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Designing the "NCU Information Portal" — analysis of the mockups of the website based on the elements of user experience and information architecture

Introduction

Nicolaus Copernicus University in Toruń (NCU) is currently implementing the project "Universitas Copernicana Thoruniensis in Futuro II — modernisation of the NCU as part of the Integrated University Programme", which is funded by the European Social Fund under the Operational Programme Knowledge Education Development. The main objective of the project is defined as the development of the potential of the NCU for the years 2019–2023 in terms of the implementation of educational programs and their adaptation to socio-economic needs[1]. This objective is to be achieved by equipping a selected group of students from new faculties with practical skills that will increase their competitiveness in the labour market, by increasing the competencies of further selected groups of students in areas of key importance for the economy and the development of the country, by developing and implementing high-quality student internship programmes, by increasing the quality and effectiveness of doctoral studies at NCU and by creating information and communication tools and activities that will strengthen and improve the management competencies of the University's executive and administrative personnel[2].

As part of the project activities related to the creation of IT and information tools, an NCU Information Portal was designed in response to the need to modernise the outdated model of university communication, which was based on a website and a set of information services addressed to university employees. This structure

1 Mapa Dotacji, *Universitas Copernicana Thoruniensis In Futuro II – modernizacja Uniwersytetu Mikołaja Kopernika w ramach Zintegrowanego Programu Uczelni*, [online:] https://mapadotacji.gov.pl/projekty/787346/ – 11.07.2022.

2 Ibidem.

was developed from 1999 to 2015, but due to the ongoing information deluge and information overload, it failed to effectively inform its target users about important issues that serve the development of the NCU[3]. The NCU Information Portal is intended to function as a place for obtaining comprehensive information on all aspects of university life relevant to the academic community, with particular emphasis on the results and effects of scientific research[4]. Moreover, it is intended to contribute to developing and strengthening the impact of the academic excellence framework[5].

The realisation of the project began, among other things, with the elaboration of the main goals for the new portal. These included preparing an initial specification of end users and identifying the site's content. The editorial team also prepared the design with a graphic designer at that stage. The result of this work was a proposal of three mockups of the website's home page. The authors of this article were involved in the design as the User Experience (UX) and Information Architecture Analytical Team after the completion of preliminary design work. The first task for the UX and Information Architecture Analytical Team was to verify the graphic design of the emerging portal. For this purpose, the team prepared a study for potential service users, which employed eye-tracking, usability tests, observation and survey methods. More details on this topic will be available in the following sections of this article, which describe the process and selected findings of the graphic design research of the NCU Information Portal.

Theoretical basis

The title of the article emphasises UX and information architecture, so these two terms should be addressed at this point. UX is the range of different perceptions and interactions that a user has when using a given product. This is usually an interactive product, meaning it is capable of both receiving information and responding to that information. The design of experiences must meet certain standards; these can be derived, for example, from the standard "ISO 9241-210:2019 Ergonomics of human-system interaction — Part 210: Human-centred design for interactive systems". According to this standard, UX represents "a user's perceptions and responses that result from the use and/or anticipated use of a system, product or service"[6]. As per the standard, UX includes all "the users' emotions, beliefs, preferences, perceptions, comfort, behaviours and accomplishments that occur before, during and after the use" of the product[7]. The standard also mentions three factors that shape UX, these being the system, the "user's internal and physical state" and the context of use[8].

3 *Specyfikacja projektu Portalu Informacyjnego UMK*, Toruń 2019, [maszynopis], s. 4.

4 Ibidem.

5 Ibidem.

6 European Committee for Standardization, *EN ISO 9241-210:2019 Ergonomics of human-system interaction – Part 210: Human-centred design for interactive systems*, Geneva 2019, p. 4.

7 Ibidem.

8 Ibidem.

Information architecture (IA), on the other hand, is understood as a design discipline "that is focused on making information findable and understandable. [...] IA allows us to think about problems through two important perspectives: that information products and services are perceived by people as places made of information and that these information environments can be organised for optimum findability and understandability"[9]. The basic components of IA include the following:

a) organisation systems — how we categorise information (e.g., chronologically);
b) labelling systems — how we represent information;
c) navigation systems — how we navigate through and browse information;
d) searching systems — how we search for information[10].

Figure 1: User experience honeycomb

Source: Morville P., *User Experience Design,* [online:] http://semanticstudios.com/user_experience_design/ – 15.12.2021.

The world-renowned IA specialist and UX pioneer Peter Morville designed the honeycomb diagram, in which he identified the most important elements of UX. These include the following features:

a) useful, that is, responsive to users' needs;
b) usable, that is, enabling users to achieve their end goal by interacting with the product;
c) desirable, that is, drawing on prestige, emotions, identity and image in design;

9 Rosenfeld L., Morville P., Arango J., *Information Architecture: For the Web and Beyond*, Sebastopol 2015, p. 1.

10 Ibidem.

d) findable, that is, easy to find, functional;
e) accessible, that is, providing the opportunity to be used by healthy people as well as those who are diseased or disabled;
f) credible, that is, influencing the users' confidence in the product;
g) valuable, that is, providing value to the producer, creator and users[11].

The above assumptions of UX and IA were largely verified in the study of the graphic design of the NCU Information Portal. This was reflected, for example, in the tools employed in this study (e.g., usability tests, and questionnaires), which will be discussed in the following sections.

Research methodology

The aim of the study was to compare three graphic designs of the Information Portal of the NCU in Toruń in terms of UX and information architecture indicators and to identify the best design and/or design elements to be used in designing the improvements.

One of the assumptions guiding social research is the desire to learn not only about quantitative trends in a specific or standard behaviour or the functioning of groups of people under certain conditions but also about the qualitative nature of any patterns associated with it. This ensures a higher quality of research and prevents potential errors and irregularities from occurring in the analysis. The principles of this approach had already been forming in the 1970s when Norman Denzin introduced triangulation to the social sciences, that is, the strategy of using multiple methods and theories in a single research project[12].

In UX and information architecture research, it is important to employ a variety of methods, both qualitative and quantitative, so that results from behavioural research can be compared with those obtained, for example, from user declarations during interviews. This was the nature of the present study, in which several research methods and techniques were used.

The following research methods were applied in the study:

a) eye-tracking — a method of testing reactions to visual or audiovisual material or an interactive product. This is the tracking of eyeball movement, which provides an insight into the cognitive processes of the subject and identifies their point of gaze.

In the context of web research, eye-tracking is used to identify areas of the screen or elements of a page that are most 'visible' or attract the most attention from users[13]. The results of eye-tracking are presented in the form of heat maps

11 Morville P., *User Experience Design*, [online:] http://semanticstudios.com/user_experience_design/ – 11.07.2022. Interaction Design Foundation, *The 7 Factors that Influence User Experience*, [online:] https://www.interaction-design.org/literature/article/the-7-factors-that-influence-user-experience – 11.07.2022.

12 Creswell John W., *Projektowanie badań naukowych. Metody jakościowe, ilościowe i mieszane*, Kraków 2013.

13 Słownik Intensys, *Eye-tracking*, [online:] https://slownik.intensys.pl/definicja/eye-tracking/ – 11.07.2022.

indicating the most frequently and longest viewed areas of the graphic or as fixation maps indicating the direction and sequence of eye shifts[14].

b) usability tests — otherwise known as task-based tests or task-based user interviews. During the tests, users were asked to search for several items of information and to browse freely through three mockups. The researchers took notes on a questionnaire designed in advance.

The two above-mentioned methods employed the following strategies:

– free viewing / free browsing — unrestricted browsing of the designs, during which the respondent did not have to follow any instructions;

– tasks — the tasks involved searching for one piece of information on each of the mockups;

– thinking aloud protocol — respondents were encouraged to think aloud, that is, to comment on the browsing and tasks performed (while searching for one piece of information on each mockup). Each session was recorded with a voice recorder.

c) observation method — behaviours were observed, and the respondents' behaviours were carefully listened to and analysed.

d) survey method — used to study users' opinions, choices and preferences. The following tools were used for this purpose:

– a short questionnaire — this consisted of three questions to each respondent about the most appropriate mockup for the portal.

– UX Questionnaire (UEQ) — allows for examining emotional reception of a design in terms of, for example, its attractiveness, effectiveness and innovativeness. It measures both classical usability aspects (efficiency, perspicuity, dependability) and UX aspects (originality, stimulation). One out of a pair of opposing features that characterise a design should be selected[15].

This paper will present only selected results of the conducted research, according to which it will be possible to indicate clearly the choice of the best mockup of the portal, as per the surveyed users.

Research procedure

The study was conducted in two parts.

The first part involved usability testing and eye-tracking[16]. First, the respondent was briefed on the session process and signed the consent to participate in the study

14 Ibidem.

15 Laugwitz B., Schrepp M., Held T., *Construction and Evaluation of a User Experience Questionnaire*. In: *HCI and Usability for Education and Work. USAB 2008. Lecture Notes in Computer Science*, vol 5298, ed. by A. Holzinger, Berlin-Heidelberg 2008, pp. 63–76. Hinderks A., Schrepp M., Thomaschewski J., *(UEQ) User Experience Questionnaire*, [online:] https://www.ueq-online.org/ – 11.07.2022.

16 The Eye Tribe eye-tracker was used in the study, and OGAMA 5.0 was employed to prepare the study and analyse the results.

and the GDPR form. Then, all the questions about issues unclear to them were answered, the equipment was calibrated and then the software with the respondent's parameters was launched. Subsequently, the respondent's number was coded, and the session began. This was followed initially by casual viewing of graphics cut in half so that they were clearly visible to the respondent (see graphics in test results below). The top of the page was shown first and then the bottom. After free browsing, an information search task section followed. After three such tasks (i.e., searching for an article on artificial intelligence, finding a subscribe button, indicating a specific event in the calendar), the decomposition part began, in which the subject compared first the top parts of the designs and then the bottom parts, and had to choose the parts that, when compared in pairs (1-3, 2-3, 1-2), they thought were best.

In the second part, the respondent proceeded to a different computer to complete online questionnaires. First, the respondent was asked to select the two best mockups, then they compared the selected one using the UXQ. Next, the respondent chose the best mockup and had to justify in three questions why he had chosen it and indicate its best and worst elements. It should be noted that when choosing the final best mockup, the respondents often deconstructed it and pointed out its strengths and weaknesses and the possible ways to improve it by using, among other things, solutions from the rejected proposals.

Each session lasted between 45 and 80 minutes. The entire process was recorded, with the consent of the subject, via a voice recorder.

Respondents and overall results of the pilot study

A total of 35 respondents took part in the study. One participant had to withdraw his participation due to a lack of time and an urgent phone call, so his incomplete survey session was not included in the results. The remaining 34 respondents were purposively assigned to six groups — one pilot and five main groups.

The pilot group consisted of 4 students (3F, 1M) studying information architecture. They were chosen because they had undergone introductory courses in academic classes on web design. These sessions allowed for improvements to the survey questions (e.g., eliminate ambiguous commands, replace the word *feature* with *element*, etc.) and for indicating their first impressions of the mockups. Students indicated that mockup no. 1 was the best in the first instance (2 respondents) because "it contains the most information encouraging people to stay on the site (leads below the articles)" and "I can find (within graphics) the most important information for me". In turn, the issue that could be improved was "poor visibility of the calendar". One respondent indicated that mockup no. 2 was the best because "the site is coherent and clear but not boring", but the colour scheme of the bottom bar should be changed because it was overwhelming. One person voted in favour of mockup no. 3, indicating that it was "the clearest and most intuitive", but the footer layout needed to be changed.

As planned prior to the beginning of the survey, the 30 main sessions were split into 5 groups. The first group consisted of the management of NCU in Toruń (1F,

5M). The second group included employees of the NCU Information Portal project (3F, 3M). The third group consisted of university administration staff (5F, 1M), the fourth group included lecturers (2F, 4M) and the fifth group included students (3F, 3M). Their results will be presented collectively in the following sections of the paper, which will also include the results of the pilot study, that is, N=34. At this point, it should be mentioned that the selection of participants into groups was purposive. The project leader from the Editorial Office was responsible for recruiting representatives from management personnel, project staff, administration personnel and lecturers, whereas the UX and Information Architecture Team was responsible for recruiting lecturers and students.

The N=34 included people aged between 19 and 64 years. The following age groups were numerically predominant: 21 years (6 respondents), 49 years (5 respondents), 19 years (2 respondents), 40 years (2 respondents) and 64 years (2 respondents). The following age groups were represented by one person each: 20, 23, 31, 34, 36, 38, 39, 42, 44, 46, 47, 51, 52, 53, 58, 60 and 61 years (17 respondents in total).

Gender proportionality was sought, and this was achieved — 17 women and 17 men were surveyed.

Selected research findings

Heat maps analysis

Image 1: Heat map, first 15 fixations, mockup 1 — top

Source: The authors.

The analysis of all observed fixations throughout the session for each area showed the following values:

1) text of the article (number of fixations = 905);
2) portal name (number of fixations = 50);
3) large image (number of fixations = 454);
4) heading (number of fixations = 317);

5) logo (number of fixations = 182).

It was assumed in the study that particular attention would be directed to the first 15 fixations. Thus, in the above-mentioned case, the analysis of the first 15 fixations for the surveyed respondents observing the top section of the first mockup of the designed page showed that the area of the banner with the name of the page attracted the greatest attention. Several respondents in the initial phase of viewing the graphics also paid attention to the title and content of the article presented and the large image.

Image 2: Heat map, first 15 fixations, mockup 1 — bottom

Source: The authors.

The analysis of all observed fixations throughout the session for each area showed the following values:

1) content of articles' briefs (number of fixations = 1848);
2) content of events' briefs (number of fixations = 534);
3) footer (number of fixations = 265);
4) calendar icon (number of fixations = 109).

The analysis of the first 15 fixations for survey respondents observing the bottom section of mockup 1 of the page indicated several areas of interest. In the first phase of browsing this mockup of the page, titles 3 and 4 of the article brief and the title and content of event 2 were of similar interest. This suggests the absence of one main element of the site that would focus the attention of potential users.

Image 3: Heat map, first 15 fixations, mockup 2 — top

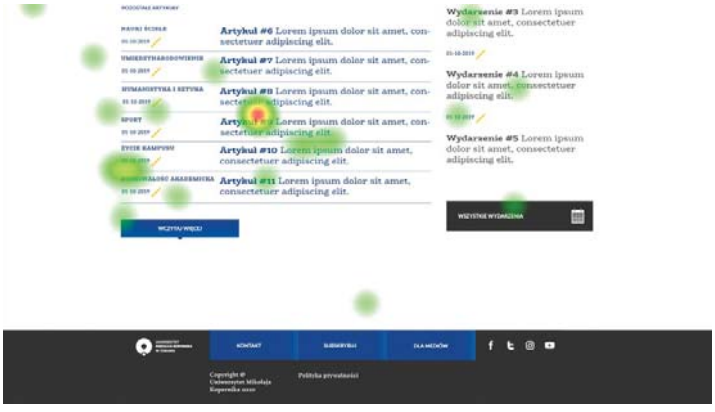
Source: The authors.

The analysis of all observed fixations throughout the session for each area showed the following values:

1) banner with the list of categories (number of fixations = 1395);
2) title of the highlighted article (number of fixations = 409);
3) large image (number of fixations = 342);
4) banner with the portal name (number of fixations = 206);
5) logo (number of fixations = 120);
6) heading (number of fixations = 79).

The analysis of the first 15 fixations for survey respondents observing the top section of mockup 2 of the page showed that the banner with the list of categories was the main area of interest. The heat map indicated high dominance of this area in the first phase of browsing. In other areas, such as the name of the page, the title of the featured article or the large image, no respondent activity was observed.

Image 4: Heat map, first 15 fixations, mockup 2 — bottom



Source: The authors.

The analysis of all observed fixations throughout the session for each area showed the following values:

1) content of articles' briefs (number of fixations = 1550);
2) content of events' briefs (number of fixations = 498);
3) footer (number of fixations = 205);
4) calendar icon (number of fixations = 74).

The analysis of the first 15 fixations for survey respondents observing the bottom section of mockup 2 of the page indicated several areas of interest. The highest number of clusters was observed for the emboldened element of article title 9. It should be noted, however, that several fixation points were observed in line 5 of the articles and over a dozen other areas where respondents focused their attention.

Image 5: Heat map, 15 first fixations, mockup 3 — top

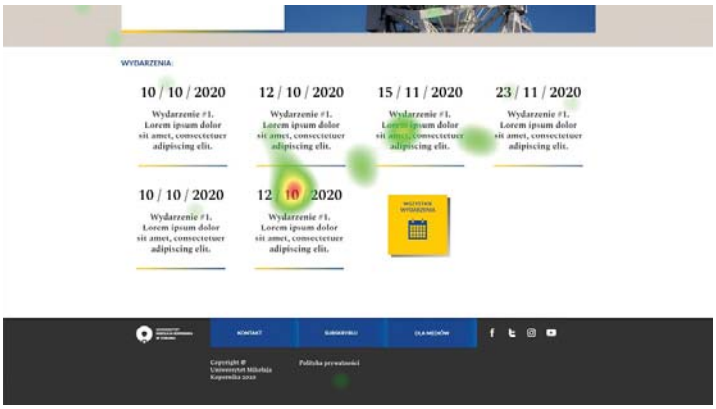
Source: The authors.

The analysis of all observed fixations throughout the session for each area showed the following values:

1) banner with the list of categories (number of fixations = 1872);
2) title of the highlighted article (number of fixations = 458);
3) large image (number of fixations = 382);
4) logo (number of fixations = 188);
5) heading (number of fixations = 167).

The analysis of the first 15 fixations for survey respondents observing the top section of mockup 3 of the page showed that the banner with the list of categories was the main area of interest. The heat map indicated quite high dominance of this area in the first phase of browsing. In the remaining areas, such as the name of the page, the large image or the title of the highlighted article, a lower respondent activity was observed.

Image 6: Heat map, 15 first fixations, mockup 3 — bottom



Source: The authors.

The analysis of all observed fixations throughout the session for each area showed the following values:

1) content of events' briefs (number of fixations = 1657);
2) footer (number of fixations = 174);
3) calendar icon (number of fixations = 124).

The analysis of the first 15 fixations for survey respondents observing the bottom section of mockup 3 of the page indicated one dominant area of respondents' interest. In the first phase, the gaze of most respondents was focused on the date of event 6. It should be noted that the main and other points of interest occurred near to the calendar icon, which strongly contrasts with its surroundings.

Analysis of eye-movement paths in relation to selected areas of interest

Image 7: Mockup 1 — top

Source: The authors.

The highest number of scanning paths occurred between the following areas:

1) large image and the text area = 15%;
2) text and large image = 12%.

The same values were observed for paths between the following areas:

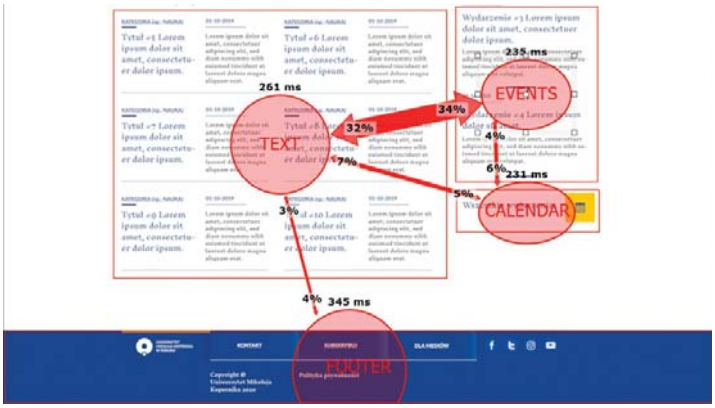
1) text and the banner with the name of the page = 9%;
2) banner with the page name and the site logo icon = 9%.

Similar values occurred between the following areas:

1) banner with the page name and the text area = 9%;
2) large image and banner with the page name = 8%;
3) banner with the page name and large image = 8%.

Most of the paths observed were determined by neighbouring areas. This demonstrates that the structure was logically organised and that there were no obvious distractors interfering with potential users' scanning of the interface.

Image 8: Mockup 1 — bottom



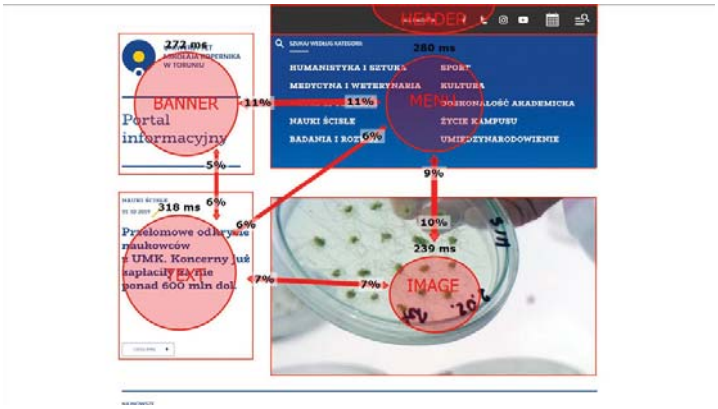
Source: The authors.

The highest number of scanning paths occurred between the following areas:

1) content of articles (text) and content of events (events) = 34%;
2) content of events (events) and content of articles (text) = 32%.

The paths of these two directions represented almost all paths observed for this mockup. In this case, it should be noted that the analysis of the paths within the area of the content of the article indicated horizontal eye movement between individual text sections. It is therefore advisable to maintain a horizontal sorting of the content of articles by publication date.

Image 9: Mockup 2 — top



Source: The authors.

The highest number of scanning paths occurred between the following areas:

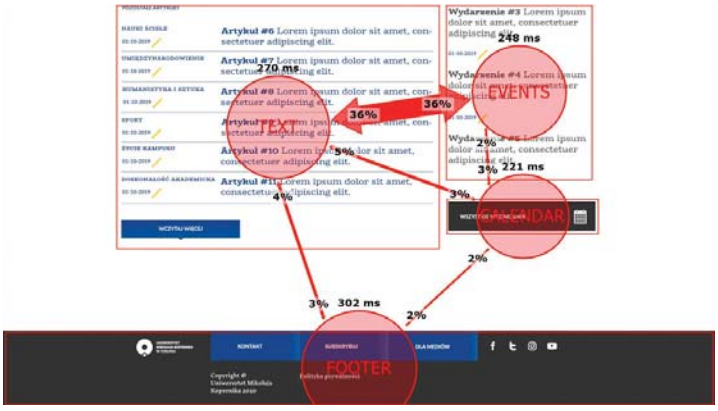
1) menu with the list of categories and banner with the name of the page = 11%;
2) banner with the name of the page and menu with the list of categories = 11%;
3) menu with the list of categories and large image = 10%;
4) large image and menu with the list of categories = 9%.

Lower values were obtained by paths between the following areas:

1) large image and content of the article (and the return path) = 7%;
2) menu with the list of categories and content of the article (and the return path) = 6%.

The above results may indicate insufficient highlighting of the article content as a potential navigation area.

Image 10: Mockup 2 — bottom



Source: The authors.

The highest number of scanning paths occurred between the following areas:

1) content of articles (text) and content of events (events) = 36%;
2) content of events (events) and content of articles (text) = 36%.

Some interest was also observed in the path between the calendar icon area and the article content area (5% and 3%, respectively) and in the paths leading from different areas to the footer area (5% in total).

The above distribution suggests a logical distribution of individual paths. The presence of the footer area along with the observed values may be related to the highlighting of navigation buttons in blue.

Image 11: Mockup 3 — top

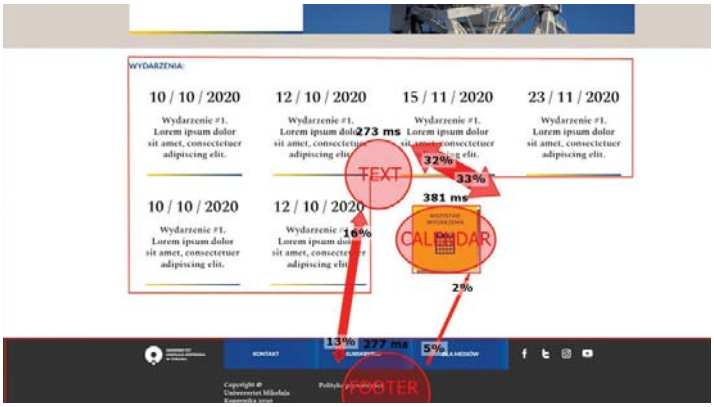
Source: The authors.

The highest number of scanning paths occurred between the following areas:

1) menu with the list of categories and the logo = 12%;
2) logo and menu with the list of categories = 11%;
3) menu with the list of categories and content of the article = 12%;
4) content of the article and large image (and return path) = 11% each.

The remaining path directions obtained similar values, which ranged from 6–8%. It is worth noting that the largest number of path directions was centred again on the category list menu area.

Image 12: Mockup 3 — bottom



Source: The authors.

The highest number of scanning paths occurred between the following areas:

1) content of events (text) and calendar icon = 33%;
2) calendar icon and content of events (text) = 32%.

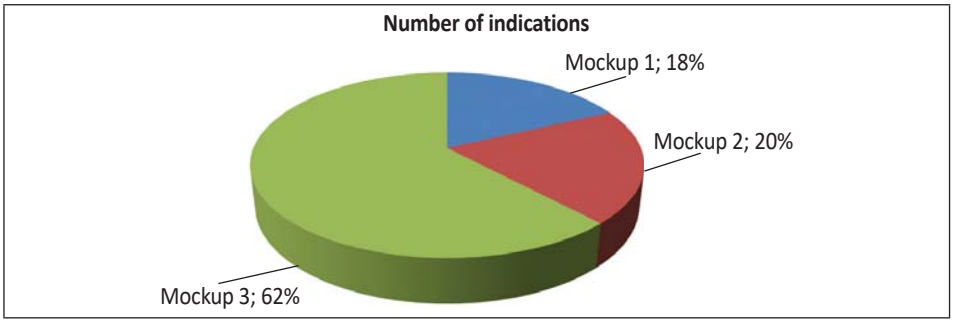
Significant interest was also observed in the direction between the footer area and the event content area, and in the return direction (16% and 13%, respectively). The path leading from the calendar icon to the footer area accounted for 5%, and the reverse path was 2%.

In this case, the effect of the navigation buttons highlighted in blue was even more noticeable.

Choosing the best mockup for the website

Most participants (21 people) indicated that, in their opinion, mockup no. 3 was the best. The second place was held by mockup no. 2 (7 indications), closely followed by mockup no. 1 (6 indications).

Diagram 1: Choosing the mockup of the website that was the best according to the respondents.



Source: The authors.

During the session, respondents spoke freely and made several comments about the mockups and the improvements that could be made. They also indicated what changes could be made to mockup no. 3 to make it more functional. Table 1 below shows the respondents' motives behind choosing the best design and indicating its strengths.

Table 1: Motives for selecting the best mockup (no. 3)

No.	The design is better, because...	Number of indications
1.	It is clear.	14
2.	I can find (within graphics) the most important information for me.	11
3.	It has a good layout/arrangement of information.	6
4.	It has a good colour scheme; it is consistent.	5
5.	It is most readable, and in the other designs there was an overload of information.	4
6.	It contains everything that a university information portal should.	4
7.	Simplicity.	3
8.	It has a good layout of images.	2
9.	Dividing sections of a page by means of colours.	2
10.	It's nice that "recommended" and "editor's choice" are separated by a background colour.	1
11.	Dividing sections of a page by means of colours.	1
12.	It looks modern, aesthetic.	1
13.	Breaking the pattern of combining graphics and text of different articles makes the page less monotonous.	1
14.	Larger font for dates is good.	1
15.	Graphics of the events are very accessible and clear.	1
16.	Functionality.	1
17.	A visually futuristic NCU logo.	1

Source: The authors.

Weaknesses of the mockup were also identified based on the form entries for the mockup finally selected (Table 2). The entries corresponded mostly to the comments in the Design Cards in the appendices, although they constituted the subjective record made by respondents, and their content was not interfered with. Some content may have been expressed differently as a comment and as a transcript (e.g., using different words, etc.).

As shown, respondents were keen to express their opinions on the design, and almost three-quarters of them had similar feelings about the choice of the best mockup.

Table 2: What needs to be changed in mockup no. 3.

No.	What changes should be made to the mockup?	Number of indications
1.	Change the colour scheme of the bottom bar, because it doesn't match the whole design; it's too heavy.	3
2.	The top bar does not match; the one in design no. 1 would be better.	3
3.	Nothing should be changed in the design.	3
4.	Menu: – make the menu more readable (e.g., highlight with colour and a different font), – the menu is not very clear; in my opinion, the hyphens used before the category names are unnecessary, – the menu could stand out more (the menu from design no. 2 draws attention better). – the bottom menu should be expanded.	 1 1 1 1
5.	There is a lack of features for people with special needs (e.g., the ability to enlarge the font, change the contrast, etc.).	2
6.	There should be a full NCU logo as per the brand book.	2
7.	There are other articles missing, it is not clear how to look for them.	2
8.	There should be a unified background (not highlighted with any colour, because this can affect loading time).	2
9.	Enlarge the footer font because I can't read it.	2
10.	The font should be simplified and standardised throughout the entire design.	2
11.	I would change the background colour of the "editor's choice" to a more modern, light colour (e.g., a light shade of heather). The brownish colour clashes with the modern look of the site. It is too "archivistic".	1
12.	I liked the footer best in mockup 1.	1
13.	Date font could be slightly smaller.	1
14.	The contact button/icon should appear in the header.	1
15.	The button to go to events in the header is unnecessary.	1
16.	Lack of blue on the top and bottom bars — it would be good to close the page in such a scheme where you can see the beginning (top/header) and the end (footer).	1
17.	The whole name "Nicolaus Copernicus University Information Portal" would be better.	1
18.	It is worth changing the name to "Portal Informacyjny" *(Information Portal)* and reserving "NCU News" for the English version.	1
19.	The search icon should be in one place, with no repetition in the category section, unless it includes other functionality.	1
20.	The recommended section should be determined by the visitor by selecting the category.	1
21.	Embolding the names of events.	1
22.	No reference in the latest section to older articles.	1
23.	Consideration could be given to adding one more section of three articles.	1
24.	I don't like the top, which is the title text. I would transfer the one from design no. 1.	1

Source: The authors.

Summary — key recommendations for the design of the website

The above research shows that most respondents preferred mockup no. 3. With the feedback of the respondents, the mockup of the information portal selected by them can be improved and an active website can be designed in accordance with it. Based on the results of the survey, the UX and Information Architecture Team recommended that preparation for the design changes should start with an analysis of Tables 1 and 2, which provided insights into the opinions and suggestions of the respondents. Subsequently, attention was required for the following indications of changes to mockup no. 3, which was chosen by the respondents.

Image 13: Heading

Source: The authors.

It was recommended to change the search icon by either removing the horizontal line elements or extending this element to include the search interface dialogue box. It was also advocated to include icons for shortcuts with functionalities to change the language version and to change the display of content intended for people with disabilities. Detailed recommendations in this regard can be found in the "Ustawa o zapewnianiu dostępności osobom ze szczególnymi potrzebami" *[Ensuring Accessibility for Persons with Special Needs Act]*[17]. It was also pointed out that an option to enlarge the font or change the contrast should be taken into account. Furthermore, it was recommended to standardise the appearance of the header and footer. As suggested by the respondents, it was indicated to embed a menu bar at the top of the page as in mockup no. 1 and to embed selected icons there.

Image 14: Banner

Source: The authors.

17 Sejm RP, *Ustawa o zapewnianiu dostępności osobom ze szczególnymi potrzebami*, [online:] http://orka.sejm.gov.pl/proc8.nsf/ustawy/3579_u.htm#_ftn1 – 11.07.2022.

It was recommended to change the name of the website to include the name "Information Portal of Nicolaus Copernicus University" as in mockup no. 1. Moreover, it was advised to increase the contrast between the background of the banner and the colour of the font of the category content and to increase the size of the font. It was also suggested that consideration be given to changing the logo to a mockup without the gradient and shading and to introducing the full name of the university. Further, it was recommended to eliminate the en-dash distinction in the category name labels.

Image 15: Content section 1

Source: The authors.

Recommendations were made to increase the font size in heading labels such as "Recommended" and "Exact science". It was also advised to standardise typefaces and introduce a lead into the content area of the article.

Image 16: Content section 2

Source: The authors.

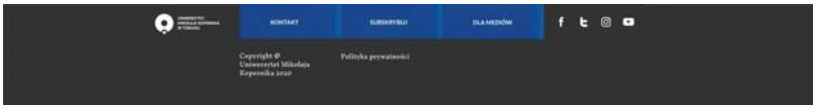
It was recommended to increase the font size in heading labels such as "Latest", "Exact science", "Humanities and Arts" and "Sport". It was also advised to standardise the typefaces and introduce a lead into the content area of the article. As an optional solution, it was recommended to consider adding one more group of articles in this layout or another.

Image 17: Content section 3

Source: The authors.

It was advised to increase the font size in the heading label "Event", change the notation of event dates, embolden the event titles, standardise the typefaces and change the horizontal sorting of events from newest to oldest.

Image 18: Footer



It was recommended to reduce the height of the footer area, change the way navigation buttons are highlighted and standardise them (e.g., "Privacy Policy") and increase the font size of individual labels and texts. It was also recommended to standardise the appearance of the header and footer (including the use of the same logo).

Fonts, labels, others

It was advised to standardise the typeface without the use of decorative typefaces and to distinguish the labels of individual sections of the page by increasing their size and using typographical highlighting.

It was also recommended to remove the symbol ":" from the following labels: "Recommended", "Latest", "Events".

Finally, it was recommended to use "Read more" navigation buttons that could be attached to the recommended article content area and tiles that contain recent articles and event content areas.

Conclusions

This study allowed for the collection of rich empirical data on the choice of mockup for the NCU Information Portal. The analysis of participants' statements resulted in the selection of mockup no. 3 and a list of recommendations for further improvements related to the launch of the portal. The use of different research methods and

techniques enabled the verification of the data obtained. This approach was particularly important when cross-checking participants' statements from the interviews against any potential distractors detected during the eye-tracker testing. Moreover, the obtained material opens new research areas for in-depth studies related to the comparison of opinions of different groups of users on the usability of websites.

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Designing the "NCU Information Portal" — analysis of the mockups of the website based on the elements of user experience and information architecture

Abstract

The study aimed to compare three mockups (static graphic designs) of the Information Portal of the Nicolaus Copernicus University in Toruń in terms of user experience and information architecture indicators and identify the best one to use for creating an active website. The

research used an eye-tracking method, usability tests, observations and surveys. Most respondents indicated that mockup no. 3 was the best of the three proposed static website page designs. The respondents justified their choice, among other things, by the fact that it was clear and easy to use, had a functional layout of information and an appropriate colour scheme. The design chosen by respondents has been improved to reflect their suggested modifications. Its final version can be viewed at https://portal.umk.pl/.

Keywords: static graphic design, mockup, website, Information Portal, Nicolaus Copernicus University, user experience, information architecture, eye-tracking.