

Goran Grubić¹, Milijanka Ratković², Lidija Paunović³
**VERTICAL PORTAL E-BUSINESS MODEL
(APPLIED FOR CONSTRUCTION INDUSTRY
IN SOUTH-EAST EUROPE)**

This article investigates the application of vertical portal e-business model for construction industry in West-Balkans countries. Advertising options analysis framework is devised and used to survey 84 portals related to the industry across 4 language segments. The findings exposed different pricing models, advertising potentials and levels of competition. Roles of social media services, search result positioning and web site performance metrics are also addressed providing benchmark metrics.

Keywords: e-business; vertical portal; web advertising; advertising pricing models; West Balkans.

Горан Грубіч, Міліянка Раткович, Лідія Паунович
**ВЕРТИКАЛЬНА ПОРТАЛЬНА МОДЕЛЬ ЕЛЕКТРОННОГО
БІЗНЕСУ (НА ПРИКЛАДІ БУДІВЕЛЬНОЇ ГАЛУЗІ
В ПІВДЕННО-СХІДНІЙ ЄВРОПІ)**

У статті досліджено вживання вертикальної портальної моделі електронного бізнесу на прикладі будівельної галузі Західно-балканських країн. Модель аналізу рекламних можливостей розроблено і використано для дослідження 84 порталів, пов'язаних із промисловістю, для 4 мов. Результати показали різні моделі ціноутворення, рекламні потенціали і рівні конкуренції. Також розглянуто роль соціальних медіа-послуг, результатів пошуку і продуктивності сайту з використанням бенчмаркінгу.

Ключові слова: електронний бізнес, вертикальний портал, інтернет-реклама, моделі рекламного ціноутворення, Західні Балкани.

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Горан Грубич, Милянка Раткович, Лидия Паунович
**ВЕРТИКАЛЬНАЯ ПОРТАЛЬНАЯ МОДЕЛЬ ЭЛЕКТРОННОГО
БИЗНЕСА (НА ПРИМЕРЕ СТРОИТЕЛЬНОЙ ОТРАСЛИ
В ЮГО-ВОСТОЧНОЙ ЕВРОПЕ)**

В статье исследовано применение вертикальной портальной модели электронного бизнеса на примере строительной отрасли Западно-Балканских стран. Модель анализа рекламных возможностей разработана и использована для исследования 84 порталов, связанных с промышленностью, для 4 языков. Результаты показали различные модели ценообразования, рекламные потенциалы и уровни конкуренции. Также рассмотрена роль социальных медиа-услуг, результатов поиска и производительности сайта с использованием бенчмаркинга.

Ключевые слова: электронный бизнес, вертикальный портал, интернет-реклама, модели рекламного ценообразования, Западные Балканы.

Introduction. Policy makers, scholars and practitioners agree that e-business is an essential ingredient of socioeconomic advance of developing countries. Therefore,

¹ Faculty of Organizational Sciences, University of Belgrade, Serbia.

² College of Management and Business Communication, Sremski Karlovci, Serbia.

³ Faculty of Organizational Sciences, University of Belgrade, Serbia.

development of e-business is seen as overall potential and trend indicator of a country's economy development. Traditionally, the problems of e-business development have been addressed through: economic, sociopolitical and cognitive barriers (Kshetri, 2007). The researchers found that e-commerce in less developed environments skewed towards information rather than product consumption (Datta, 2011). The most of scoped countries are sharing the same issues, therefore an e-business model based on industry specific information provision is appropriate for evaluation.

Portals are recognized as one of the most common e-business models by authors, where vertical portals (also called specialized portals, affinity portals) are defined as subtype focused on specialized marketplaces and/or industries (Chaffey, 2009a; Laudon and Guercio, Traver, 2010; Rainer Jr. and Turban, 2009). Such e-business model may be considered as part of wider type: advertising site (Kumar and Kumar, 2009), since selling advertising services and online space is the main source of revenue.

The construction business is a very specific industry, generally nonrelated to the Internet, with significant turnover in both developing and advanced countries. Importance of Internet advertising for non-Internet industries and new competitive opportunities created by nontraditional medias is underlined by sales, marketing, and advertising professionals and scholars (Moriarty, Mitchell, and Wells, 2009; Clow and Baack, 2010; Hollense, 2006; Jobber and Lancaster, 2009; Grubic, Ratkovic, and Janjusic, 2011; Ratkovic and Grubic, 2011). PR practitioners and academics agree that Internet communication has very important role (Wilcos et al., 2005; Cutlip, Center, and Broom, 2006) for successful public relations of a brand. Brands with powerful marketing should prefer direct advertising while smaller advertisers may relay on contextual advertising networks, as a study suggests (Li and Jhang-Li, 2009). Direct advertising has better effect on positioning in search results (SEO) and greater cost effectiveness but it is more complex to manage.

Attracting direct advertisers demands additional efforts while promising greater profits and wider market. On the other hand, publishing ads from contextual advertising networks is much simpler with other drawbacks inherited. To get the best from both options some advertising sites publish contextual ads next to their own advertising space.

Research goals. The goal is to address various aspects of the vertical portal model applied at particular market and industry and to evaluate its competitiveness in the Internet era. The research will provide insights to advertising options, price ranges and models, competitiveness and feasibility of the vertical portal model. The secondary goal is determination of performance benchmark metrics for the most important aspects of a web portal. The findings should help a publisher to develop a better pricing model, to perform benchmark and to have better overall business planning on strategic level. Advertiser may use the findings to evaluate advertising options and Internet advertising feasibility for a particular industry. The research is focused on particular industry and market segment but the methodological framework may be applied to other cases.

Development and evaluation of a framework suitable for various industries and markets is also part of research goals. The framework would help professionals and academia in better understanding of advertising options in a particular industry and

market segments. It is a real life fact that many companies are making competitor analysis automatically and autonomously by IA crawling the web at speed of electronics (Yihua Philip et al., 2005). Current framework is partially using automated data gathering and processing. Future work will focus on extending of automatic processes within the framework.

Research scope. Research is focused on West-Balkans countries: Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Macedonia, Bulgaria and Albania. This segment has the total population of 32.8 mln people speaking 6 languages (IMF, 2011; Vukmirovic, Pavlovic, and Sutic, 2010). During early years of Internet commercialization the academics foreseen that segmentation of Internet geographies will favor cultural over technological, geographical and political aspects (Zook, 1993). Therefore, further analysis used lingual segmentation instead of political (country based) one. About 3000 web-sites were manually reviewed during the survey sample preselection. The result of this review process is an appropriate set of vertical portals dedicated to construction industry, counting 84 web-sites.

Methodology and data sources. The main methods used in this research are: survey, manual web review and automatic web content and data retrieval and processing. Automatic tasks are performed with our specialized research software imbVeles using web-sources, commercial and noncommercial API services.

Primary data sources

- *Web-content* — the home pages of the key industry actors.
- *Google Search* — Google Search API is used for automatic web search and results gathering. In the first phase the web search is used to select the most appropriate web portals.
- *Portal pricing survey* — Portal sales are asked about maximum (biggest banner, the best placement) and minimum (smallest banner, the least placement) prices for advertising models: Fixed monthly banner rent, CPM (cost per 1000 appearances) and CPC (cost per click).
- *Portal content analysis* — manual quality review and automatic technical content analysis was performed.

Secondary data sources

- *Macroeconomic statistics* — country level statistics were needed to learn more about targeted markets. Main sources were: IMF's World Economy Outlook databases and Eurostat's: Economy and Information Society Databases.
- *Google AdWords data* — the relevant metrics about Google Ads contextual advertising opportunities for the industry and the market segments.
- *Traffic data* — the traffic and linkage metrics from Alexa (commercial Alexa Web Information API) and DoubleClick services (manually from a portal profile page).

Initial phase of the research. Web search engines are widely accepted services for retrieval of relevant documents using search query consisting of keywords. Relevance and quality of the results retrieved are permanent subject of criticism and re-evaluation but it seems that search engines are in the most cases successful in meeting user needs (Thelwall 2008; Hariri, 2011; Van Couvering, 2007; Lewandowski and Spree, 2011). The process of Semantic Web development may change ways of document retrieval but current search engine technology is still mostly based on keywords query

(Fernandez et al., 2011; Parsia, 2003). Therefore, defining an appropriate keyword set for description of the construction industry was the key task of initial research phase.

Initial keyword pool with 250 keywords was populated by home page content analysis of key companies in the industry: Firestone Building Products, Sika, Flag/Soprema, Trelleborg, Protan, Bauder, Fatra. The consultations with the construction industry professionals led us to the shorter list of 88 keywords. Keywords had been translated into Croatian, Slovenian, Macedonian, Bulgarian and Albanian. Local industry representatives voluntarily checked and corrected where necessary the translation of the keywords.

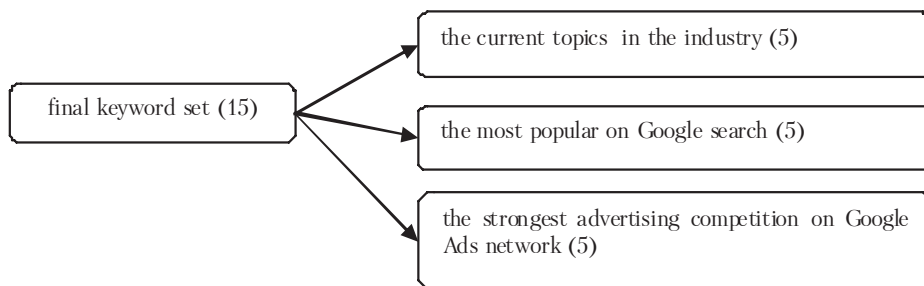


Figure 1. Structure of final per language set counting 15 words or phrases (keywords)

The final set was shortened to 15 words per language. The first 5 keywords are selected to cover the most current topics in the industry. Other 10 are designated by Google AdWords statistics for targeted languages: 5 the most popular searches and the 5 keywords with the strongest competition on Google advertising network. If a word was already contained it had been replaced with the next ranked one.

Selecting the collections. Per language list of the industry related domains was generated by top 50 Google results accumulation for every keyword in a set. Domains were ranked by number of occurrences.

Table 1. An example of the related domain list, 5 the highest ranked sites for Croatian language

Domain name	Number of occurrences in search results
webgradnja.hr	137
gradimo.hr	73
gradjevinarstvo.rs	68
hrcak.srce.hr	45
bib.irb.hr	42

Croatian and Serbian language related domain list had identical members (with different ranking) although used keyword sets had been different. This was the initial clue that these two markets are deeply interconnected. The first 300-350 domains per language had been manually inspected before a per-language set of 20 vertical portals (related to construction industry) had been formed.

The process of gathering the industry related domains shows that Albanian and Macedonian web segments are not enough developed: these languages had from 3 to 4 times less unique domains related to construction, civil engineering and architecture. Since Google AdWords tools are not supporting these languages, there been no

accurate information about popularity and average CPC. In accordance with these findings these languages had been excluded from further analysis.

Table 2. Discovered related domains per market segment and recognized ad publisher. Detected ad publishers are unique for each market

Language	Number of discovered domains	Vertical Portals found (unique)
Croatian	1,931	20
Serbian	1,931	24
Slovenian	1,663	20
Bulgarian	1,519	20
Macedonian	474	-
Albanian	470	-

Traffic statistics estimation. Gathered for 79 portals, Alexa had no traffic information for 5 domains due their low popularity. These portals had been dismissed from further analysis. Alexa indicators:

- *Page views per million* — the fraction of all the page views by toolbar users go to a particular site.

- *Page views per user* — the average numbers of unique pages viewed per user per day by the visitors to the site.

- *Average time on site* — estimated average time that a unique visitor spends on a site

Alexa traffic stats quality has limitation since main source is the behavior of the Alexa Toolbar users (~6,5 mln users worldwide). To improve traffic insight more reliable data source was combined: Google DoubleClick Ad Planner service. The service make estimations using wider range of sources: shared Google Analytics stats, ad publisher server logs, Google Search data etc. Under its terms and conditions Google prohibits automatic data gathering, nor commercial API is available, so traffic information is manually collected browsing site profiles. The service provide profiles for sites having traffic above certain level, therefore 31 out of 79 cases covered.

DoubleClick indicators:

- *Unique users* — the unduplicated number of users visiting site over a month.

- *Total visits* — the number of times a site is accessed by unique visitors.

- *Page views* — the number of page views in month.

- *Average time on site* — estimated average time that a unique visitor spends on a site.

The total page views (tPV) is the most important traffic figure used in analysis due its role in CPM and CPC estimations. It is calculated as page views per user (pVUa) multiplied by unique users count (uUC) estimated with regression model:

$$tPV = pVUa \times uUC$$

As the final traffic indicator, where available, the unique monthly users had been accepted. In other cases (48 of 79) the value was projected using regression curve estimation. Regression model was based on Alexa Global Reach as independent value and double click unique users as dependent value. Quadratic and Cubic curve models were selected as best fit for value pairs. The second was accepted as the final traffic indicator.

Positioning score calculation. It is clear that position in result list has direct influence on number of visitors gained from a particular search engine. Dilemma is how

to compare different result positions and to determinate how much is one position better or worse than other result.

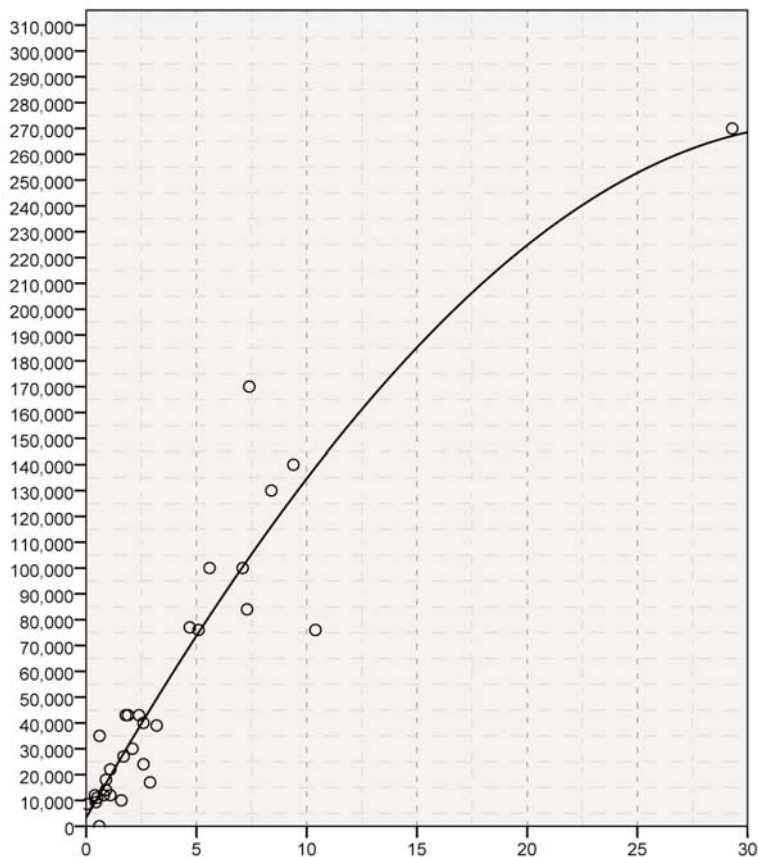


Figure 2. **Regression curve estimation, the segment of curve used for unique visitors projection**

Regarding the impact on web traffic, the study suggests that listing on the first result page in a search engine has 50% greater effect than listing on the second or third pages (Moriarty, Mitchell, and Wells, 2009). Our scoring model: imbVesSEO3P algorithm is reflecting the same. The final positioning score per language is calculated as sum of imbVesSEO3P scores of the best domain position in search result for a keyword in keyword set. The list of queried words and phrases is set of 15 keywords compiled on the way described in the first chapter of this document.

Prices and models. There are 3 main advertising pricing models and all were met during this survey.

Fixed banner per month is the most similar to traditional advertising and the most common model offered by ad publishers. This model is offering easy budgeting control, but the main issue is inability of making direct audience-aware comparison between sites.

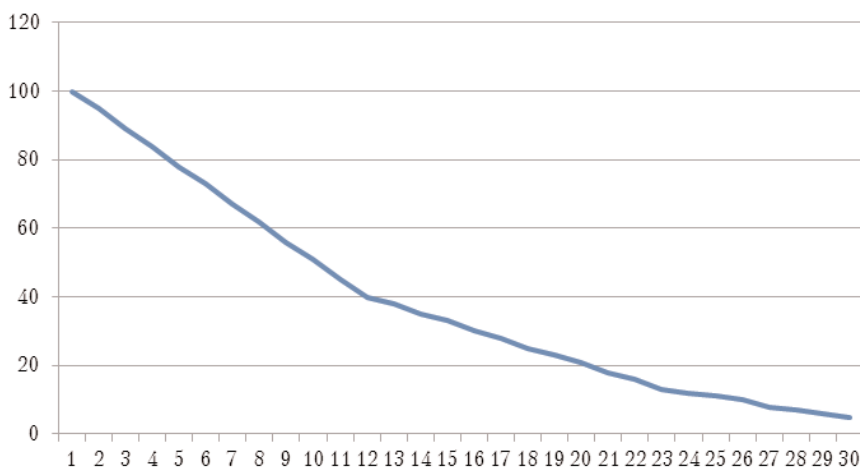


Figure 3. The imbVelesSEO3P test curve: X is the best position of a domain in search results, Y is positioning score calculated by *imbVelesSEO3P* algorithm

CPM (Cost-per-Mega impressions) — This is a better model for benchmarking but the problem is that banners are usually displayed in rotation, so contained links would not help search engine positioning of an advertised site. CPM is usually supported as second model, beside fixed banner rent. Drawback of this model is that page view is counted even if a user just refresh a page.

CPC (Cost-per-click) — The best pricing model but supported only in 2 out of 79 cases. In contrast, all major contextual advertising networks (Google AdWords, Yahoo Ads, Bing Ads etc.) are widely using this model.

All prices had been converted into CPC equivalent using traffic estimations and the formula:

$$eCPM = (ICB) / (tPV / 1000),$$

mEB — the most expensive banner, usually on the best banner page location and/or with the biggest surface;

ICB — the low-cost banner — the smallest banner in offer.

Conversion from CPM to CPC relayed on 2% click-through rate (cTR) that is a commonly agreed approximation among experts. Accuracy of this estimation has impact on Google AdWords vs Direct Advertising evaluation. eCPC is the equivalent price calculated as eCPM multiplied by 2% cTR.

Price findings. The prices of basic text link, as well as specialized forms of advertising (dedicated PR articles, subpage presentation, newsletter advertising) were not included in prices analysis due to heterogenic nature of the offer. In very few occasions a price of a simple text link is used instead of banner price because of very small price range between the most expensive and the banner with lowest price. Overview comparison between two advertising options exposes slightly bigger traffic potential of contextual advertising (Tables 3 and 4).

The CPC model is found only in few cases but never as the only one. Every 5th portal uses CPM model as preferred while all portals on Serbian segment express prices only as fixed rent. Serbian market seems to have the lowest prices, while

Slovenian has the highest (Table 4). The average CPC for contextual advertising is less then lower eCPC in 54% and less then higher eCPC in 78% of cases in collection. Price comparison showed that Serbian portals have the best competitive position against Google Ads: aCPC is less then lower eCPC in 33% of portals at this market (Table 5). Higher contextual prices at Serbian market could be the result of lower keyword competition: 124% (Table 3).

Table 3. Overview of contextual / search engine advertising with Google AdWords

	Country	Language	Popularity	Competition factor	Average CPC
			<i>monthly traffic potential</i>	<i>advertisers competing to same keywords</i>	<i>est. price per one visitor</i>
1	Slovenia	Slovenian	404,928	587%	0.16 EUR
2	Serbia	Serbian	632,891	124%	0.21 EUR
3	Croatia	Croatian	731,905	315%	0.23 EUR
4	Bulgaria	Bulgarian	999,968	660%	0.21 EUR
		Total:	2,769,692		0.16-0.23 EUR
	<i>Albania</i>	<i>(n/a)</i>	<i>*439,976</i>	<i>41%</i>	<i>0.25 EUR</i>
	<i>Macedonia</i>	<i>(n/a)</i>	<i>*748,590</i>	<i>7%</i>	<i>0.16 EUR</i>

Table 4. Overview of direct advertising per market pricing. Average CPC is calculated only for sites with known price

	Country	Popularity	Maximal CPC	Average CPC
		<i>monthly traffic potential*</i>	<i>The highest estimated cost-per-click</i>	<i>Average cost-per-click</i>
1	Slovenia	422,181	2.22 EUR	0.55 EUR
2	Serbia	746,885	0.68 EUR	0.16 EUR
3	Croatia	392,288	0.85 EUR	0.34 EUR
4	Bulgaria	694,034	0.48 EUR	0.21 EUR
	Total:	2,255,388		0.16-0.55 EUR

Table 5. Traffic to price correlation and competitiveness with Google Ads. Correlation is significant at level 0.05, 1-tailed test

	Segment	Traffic (tPV) to (lower) eCPC Pearson correlation		Google Ads is cost-wise better option then lower eCPC	Prefered pricing model		Responded / enquired cases
		<i>Correlation</i>	<i>Significance</i>		<i>Fixed</i>	<i>CPM</i>	
1	Slovenian	-0.286	0.228	67 %	67 %	33 %	12 / 20
2	Serbian	-0.318	0.092	33 %	100 %	0 %	19 / 24
3	Croatian	-0.108	0.370	67 %	68 %	32 %	19 / 20
4	Bulgarian	-0.630	* 0.026	60 %	75 %	25 %	12 / 20
	All cases	-0.158	0.252	64 %	79 %	21%	61 / 80

* Only Bulgarian segment has significant correlation.

The general absence of correlation between traffic and eCPC suggests that portals don't see traffic gain as the main source of added value and competitive strength. The correlation is significant on Bulgarian segment suggesting that direct ad publishing competition is better developed there. It might be the result of local statistical services (tyxo.bg, counter.search.bg, bgtop.bg) existence since such services are increasing transparency, and therefore, boost overall market competitiveness. Content analysis couldn't detect affiliations with such services on other segment, so it is specific for Bulgarian market.

Table 6. Detected advertising network memberships

Network	Description	#	%
Google Ads	the biggest contextual and search engine advertising network in the world.	17	20.24%
Adtech ads	Germany-based advertising service and ads aggregator, very active in Bulgaria	3	3.57%
eTarget	USA-based advertising network, very active in the region	3	3.57%
httpPool	an advertising network operating in Serbia	2	2.38%
Blic ads	service by Serbian media company Blic	1	1.19%
OpenX	an independent advertising service operating in 100 countries worldwide.	1	1.19%

Tested sites count: 84. Advertising networks that are also supported by test but no affiliated publishers found: Yahoo Ads, DoubleClick Ads, Bing Ads

Every fifth portal is publishing contextual Google Ads, beside its own direct advertising services. This might be a clever way to cover market segment where Google Ads is in better price-wise competitive position. Local and regional networks are usually offering greater advertising commission than global ones but aggregate much lower demand.

About half of the portals are displaying prices on their web page or in downloadable PDF catalogs. Others demand email enquiry and during 2 weeks we gathered the most of offers. Until the end of this research 23 of 84 never replied to our enquiry, therefore we consider such sites as abandoned. Prices were converted from local currencies (RSD, HRK, BGN) to Euro using exchange rates valid at the end of February 2012.

The publishers are usually offering amount discount, so designated advertising expenses are considered as maximal possible. For fixed banners discounts for half-year advertising are from 10% to 30%. Similar discounts are for multi-thousand impression packages for CPM models.

Performance benchmark metrics. Incoming links are the important aspect of SEO, therefore it is detected for the leading search engines.

Table 7. The detected incoming links by different search engines and analytic services

	Alexa	Google	Yahoo	Bing
SUM	7,321	393	66	45
*COUNT	82	82	83	83
AVG	89.28	4.79	0.80	0.54
MAX	787	36	10	8

* for some sites the services couldn't provide any data so count is variable.

There is direct (0.351) and significant (1-tailed test, where correlation is significant at the 0,01 level) correlation between incoming links detected by Alexa and estimated monthly total page views. It's turned out that Alexa Inlinks is the most relevant indicator of links building success. It is in significant correlation with estimated traffic and weak but still noticeable correlation with Yahoo and Bing incoming link data. Surprisingly, the Google link count is completely unrelated to other 3 sources.

The Pearson test between imbVesSEO3P score and estimated total number of monthly page views also shows strong correlation (0.466) with great significance (0.019 1-tailed, at level 0.05 correlation is significant). This finding does confirm the

strong influence of search engine positioning on website traffic. The measured Pearson correlation between imbVelesSEO3P scores for Serbian and Croatian portals is very strong: 0.832, with clear significance (0.00) tested with 1-tailed test (correlation is significant at the 0.01 level). Slovenian market is loosely related to Serbian (0.193) while with Croatia has weaker but significant correlation. Bulgarian market, on other hand, is fully isolated from the rest.

Average count of internal links on home pages is 147.2 and the biggest internal link count is 853. Internal links are less hazardous for portal's search engine reputation influence then outbound ones. Average outbound link count is 8.21, and spotted maximum is 65. Social media sites and networks are part of Web 2.0 concept and their significance for wide range of industries is confirmed by the research.

Table 8. Detected social media affiliation

<i>Social Networks</i>	<i>Cases</i>	<i>%</i>
Facebook	29	34.52%
Twitter	16	19.05%
YouTube	7	8.33%
LinkedIn	5	5.95%
addThis	5	5.95%
Google Plus	3	3.57%

Table 9. Presence on youtube.com of the related domains pool

	Count	of related domains
SI	29	1,663
RS	31	1,931
HR	31	1,931
BG	20	1,519

Every third portal is affiliated with Facebook. Video social service YouTube.com is the most frequent domain name in search results for all markets. AddThis.com is easy to integrate and free tool for all-in-one page sharing over social media. This tool is used by www.nasa.gov and other hi-profile web sites confirming its reliable nature.

Loading time is the biggest issue of complex portals and syndicated sites. The average loading time is 1.43s, the fastest portal has average loading for 0.25s, and the slowest loading in 3.3s. The impatience of common computer user haven't changed since dawn of computing. Jacob Nielsen's study determine 3 time limits critical for user behavior (Chaffey, 2009b) where 1s is when user's flow of thought starting to be interrupted.

Table 10. The average time that users spend on the portals

	DoubleClick Ad Planner	Alexa Site Info
COUNT	32	70
AVG	5.40 min	2.41 min
MIN	1.83 min	0.47 min
MAX	20 min	10.53 min

*Covered cases count is variable since each data source has specific crawling and publishing policy.

Average time is an important indicator of page content quality and its accordance with overall Internet marketing strategy. Aggressive SEO techniques may drive

search traffic to a web site but inappropriate content would result in lowering average time and increase of bounce rate. Bounce rate measures the percentage of users that open just one page and then leave the site. Bounce rates of the portals are in range from 21.6% up to 83.7%, where average is 57.28% (67 cases). This is a very high figure. For non-entertainment content and professional web presentations bounce rate around 30% is considered as acceptable, and around 25% should be an optimal goal to achieve. The main generators of bounce visits are search engines. About quarter of the incoming traffic (27.8%) to the portals is generated by search engines where Google dominates.

Conclusion. During this research a framework is devised with the purpose to analyze a industry-related advertising market. This framework may be utilized for various industries and market segments.

Findings exposed the specifics and similarities between market segments regarding vertical portals. Unlike others, the portals at Serbian market are avoiding CPM/CPC pricing models while, in most cases, successfully competing global advertising networks like Google Ads. To disperse incomes more than 30% of the portals accepted combined strategy: offering their own advertising services and publishing ads provided by a contextual advertising network (Table 6) at the same time. The results confirmed that portal traffic is highly related to search engine positioning — where domain positioning on first 3 pages (30 results) is the most important. The analysis shown that Serbian and Croatian markets are deeply interconnected, so cross-market competition is a relevant factor to consider during a business model deployment.

Set of relevant web site indicators is designated: internal and outbound link count, loading and browsing time as well as search engine traffic income and bounce rate. These are to be used by practitioners to benchmark performances and services.

Table 11. Framework for industry specific advertising market evaluation

Describing the Industry	Selecting a proper keyword set
Finding relevant portals	Search result aggregation and manual review
Traffic metrics	Estimating traffic statistics using public web statistical sources
Search engine positioning scoring	Analysis of search results for the keyword set
Price survey	Gathering data on minimum and maximum advertising prices
Price model equalization	Calculating comparable CPC equivalent
Market analysis	Testing correlation between traffic and CPC, cross market ranking scores
Benchmark metrics	Incoming and outbound links, incoming traffic sources, social media affiliation, loading and browsing times

The research confirmed the relevance of social media services and local contextual advertising networks for a very specific industry like construction and civil engineering.

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References:

1. Chaffey, D. (2009a). Introduction to e-business and e-commerce. In: E-BUSINESS AND E-COMMERCE MANAGEMENT: Strategy, Implementation and Practice. 4th ed. Pearson Education, Inc.

2. *E-business infrastructure*. (2009b). In: E-BUSINESS AND E-COMMERCE MANAGEMENT: Strategy, Implementation and Practice, 4th ed. Pearson Education, Inc.
3. *Van Couvering, E.* (2007). Is Relevance Relevant? Market, Science, and War: Discourses of Search Engine Quality. *Journal of Computer-Mediated Communication* 12 (3): 866-887.
4. *Cutlip, S. M., Center, A. H. and Broom, G. M.* (2006). External Media and Media Relations. In *Effective Public Relations*, 9th ed. Prentice Hall.
5. *Datta, P.* (2011). A preliminary study of ecommerce adoption in developing countries. *Information Systems Journal* 21 (1). 3-32.
6. *Clow, K. E., and Baack, D.* (2010). E-active Marketing. In: *Integrated Advertising, Promotion and Marketing Communications*, 266-294. 4th ed. Pearson Education, Inc.
7. *Fernandez, M., Cantador, I., Lopez, V., Vallet, D., Castells, P. and Motta, E.* (2011). Semantically enhanced Information Retrieval: an ontology-based approach. *Web Semantics Science Services and Agents on the World Wide Web* 9 (January): 434-452.
8. *Grubic, G., Ratkovic, M. and Janjusic, D.* (2011). Business Improvement of Industrial producers in Serbia using web technologies. In: International Conference "Research and Development in Mechanical Industry", ed. Predrag V. Dasic, 2:723-731. Soko Banja: Scientific and Technical Center for Intellectual Property, September.
9. *Hariri, N.* (2011). Relevance ranking on Google: Are top ranked results really considered more relevant by the users? *Online Information Review* 35 (4): 598-610.
10. *Hollense, S.* (2006). Internet promotion. In: *Marketing Planning*, 270-278. McGraw-Hill Education.
11. *IMF.* (2011). World Economic Outlook Databases (WEO). International Monetary Fund. <http://www.imf.org/external/ns/cs.aspx?id=28>.
12. *Jobber, D. and Lancaster, G.* (2009). Internet and IT applications in selling and sales management. In: *Selling and Sales Management*. 8th ed. Pearson Education, Inc.
13. *Kshetri, N.* (2007). Barriers to e-commerce and competitive business models in developing countries: A case study." *Electronic Commerce Research and Applications* 6 (4): 443-452.
14. *Kumar, M. R., and Kumar, M. D.* (2009). An Analysis of E-Commerce Models and Strategies. *Advances In Management* 2 (12): 7-11.
15. *Laudon, K., and Guercio Traver, C.* (2010). E-Commerce Business Models and Concepts. In: *E-Commerce 2010: Business. Technology. Society.*, 2.1 - 2.55. 6th ed. Pearson Education, Inc.
16. *Lewandowski, D., and Spree, U.* (2011). Ranking of Wikipedia articles in search engines revisited: Fair ranking for reasonable quality? *Journal of the American Society for Information Science*, 62 (1): 117-132.
17. *Li, Y.-M., and Jhang-Li, J.-H.* (2009). Pricing display ads and contextual ads: Competition, acquisition, and investment. *Electronic Commerce Research and Applications* 8 (1): 16-27.
18. *Moriarty, S., Mitchell, N. and Wells, W.* (2009). Internet and nontraditional media. In *Advertising: Principles & Practice*, 336-358. 8th ed. Pearson Education, Inc.
19. *Parsia, B.* (2003). Semantic Web Services. *Bulletin of the American Society for Information Science and Technology* 29, (4): 12-13.
20. *Rainer Jr., R. K., and Turban, E.* (2009). Network Applications. In *Introduction to Information Systems: Supporting and Transforming Business*, 134-164. 2nd ed. John Wiley & Sons, Inc.
21. *Ratkovic, M., and Grubic, G.* (2011). Internet as remedy of marketing improvement. *Ekonomika* 3 (LVII): 63-74.
22. *Thelwall, M.* (2008). Extracting Accurate and Complete Results from Search Engines: Case Study Windows Live. *Journal of the American Society for Information Science* 59 (1): 38-50.
23. *Vukmirovic, D., Pavlovic, K. and Sutic, V.* (2010). The use of ICT in the Republic of Serbia, 2010. Ed. Milica Stanic Mirjana Ogrizovic BraSanac, Bozidar Popovic. Belgrade: Statistical Office of the Republic of Serbia. <http://webzrzs.stat.gov.rs>.
24. *Wilcos, D. G., Cameron T., Ault H. P., and Agee, K. W.* (2005). Internet and new technologies. In: *PUBLIC RELATIONS: Strategies and Tactics*, 269-295. 7th ed. Allyn & Bacon.
25. *Yihua, P. S., Mykytyn, P. P. Jr., Litecky, C. R and Allen, G.* (2005). Competitor analysis and its defenses in the e-marketplace. *Communications of the ACM* 48 (8): 107-112.
26. *Zook, M.* (1993). The Geographies of the Internet. Ed. Blaise Cronin. *Communications* 40 (1): 53-78.

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