

EVALUATION OF INFORMATION ARCHITECTURE IN UX DESIGN FOR STREAMLINING USER NAVIGATION

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Abstract

Information architecture (IA) is a crucial element of User Experience (UX) design that creates a structure for how people move between spaces in various digital formats, such as websites and applications. This paper looks at IA's potential for facilitating user navigation by organizing, categorizing, and presenting content in navigable ways. The research highlights the importance of understanding context (business goals, technology), content (documents, data, metadata), and the user (needs, tasks, behaviors) to develop more intuitive navigation pathways for the project. Essentially, a considered IA provides more meaning and access to content users are trying to understand, while also lowering cognitive load, improving the experience, and allowing the user to complete tasks effectively. Information architecture IA provides the roadmap or guide for users to navigate knowledge spaces, and this evaluation aims to show the relevance of IA to the success of UX design.

Keywords: Concept of Information Architecture, UX Evaluation Methods, Impact of Information Architecture (IA) on User Navigation, Challenges of IA.

I. INTRODUCTION

IA is an essential component of UX (User Experience) design that relates to how users navigate digital products. IA is about how content is organized, classified, and presented within a system, be it a website, application, or other digital interface that allows the user to easily find and navigate information. IA describes how various elements, such as navigation menu, labels, categories, and search, will design users' experiences with their journey [1]. IA simplifies journeys for users by documenting user flow, organizing content, and defining clear navigation paths, so users can complete the desired task with minimal effort, thus alleviating frustration and cognitive load.

Essentially, if implemented correctly, IA serves as a "map" enabling users to navigate through a product and access content as they need it. When designing IA, we must be careful to consider how content is classified and expressed, the hierarchy of content, the location of key navigation elements, and what content should be labelled. Lacking a positive IA, users may spend longer periods trying to find related content or becoming confused by errors and disinterest.



Evaluating IA in UX design is essential for comprehending how consumers interact with a product and for seeing areas where the navigation flow may be improved. Good IA is key to efficient navigation because it helps to logically organize content and reduces unproductive steps in the user's journey [2]. Studies indicate a strong, clear IA can enhance user satisfaction, increase accessibility, and promote task completion. Given the expectation today for fast, frictionless interactions with products, the relevance of IA in positive user experiences should not be underestimated. This paper prioritizes assessing the value, processes, and efficacy of IA as it relates to UX design. It also identifies how IA streamlines user navigation, contributing to users' overall usability and satisfaction with a digital product.

II. THE CONCEPT OF INFORMATION ARCHITECTURE

In actuality, context, content, and users are all connected to the IA. We can determine what information an architect needs to know to create a useful IA by looking at three fields. These three areas are the main emphasis of this section, which also explains their significance [3]. A similar concept is explained in Figure 1, where it is noted that there is no technology field because IA is not supposed to get involved in technological matters. But we can't overlook technology.



Fig. 1. The Infamous three Circles of Information Architecture Context

Enterprise objectives, finance, governance, society, resources, innovations, and limitations are all referred to as "context." Technically speaking, the context has to do with how the data is created or managed. From the perspective of tasks and activities, the context explains the who, what, and why of the information production or management.

Every website has a certain organizational environment. Every organization has its own purpose, goals, approach, personnel, technology and physical infrastructure, budget, and culture. Each of these elements is specific to its organization and context [4]. This implies that while the IA needs to fit the organization's information, it is also unique. Since not all of the information is recorded on paper, determining the context could be difficult.



A. Content

The word 'content' describes the volume, existing structure, and types of documents or data. Although it is a broad phrase, it refers to the components of the website. Documents, apps, services, schema, and metadata are a few examples.

Knowing what kind of material you have is a smart first step before creating the IA. If you are unsure of the type of content you have, you will likely have issues because the necessary content does not all match together [5]. Nevertheless, on a new project, you cannot control the situation, but you can determine what kind of data will be available after the project. While reviewing the course content, I think about information ecology. For instance, what will be regulated in terms of content ownership, file format, application structure, metadata, size, and the ability to change over time must be addressed.

B. Users

The word 'users' denotes audience, tasks, needs, information-seeking behaviour, and experience. It is essential to comprehend consumers and their demands, as well as their information-seeking behaviours[6]. The organization's management may want a limited number of papers on a given issue, but the organization's researcher may need to locate all pertinent documents, perhaps spending hours in the search.

This knowledge helps in identifying the sorts of information required and selecting the appropriate material for users. Learning materials may be developed by directly enquiring about users' needs and preferences. This may also be accomplished by examining current websites or intranets. In an organization, one may enquire of personnel about the essential piece of knowledge they cannot forgo or examine frequently accessed sites[7]. Comprehending consumers' wants will ensure that the current information fulfils essential requirements, discovers informational deficiencies, facilitates the accessibility of critical material, and prioritizes content initiatives.

Addressing a user's requirements is insufficient. The subsequent stages include ascertaining their use of the information. They may want to acquire information, conduct an in-depth exploration of a subject, refine a large array of goods and things, share it with others, or print it. Before proceeding, customers should review all pertinent information, such as reading the product description in e-commerce sites before adding items to their shopping basket. Similarly, the context in which people access and use data is critical. Any given piece of information may be perused at leisure on a huge screen or accessed on the go with a mobile device.

III. MAJOR USABILITY AND UX EVALUATION METHODS

The crowd may classify the approaches to usability and UX testing into two broad groups: (1) user-based evaluation, and (2) inspection evaluation. Standardized questionnaires and usability testing are among the many user-based assessment techniques used today, and this section of



the study devotes the majority of its time to providing an in-depth explanation of each of these assessments. The following is an overview of alternative inspection and user-based approaches, as shown in Figure 2.



Fig. 2. UX Evaluation Methods

- Card sorting: An increasingly common method for developing and testing taxonomies and navigational structures is card sorting [8]. Open card sorting tasks require users to arrange a representative sample of items into meaningful groups and to give each group a label. Groups in a closed sort are set up in advance. Being analyzed with advanced statistics, the data guides the proper organization of the content.
- Surveys: Surveys may be used in UX assessment to collect evaluations of a user's past interactions with a website or product. You may ask them to think about their whole experience or to zero in on a specific encounter if you want them to. Standardized questions, which will be covered later in this section, are often used in these 985 surveys.
- Analytics: It is possible for software systems to record the way users interact with the website or application. With transactional systems, it is common to find out which steps make users give up, ask for help or finish what they are doing [9]. By analyzing why, a system works poorly, problems can be fixed which may boost conversion rates and how customers regard the company.
- A/B testing: In the usability lab, you can run tests that mimic real-world use and evaluate major design changes, but gathering a big enough sample to catch minor tweaks might be a challenge. The purpose of an A/B test is to compare two different designs by randomly assigning website visitors to either option (A or B).
- Heuristic evaluation: An expert in usability principles conducts a heuristic assessment by comparing an interface to a limited collection of general rules called heuristics. These principles are often formed by studying the reasons behind issues that were found in



usability testing[10]. To find out how effectively an interface follows these principles and where it falls short, evaluators conduct an inspection. Although there are others, this is the most well-known collection of heuristics.

• Practical Usability Rating by Experts (PURE): A variant of the cognitive walkthrough known as the PURE approach involves having several evaluators ideally, those well-versed in both the product domain and human-computer interaction principles break down user tasks and assign each one a difficulty level out of three[11]. At both the task and product levels, PURE scores are generated from the ratings. A diagnostic collection of concerns discovered during the task review and an executive-friendly dashboard are the outputs.

IV. THE IMPACT OF INFORMATION ARCHITECTURE ON USER NAVIGATION

IA is important for how users navigate and interact with a digital design. IA score highly on all of the above dimensions because it organizes, structures and labels content in ways that make information easy to find and use [12]. Since these authors advocate for usability in design processes, making the user's journey simple, makes for an effective user experience.

A. Enhancing Navigational Efficiency

A well-structured IA lowers cognitive load, which enables the user to process information more efficiently. When content is organized logically, the user knows what to expect when looking for information, allows for faster navigation and task completion. A well organized, logical structure is essential to lowering the time spent, and ultimately the effort the user expends when looking for information.

B. Interplay between Information Architecture and Navigation Design

Although IA is where the content is organized and makes sense of, navigation design helps the user move through that organized content. IA and navigation design combine to form a user experience. Good IA is the previous step of developing navigation systems that are user-friendly and natural while allowing the user to traverse and work through the content in a meaningful and easy way.

C. Impact on User Satisfaction and Engagement

According to studies, people are more inclined to interact with and return to websites that have user-friendly navigation and thoughtful IA. One example is the research conducted to test the job pages of LinkedIn and Glassdoor [13]. In all instances, users ranked it more useful, and were more effective at completing tasks, when the pages were properly organized and labelled.

D. Challenges in Information Architecture Affecting Navigation

The IA is poorly planned out, it can create a frustrating experience for users. Issues such as unclear labels, inconsistent approaches to categorizing similar types of content, and deep



hierarchies can inhibit easy navigation, which may lead to users abandoning tasks or leaving for another site. These are valid concerns to address when assessing whether navigation works or does not work.

E. Evaluation Methods for Information Architecture and Navigation

There are many evaluation methods used to evaluate how effective IA is at helping users find their way around a site. For instance, tree testing shows us how easily people can locate pieces of information in a site structure. At its best, this process reveals navigational issues that would be impossible to identify if the evaluation method didn't exist.

V. CHALLENGES IN DESIGNING EFFECTIVE INFORMATION ARCHITECTURE

Creating a usable IA is not just about organizing content, but also about successfully harmonizing user needs, technical capacity, and future feasibility [14]. Below are the biggest hurdles we must face when creating an IA that will allow users to navigate efficiently:

A. Balancing Simplicity with Complexity

The balance between simplicity and complexity is a major IA design difficulty. A basic, minimal navigation system helps users find information quickly and reduces cognitive overload, but an overly simplistic IA can hide information, forcing users to assume or take extra steps[15]. However, a sophisticated IA with multiple categories, deep hierarchies, and redundant pathways might be overwhelming. Designers must decide how much information to show and how to structure navigation to maintain clarity and depth.

B. Aligning Information Architecture with User Mental Models

It's also crucial that IA matches users' mental models, their preconceived notions about information organization. Digital system users anticipate straightforward labels, classifications, and linkages and employ mental models from previous experiences. They may become confused, frustrated, and take longer to complete tasks if the IA structure is different. Due to background, culture, and competence, mental models vary; certain users may prefer certain conventions. User research is helpful, but transferring diverse mental models into an IA framework is difficult.

C. Managing Evolving and Expanding Content

New content features, and services keep websites and apps fresh. An effective IA will offer this feature without disturbing navigation or creating an information silo. Content expansion makes it hard to maintain a logical, user-centred architecture. New sections may create a hierarchy or delete structures, and obsolete material is a worry [16]. An IA with flexibility and scalability allows content to be added without interrupting users or rewriting the IA.



D. Ensuring Accessibility and Inclusivity

Creating IA for all users, especially disabled users, is difficult. Supporting users with assistive technology requires clear navigation pathways, labels that communicate meaning without a visual cue, keyboard accessibility, logical tab orders, and relevant links [17]. Because accessibility features add complexity, it can be difficult to construct inclusive iterations while maintaining design control. Sharing the IA with users requires extensive testing. Making sure it works for disabled and non-disabled users is crucial.

E. Achieving Consistency across Platforms and Devices

In the multi-device environment, customers see content on desktops, mobile devices, tablets, and more. Creating an IA with consistent and predictable navigation across devices is difficult. Screen size, interaction modes (touch vs. mouse), and user contexts (mobile vs. on-the-go) affect IA use. Designers must provide consistent IA across devices and identify the best way to maintain logical linkages between content and navigation structure. Planning and periodic testing are needed to achieve device consistency without compromising usability or performance.

F. Testing and Validating Information Architecture Effectiveness

Evaluating IA serviceability is crucial yet difficult. Card sorting and tree testing are great for testing basic navigation patterns, but they don't replicate true online behaviour. Time on task and unforeseen difficulties may only appear in longitudinal testing. IA design changes as content grows and user expectations change, complicating this task. Testing IA regularly is essential to evaluating its viability, but it takes time and people and isn't always doable in a fast-paced development cycle.

VI. LITERATURE OF REVIEW

In this section, Table I below lists UX Design techniques for streamlining User Navigation that form the basis of the Executive Summary.

Firas Adredah Mansoor (2023) chose a descriptive-analytical technique as a specific way to carry out the work and used organized interviews, surveys, and observations to gather data. SPSS, a statistical program, was used to look at the study's data. Several important results came out of the study. The study showed that the parts of organizational knowledge, as one of the aspects of information design, had a statistically significant effect on each other. The most important feature was found to be information technology, while organizational mindset had the least effect on getting benefits for the end customer [18].

Huda et al., (2023) The user interface and user experience of Bromo Tengger Semeru National Park's current website need to be improved in order to portray the park's features in a more modern and eye-catching manner. This is addressed by using qualitative research techniques in conjunction with the design thinking process as a foundation for the design stages.



Questionnaires and interviews were used for data collecting, and usability testing was done to evaluate how user-friendly the website was[19].

Hiererra et al., (2022) to determine the steps involved in UX design for a mobile application, Augmented Reality based on Gamification for Cultural Heritage Tourism, and to provide the prototype design and the testing results; this study uses the Design Thinking Method to design the prototype and the System Usability Scale (SUS) to identify and validate the testing results; the author formulates two research questions and then clarifies the answers by outlining the steps involved in creating a prototype, which include the empathise, define, ideate, prototype, and testing stages, the author then uses the SUS method to determine the testing results, obtaining an 88.5 in the excellent and acceptable categories[20].

Goel, Tanwar and Sharma (2022). The whole prototype process is carried out using the Usercentred Design (UCD) methodology. The start screen, create an account, and home screen are the three stages of user flow that are also discussed. According to the results of the sample prototype test, the main menu page and its experience scored five points, the app's overall UI/UX scored five points, and the app's design elements scored an average of four out of five[21].

Wijaya et al., (2021) User pleasure in an online art exhibition is significantly impacted by UI and UX design. This study aims to determine how user happiness is impacted by UI and UX design as well as how to create a successful online art gallery UI and UX. Using a literature review methodology, we assessed 27 research articles about UI and UX design in an online art museum. Additionally, we employed a questionnaire-based survey to gauge the System Usability Scale (SUS) of two well-known art galleries. The findings demonstrated that user happiness is significantly impacted by the UI and UX designs of an online art exhibition. However, user pleasure varies depending on the individual; for instance, consumers dislike dark websites[22].

Christensen et al. (2020) aim to gain an understanding of how UX is defined and discussed by both academics and practitioners. While UX design has been defined in several ways by scholars and industry professionals, no one comprehensive definition has emerged as of yet. In what ways will educational institutions train future workers for this vague occupation [23].



Author	Area of Focus	Limitations	Key Findings	Future Scope
Firas Adredah	Impact of	Limited to	Organizational knowledge	Broader application in
Mansoor	organizational	descriptive-	components significantly	different organizational
(2023)	knowledge on	analytical methods;	affect each other; IT had the	contexts; testing across
	information	reliance on SPSS	most influence; mindset the	industries
	design	only for analysis	least	
Huda et al.,	UI/UX redesign	Focused on one	Website needed	Expansion to mobile
(2023)	of a national	website; qualitative	improvement in modern	platform; cross-park
	park's website	approach only	visual appeal and usability;	usability comparisons
	using Design		Design Thinking guided	
	Thinking		effective redesign	
Hiererra et al.,	UX design	Only prototype-	Scored 88.5 on SUS; Design	Broader real-world
(2022)	process of an	based testing;	Thinking successfully	implementation;
	AR-based	limited to SUS for	applied through all five	longitudinal UX tracking
	gamified app for	evaluation	stages (Empathize to Test)	
	cultural tourism			
Goel, Tanwar	Mobile app	Evaluation limited to	UI/UX components scored	Integrating more features
& Sharma	development	3 user flow screens;	high (avg 4–5); excellent	and testing with diverse
(2022)	using User-	lacks broader user	reception for main menu	user groups
	Centered Design	base analysis	and overall app experience	
	(UCD)			
	methodology			
Wijaya et al.,	UI/UX's impact	User satisfaction	UI/UX strongly influences	A/B testing of UI
(2021)	on online art	found subjective;	satisfaction; dark-themed	elements; personalization
	galleries' patron	based on literature	websites often disliked	of themes per user
	satisfaction	review and limited		preference
		survey data		
Christensen et	Definitions and	No unified UX	UX remains vaguely	Develop a standardized
al. (2020)	discourse of UX	definition; lacks	defined; gap in how	UX curriculum; promote
	in academia and	empirical testing or	educational institutions can	academia-industry
	industry	prototyping	train students for evolving	collaboration
			UX roles	

TABLE I.Literature Summary On Evaluation Of Information Architecture In Ux Design

VII. CONCLUSION AND FUTURE SCOPE

The assessment of IA within UX design highlights its importance in improving user engagement and ultimately user satisfaction. IA facilitates user movement throughout the website while thinking about user needs as well as organizational goals, ultimately leading to decreased user frustration and successful task completion. Strong and efficient IA improves the flow of content throughout a site or application, thereby enabling users to find the content they need with little effort, thus enhancing usability overall. The research also highlights that successful IA is an iterative process that requires ongoing monitoring and assessment to move with continually evolving user needs and expectations. Overall, it is a critical investment in IA that will have a positive impact on user experience, higher levels of user engagement, and ultimately a strong brand presence in the digital marketplace.

Future work in IA studies may be directed towards creating adaptable IA frameworks that can



change in response to input and user actions. Integrating IA and machine learning to personalize IA for individual users, based on their preferences and interaction patterns, holds promising potential. Additionally, exploring the role of IA in cutting-edge fields like AR, VR, and voice-activated interface development could expand its impact on user experience. Further studies can investigate IA's influence on accessibility for diverse user groups, ensuring inclusive design practices. Continuous advancements in IA will remain crucial for shaping intuitive and user-friendly digital products.

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