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THE IMPACT OF INFORMATION ORGANISATION SCHEMES ON THE QUALITY OF INFORMATION ON THE WORLD WIDE WEB

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Purpose: Identification of the potential impact of information organisation schemes on the quality of information. The schemes under consideration are presented in the context of improving the quality of information presented on Web pages.
Design/methodology/approach: The literature review on information architecture and information quality presents an analysis of the possible impact on information quality of exact and ambiguous schemes. The research utilises examples of the use of information organisation schemes on websites in different areas and industries.
Findings: The analysis of the presented schemes revealed that several information quality characteristics were affected. The alphabetic, chronological and geographic schemes (exact schemes) were found to significantly improve eleven information quality criteria: timeliness, accessibility, unambiguity, completeness, clarity, usefulness/utility, consistency, speed, usability, verifiability and comprehensibility. Thematic, task-based, metaphor-based and hybrid (ambiguous schemes) affect eight information quality characteristics: relevancy, speed, timeliness, accessibility, completeness, communicativeness, clarity/understandability, and credibility. Five are present in both groups of schemes: timeliness, accessibility, completeness, speed, and comprehensibility. It is important to note that the set of features presented is not exhaustive and that the identification of new ones requires further in-depth research.
Research limitations/implications: The limitations of the conducted research include the presentation of a limited number of examples from different areas. Further research focused on a specific industry will allow for detailed verification of the identified characteristics or the discovery of new ones.
Practical implications: The utilisation of information organisation schemes enhances the quality of the information presented, which has practical applications in the presentation of information on the World Wide Web. The presentation of poor-quality information can result in erroneous decisions, which can give rise to a number of adverse consequences, particularly for individual users.
Originality/value: The characterisation of schemes presented in the publication enabled the demonstration of their impact on several characteristics of information quality. Furthermore, examples of the use of schemes in improving selected features of information quality on the World Wide Web were indicated. The publication is aimed at both users of websites, producers and providers of information, as well as managers of websites.
Keywords: information organisation schemes, information quality, improving information.
Category of the paper: research paper.

1. Introduction

Information architecture is the organisation, structuring and presentation of information in information systems to facilitate efficient access to content made available to users. The importance of information architecture in a dynamic digital environment continues to grow. With the increased amount of information on the Internet, it is becoming essential to organise information in a way that makes it easy to understand, navigate and find the information needed. Information architecture therefore plays a key role in creating intuitive and effective information systems that meet the needs of users. To ensure this, it becomes necessary to design an information structure that takes into account both business objectives and user needs. The effective organisation and presentation of information (e.g. on websites, mobile applications) influences its easy accessibility and usability, which can consequently improve the quality of information for users.

The creation of a logical structure for information enables users to easily find and search for the data they need. The problem of organising information is significant in an era of exponential growth in the amount of information generated on the Internet, where both individuals and companies publish content. The challenge is to classify the content of a website, whose content can be both homogeneous and heterogeneous resources. The first case is relatively straightforward to manage, as it consists of similar or identical elements, such as product descriptions in the book category: title, author, year of publication, and price. The second case is particularly pertinent to websites. Differentiation arises, among other things, from the fact that text, graphic, audio and video resources are stored in different file formats. The collections of information can be static (unchanging) or dynamic (subject to updating) and vary in level of detail, creating a kind of hierarchy (e.g. category, subcategory, product). In the area of text messages, there is content relating to different areas: product offers, news, and finance. Classifying heterogeneous information objects prevents the use of a single system for organising website content. In the case of enterprise websites, they are often grouped according to the internal organisational structure, for example, departments such as sales, marketing, service, human resources, and management.

In the context of information architecture, information quality plays a pivotal role, in influencing the overall effectiveness of a website. The information content of a website, the infrastructure of a website, the needs of users or the requirements of site owners are examples of areas where information quality problems may arise. The identification of the causes of information quality problems is essential, followed by the implementation of specific methods and tools to guarantee the quality of the information. Information that is of value should not only be easily accessible but also relevant, aligned with the expectations of the users and focused on the needs of the final audience.

In evaluating the quality of information on websites, it is essential to consider the following factors (Calero, Caro, Piattini, 2008, p. 467):

- The general issues associated with the quality of information on websites.
- The necessity to integrate structured and unstructured data.
- The necessity to integrate data from disparate, autonomous sources.
- The dynamic nature of the web.

The purpose of this publication is to identify the range of information quality characteristics influenced by information organisation schemes. This is due to the fact that there is a research gap in this area. There is a lack of research on the impact of information organisation schemes on the quality of information on websites. In order to achieve this purpose, the following research questions were posed:

- Are there examples of the use of information organisation schemes on websites with different themes?
- Does their practical relevance exist in both the group of exact and ambiguous schemes?
- Do information organisation schemes play an important role in improving selected characteristics of information quality?

In the introduction, a variety of definitions of information and its quality are presented on the basis of literature research. Taxonomies of information quality characteristics derived from different points of view are presented: ideal information, recipient-oriented information, producer-oriented information and ready-to-use information. The field of information architecture is further defined, and its four components are described: information organisation, labelling, navigation and search. This was followed by a study of the impact of information organisation schemes on information quality. The schemes presented were divided into two categories: exact (alphabetic, chronological and geographical) and ambiguous (topical, task-based, audience-based or metaphor-based, and hybrid). The schemes considered were presented in the context of improving information quality attributes, e.g. accessibility, completeness, timeliness, comprehensibility or consistency of information. The study employed examples of the utilisation of information organisation schemes on websites across a range of domains, including education, health, e-commerce, public services, banking, and social media. In conclusion, a summary of exact and ambiguous schemes is presented with examples of their use and information quality characteristics. The identified characteristics do not represent a closed set. The results obtained indicate the possibility of using the presented schemes in the process of improving information quality on websites. The next stage of future research will be to determine the possible impact of information organisation structures on improving information quality.

2. Information quality and its characteristics

In information theory, there is no universally accepted definition of information. Rather, it is assumed that it is a primary concept that is not subject to definition in a normative sense (Czerwiński, 2001). The word information has been known since the dawn of time and derives from the Latin term informatio, meaning "an idea, explanation, notification". In colloquial speech, it can be defined as any message (Kieżun, 1980, p. 274). In certain disciplines, including economics, information can be regarded as a product, or a resource (Oleński, 2003; Arrow, 1979; Bates, 1988; Buckland, 1991; Hirschleifer, Riley, 1992). Consequently, it can be subjected to a multitude of processes, which are collectively referred to as informational processes. Information processes encompass the generation of information, the analysis of its quality, and the processes involved in maintaining this quality (Oleński, 2003, p. 39).

In the field of quantitative information theory, the quantitative aspect is of primary importance (C. Shannon). This branch of information theory is not concerned with the content or meaning of information. The fundamental concept in this case is a message which is properly coded and contains a specific quantity of information (Baborski, Duda, Forlicz, 1977, pp. 153-158). The content of information and its meaning are the primary focus of qualitative information theory. In its framework, information is considered to be a specific collection of data that has a fixed meaning ascribed to it by the creator or receiver of the information. Two distinct approaches can be identified: infological and datalogical. These were initially developed by B. Sundgren (1973) and B. Langeforse (1980). The datalogical approach assumes that information is depersonalised, adopting an objective stance. The datalogical interpretation of information defines it as "the flow of data or truths formulated as strings of characters of a certain language from the sender to the receiver". The infological approach emphasizes information as the content conveyed by a message. The underlying assumption is that the message's recipient will interpret and comprehend the message as intended by the sender. In this context, information becomes subjective, contingent upon the receiver's consideration of psychosociological, linguistic, and semantic factors.

In the academic literature, authors propose various definitions of the concept of information quality. These definitions indicate that information quality is a multidimensional category. For instance, authors have proposed various types of quality, including ideal information (Gerkes, 1997), information recipient-oriented (Wang, 1998; Kahn, Strong, Wang, 2002), information producer-oriented (Kahn, Strong, Wang, 2002), and information ready for use (Huang, Lee, Wang, 1999). The analysis and evaluation of information quality should be conducted in the broadest possible context of use. The infological approach examines the relationship between the data, taking into account the whole possible context related to the user/consumer of the information (context: linguistic, social, psychological) and the task at

hand. This approach enables the distinction between information quality and data quality, as the analysis takes into account the whole possible context related to the causes of poor information quality and its consequences. If the recipient of a message is unable to interpret and understand it, then the information contained in it is of no use to them and we cannot speak of its quality. This is a necessary assumption for considering the usefulness and, consequently, the value and quality of information. Various attempts have been made to systematise the attributes (evaluation criteria) of information quality, which often occur in the context of dimensions of quality, treated as composite characteristics.

B. Kahn, D. Strong and R. Wang, in their Product and Service Performance model for Information Quality (PSP/IQ), identified and assigned 16 information quality characteristics to four dimensions.

- The integrity dimension contains four characteristics: accuracy, conciseness, compactness and completeness.
- The assurance dimension contains two characteristics: timeliness and security.
- The usefulness dimension contains five characteristics: sufficiency, relevance, comprehensibility, interpretability and objectivity (the last two being on the borderline between usefulness and applicability).
- The applicability dimension contains five characteristics: credibility, accessibility, ease of manipulation, reputation and added value (Kahn, Strong, Wang, 2002, pp. 186-187).

The operationalisation of the information quality characteristics has been done based on the producer and consumer of information specific to products and services (the four dimensions of the PSP/IQ model). This makes it easy to identify which product and service quality attributes are most important from the consumer's point of view and which are most important from the producer's point of view.

Other dimensions of information quality have been adopted by L. English. He distinguished between inherent and pragmatic characteristics of information quality (English, 1999). The inherent features are those that do not depend on its use and describe the information in a static state. These include conformance to definition, completeness, reliability, consistency with other sources, consistency with reality, accuracy (precision), and degree of redundancy. Pragmatic characteristics, on the other hand, define the extent to which information enables users to perform their tasks effectively and thus describe information in processes (in a dynamic state). They include accessibility, timeliness, understandability, compatibility of derived information with primary information, and correctness, among others.

L. Floridi (1999) proposed a different classification of information quality. He distinguished four categories of quality features within which he identified twenty-seven characteristics. These categories of information quality criteria are:

1. Modal properties, which reflect the degree to which the information is adaptable to use, in particular the consistency of the information and its actual existence.

2. Humanistic properties, such as accuracy, integrity and richness of information.
3. Illuminist properties, such as variety of forms, accessibility of information, transferability to different users, and systematic availability.
4. Constructivist properties, such as the correctness of the information, its validity and normativity.

Another taxonomy of information quality characteristics was presented by B. Stvilia, Les Gasser, M.B. Twidale and L.C. Smith (2007, pp. 1723-1724). Based on theory and practice, they identified 22 characteristics of information quality, which can be grouped into the following three categories:

1. Intrinsic information quality includes the qualities of accuracy, consistency, complexity, semantic congruence, structural congruence, age of information, redundancy, naturalness, precision/completeness.
2. Relational or contextual information quality includes the qualities of accuracy, accessibility, complexity, naturalness, redundancy, relevance, precision/completeness, security, semantic consistency, structural consistency, verifiability, variability/variability.
3. Reputational information quality includes the attribute reputation - the degree of reputation of an information object in a given community or culture.

U. Gupta, on the other hand, believes that collections of information in an information system should be characterised by the following quality features (Gupta, 2000): usefulness of information in the subjective sense, relation to the solved problem (relevance), timeliness, accuracy, appropriate format (adapted to the user in the context of the solved problem), completeness (understood as sufficiency in the opinion of the recipient), accessibility (taking into account the conditions of information security on the one hand and the perceptual abilities of the user on the other).

The presented taxonomies of information quality characteristics (evaluation criteria) are very different and difficult to compare, as they start from different premises. However, the perspective of the producer and receiver of the information and the focus on the usability of the information are important because they represent information quality features that are relevant for websites treated as a specific information system.

3. Information architecture: a system for organising information on websites

In the field of web design, information architecture is regarded as a fundamental step in the creation of the structure of information, which forms the core of its usability and functionality (Spencer, 2010). The most frequently cited definitions in the literature are those presented by L. Rosenfeld, P. Mougille and J. Arango (2017), which define information architecture as:

1. The structural design of shared information environments.
2. The synthesis of organisation, labeling, search, and navigation systems within digital, physical, and cross-channel ecosystems.
3. The art and science of shaping information products and experiences to support usability, findability, and understanding.
4. An emerging field and community of practice that is focused on the transfer of design and architectural principles to the digital landscape (p. 31).

Information architecture is often described as comprising four subsystems (Rosenfeld et al., 2017, pp. 79-80): the information organisation system, the labelling system, the navigation system, and the search system. These are key elements of information architecture in the creation of information space, especially in the context of user interface design and, in particular, websites. The information organisation system includes structures and diagrams that help to organise and hierarchise the information in the system. The aim is to facilitate the accessibility and comprehension of information for users. Information organisation represents a pivotal aspect of information architecture, which serves to assist users in navigating the system. The process of labelling can be defined as the assignment of labels, or keywords, to content or system elements. This enables the categorisation and indexing of information. Labels can be utilised within an organisation's system to assist in the tagging of content according to different topics or categories. They can also be used to personalise the user experience. A navigation system is a structure that allows the user to navigate through the system. It can include menus, links, navigation buttons and other elements that facilitate travel between different sections of the system. Relatively intuitive navigation is a key element to ensure usability and user satisfaction. A search system allows users to find specific information within the system. This can be a simple search form or an advanced system that includes algorithms and semantic analysis. Effective search is crucial when users are seeking specific information without having to navigate the entire system structure. The coexistence of these systems is the foundation of information architecture. Effective organisation, labelling, navigation and search contribute to the fulfilment of user needs, contextual understanding and efficient navigation through the system. In the opinion of K. Zaranska, it is necessary to extend the definition of AI to include the relationships between the different subsystems, with the aim of providing high-quality information that is consistent with user expectations (Zaranska, 2017, p. 11).

A key element of the information architecture is the information organisation subsystem (Spencer, 2010, p. 4). Information organisation systems consist of organisational schemes and organisational structures. An organisational scheme defines the common features of content elements and influences the logical grouping of these elements. In the classification of information organisation schemes, a distinction is made between exact and ambiguous schemes. The organisational structure defines the types of relationships between individual elements and groups (Rosenfeld et al., 2017, p. 96). Among the components included in the structures,

one can distinguish between a hierarchical structure (top-down approach), a database model (bottom-up approach), hypertext (network of hypertext connections) and community classification - free tagging (Rosenfeld et al., 2017, pp. 105-115). This paper is limited to discussing the potential impact of information organisation schemes (on web pages) on improving information quality features.

4. The impact of exact organisation schemes on information quality

The group of exact schemes includes alphabetical, chronological and geographical schemes. The alphabetical organisation scheme is the basic type of scheme and is the most widely used on the World Wide Web. Information grouping is based on defined information objects, which require some knowledge about them in the search process. The common characteristics of information objects allow them to be classified into specific alphabetical categories. Alphabetical schemes on Web sites are based on the ordering of content, usually by first letter or keyword. The introduction of such an arrangement has a variety of applications, whether in the context of catalogues, lists or indexes. Ordering criterion is alphabetical, e.g. by surname (people), product (products) or subject (alphabetical indexes). Examples of people lists are alphabetical lists of authors of publications in a library catalogue, or contact lists in an address book. This makes it easier to quickly find and identify information about specific people. Product lists are used to present products in alphabetical order by product name or category. This has a positive impact on online shopping behaviour, making it easier to find a particular product. Alphabetical indexes, on the other hand, are widely used in dictionaries and encyclopaedias. An alphabetical index of entries provides quick access to definitions and improves navigation through the system. The use of alphabetical indexing in a corporate catalogue organises the catalogue by name, increasing the efficiency of searches.

The use of a selected alphabetical scheme can improve the overall usability of a website by increasing its readability and the efficiency of information retrieval. The user does not need to know what he or she is looking for, because the resources are organised according to a known set of criteria, and it is possible to access the information based on the unambiguous properties of the information element sought (its name). The use of alphabetical schemes in organisational structures on the Web can make it much easier for users to find the information they need, especially in the case of large data sets.

Based on the above examples, a number of information quality features can be identified, such as consistency, unambiguity, accessibility and completeness. The maintenance of an alphabetical presentation of content allows for its correct interpretation and the avoidance of contradictions in its use, which characterises the information quality feature of consistency. The alphabetical ordering of terms defined according to precise rules determines their

unambiguous understanding. In addition, the ease of navigating and searching in an alphabetically organised environment ensures that the information is quickly accessible to users (accessibility attribute). In such schemes, the information contains enough (optimal) data to be used for specific activities (completeness attribute).

A chronological scheme for organising information is used to present content in temporal order, where events, data or items are arranged according to their order of occurrence over time. Examples of this type of scheme include lists, tables and time charts. Chronological schemes are used in a variety of contexts on the World Wide Web, including the presentation of events, progress or change over time, scientific studies and phenomena, biographies, dates, tutorials and instructions. History, archaeology or news sites often use chronological schemes to present events (current world events), progress (battles, the course of war) or changes over time (ice ages, scientific milestones). Chronological information is used to present biographies of historical figures, scientists, politicians on Wikipedia pages. Chronological schemes are useful for describing the stages of tasks performed in chronological order in manuals, guides and tutorials. They are also used to analyse business data, time trends (stock prices), changes in economic data (inflation rate, unemployment rate), demographic data (birth rate) or climatic data (temperature change), allowing data to be understood and interpreted in the context of its occurrence over time.

Chronological schemes on websites are mechanisms for improving the quality of information and are called information contextualizers (Eppler, 2006, p. 145; Krzesaj, 2022, pp. 334-336). The placement of time information plays a key role in understanding and contextualising content. It determines when information was created and when it was published. The information found may be misunderstood by the user if there is no connection between different events or elements in terms of when they occurred. Chronological schemes on websites have an impact on many characteristics of information quality. The context provided increases the clarity of the information, its perceived accuracy in the situation of use, and its traceability. The correspondence of the information with the actual state of affairs determines the timeliness of the published information. Chronological information enhances user comprehension by illustrating natural thinking about the sequence of events or data. Recipients can find information quickly, increasing its usefulness. Mechanisms for contextualising information make published information more credible. They increase the consistency of information, which is important when communicating complex content. The use of chronological schemes on websites is therefore an important tool that can improve the quality of information provided.

The geographic organisation scheme of information on websites refers to how content is presented and organised by geographic place, region or location. This means that content is grouped and presented to users based on its geographical location or association with a particular region. The use of these patterns of information organisation is most evident on mobile devices. Websites can provide personalised content that takes into account users' local

preferences and needs. For example, a local services page allows users to find the nearest restaurants, hotels or shops. Websites that provide local news or information can organise their content by geographic region, thereby expediting the search process. Websites that offer advertisements for the sale or rental of real estate make their content available based on geographical location, thus facilitating the ability of users to locate listings that align with their interests.

A geographical information organisation scheme can be beneficial for users seeking content related to specific geographical areas and for companies or organisations wishing to promote their products and services in specific regions.

Geographical schemes on websites facilitate the personalisation of information, which enhances the quality of the information in terms of accessibility, comprehensibility, usability, speed of delivery and verifiability. Organising information based on its geographical location makes it possible to provide personalised content based on user preferences and needs, which significantly improves access to information (accessibility attribute). Providing information based on geographical schemes increases the context of the message, leading to a better understanding and correct interpretation of the content presented. Increasing accessibility and providing context improves the usability of the information, which allows it to be used for specific activities (purchasing decisions, searching for tourist attractions). Furthermore, the information presented can be verified, which affects its credibility, especially in the case of local information, e.g. opinions on restaurants or places worth visiting.

5. The impact of ambiguous organisation schemes on information quality

The second group of information organisation schemes includes ambiguous schemes: topical organisation schemes, task-oriented schemes, audience-specific schemes, metaphor-driven schemes and hybrid schemes. Ambiguous schemes on the Web are characterised by categorisations that deviate from a precise definition. They are full of ambiguous terms, lack clarity, are characterised by ambiguous organisation and have features of subjectivity in human perception and understanding (Rosenfeld et al., 2017, p. 99). Unlike exact diagrams, they are difficult to design and maintain, but they are more valuable from a user perspective. Their greater utility comes from the fact that we do not always know what we are looking for, as is the case with alphabetical schemes (we are looking for a specific item from a list). The user's information needs are not always predetermined and the process of finding information is often iterative.

A topical information organisation scheme focuses on grouping content around specific topics, categories or domains to facilitate navigation and search. This type of schema helps users quickly find content related to their interests or needs. Information can be classified in

a number of ways. Grouping items according to a particular topical hierarchy that includes categories (broader categories) and subcategories (more specific categories). Such a division can be seen in online shops, where categories and subcategories allow customers to quickly browse and search for products in specific industries. The same is true of news portals, where topical sections such as Poland, World, Business, Entertainment or Sport are created. Another example is the grouping of content using tags. The result is the creation of topical categories, as is the case in social networks. The creation of such a classification allows the filtering of existing categories as well as the creation of new ones that are not yet known. Topical organisation schemes are used to present the structure of websites in the form of a map. The site map contains various sections and sub-sections grouped by topic. A major problem with topical diagrams is that the user does not understand the designer's intention in terms of grouping resources.

The topical information organisation scheme facilitates the rapid identification of pertinent information on a specific topic through the use of content grouping mechanisms. Additionally, it enhances the relevance of the content obtained, which is tailored to the information task set by the user (narrowing the search to categories or subcategories). By increasing its accessibility, the scheme enhances the efficiency of information retrieval, which in turn facilitates the use of content on websites. The topical organisation of information by individuals with relevant expertise in a particular area of knowledge enhances the reliability of the message. One example of how the reliability of the content can be enhanced is by presenting validated information on medicines in a manner that groups them according to their use in the context of specific disease symptoms (e.g. pain, fever, hay fever).

A task-oriented scheme is used to organise information on web pages according to specific tasks performed by the user. Functionality and clarity of content makes it easier to perform specific tasks or find specific information on a website. In task-oriented schemes, information is organised as a collection of processes, functions and tasks. A process-oriented task scheme organises information and functions around a sequence of actions performed by the user (e.g. the process of booking a hotel room). The organisation of information can also take the form of the user achieving a specific goal, such as making a purchase or finding information. It can also refer to the performance of specific tasks by grouping both content and functions into topical groups, e.g. placing an order.

These schemes interact with a set of information quality characteristics, namely accessibility, relevance, completeness, timeliness and credibility. Filtering information by selecting a specific task to perform allows the user to quickly find the information they require, thereby enhancing the accessibility of the information. Access to the most frequently used functions on a bank's website, such as checking account balances, making a transfer or transfer history, is more tailored to the user's needs, which increases user satisfaction (relevancy attribute). A government website presenting public services grouped by task (e.g. tax, travel) contains a collection of information on the submission/issuance of documents (e.g. tax

declaration, passport), including details of the forms of their execution (stationary or online service). The aforementioned public service schemes significantly improve the completeness of the information obtained (collection of all the information necessary to perform the task), its timeliness (ongoing updating of changes to regulations) and the credibility of the information source (trust in the information provided by the government agency).

Audience-specific schemes take into account the needs and preferences of different groups of website users. These schemes split the content, structure and navigation presented into smaller parts by adapting them to the expectations of a specific group of addressees (Rosenfeld et al., 2017, p. 102). Content design and presentation strategies ensure that websites are more usable, understandable and attractive to their audience. Among the most common examples of audience-specific schemes are audience segmentation and personalisation. The former is based on dividing users into segments or groups. The criterion for division can be defined by technological, demographic or behavioural characteristics. The division based on technological attributes may refer to the type of device used (tablet, computer, smartphone users), the preferred communication channel (e-mail, SMS, social media), or the level of familiarity with the technology (novice, advanced users). Segments separated by demographic criteria include, for example, age (children, adults, seniors), gender (male, female), location (urban, rural) or education (primary, secondary, higher education). Shopping habits, frequency of purchases or brand loyalty are behavioural characteristics that frequently divide e-commerce shoppers into segments. The second example of organising information by audience concerns personalisation mechanisms. Personalisation of content can refer to the division of users based on their behaviour, preferences, browsing history or other data. An example of this splitting of content could be the distinction of its audience groups on a university website (applicant, student, doctoral student, employee, business). The term 'personalisation' can be defined as the adaptation of interactions (such as personalised messages and forms) and website features (such as responsiveness and accessibility for people with disabilities) to users' preferences. Furthermore, audience-focused information organisation schemes can be categorised as either open or closed. In an open scheme, members of one audience group can access content intended for another group. In contrast, in a closed scheme, users are unable to navigate between sections intended for different audiences (Rosenfeld et al., 2017, p. 103).

The use of audience-specific information organisation schemes on the web allows for the improved relevancy, better accessibility and understanding of information (clarity of information). Adapting the information displayed to the problem the user is dealing with, as is the case with the breakdown of services provided on a government site (citizen, entrepreneur, civil servant, farmer), significantly affects the relevancy of the information provided. Adaptation of the website's appearance to the resolution and size of different types of devices (responsiveness) increases the accessibility of the information for different user groups. The quality and clarity of the information for the user influences better understanding.

In conclusion, audience-based schemes enhance the quality of the information presented by segmenting content into content tailored to specific audiences.

Metaphor-driven schemes utilise familiar and communicative metaphors to assist users in comprehending information, structure, and navigating complex content on a website. Frequently, the metaphor of a book is employed to organise content on a website. The structure and conventions of a book, including a table of contents, summary, introduction, chapters, and headings, facilitate navigation of a website or a specific section of a website. To illustrate, an article on a page might contain a table of contents, an abstract and chapters. The organisation of Wikipedia is analogous, where entries are described in sections (the equivalent of a chapter), with links to bibliographies and a table of contents, thus facilitating navigation and comprehension. Another exemplar of website design is the utilisation of symbols and interactions reminiscent of a real space, such as the metaphor of a shop, library or waiting room. In this approach, a virtual shop can reflect elements such as aisles, racks, shelves to facilitate product categorisation. Similarly, in the case of a website built in the conventional format of a library, the way the content is organised relates to its classic components. In a virtual space such as a website, the user can navigate through its sections or perform various stages of tasks, just as they would in the real world. The manner in which content is organised and presented on the website enables orders or ticket reservations to be made in accordance with familiar stages observed in their traditional counterparts, such as the selection of goods, form of delivery, payment, and shipping. The effectiveness of metaphors mainly depends on their familiarity by users (Rosenfeld et al., 2017, p. 103).

Schemes based on metaphors have an impact on certain features of information quality. These schemes facilitate the understanding of content and interaction with websites, thereby improving the clarity of the structures presented. The clarity of the structures presented, without any special interpretation, significantly improves the communicability of the information provided (shop or library metaphors). Easy browsing improves access to information and allows better assimilation of information. Furthermore, the use of metaphors from the real world improves cognitive processes, increasing the relevance of the information found by the user. The organisation of content based on analogies improves the completeness of the information provided, which is necessary for the accomplishment of specific tasks. These tasks may be carried out in successive steps, such as the aforementioned order processing or hotel booking process.

The final set of schemes presented are hybrid schemes, which integrate disparate methods, techniques and content organisation strategies to create a more comprehensive structure of information. The utilisation of distinct ambiguous schemes based on tasks, topics, audiences or metaphors allows for the creation of a coherent and useful structure for users. The combination of different methods significantly influences information quality criteria by increasing the completeness, accessibility, timeliness, credibility and relevance of the information. A case in point is the government service, which employs both audience-based and task-based schemes.

The service segments its recipients (citizens, entrepreneurs, government official, and farmers) and categorizes its services (e.g., taxes and passports) internally. This approach affects the completeness, timeliness, reliability, and relevance of the information. The information within individual services is sorted alphabetically.

Another example is the combination of a metaphor-based scheme with an audience-based scheme. The way content is organised on a page based on the book metaphor, combined with responsiveness, provides better accessibility and readability on different devices (smartphone, tablet, laptop). A hybrid information organisation scheme can combine audience segmentation with personalisation mechanisms. In the first stage, audience groups are created based on user behaviour, and then information is personalised to the needs of each segment.

6. Conclusions and further research

Information organisation schemes are a fundamental aspect of information architecture, and their correct implementation ensures information quality. The features of schemes presented in the publication enabled to demonstrate their impact on a number of information quality criteria. Table 1 presents a summary of exact and ambiguous schemes with examples of their application and information quality characteristics. In the first group of schemes (alphabetical, chronological and geographical), a set of ten information quality features was distinguished. Among the ambiguous schemes (topical, task-oriented, audience-specific, metaphor-driven and hybrid), nine information quality characteristics were identified. These include timeliness, accessibility, completeness, speed and comprehensibility, which were found to be present in both groups of schemes.

The limitations of the research conducted include the small number of examples, which may have affected the number of characteristics identified. Further detailed analysis of the features on an extended research sample is required, which may result in the discovery of new attributes of information quality. In parallel, verification of already identified characteristics in selected areas is required. One possible direction is the study of the impact of information organisation schemes on the quality of information on the websites of Polish and foreign government portals. Another area of interest is social media, including Portal X, Instagram, and Facebook.

The findings of this research have both practical and theoretical implications. The preliminary results indicate a strong relationship between the use of organisational schemes and information quality. The examples presented demonstrate the widespread use of information organisation schemes on websites. The content provided by these schemes covers a wide range of areas of human life, including education, health, e-commerce, public services, banking and social media (Table 1). The implementation of these schemes is relevant to website users, information producers and providers, as well as website managers.

Table 1.
Information organisation schemes, application examples and identified information quality characteristics

Information Organisation Schemes	Type of Scheme	Application Example	Information Quality Characteristics
Exact Scheme	Alphabetical	– Online encyclopaedia with alphabetical index – An auction site with an alphabetical catalogue and list of products – Information portal with alphabetical list of news categories – Social networking site with alphabetical contact list – Digital library with alphabetical indexes of authors and titles – Educational site with alphabetical topical sections – Online shop with alphabetical product categories – Audio streaming platform with alphabetically arranged music albums – Information service with alphabetical tagging	Consistency Unambiguity Accessibility Completeness Speed
	Chronological	– An information service with chronological information – Online encyclopaedia with a chronological index – Stock exchange service providing statistical data and analysis	Timeliness Comprehensibility Speed Usefulness/Utility Clarity Consistency
	Geographical	– Information service with local news – Platform for local announcements – Tourist portal – Mobile application with new offers and promotions	Accessibility Comprehensibility Usability Speed Verifiability
Ambiguous Scheme	Topical	– An information service with topical sections – A social networking site with topical categories grouped by tags – An educational website with content grouped by subject or topic – An online pharmacy with drug categories grouped by disease	Speed Relevancy Accessibility Credibility
	Task-oriented	– A banking service focused on user tasks – A government site showcasing the delivery of public services – A travel portal providing a step-by-step process for booking holidays	Accessibility Relevancy Completeness Timeliness Credibility
	Audience-specific	– Information portal that allows logged-in users to personalise content – Recommendation system on a streaming platform – Online shop with segmentation of customers based on their shopping preferences – Government service segmenting service recipients – University website with audience segmentation	Relevance Clarity/ Understandability Accessibility

Cont. table 1.

	Metaphor-driven	– An educational portal based on the metaphor of a school – An online shop based on the metaphor of a traditional shop – An information portal based on the metaphor of a book – Wikipedia based on the metaphor of an encyclopaedia	Relevance Accessibility Communicativeness Completeness
	Hybrid	– The government website combining segmentation of service recipients into internal service categories – The university website in a responsive version	Completeness Timeliness Credibility Relevancy Accessibility Speed

Source: own study.

In the practical area, the appropriate selection of information organisation schemes in the web design process will enhance the usability and functionality of websites. It should be remembered that the information organisation system also includes organisational structures that have not been analysed. The analysis conducted and the results obtained have significant implications for the field of information quality management and information architecture (website design). By complementing the research with an analysis of the potential impact of information organisation structures on Web pages on information quality, it will be possible to assess the information organisation subsystem. By extending the research to the other three subsystems of information architecture (labelling, navigation and search), it will be possible to gain a holistic view of the relationship between these elements and information quality. The results obtained from the four subsystems will enable the determination of the potential influence of the various areas of information architecture on information quality.

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