

# Modelling the Effectiveness Index of Digital Marketing Strategy Oriented to Increase the Popularity of Maritime Education

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**ABSTRACT:** Digitization of the maritime transport formed a paradoxical situation of an increased interest in informatics and data sciences among youth, whilst the level of interest of these programmes in the maritime education and training (MET) field remained relatively low. Based on theoretical modelling the solution to the problem is divided in two parts, one of which is related to adding data sciences to MET and the other refers to increasing intensity of digital advertising to solve the problem of low knowability index (KI) of MET. The research showed that KI is the output of effective digital marketing strategy. Thus, all parameters characterizing effectiveness could be divided into categories and by applying AHP methods the weight of each criteria could be assessed. Based on the weights and on the analytical measurements collected from monitoring tools the KI was calculated. Analysis of KI component and whole KI found out main ways of increasing MET popularity, which could be implemented through on increasing advertising intensity in the social networks the whole year and also by adding new content which are related within the digitization into MET study programmes' modules.

## 1 INTRODUCTION

In a broad sense Maritime education and training (MET) includes the upbringing of seafarers and sea port specialists. In the global education market MET strongly depends on the changes in labour market due to digitization, which created a wide range of possible study programmes in MET. The digitalization of social processes involved a lot of people into the digital social environment where they could be found as potential customers. But it is only one reason for looking for solutions on increasing MET popularity effectively.

Another reason is the increasing competitiveness between study programmes from the point of view of study programme scientific direction. Based on the case of Lithuanian Maritime Academy (LMA)

maritime education study programmes are placed in different scientific areas such as engineering, technology, management, economics and computer sciences and all of them are dependent on the competitiveness with another study programmes from the same scientific direction. And from this point of view the problem of MET attractiveness could be found. This second reason influenced the needs of higher maritime education to increase the attractiveness of the MET study programmes between adolescents and the needs to increase the exceptional attractiveness of maritime sector by adding some important facts about this sector in the digital environment which is friendly for the most part of potential customers of MET institutions. Thus, the contextual awareness of customers which could be interested in MET supposes the fact that main pool of customers could be found in the digital environment.

It can be projected that the increasing of popularity and attractiveness of MET could be based on the creative and technological strongly developed marketing strategy concentrated on the looking for the most effective way of attracting future customers. This task is also addressed with existing digital tools in the market, there are tools such as Facebook, Instagram, YouTube, Twitter, LinkedIn and their advertising plans, also Google tools such as Google AdWords linked with the internet website, also monitoring and analysis tools such as Google Search console, Google Analytics which could be employed the cheapest. The theoretical and practical problems are the following: what is more important in the marketing strategy – content or technologies; how to measure the effectiveness of implemented digital marketing strategy and how to assess its impact on MET attractiveness and popularity. The possible hypothetical answer could be based on the technique of evaluation of specific index, based on the indicators, collected from the social network's accounts, website visibility and analysis tools.

Based on these preconditions of problem's existence, the research object is the effectiveness of MET digital marketing strategy. The main goal of research is to create the model for measurement of the effectiveness of the digital marketing strategy oriented to the increasing the popularity of MET. The objectives of research are the following: to indicate the changes of MET under the influence of Fourth Industrial Revolution (4IR), to describe the concept of digital marketing strategy effectiveness under the collection of main effectiveness criteria, to model the digital marketing strategy effectiveness measurement index and empirically test this index by applying the model to assess the effectiveness of Lithuanian Maritime Academy marketing strategy. The effectiveness index of the digital marketing strategy is oriented to the increasing the popularity of MET and it is titled as Knowability Index (KI) in this research. The KI is constructed as the collection of ranked elements representing the general awareness about MET and knowledge on a certain MET subject and matters related to it. The main research methods are scientific literature review, content analysis, comparison and modelling. The modelling is based on the analytical hierarchy process (AHP) methodology and its combination with the data analysis methods. The main limitations of the research can be related with the local context of the digital marketing strategy, which may affect the structure and scope of the elements of the KI model. Also, the factor of subjectivity of maritime nation mentality can take a place in the qualitative level of the research. Despite these limitations, the continuity of the research could be implemented in the area of applying this methodology by the collecting wider ranged collections of criteria.

## 2 DIGITAL MARKETING STRATEGY FORMATION IN ACCORDANCE WITH THE MET CHALLENGES UNDER THE 4IR INFLUENCE

Traditional seafarer training has always focused on the acquisition and use of practical skills. Also MET is strongly dependent on the environmental changes and should react immediately to its changes as it happening in nowadays markets under the influence of 4IR.

A crucial precondition for MET is digitization challenges and smart workplace development because this fact justifies the needs to train not only practical skills but also to use training facilities for the development of in-depth analytical and critical thinking skills in the field of professional interests which are wide in the MET: from the marine competencies, i.e. navigators and ships engineers, upon the port and shipping managers, technologists, programmers and data analysts. The global trends in MET is increasingly to link the higher education essentially with the practical preparation for labour market by providing specific competences with more general or deeper academic components leading to an academic qualification with the analytical dimension of knowledge [11]. Based on the MET conception related to the digitization of global supply chain it is important to mention that the digital and analytical competences become a significant part of MET programmes. Rapid development of information and technologies is the main impetus for the transformation of education, updating its content and forms, methods and technologies, improving the efficiency and accessibility of quality education [6].

Table 1. Competencies of future maritime personnel [12, 13]

| Shoreside  | Afloat  |
|--|---|
| Supply chain logistics; Internet of Things (IoT) - including digital integration, data analysis and decision making;   | The basics of IoT, data analysis and decision making; Engineering technology; Deck operations; Ship's handling experience; Integrated electronics training and bridge skill assessment; |
| Both Shoreside and Afloat Personnel  |   |
| Cyber security (identification, prevention, mitigation); Digital readiness; Mechatronics; Electrical power systems; Automation systems; Automation –remote operation (A&RO); Risk assessment, risk analysis and decision making; Safety management systems and auditing; Behavior based safety; Interpersonal relationships, leadership, team-work, and coaching in a new-virtual world. |   |

The process of MET modernizing has started. Automated operations of the whole water transport sector and other transitions will happen under the 4IR influence and changes in technology moving MET towards the future. This will change the necessary scope of skills and competencies (Table 1) by including data science, digital and analytical competences in all MET areas. Ships and seaport terminals will become more and more autonomous and autonomy will increase as fast as autonomous

shipping will start. Maritime academies must be prepared to train ship or terminal operators working under remote and smart workplace conditions. It will encourage the implementation of the simulator-based training and will increase in demand the study modules related to 4IR technologies' integration, automation systems, cyber-security and the whole data analysis for decision making are needed to be implemented [12]. Thus, digitalization of the education processes will enhance the qualification of scholars and lecturers in the frame of COLREGS expertise's integration into MET [12, 13].

Hence the modernization of MET supposes to change awareness of MET and requires to increase targeted information about the challenges and changes of MET and this information should be shared in common sites because the KI of modernized MET is the relatively low. Whilst the youth's interest in informatics and data engineering is increasing the MET attractiveness remains at stable low level. Therefore, MET organizations meet the challenges of increasing not only institutional attractiveness, but also the whole maritime industry's attractiveness by presenting the new technologies of maritime industry and the perspectives of wholly autonomous technological ecosystem, which will require high qualified maritime industry specialists with critical, creative and analytical thinking and high level of digital readiness.

The possible solution to increasing the attractiveness of MET in the sector of higher education is MET institutions, industry networks and clusters where MET organizations can work together with the active industry's participants to better prepare mariners to be able to succeed in a modern industry that will continue to see advances in technology and automation in the future. Meanwhile, maritime knowledge-based clusters as it mentioned in the research of Zhou et al (2021) are highly oriented to the creation of the value-added services for global supply chain's customers. And it means that knowledge-based cluster could be involved to the solving of MET KI problems also. This type of stakeholders' networks' inclusion into MET KI problem solving implies the ensuring of the central knowledge base supporting through the knowledge generation hubs called as learning organizational networks and it means that these clusters could be more effective in the area of the increasing of the MET KI from point of view of effective marketing strategy [20]. Hence one of the solutions are blended learning programs in maritime academies strong cooperation with maritime industry, with other academies. To avoid of the disturbing of the infancy of the training the greater involvement of maritime administration is needed also. This way will provide the thoughts on increasing of the attractiveness of modern MET and ensuring skills which are seen as needed for the next generation of specialists for maritime industry. Main points that ensure the demand of competent seafarers and shore specialists are their possibilities to get gain strong digital readiness and cyber security skills and train anywhere and at any time. And these points should be knowable for the MET customers. Therefore, as it was mentioned in the researches of Basak (2017), MET is an emerging trend in the education sector and further innovation experiences

so the increasing of its popularity also could be mentioned as an innovation because KI is required to diffuse and implement new ways of knowledge sharing in the maritime industry. Also KI represents innovative ways of implementation of marketing strategy aimed to introduce potential customers with the changes in order to discover the multiple modalities, a better understanding of MET factors, problems, development directions in accordance with 4IR, and to increase KI by using the effectively working marketing tools [3].

Based on presented arguments, the important part of increasing MET popularity is the increasing its attractiveness and this attractiveness could be measured by the high level of KI. Thus, for the success of the MET and maritime industry maritime academies have the obligation to spread the modern outlook of the maritime industry and emphasize it. This is the way how to supply the maritime industry with seafarers and port specialists. G. Kalvaitiene, I. Bartuseviciene & V. Sencila (2011) found that the maritime education and training institutions have to explain young people all merits of maritime profession and show possibility for them to find emotional attractiveness and realization of their interests if they choose maritime professions [9]. In this case, according to the results of the research the studies will be effective and quality of MET will increase. Another point of view of MET challenges is related with the attractiveness of MET for youth because the problem is related with the low level of KI of maritime industry and the modernization of processes. And the KI increasing could be realized by the implementation of effective marketing strategy which could looking for the potential customers of MET services in the digital environment.

It could be assumed that digitization processes under the influence of 4IR transformed market by creating possibilities for young people who are the potential customers of higher education to shift their activities to the social media where traditional advertisement are not visible at all. Technological progress is fast, but KI have a late component so it has lower intensity in comparison with the technological solutions implementation. Maritime transport sector has lower range of KI which could be because of the fact that the maritime industry is only a complementary domain of the global supply chain with the logistical connectivity component. Therefore, KI of maritime industry is lower than KI of another sectors' and this fact describes the MET KI problems. But the 4IR influenced qualitative parameters of MET by requiring to include the main technological, digital and analytical preparedness of future maritime industry specialists, so the integration of new digital solutions in the maritime processes could be a motivation factor for youth which are interested in the study programmes in technologies, engineering, informatics and data analysis fields. But for the implementations of ideas of increasing the MET's KI the effective marketing strategy required. Hence the questions of modern marketing technologies adoption and their combining to advertise MET in the most effective way also is required.

The importance of effective MET's advertising is increasing, because the MET institutions compete with

others educational institutions in the global market of education. On the one hand, strong competitive advantage of the MET programmes in the national and international market is their specific internationally regulated awarded competencies. On the other hand, MET programmes are the part of whole study system, and internally, in the group of programmes, compete for the client's attention. How to reach the wide range of potential customers? The modern marketing strategy can be constructed by using the digital marketing tools of social networks. To measure effectiveness of this marketing strategy the KI will be calculated.

Parallel to the challenges of 4IR in MET, the new internet technologies and social media influence the challenges of MET organizational marketing strategies because the main part of globally used communication technologies have become the main part of everyday life for millions of youth around the world which are potential customers of services and products in the global international market. As it found by some researchers [4, 5, 7, 17] the social media usage has become an integral element to the marketing strategies' implementation in a wide range of private and public organizations in different fields of business activities because based on the findings of the forecasts present that number of social media users will to almost 3.43 billion users by 2023 [5]. Modern digital social media environment on the internet allows to all companies and their clusters to achieve marketing objectives at relatively low cost [2], but organizations have to respond to these changes in consumers behavior and have to start making digital technologies and possibilities as an essential and integral component of their marketing strategies [19]. And also, important scientific findings say that the intensive growing of digital and social media technologies and applications could be widely used for creating awareness of private, public services and political promotions [7] and it means that increased awareness could positively influence and KI, popularity and the attractiveness of offered products and services for the markets. As Kotler (2007) found the marketing in the public sector, which part is MET sector, hasn't enough attention from decision makers and the managers of public institution usually fall in doubt: from one point of view the advertising of public services have not direct purpose as it is in private business sector with the orientation to benefit, from another point of view anybody doesn't know how to prove the advertising impact on the changes of services demand of public entities [4]. And the factor of KI becomes actual and usable in the marketing strategies of public organizations especially in the segments with the deeply specialization.

Based on Rebeca M. Achem et al (2017) findings organizational marketing strategies should be changed and should be oriented by two directions: the traditional marketing channels and digital marketing channels should be used in integrative way and the effectiveness of marketing depends on the both channels and consisting of main engagement, behavioral and relationship indicators, creating quietly high self-awareness of target groups of advertising influence [1]. As it was mentioned before the effective marketing strategy could be constructed in an integrative way by the using of well - developed

KI in the traditional marketing environment and by extending it to the digital space. Working this way both types of organizations public and private organizations can significantly increase the benefit from making digital marketing as an integral element of their overall business strategy working effectively.

### 3 METHODOLOGY OF DIGITAL MARKETING EFFECTIVENESS ASSESSMENT

KI in internet space is an important indicator for the assessment of the effectiveness of applied marketing strategies and tools. It means that the effectiveness of marketing in organizations could be measured and compared by different advertising campaigns which were happened in different periods of time. As it is found in ontology-based marketing research, the effective marketing could be measured not only by the changes in the numbers of new clients of maritime education services, but also by the impressions and clicks of website visitors and important information could be extracted from the website visitor's analysis. As the meaning of digital marketing is a part of marketing strategy based on applying the internet tools such as social networks, websites, google AdWords, boosting posts in the social apps and another activity also could be used, but it is important to note, that all activities and effectiveness could be find in the website visiting information and it means that MET organization website is the landing place of all applied marketing tools (fig. 1) and in the background of website and website analysis tools such as Google Analytics could be applied.

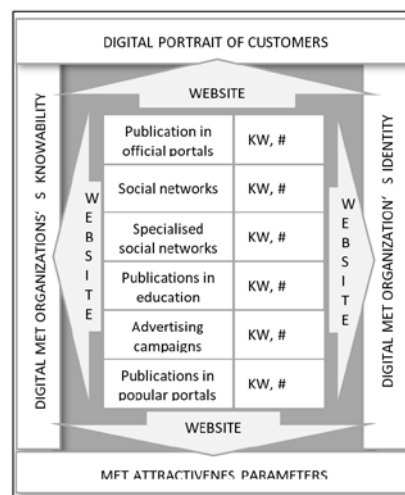


Figure 1. MET organization's digital marketing strategy's effectiveness concept [9, 13]

With the organizational context and the structure of stakeholders, MET organization interacts by using a couple of different marketing tools which have different purposes and advertising schemes, but the main target of these tools is to attract as much as possible customers and to increase the attractiveness of MET as a part of the whole maritime education sector. As it presented in the figure 1, interactions with the stakeholders could be realized in different ways: by using social networks (Facebook, Instagram, TikTok, Vkontakte and another) dependent on the usage of stakeholders and including specialized

networks (YouTube, LinkedIn, Pinterest, Up Work and etc.), by using different type of publications in the official governmental portals, specialized MET and/or educational portals, daily news portals and another mass information environments and channels. The selection of communicational channel strongly depends on the target groups, so it is another important research field, but this research is more oriented into the possibilities to measure the effectiveness of marketing strategy as the way to increase KI and attractiveness of MET sector.

The presentation of MET's marketing strategy as it is showed at figure 1 creates possibilities to explore the digital identity formation problems: a lot of different keywords are used in the digital environment, because each digital portal has his own keywords, hashtags and the organization create different systems of keywords and hashtags for the representing itself in the digital environment, but if these elements are used chaotically the entropy level increases and the organization has a big risk to lose its identity at all. And the losing of identity as it mentioned in the researches of Ajina (2019), Hossain et al (2020), Dwivedi et al. (2020) is leading the negative impact on KI level which could influence the decreasing of attractiveness [2, 5, 8].

The such type of problems could be solved by the unification of used keywords and hashtags for the increasing efficiency of marketing strategy and the main basic assumption of effectiveness is directly well constructed system of keywords which is called as digital identity and is strongly related with the organizational KI by applying modern market methodologies as ontology-based marketing or graphs of knowledge. But the more important problem exists in the usage of combined different social networks which have different usability in the different target groups. Thus, the marketing strategy in MET organizations could be based on the collecting data from the website monitoring tools, also collecting data by surveying the first course students, also by weighting the significance of marketing strategy elements by their importance for the MET KI increasing.

Chaffey and Patron (2012), Saura, Palos-Sanchez and Cerda Suarez (2017) found out the set of important key indicators could be used for the assessment of effectiveness of implemented marketing strategy under the hierarchical structure model divided into the categories and subcategories [4, 16]:

- website visiting indicators such as new users, monthly (or annually) visitors, speed of opening a web page, different visitors' activities and organic search parameters. One of them is CTR, described as click-through rate (impressions vs clicks), and means metric measures which is the number of clicks advertisers receive on their ads per number of impressions;
- redirection parameters from other websites such as number of visitors and number of sessions;
- effectiveness of using Google AdWords advertising such as prices per clicks, per customers and per sessions, also the balancing the number of advertising campaigns;

- social networking parameters such as redirection from used social networks, including of opened pages and number of sessions (fig.2).

But for the collecting required data it is important to identify main preconditions which are well organized structure of website including representing keywords and the active google analytics or another monitoring tools with the integrated programming code to the website code sources. Installed and activated monitoring toolset such as Google Analytics enables the possibilities to identify the specificity of market and directly helps to establish main characterized parameters of potential customers and based on the indicators of usability internet website which are creating the potential customer's image which is useful for the improving of marketing strategy. Going from the starting position of LMA interactions with the stakeholders through its website, the monitoring tools were integrated into the website code and redirection from another social media were implemented into the target pages. Therefore, the main criteria could be described based on the KI theoretical findings which shows that the KI could be evaluated by applying combined research methodology based on the quantitative and qualitative methods:

- the main key indicators of marketing effectiveness should be identified on the base of theoretical modelling and their statistical data could be collected by using the visitors' monitoring tools on website;
- the analytical hierarchical process (AHP) methodology as the multi-criterial decision-making method could be applied for the assessment of weights of each criterion by applying the pairwise comparison of criteria during the expert survey consisted of academy's marketing group and scientist working in MET in the field of management.

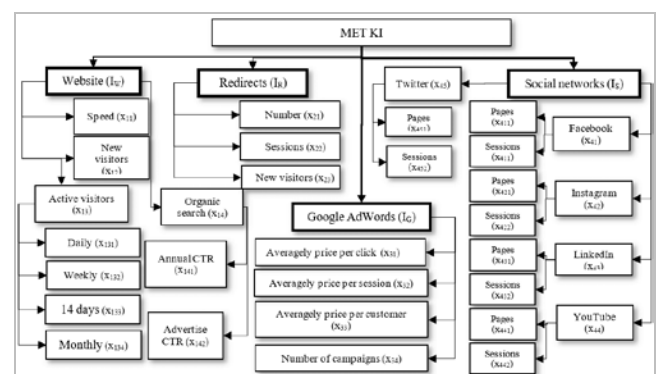


Figure 2. The elements of KI [1]

By applying of this combined research methodology all key parameters of MET marketing effectiveness were divided into the main four groups of criteria and each of them was divided into the subcriteria (fig 2). All subcriteria could be measured by quantitative indicators. Based on this hierarchical structure the questionnaire for pairwise comparison was prepared as it described in the AHP methodology [14]. The multi-criteria decision-making methods can be employed to identify quantitative or qualitative evaluation criteria and the AHP methods have been increasingly applied to academic research in recent

years. Pophalie et al. (2011) suggested that AHP is powerful tool which can be used to determine appropriate alternatives in multiple objective decisions, Lin and Hsu (2003) used AHP to identify Internet advertising networks, Sharma and Joshi (2020) compared the monitoring tools in online advertisements context by applying the AHP methods, so it means that the selected methods are adequate for the research problem investigation [10, 15, 18].

The experts for the survey were selected according to the criteria "Participant of the LMA marketing strategy planning group". In total 10 experts were selected: 1 director, 1 vice director for academic affairs, 6 heads of departments (navigation, engineering, port economics and management, personnel management, IT laboratory and library), 2 LMA scientists, having doctor degree in social sciences (management and education). The questionnaire of the survey was based on the LMA website structure and content, marketing complex and were consisted of criteria presented in figure 2, representing the criteria groups of MET knowledge, MET attractiveness, MET marketing and other factors.

Based on the AHP methodology and the results of expert survey the MET KI could be calculated by applying the formula:

$$KI = \omega_W \cdot I_W + \omega_R \cdot I_R + \omega_G \cdot I_G + \omega_S \cdot I_S$$

where:

$$I_W = \sum_{l=1}^2 \omega_{Wl} \cdot X_{Wl} + \omega_{W3} \cdot \left( \sum_{k=1}^4 \omega_{W3k} \cdot X_{W3k} \right) + \omega_{W4z} \cdot \sum_{z=1}^2 \omega_{W4z} \cdot X_{W4z}$$

$$I_R = \sum_{l=1}^3 \omega_{Rl} \cdot X_{Rl}$$

$$I_G = \sum_{l=1}^3 \omega_{Gl} \cdot X_{Gl}$$

$$I_S = \sum_{l=1}^5 \omega_{Sl} \cdot \sum_{k=1}^2 \omega_{Sik} \cdot X_{Sik}$$

and  $\omega$  – the weight of each parameter in each category group, which were calculated by algorithm of AHP method which is operating with the experts pairwise comparison's results.

For the assessment KI the quantitative parameters are taken from the statistics of applied monitoring tools, which is Google Analytics in the case of LMA. And the dynamics parameter should be used for the quantitative measurement of each  $x$  which could be applied for the comparison of situation changes. As the LMA started with the digital marketing only at 2019, so the comparison of two periods will be done: firstly, the indicators of annual results will be compared and secondly the indicators of intensive marketing period will be compared also by the using the annual growing indicators, which will be calculated by formula:

$$X_{Clk} = \frac{X_{Clk}^{2019}}{X_{clk}^{2020}}$$

where  $C=\{W, R, G, S\}$ ,  $l$  and  $k$  the indexes of sub criterial groups.

Also, it is important to mention, that the research idea and strategy is based on the logical direction "the greater is better", so the negative parameters such as increasing of speed opening the web page and increasing the price per click, session or customer are inverted in this way:

$$X_{Clk}^{converted} = \frac{1}{X_{Clk}}$$

Based on the methodological findings of the research it could be mentioned that the popularity of MET study programmes in the context of marketing theories and principles is based on the combined conception of attractiveness assessed by KI, but the effectiveness of marketing strategies is more related with the conception of the knowability which could be measured by monitoring statistics and could be compared dependent to different periods and their duration. Also, construction of research methodology shows that the fundamental basis of quantitative measurement of KI parameters could be located on the MET organization's website which is the main source of KI parameters and also the basis for the formation of digital identity which also representing the knowability. For the calculation of indexes, the significance weights could be used dependent on the importance of used parameters and these weights could be assessed by application of AHP methodology in the research.

#### 4 ASSESSMENT OF THE MET KI

Applied AHP methodology and calculated index of consistency are presented in the table 2. Based on the opinion of experts the highest significance was acquired for the website parameters' category where two subcategories have similar high significance level: they are the number of new visitors and the CTRs of organic search (Table 2).

Table 2. Results of expert survey: AHP weights for each criterion (expert survey, AHP calculations)

| Weights of Website visits | Weights of red.                          | Weights of AdWords | Weights of social networking              |
|---------------------------|--|--------------------|---|
| $\omega_W=0.4$            | $\omega_R=0.15$                          | $\omega_G=0.2$     | $\omega_S=0.25$                           |
| $\omega_{W1}=0.2$         | $\omega_{R1}=0.3$                        | $\omega_{G1}=0.3$  | $\omega_{S1}=0.35$                        |
| $\omega_{W2}=0.3$         | $\omega_{R1}=0.2$                        | $\omega_{G2}=0.2$  | $\omega_{S11}=0.5 \quad \omega_{S12}=0.5$ |
| $\omega_{W3}=0.2$         | $\omega_{W31}=0.2 \quad \omega_{R1}=0.5$ | $\omega_{G3}=0.3$  | $\omega_{S2}=0.25$                        |
|                           | $\omega_{W32}=0.2$                       | $\omega_{G4}=0.2$  | $\omega_{S21}=0.5 \quad \omega_{S22}=0.5$ |
|                           | $\omega_{W34}=0.3$                       |                    | $\omega_{S31}=0.5 \quad \omega_{S2}=0.5$  |
| $\omega_{W4}=0.3$         | $\omega_{W41}=0.4$                       |                    | $\omega_{S4}=0.15$                        |
|                           | $\omega_{W42}=0.6$                       |                    | $\omega_{S41}=0.5 \quad \omega_{S42}=0.5$ |
|                           |  |                    | $\omega_{S5}=0.1$                         |
|                           |  |                    | $\omega_{S51}=0.5 \quad \omega_{S52}=0.5$ |

It means that the website and the organic search have the highest level of KI in the MET sector: the KI increasing as the organic search parameters are increasing. The second group of parameters with the weight of 0,25 was assigned for the group of criteria representing the redirections from the social networks. At the moment of the research the LMA had 7 account on Instagram, well developed and active account on Facebook, also account on the LinkedIn and Twitter, but the YouTube account was

only in plans and for the forward researches. The group of parameters related with the directed marketing activities has the lowest levels of significance. Usually they also could be expanded into the annual marketing activities especially the publications in other digital informational portals which are redirecting the visitors to the LMA landing page.

Investigation of quantitative parameters located in the monitoring data base identifies the situation that all parameters during intensive advertising period is increasing significantly, but during the whole 12 months period is low enough and it means (Table 3), that the advertising campaigns are located in the period of acceptance of new students and advertising activities are effective in the context of new customers, but it is not enough effective in the context of KI.

It is found that the parameter of new visitors in the category of website the averagely increasing and seeks 1.12 and it means that annual increasing of this indicator seeks 12%, but during intensive advertising activities this indicator increases more intensively and annual increasing is equal is equal 115% (table 3).

Table 3. The values of all parameters fixed in the Google Analytics historical data (2019, 2020)

| Values of Website visiting |                       | Values of redirections      |                       |
|----------------------------|-----------------------|-----------------------------|-----------------------|
| Annual                     | Intensive advertising | Annual                      | Intensive advertising |
| XW1=0.11                   | XW1=0.11              | XR1=1.05                    | XR1=1.62              |
| XW2=1.12                   | XW2=2.15              | XR2=0.99                    | XR2=1.71              |
| XW31=0.25                  | XW31=1.32             | XR3=0.75                    | XR3=1.12              |
| XW32=0.82                  | XW32=1.10             |                             |                       |
| XW33=0.81                  | XW33=1.25             |                             |                       |
| XW34=0.77                  | XW34=1.60             |                             |                       |
| XW41=1.12                  | XW41=1.22             |                             |                       |
| XW42=1.12                  | XW42=1.22             |                             |                       |
| Values of AdWords          |                       | Values of social networking |                       |
| Annual                     | Intensive advertising | Annual                      | Intensive advertising |
| XG1=31.92                  | XG1=31.92             | XS11=6.15                   | XS11=12.40            |
| XG2=2.43                   | XG2=2.43              | XS12=5.11                   | XS12=11.15            |
| XG3=1.68                   | XG3=1.68              | XS21=1.00                   | XS21=42.25            |
| XG4=7.00                   | XG4=7.00              | XS22=1.00                   | XS22=57.00            |
|                            |                       | XS31=1.00                   | XS31=8.00             |
|                            |                       | XS32=0.99                   | XS32=4.00             |
|                            |                       | XS41=0,00                   | XS41=0,00             |
|                            |                       | XS42=0,00                   | XS42=0,00             |
|                            |                       | XS51=1.00                   | XS51=2.15             |
|                            |                       | XS52=0.99                   | XS52=1.05             |

A similar situation could be identified in the group of redirection parameters and it could be seen that all parameters are greater during the advertising periods, and it is important to note, that the last year growing had negative dynamics and the number of visitors and sessions form redirections decreased (table 3). These results identify the demand to keep the marketing strategy in the intensity the whole year and to ensure the periodicity of publications to be enough in other portals for the ensuring the required level of KI of LMA and its MET programmes.

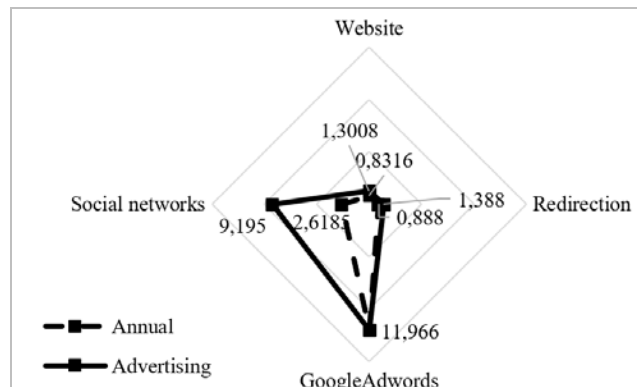


Figure 3. KI of LMA MET programmes by its components

Analysis of KI by the assessment of different components of the whole KI (fig. 3) shows that the biggest difference was established in the range of social networking. The whole year's KI value is 3,5 times less than the value fixed during the period of intensive advertising. It means, that the increasing of effectiveness of LMA marketing strategy could be implemented through the increasing of advertising in social networks not only on the period of accepting new students but extended through the whole year, because the difference of parameters is significant.

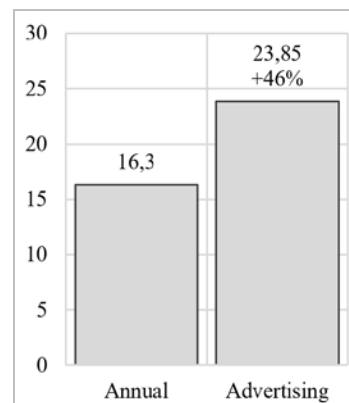


Figure 4. Total KI of LMA MET programmes

The effectiveness of marketing strategy measured by KI (fig. 4) has more effectiveness during intensive advertising periods also and it is bigger 46% than in the whole 12 months period. And it means that the marketing strategy is oriented more to the new customers attracting, but based on the MET problems of KI and MET popularity increasing strategy could be implements by increasing the usage of specialised promotion tools at social networks whole year and increasing the popular articles in the other portals about MET challenges under the influence 4IR and the changing workplace in the future which will be fulfilled with the new technologies and will require digital, cybersecurity and data analysis competences.

## 5 CONCLUSIONS

The analysis of the changes of MET due to the influence of 4IR shows that MET is influenced by two types of factors: firstly, the changed demand for the learning outcomes of MET programmes influenced the demand for the new competences such as the data

analysis, IoT and cyber security; secondly, the changes of youth's fields of interests and increased popularity in informatics and data science are not so attractive in MET context. Based on these influencing factors the hypothetical assumption was done: increasing of MET popularity could be implemented by renewing of MET programmes on the base of adding new content related with the digitization and sharing information about it in wide range of social media environments on the base of effective digital marketing strategy.

The description of the concept of digital marketing strategy's effectiveness under the collection of main effectiveness criteria showed that the conception of effectiveness in the field of MET marketing strategies is strongly related with the increasing KI of the organization in the digital environment. Thus, the main effectiveness assessment methodology was related with finding the algorithm for calculating KI.

The methodology of the MET KI is based on AHP methodology, using statistical data from the digital marketing monitoring tools and expert survey outcomes. The analysis of KI was divided in two periods: (1) the annual results of visitor's dynamics; (2) the visitors' dynamics during intensive advertising periods. The quantitative parameters were measured by the growing indicators in 2020 in comparison with the period in 2019.

To generalize the statistical and empirical data research results by using AHP method it can be highlighted two main elements having strongest impact on MET KI: the content of the MET institution's website and its visitors' dynamics. Based on the results of the LMA KI analysis it can be recommended for the MET institutions to keep their website periodically updated with relevant information about the MET. The results of the research showed that LMA KI value can be affected by consistent actions with KI components through digital marketing strategy's implementation. For example, KI value is increasing when MET related information is sharing outside LMA website in other digital portals and redirecting them back into LMA website's landing page. The assessment of the KI and its elements in different periods shows that the increase of the effectiveness of LMA's marketing strategy could be implemented by increasing its advertising in social networks not only on the periods of accepting new students, but through the whole year.

The KI model is adaptive by changing the relevant elements according to the needs of institutions. The research results can be applied to any educational institution that seeks to increase its marketing strategy effectiveness and attract students for successful competition in the education market and for creation of bigger popularity of the specialized professional sector, as it was presented on the example of MET.

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