THE QUALITY OF INFORMATION ON WEBSITES OF INSURANCE COMPANIES AND THEIR COMPETITIVE POSITION

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The aim of this article is to present results of studies on the relationship between the evaluation of the quality of the information contained on a website of an insurer and its competitive position. The evaluation of the quality of the information on the websites of insurance companies was based on the scoring method using an original tool to assess the quality of the information on the Internet. Its structure is based on the model of the information quality proposed by Eppler and includes 16 statements concerning individual quality criteria. The assessment of the competitive position of insurers took into account their share in the market of personal and property insurances (measured by the share in gross written premium) and the scale of the impact on the market through their websites (measured by their popularity). The studies carried out and the analysis of their results did not confirm the existence of statistically significant correlation between the quality of the information contained on the websites of insurers and their share in the market. However, the hypothesis was verified that there is a statistically significant correlation between the quality of the information contained on the websites of insurers and their popularity.

Keywords: quality of information, website, Internet, insurer, competitive position

1. Introduction

It is increasingly common in Poland to use websites as sources of information and communication tools in matters relating to insurance. This is due to widespread access to Internet and development of websites of insurance companies offering

different types of services ranging from a presentation of an offer through an access to detailed information on individual products to an interactive contact with an advisor for additional information. It is also possible to conclude an insurance contract online or make a claim in the same way. However, the increase in the access to insurance information sources and development of the services offered through professional websites of insurance companies are not followed by proper quality of the information [8]. Therefore, it is very difficult to obtain reliable and useful information for an average user, who does not have sufficient knowledge and is not able to assess the quality of the information. The full evaluation of the quality of the information contained on the websites is a difficult task, both in methodological and practical terms [1, pp. 114-116]. Therefore, it is worth to answer the following questions:

- Is there a correlation between the quality of a website of an insurer, especially the quality of the available information, and the position occupied by the insurer on the market?
- Does the quality of the information available on a website of an insurer correlate with the popularity of this website?

The aim of this article is to present results of studies on the relationship between the evaluation of the quality of the information contained on a website of an insurer and its competitive position.

2. The evaluation of the quality of the information on the websites

The evaluation of the quality of information on a website is part of the evaluation of the quality of the service treated as an information system [1, p.71]. There are many conceptual models useful to assess the quality of information on the Internet [2]. The framework model proposed by Eppler [4] meets requirements of a set of criteria such as universality, relevance, flexibility and completeness. It is in its design that a horizontal and vertical structure can be distinguished. The horizontal structure reflects four views of the quality of the information related to grouping the key quality criteria in dimensions/categories. They take into account different roles and requirements of people towards information: authors/producers, administrators/managers of information systems, maintainers of information systems, users of information systems/consumers of information. The four dimensions appearing in the model are: relevance/adequacy of the information from the point of view of the expectations and requirements of the whole community, "content" of the information as internal features characterizing the information or an information product, the optimized process of the content management (from the point of view of the requirements of the whole community), reliable structure for providing information. The first two dimensions refer therefore to the quality of the content of the

information. The further two dimensions are related to the quality of the media, i.e. processes and infrastructure by which information is provided. These are: the optimized process and the reliable structure for providing information. It is on the websites that the roles of producers and administrators/maintainers are usually merged. Thus, the presented quality framework may be reduced to three dimensions, where the two last dimensions are merged, since it is a data producer/administrator that is responsible for them. The vertical structure of the framework reflects the phases in the life cycle of the information from the point of view of a user. He has to find, understand and assess the information, adapt it to the context and apply it in an appropriate manner. The third element of the framework consists of the principles of information quality management, which are supposed to provide practical assistance in their implementation. The principles apply to the four phases in the vertical structure.

The quality model presented above allows for creating tools tailored for the specificity of the insurance industry for testing the quality of the information on the websites.

3. The competitive position of insurers

The competitive position of a company is defined as: "a result of competing achieved by a company in a given sector considered against the background of the results achieved by competitors" [10, p.89]. It is a multidimensional category determined by a combination of such factors as the market share, the share in the main segments of the market, the impact on the market, the scale of operations, technologies and technical skills, skills and adaptability [5, p.38]. In the studies on insurers, two of the categories were taken into account, i.e. the market share and the scope of the impact on the market. The percentage share in the premiums written was used to assess the share of individual insurers in the market. On the other hand, one of the most important elements of the impact on the market is the information activity of the entities performed in the form of transfer, acquisition and exchange of information. Nowadays, it is largely implemented in the virtual space with the use of the Web information system (web pages, portals, websites). It is the popularity of the system that can be used to assess the impact of a company in this respect.

The data on the size of the premiums written obtained by individual insurers come from the most recent report of the Polish Chamber of Insurers [9].

The indicator, which reflects the popularity of the given website, is the number of its users. The systematic investigations under the name of "Megapanel", which allow for determining the value of this indicator, are carried out by Polish companies such as Polskie Badania Internetu and Gemius. Unfortunately, there

were only five insurance companies investigated in this way in July 2015[1]. Therefore, the popularity of the websites on insurers was determined on the basis of the PageRank ratio. It is for this purpose that the Alexa indicator can be used as well, however, its value is unknown for many less popular Polish services. The PageRank was created by Larry Page and Sergey Brin from the Stanford University. It is in the model created by them that, behaviors of a web user, who browses randomly selected websites and chooses subsequent hyperlinks without going back, are reproduced. The probability that he will visit the given website is its PageRank. It is by using this method that the websites receive the values ranging from 0 to 10. The PageRank is the development of the long-known heuristics, according to which the quality of the text is proportional to the number of texts referring to it [7]. The improvement proposed by the authors of the algorithm was to weigh the quality of links pointing to the text using their own PageRank. Thus, if a given website is referred by a website with a higher rating, it is more important than a reference of an unpopular website. The PageRank value depends principally on the Link popularity factor, which is determined by the number of connections leading to the website from other websites and the "value" the connections. There are plug-ins for different browsers enabling preview and download of the current PageRank value for the visited websites. However, it must be emphasized that the PageRank is not fully reliable now, when it comes to measuring the popularity of websites. Since the PageRank algorithm is used by the Internet search engine of Google [3], there are taken various actions commonly called *search engine optimization - SEO*, which aim at achieving by a given website the highest possible position in search results. They allow for achieving a high value of the PageRank indicator.

4. Research methodology and results

The aim of the studies carried out was to verify the following hypotheses:
1. There is a statistically significant correlation between the quality of the information contained on the websites of insurers and their share in the market of personal and property insurances,
2. There is a statistically significant correlation between the quality of the information contained on the websites of insurers and their popularity.

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[1] The information given by a representative of the PBI sp. z o.o. in August 2015

It was in order to verify or falsify these hypotheses that the following research procedure had to be performed:

1. To select a group of websites of insurers,
2. To make an evaluation of the quality of the information on the selected websites,
3. To make a statistical analysis of the correlation between a measure of the quality of the information and the share in the market.
4. To make a statistical analysis of the correlation between a measure of the quality of the information and the popularity of the website.

Ad 1. While selecting the insurers and their websites, the following criteria were used:

- Head office in Poland,
- Running of the business activity in more than one group of insurances in Chapter II for at least one year (personal and property insurances without life insurances).

The insurance companies corresponding to these criteria were identified on the basis of the list of "companies operating in the form of a joint stock company" and "a list of companies operating in the form of a Mutual Insurance Company (MIC)". Both of these lists are published by the Financial Supervision Commission and include a total of 31 entities [6]. Of these, 27 met both of the criteria. All of these insurance companies have an active website. However, the website of the PARTNER TUiR S.A. was excluded from further studies, since it contains only basic contact data and data on the scope of insurances. It is in this way that 26 websites were selected for further studies.

Ad 2. There are known very few studies on evaluation of the quality of websites of insurance companies in Poland [8]. It should be also emphasized that the studies covered a very small group of insurers and the evaluation was made in relation to the broader service quality: there were evaluated among other layout of web pages, possibility to calculate premiums quickly or intuitive forms. It is for this reason that it was decided that the evaluation of the quality of the information on the selected websites would be performed using the scoring method with the use of own tools. It was for this purpose that a form containing statements allowing to make an assessment of the criteria of the quality of the information on the basis of the quality framework proposed by Eppler was prepared. The resulting tool (see annex) contains 16 statements relating to 16 criteria with possible answers according to a five-point Likert scale: *I strongly disagree*, *I rather do not agree*, *It is hard to say/I have no opinion*, *I rather agree, I strongly agree*. The answers to individual statements were coded in the form of numerical values from 1 (*I strongly disagree*) to 5 (*I strongly agree*) respectively.

The evaluation of the selected websites was made by a group of ten students - participants of a MA seminar since 15th to 19th June 2015[2]. Then, a sum of the points obtained in this way was calculated for each of the websites and thus a synthetic measure of the quality of information was obtained. The average values of this measure for 26 tested websites are presented in the table 1.

Table 1. Average values of the synthetic measure of quality information for 26 websites of insurers

No.	The name of the insurer (service address)	Measure	No.	The name of the insurer (service address)	Measure
1	ALLIANZ POLSKA S.A. (www.allianz.pl)	72	14	SIGNAL IDUNA POLSKA TU S.A. (www.signal-iduna.pl)	65
2	AVIVA TUO S.A. (www.aviva.pl)	72	15	WARTA S.A. (www.warta.pl)	65
3	AXA TUiR S.A. (www.axa.pl)	71	16	CONCORDIA POLSKA TUW (www.grupaconcordia.pl)	64
4	LINK4 TU S.A. (link4.pl)	71	17	INTER POLSKA S.A. (www.interpolska.pl)	64
5	PZU S.A. (www.pzu.pl)	71	18	INTERRISK TU S.A. (www.interrisk.pl)	63
6	GOTHAER TU S.A. (www.gothaer.pl)	70	19	BRE UBEZPIECZENIA S.A. (www.breubezpieczenia.pl)	62
7	ERGO HESTIA S.A. (www.ergohestia.pl)	68	20	BZ WBK-AVIVA TUO S.A. (www.bzwbkaviva.pl)	61
8	GENERALI TU S.A. (www.generali.pl)	68	21	EULER HERMES S.A. (www.eulerhermes.pl)	60
9	KUKE S.A. (www.kuke.pl)	68	22	BENEFIA TU S.A. (www.benefia.pl)	56
10	COMPENSA TU S.A. (www.compensa.pl)	67	23	TUZ TUW (www.tuz.pl)	55
11	EUROPA S.A. (www.tueuropa.pl)	67	24	TUW (www.tuw.pl)	54
12	SKOK TUW (www.skokubezpieczenia.pl)	66	25	CUPRUM TUW (www.tuw-cuprum.pl)	52
13	UNIQA TU S.A. (www.uniqa.pl)	66	26	POCZTOWE TUW (www.tuwpocztowe.pl)	52

Source: own study based on evaluation results

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[2] These were students of economics and the subject of the seminar was among others the quality of the information on the Internet

The basic descriptive statistics of the distribution of this measure are as follows: maximum value is 72 (websites of Allianz and Aviva), minimum value is 52 (websites of Cuprum and Pocztowe), discrepancy is 20, coefficient of variation is 0.1, skewness of the distribution is -0,727 and kurtosis is -0,448. This shows that there is a left-sided asymmetry of the distribution and it has the nature less concentrated around the mean value.

As for the evaluation of the individual quality criteria, the worst is the evaluation of the content management process on the investigated websites. The websites are generally not enough *interactive* - the median of evaluations is 3 (e.g. they rarely offer contact with a dealer or an adviser by chat) and *sources of information* are not clearly indicated - the median of evaluations is 3. Sometimes, it is also not possible to *reach the desired information quickly* (e.g. there is no search engine or a map on the website). Therefore, it is difficult to say that the process of information delivery is optimal. The *availability of website addresses in the virtual space* was also poorly assessed: the median is 2 (statement 13 in the annex). The availability may be considered as a criterion characterizing the possibility of using certain functions by a user (such as acquisition, searching, browsing, visualization information), both in time and in space. In the first case, the availability is characterized by the infrastructure of the service within a fixed period due to the safe and easy access to information through appropriate mechanisms and tools used in the website information systems. This kind of availability has been evaluated on the basis of statements 14, 15 and 16. It was assessed very well (the median assessment were: 4, 5 i 5). In the second case, the availability is characterized by the possibility to obtain the Internet address of the website, e.g. using search engines or catalogs of the parties. It turned out that the websites of even the largest insurers were not registered in popular directories such as Onet that Dmoz[3] (the fact of the registration was verified using the Seoquake 1.0.25 plug for Google Chrome). Whereas, the websites of the smallest ones are visible in the search results of popular search engines (e.g. Google Bing, Yahoo) on very distant positions. From this point of view, the best availability of addresses in the virtual space is offered by websites offering comparisons of specific types of insurances (e.g. rankomat.pl, swiatubezpieczen.com) and not the websites of individual insurers. On the other hand, such features like *concision* and *consistency had a very* evaluation (median equal to 5) (e.g. publicly available document formats to download). This demonstrates a very high level of integrity to facilitate the subsequent use of the information. The appropriateness of the information published by insurers was also rated very high. The information in the tested websites (e.g. general insurance conditions - OWU,

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[3] It is due to the fact that the importance of directories in the scale generated traffic on the Internet is currently marginal as compared to the search engines

descriptions of procedures for settling claims) is *comprehensive*, *accurate* and *clear* (median assessment equal to 5).

Ad 3. An analysis of the correlation between a measure of the quality of the information on websites and shares of insurers in the market was carried out. It is in the table 2 that percentage share of individual insurers in the market in 2013 is presented.

Table 2. The share of individual insurers in the market in 2013

No.	The name of an insurer	Market share	No.	The name of an insurer	Market share
1	PZU SA	32,41%	14	CONCORDIA POLSKA TUW	1,36%
2	WARTA SA	13,39%	15	EULER HERMES SA	1,08%
3	ERGO HESTIA SA	11,76%	16	SKOK TUW	1,06%
4	ALLIANZ POLSKA SA	7,04%	17	TUZ TUW	1,03%
5	UNIQA SA	4,38%	18	BENEFIA SA	1,01%
6	INTERRISK SA	4,24%	19	AXA SA	1,01%
7	COMPENSA SA	4,09%	20	BRE UBEZPIECZENIA SA	0,78%
8	GENERALI SA	3,80%	21	BZ WBK-AVIVA TUO SA	0,63%
9	EUROPA SA	2,79%	22	INTER POLSKA SA	0,46%
10	GOTHAER SA	1,97%	23	POCZTOWE TUW	0,32%
11	TUW T.U.W.	1,91%	24	CUPRUM TUW	0,23%
12	AVIVA-OGÓLNE SA	1,47%	25	SIGNAL IDUNA POLSKA SA	0,19%
13	LINK4 SA	1,46%	26	KUKE SA	0,16%

Source: own study based on the report of the Polish Chamber of Insurance 2013,
Center of Insurance Education, ISBN-926558-2 978-83-4

Given the one dimensional quartile criterion, it can be concluded that that the variable presented in table 2 contains three observations due to the condition $X > Q_3 + 1.5(Q_3 − Q_1)$ (for PZU S.A., Warta S.A. and Ergo Hestia S.A.). Therefore, it was decided to conduct an analysis of the correlation between the measure of the quality of the information on the website and the share of the insurers in the market only on the basis of the Spearman rank correlation coefficient. The results are presented in the Table 3.

Table 3. The results of the analysis of the correlation between the measure of the quality of the information on the websites and the share of the insurers in the market

Measure	Value	Significance
Spearman rank correlation coefficient	0.454	0.093

The results show that the Spearman rank correlation coefficient has a small positive value and thereby is statistically insignificant.

The presented statistical analysis allows for falsifying the first of the hypotheses posed. It turned out that the strength of the relationship between the measure of the quality of the information on the websites and the share of the insurer in the market is poor. Moreover, it cannot be concluded that this relationship is statically significant.

Ad 4. The regression analysis between the measure of the quality of the information on the websites and the popularity measured with the PageRank was carried out. It is in the table 4 that the values of the PageRank for the tested websites are presented an in the table 5 the results of the regression analysis are shown.

Table 4. The PageRank value for the investigated websites of insurers

No.	The name of the insurer (service address)	Page Rank	No.	The name of the insurer (service address)	Page Rank
1	KUKE S.A. (www.kuke.pl)	6	14	EULER HERMES S.A. (www.eulerhermes.pl)	4
2	ALLIANZ POLSKA S.A. (www.allianz.pl)	5	15	EUROPA S.A. (www.tueuropa.pl)	4
3	AVIVA TUO S.A. (www.aviva.pl)	5	16	GENERALI S.A. (www.generali.pl)	4
4	BZ WBK-AVIVA TUO S.A. (www.bzwbkaviva.pl)	5	17	GOTHAER S.A. (www.gothaer.pl)	4
5	CONCORDIA POLSKA TUW (www.grupaconcordia.pl)	5	18	INTER POLSKA S.A. (www.interpolska.pl)	4
6	INTERRISK S.A. (www.interrisk.pl)	5	19	SIGNAL IDUNA POLSKA S.A. (www.signal-iduna.pl)	4
7	LINK4 S.A. (link4.pl)	5	20	SKOK TUW (www.skokubezpieczenia)	4
8	PZU S.A. (www.pzu.pl)	5	21	TUW T.U.W. (www.tuw.pl)	4
9	AXA S.A. (www.axa.pl)	4	22	TUZ TUW (www.tuz.pl)	4
10	BENEFIA S.A. (www.benefia.pl)	4	23	UNIQA S.A. (www.uniqa.pl)	4
11	BRE UBEZPIECZENIA S.A. (www.breubezpieczenia.pl)	4	24	WARTA S.A. (www.warta.pl)	4
12	COMPENSA S.A. (www.compensa.pl)	4	25	CUPRUM TUW (www.tuw-cuprum.pl)	0*
13	ERGO HESTIA S.A. (www.ergohestia.pl)	4	26	POCZTOWE TUW. (www.tuwpocztowe.pl)	0

Source: own study with the use of the Seoquake 1.0.25 plug for Google Chrome, date of the measurement: 20.07.2015; * during the measurement a problem was signaled with the file robot.txt

Table 5. The results of the regression analysis between a measure of the quality
of the information on the websites and its popularity

Measure	Value	Standard Error
M	0.145	0.033
B	−5.281	2.101
R^2	0.453	
F	19.842	
F_{crit}	4.260	
$p(F)$	0.000	

The results presented show that the regression model is fairly well matched. The determination coefficient R^2 reaches the value of 0.453 and the relationship between the measure of the quality of the information on the websites and their popularity is statistically significant at alpha = 0.05 ($F > F_{crit}$, $p = 0.000$).

Moreover, the analysis of the correlation between the measure of the quality of the information on the websites and their popularity measured using the PageRank was carried out. The results are presented in the Table 6.

Table 6. The results of the correlation analysis between the measure of the quality
of the information on the websites and their popularity

Measure	Value	Significance
Pearson linear correlation coefficient	0.673	0.000
Spearman rank correlation coefficient	0.555	0.008

The results presented in the table 6 show that both the Pearson linear correlation coefficient and Spearman rank correlation coefficient have relatively high positive value and are statistically significant.

The both types of the presented statistical analysis allow for verifying the second of the hypotheses posed. It was found that the strength of the relationship between the measure of the quality of the information on the websites and their popularity measured with the PageRank is quite strong. Moreover, it can be concluded that this relationship is linear and is statically significant.

5. Conclusions

In the light of the studies carried out, the following conclusions can be drawn:

1. In the evaluation of the quality of the information on the websites of insurers operating in Poland, the worst score was obtained by the content management process. The websites subjected to the examination were generally too little interactive and the sources of information were not clearly indicated.
2. A very good score was obtained by such features of the information published on the websites as concision and consistency. Moreover, the information on the examined websites is comprehensive, accurate and clear.
3. There is no statistically significant correlation between the quality of the information contained on the websites of insurers and their share in the market of personal and property insurances.
4. There is a statistically significant correlation between the quality of the information contained on the websites of insurers and their popularity.

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APPENDIX

The quality of the information on the website.

For all the statements should be answered by a Likert scale:
1 = "I strongly disagree"   *2 = "I rather not agree"*
3 = "It is difficult to say/I have no opinion"   *4 = "I rather agree"*
5 = "I strongly Agree"

1. The information on the website was comprehensive.
    (products and their variants, rules for claims, agents, guides, dictionaries, forms, FAQ,
    contact centers, press, etc.)
2. The information contained on the website is accurate and precise.
    (e.g. what data are needed for conclusion of an insurance contract, procedure of settling
    a claim step by step, provisions in the General Conditions)
3. The information was clear and understandable.
    (Are the descriptions of products, processes of settling claims, provisions in General Con-
    ditions clear and understandable)
4. The information was relevant to me.
    (e.g. insurance calculator, description of scope/variants and benefits resulting from insur-
    ance - comparison of variants, General Conditions)
5. Information was generally brief and to the point.
6. Information and its format were consistent and without contradictions.
    (public document formats such as PDF, compatible formats of dates in forms, etc.)
7. The information contained on the website was free from errors.
8. The information is up to date and updated.
    (Were the document update dates available, were the cited sources up to date)
9. Navigation on the website was convenient and easy to use/friendly.
10. I was able to reach quickly the information that I wanted.
    (e.g. there is a search engine)
11. Sources (e.g. authors, institutions) of the provided information were clearly indicated.
12. The website is very interactive in the sense that I can customize it to my personal needs
    (it was possible to personalize it).
13. The service address was easily available (is it visible in search results or is it registered in
    the popular catalogs - e.g. Onet, WP, DMOZ)
14. The website seems to be very secured and very well protected against tampering or inter-
    ference. (Is there a privacy policy, can *http* protocol of the website be encrypted, is the
    access to the data authenticated while settling claims, are the documents sent protected).
15. The website seems to be very well maintained (reliable).
16. The infrastructure of the service was quick in terms of response time and downloading
    time.