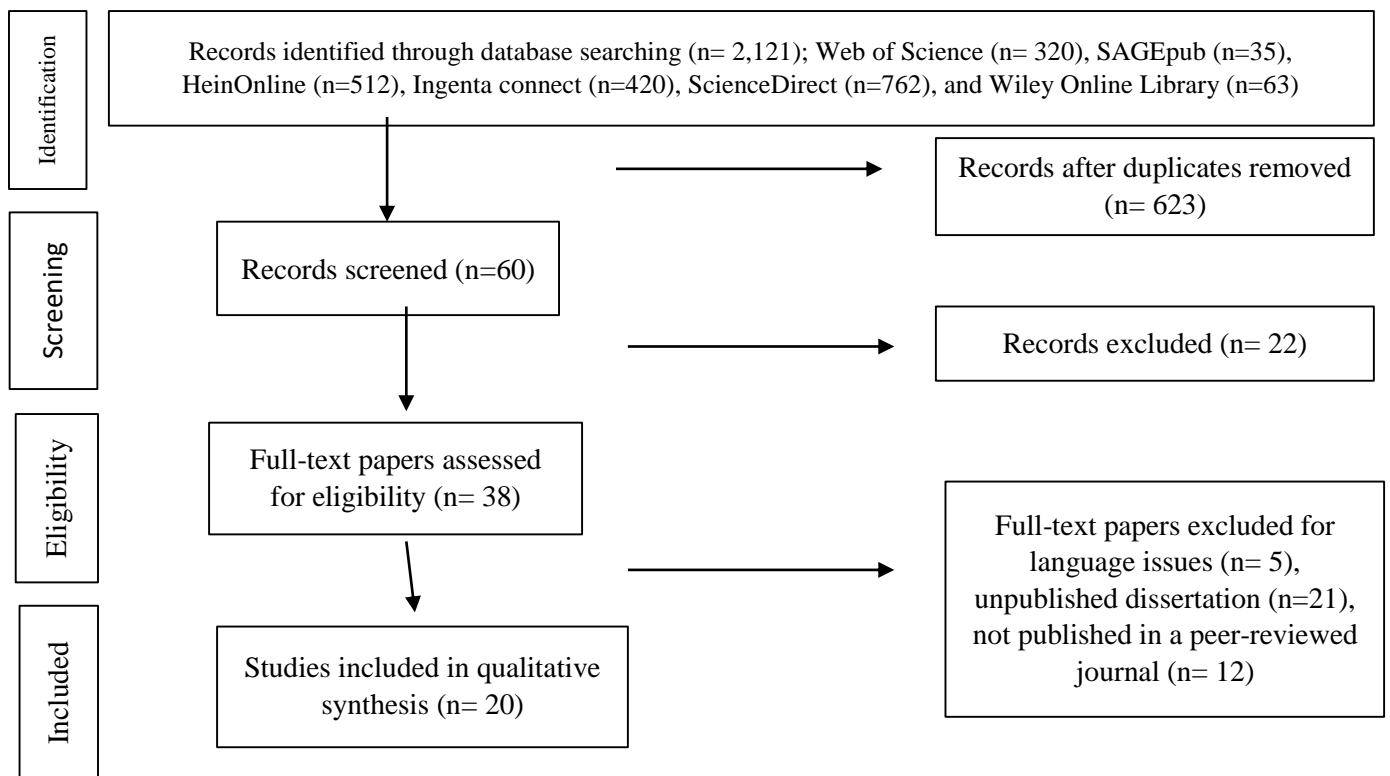
Identification

Records identified through database searching (n= 2,121); Web of Science (n= 320), SAGEpub (n=35), HeinOnline (n=512), Ingenta connect (n=420), ScienceDirect (n=762), and Wiley Online Library (n=63)

Records after duplicates removed (n= 623)

Screening

Records screened (n=60)

Records excluded (n= 22)

Eligibility

Full-text papers assessed for eligibility (n= 38)

Full-text papers excluded for language issues (n= 5), unpublished dissertation (n=21), not published in a peer-reviewed journal (n= 12)

Included

Studies included in qualitative synthesis (n= 20)

Fig 1. PRISMA flow diagram of paper selection process

3.2. Country in Which The Data Were Collected

In terms of the geographical characteristics of the studies that were included, Vaid et al. (2020), Gonzalez et al. (2014), Hunter and Perreault (2007), Smith (2006), Low (2000), Lassk et al. (2012), Strahle (1996), Blattberg and Neslin (1993) and Grönroos (1990) were in the US. While, Djakasaputra et al. (2021) in India, Ataman et al. (2010) in France, Seukindo (2017) in Tanzania, Tudose et al. (2017) in Romania. While, Goetz et al. (2013), Homburg et al. (2008), Homburg and Jensen (2007) in Germany, and Porto et al. (2017) in Brazil, Troilo et al. (2009) and Guenzi et al. (2007) in Italy.

3.3. Literature Review

Reviewing literature showed that with regard to key methodological features of studies, all studies reviewed were empirical and quantitative in nature. A cross-sectional design was used in the majority of the investigations.

Table 1: Literature Studies

Study	Main findings	Study limitations	Risk of biases
Grönroos (1990)	Strengthening, establishing, and developing customer relationships is the most important goal, which can be done by profit where organizational, individual, and objectives are met.	Developed from empirical research on consumer-packaged goods and durables. Furthermore, In the North American marketing environment, it was improved, the aspects are specific.	As the risk of bases was in sampling because of non-probability sampling techniques.
Hunter and Perreault (2007)	Corroborate the hypothesis that using ST to evaluate or present information has a favorable impact on a salesperson's ability to create customer relationships. However, when a salesperson uses ST to evaluate data, it has a detrimental impact.	In this study, the used process approach is focusing on assessing intermediate outcomes from various aspects of ST, which is fitting with IT's contexts that affect individuals' performance.	The risk of biases is represented in the desire to include more measures that are reliable and quantitative about the performance of sales.
Blattberg and Neslin (1993)	The primary findings were that incremental sales per redemption varied amongst brands, ranging from 0.208 to 0.534, besides the divergence of trademark vulnerability in coupons' competition. These results show that the ability of specific firms to get a huge market share in a coupon environment is shown as a result than they would in firms without it, while others lose market share in a discount environment.	This study has been done from the viewpoints of the sophisticated practitioner who lacks to develop besides who hopes to take part in the field.	According to the space limitations, the study pays efforts to illustrate the mentioned models in promotional literature and their kinds, while even working on improving the models of brand-specific the region-specific in order to prevent the bias, there are seldom appropriate information and data for a determined trademark in a determined region that is suitable with the model.

Ataman et al. (2010)	Retail has a high intensity whereas the advertising was low. Accordingly, the study considers that the impact of distribution may be weak while the impact of advertising may be strong in the U.S., the study findings confirm that for long term advantages the advertising is very important per se the major driver for the country's markets.	The findings are subject to several notable limitations, some of which point out several future research opportunities, firstly, it's not easy to decide how much the DLM observations and variables size is, secondly, for the marketing mix there are many potential relatedness's.	This study can be considered as an adjustment for bias because of its selection difficulties, and the omitted variables.
Porto et al. (2017)	First, marketing activities accurately predict product sales, and; second, marketing activities are inefficient in generating profit if they are increased in the same proportion as product and goods costs.	The time for filling the questionnaire by the sample was restricted.	To uncover potential deviations from regression consistency, the researchers created cumulative sum plots of residuals.
Troilo et al. (2009)	That (DIMS) progresses the implication and engagement between Marketing and Sales, and aids in the spread of a customer-centric culture throughout the business.	This study is cross-sectional and combines the use of a convenience sample; any attempt to generalize the findings or infer causal linkages should be approached with caution.	(AMOS 7.0) were used so the indirect impacts of (DIMS) on market performance and superior customer value have been obtained with bias-corrected.
Vaid et al. (2020)	The insider status of an appointee, which represents less formalization of activities, can alleviate this disturbance by stabilizing structures during the transition, in addition, specializing in B2B marketing technology mitigates the unfavorable impact of combined M&S appointments.	Although the antecedents of the merging of marketing and sales into one role were not examined in this study, maybe there are impacts of the previous aspects on the understanding of perceptions about the company's value.	This study can be considered as an adjustment for bias because of its selection difficulties, and the omitted variables.

Tudose et al. (2017)	sellers and producers have to strictly manage the marketing plans, their tasks, also the expenses associated with them, all due to globalization and growing competition.	The study limitation was presented in the analysis of the mission of cost structure done for one firm.	Has tended to focus on theory rather than considering tactics employed together or in succession.
Goetz et al. (2013)	achieving an advanced level of marketing orientation demands a powerful function of marketing, otherwise, market-oriented businesses are affected by the impact of the sales unit's power.	For the different variables it used the single information reports, also, the hybrid organizational arranging was excluded from choosing in the sales department.	Comparing the late and earlier responding rates has prevented the risk of bias.
Seukindo (2017)	Sales promotion and publicity had an insignificantly small beneficial impact on sales performance.	Scoping the study to consist only of the soft-drink firms has prevented the study limitation, besides the limited time for filling the questionnaire by the sample.	It included one firm to obtain the data
Gonzalez et al. (2014)	The structural sources of social capital that are related to the firm's networks are the way to drive RMs' sales performance.	Findings are difficult to extrapolate across firms or industries.	The participants have been chosen based on their accessibility and availability.
Smith (2006)	First, the authors propose a complex interplay between marketing efforts, follow-up delays, and sales efficiencies; second, according to their study, they insist that multimedia spending has a basic impact on the effectiveness of subsequent communications.	When the query gets into the call center, more information about the prospect's media exposure can be gathered.	To uncover potential deviations from regression consistency, the researchers created cumulative sum plots of residuals.
Low (2000)	Organizations with integrated marketing communications systems are more likely to be small, consumer-focused , and service-oriented businesses toward more experienced management, meaning that their products can be growing in market share rapidly.	The study limitation was presented in the analysis of the mission of cost structure done for one firm.	Any attempt to generalize the findings must be done with caution.

Lassk et al. (2012)	The chief account manager able to collect the resources depending on the marketing and sales process is a very majority in the firm's success.	The reliance on either staff or consumer reactions, but not both.	The research on the utilization of specific sales methods has tended to focus on theory rather than considering tactics employed together or in succession.
Djakasaputra et al. (2021)	In the digital era, digital marketing has a large impact on sales performance, as does quality service, and digital marketing has a significant impact on sales performance through quality service.	This study has been done from the viewpoints of a sample with a short-term experience	The risk of biases was in sampling because of nonprobability sampling techniques.
Homburg et al. (2008)	In order to lead the trademark to success, it is necessary to achieve harmony between marketing and sales, besides the experience in the marketing field.	First, more research should be done to examine the structural linkages and integration mechanisms of M & S; and second, more research should be done to collect data from multiple respondents rather than key informants.	The risk of biases was in sampling because of nonprobability sampling techniques.
Strahle (1996)	Even if sales managers give build activities a greater priority than hold activities when assigning hold sales targets to goods, they nevertheless give build activities a higher priority than hold activities. Furthermore, the findings clearly show that sales management prioritizes selling over all other goals and activities.	This study has been done from the viewpoints of a sample with a short-term experience	Comparing the late and earlier responding rates has prevented the risk of bias.
Guenzi et al. (2007)	Superior customer value generation and market success are positively influenced by the utilization of a direct sales force and customer-oriented salespeople.	What appears as a major issue in the connection between the Marketing and Sales departments is that value creation for the customer increasingly originates from collaborative Marketing and Sales efforts.	Avoiding the method bias in the study has demanded the researcher to collect the data from many informants in the same company.

| Matthyssens et al. (2006) | In some cases, both sales and marketing fail to appreciate the necessity of collaboration. Stereotypes, unilateral dependent relationships, differing "hierarchies of goals," and a variety of organizational and communication variables are the most significant obstacle to both departments integrating as they should. | More large sample surveys are needed, as well as the testing of exploratory findings and the identification of possible situational disparities. | To uncover potential deviations from regression consistency, the researchers created cumulative sum plots of residuals. |

4. RESULTS AND DISCUSSION

Marketing is defined as employing media methods to show unpaid coverage in stories about their product (Grasby et al., 2000). It is also defined as a system that requires a company to base its activities on the wants and needs of users in target markets (Stokes, 2000). While Peter Drucker considers marketing as a basic that is unable to be a separate tool (Swaim, 2011). Marketers must be working on getting their ideology to the target store, not only a simple product (Dubrin, 1997). In order to attain that, firms utilized a number of marketing methods and tools (Kotler and Keller, 2009).

Communication is very important in the marketing field so it's necessary to deal correctly with it in order to improve the luxury of the trademarks, therefore, it's not acceptable to miss evaluate its impact. Experts claim that in the 1990s, marketing is communication and communication is marketing which the two are inextricably linked (Boyd et al., 2000). The sales promotions process attempts to motivate the consumers to try or buy the product called short-term incentives that aim to raise the level of product purchase. Designed specially to increase quick sales and build loyalty (Blythe, 2006).

Personal selling, which involves personal interaction, is another type of marketing that is progressively becoming the backbone of service marketing businesses (Kotler, 2006), in addition to describing it as a task involving direct communication with the consumers by face-to-face (Jobber, 2007), furthermore, there is sponsorship which is the cost-effective alternative since traditional media have become more expensive (Kotler and Armstrong, 2010).

The previous literature ensures that it's very important to establish and improve customer relationships that it leads to an increase in profit where organizational, individual, and objectives are met. Also, mixed results were found that the impact of distribution may be weak

while the impact of advertising may be stronger, to sum up, results confirm that for long-term advantages the advertising is very important per se the major driver for the country's markets.

5. LIMITATION

Despite the comprehensive search across databases, some related papers might be missed due to including only studies published in English, selected search terms, and database limitations. In addition to containing important data in non-peer-reviewed studies, dissertation studies, and unpublished theses.

6. CONCLUSION

The findings collected from the mentioned review explain the impact of the marketing mix on sales. According to the results, it is important to develop connections with consumers and create a friendly relation so they encourage to buy the product leading the profits to increase. Future research might enhance developing more efficient marketing methods and the relation of many variables like the cultures with marketing mix impact on sales, in addition to improving the interests of employees in the marketing field.

Based on all studies that the researcher has studied she recommends the following:

• Other researchers should provide more studies in this field to increase the knowledge and data about marketing and sales in order to solve the problems that face the advertisement process.

• The business and services sector shall substantially promote its service through promotion elements because promotions impact a large number of customers, inspiration activities, and awareness creation when they decide to use the service. Thus, they need to improve awareness creation and inspiration to increase the number of purchased items per customer.

• Government should support the marketing sector by providing the tools and experts besides decreasing the taxes and fees in case of using development marketing methods.

This study aims to explore the effect of marketing mix on sales, accordingly, this research paper studied a number of researches about the marketing mix and its effect on customer behaviour, considering a specific type of procedure and method in order to guarantee valid research, thus, the criteria of eligibility includes the studies assessing the phenomenon of the effect of marketing on sales that written in English languages, published in a scholarly peer-

reviewed journal, and studies that publication date between the '90s and 2021. While the excluded studies that were not published in a peer-reviewed journal, the unpublished thesis and dissertation, and studies that are a single case. Following the previous procedures, 20 eligible empirical studies were included after omitted a further 2121 studies because they were duplicates (n =623) and only had an abstract (n = 22). Consequently, a total of 38 studies were selected for the eligibility phase. The present paper carried out a systematic review of available literature using Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines.

This research paper explains that the success and long-term expansion of most businesses are dependent on increasing product awareness and ultimate acquisition. Most trade firms face a substantial issue in understanding how to assess and evaluate the impact of their integrated marketing communication operations on their overall company success. As marketing authors have pointed out, determining the effectiveness of sponsorship is the most difficult aspect of marketing communications campaigns.

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