

Infographics in digital ads: A/B testing for content optimization

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Introduction



The use of infographics as one of the multimedia elements in digital advertising contributes to the optimization of advertising content, which also contributes to SEO optimization. Information graphics or infographics are a visual representation of information, data, or knowledge. Such graphics are used when complex information needs to be explained quickly and clearly, such as in signage, maps, journalism, technical writing, and education. They are also used as a tool to facilitate the process of developing conceptual information. Infographics are visual content that the recipient of the message easily adopts, and on social media, they are shared faster and more frequently than a text post, meaning they go viral more quickly.

Problem Description



The main goal of this was development of a model for creating intelligent advertising content, consisting of infographics, in real time. In order to achieve this, it was necessary to integrate intelligent technologies that work on the principle of ontology and semantic-based information.

Methods



In this paper, an attempt was to integrate the idea of A/B testing into the context of testing multimedia elements of websites with digital advertising content to provide a method for improving usability in web and ads development. This required creating a model capable of copying the logic of each user step to create real-time intelligent advertising content that reaches users through multimedia channels. To achieve this, the first step was to integrate personalization technologies that work on the principle of ontology and semantic-based information. The sequence diagram connected the user, the multimedia advertising content, and the database through modelling, filtering, and content customization. An A/B test was conducted to test the relationship between two data sets and these data sets are compared to determine whether or not a statistically significant relationship exists. For this purpose, the z-test was performed. The observed z-score is a number that indicates how many standard deviations above or below the population mean a value derived from a z-test is.

Results



The first website with digital ads is a control website named A that contains text, and the second website is a variant named B that contains an image as an information carrier (Table 1).

Table 1 Visits, conversations and std. errors for text/image

A/B test	Users	Conversions	Conversion rate	Standard error
A Text	4110	264	6.42%	0.0317%
B Image	4216	377	8.97%	0.0054%

A good conversion rate is above 10%, and both of tested web pages have below average conversion rates. Based on the inputs, the estimated confidence interval that the value is statistically significant is determined based on z-score confidence intervals for 90% and 95% conversion rate limits. These are then used to test the p-value against the confidence intervals (Table 2).

Table 2 Significance levels based on inputs, text/image

A/B test	90% Conversion Rate Limits		95% Conversion Rate Limits	
	From	To	From	To
A Text	3.98%	6.29%	3.22%	5.19%
B Image	7.78%	8.53%	7.05%	8.82%

In the next step, the z-score and p-value are calculated. The results show that the p-value is less than 0.05. This means that the test is statistically significant and web page B with the image better than web page A. In other words, version B converts 39.75% better than version A (Table 3).

Table 3 Z-score, p-value and significance, text/image

A/B test	z-score	p-value	Significant	Improvement
A Text	3.912	0.0043	yes	-
B Image	5.638	0.0007	yes	39.75%

On the same principle the second experimental unit are created, but the first website i.e., control website named A contains text, and the second website i.e., variant website named B and contains an infographic as an information carrier. Tested web page A have below average conversion rate (5.73%), and tested web page B achieved an average rate of 10.67% (Table 4).

Table 4 Visits, conversations and std. errors for text/infogr.

A/B test	Users	Conversions	Conversion rate	Standard error
A Text	3261	187	5.73%	0.0007%
B Infographic	3887	415	10.67%	0.0012%

Table 5 shows the estimated confidence interval that the value is statistically significant based on z-score confidence intervals for 90% and 95% conversion rate limits, which in turn are used to test the p-value against the confidence intervals. How is mentioned before, good conversion rate is above 10%, and both of tested web pages have below average conversion rates.

Table 5 Significance levels based on inputs, text/infographic

A/B test	90% Conversion Rate Limits		95% Conversion Rate Limits	
	From	To	From	To
A Text	2.16%	4.09%	3.73%	4.58%
B Infographic	8.38%	9.12%	7.82%	8.59%

Table 6 shows the z-score and p-value for the second experimental unit. The p-value is less than 0.05 and this means that the test is statistically significant and web page B with has better conversion results than web page A. In this case, version B converts 42.70% better than version A.

Table 6 Z-score, p-value and significance, text/infographic

A/B test	z-score	p-value	Significant	Improvement
A Text	3.006	0.0078	yes	-
B Infographic	5.223	0.0001	yes	42.70%

On the same principle and the third experimental unit are created, but the first website i.e., control website named A contains image, and the second website i.e., variant website named B and contains an infographic as an information carrier.

The conversion rates and standard level of error are calculated and for the second experiment unit and presented in Table 7. The tested website A and the third time have a below average conversion rate (8.78%), and the tested website B achieved a borderline average rate of 9.95%.

Table 7 Visits, conversations and std. errors for image/infogr.

A/B test	Users	Conversions	Conversion rate	Standard error
A Image	4008	352	8.78%	0.0061%
B Infographic	4492	447	9.95%	0.0293%

Table 8 shows the estimated confidence interval that the value is statistically significant based on z-score confidence intervals for 90% and 95% conversion rate limits, which in turn are used to test the p-value against the confidence intervals.

Table 8 Significance levels based on inputs, image/infographic

A/B test	90% Conversion Rate Limits		95% Conversion Rate Limits	
	From	To	From	To
A Image	4.98%	6.12%	5.19%	7.03%
B Infographic	7.43%	8.17%	6.92%	8.76%

Table 9 shows the z-score and p-value for the third experimental unit. The p-value is less than 0.05 and this means that the test is statistically significant and web page B has better conversion results than web page A. In this case, version B converts 27.01% better than version A.

Table 9 Z-score, p-value and significance, image/infographic

A/B test	z-score	p-value	Significant	Improvement
A Image	6.217	0.0056	yes	-
B Infographic	2.911	0.0009	yes	27.01%

Discussion / Conclusion



Interaction between users and websites requires intelligent systems for clusters of similar data that can be used to optimize and customize content for each user. Therefore, it is necessary to know the capabilities of files to increase the loading time of web pages. The results presented in this paper show that images achieve a better conversion rate than text in digital ads and that infographics achieve better conversions than text and images. This is the expected result, as an infographic combines text and images in an easy-to-read format. Although the websites from all three experimental units had below-average results for text, this test was not related to the design and appeal of the digital ads, but to the use of a specific information carrier. The model of A/B testing not only provides the opportunity to maximize conversion rates, but also to significantly increase knowledge about how web pages are presented. It can also determine a set of optimized practices for multimedia elements of advertising content. The proposed testing model provides the perfect opportunity to thoroughly test the web design before launching the website. The same analogy can be used for other elements of the website such as photos, animations, colors, content management system elements, etc.

ACKNOWLEDGMENTS

This paper was supported by the Financial Support of University of Zagreb "Optimization and personalization of multimedia content using artificial intelligence".