Information Architecture Analysis of Academic Degree College Websites of Sidho-Kanho-Birsha University in Purulia: a study

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Abstract

This study aims to examine and analyse the information organisation strategy, presentation style, labeling and navigation techniques, etc. that are displayed on websites of some selected degree colleges affiliated with Sidho-Kanho-Birsha University and assess those strategies in a methodical manner using different information architectural components. The necessary data for this study have been gathered by utilising web-based survey and observation techniques. Various information architectural components were used to analyse and then tabulate the collected data. The findings of this study show that all the selected (i.e. 19) college websites contain chronological schemes for organising their web content. They all have three sub-components of labeling system: hyperlinks, headings and navigation options. The geographical scheme is not followed by any of the selected websites. This article will help to construct an information architecture model for the websites of academic institutions. It may also assist other researchers working in this area.

Keywords: Information architecture, Information architectural components, Sidho-Kanho-Birsha University, Website information architecture

1. Introduction

In today's information environment, the World Wide Web is certainly the primary source for locating and finding information. It is crucial for users to find information quickly because they feel overwhelmed by the amount of information available on a webpage or website.

Therefore, it is important to organise content for the purpose of providing people with the ability to understand, explain and control things. The main objective of information architecture is to help users retrieve information according to the requirements of users. A good organisation of information assists users in browsing and finding their required information effectively. Hence, an efficient organisation of information is very much needed in an information space (Hamad, 2018). Information architecture (IA) is generally understood to be the art and science of structuring and arranging information environment to maximise their accessibility and usefulness in helping people effectively meet their information demands. The general definition of IA development for websites is the process of organising the structure and content of the website, labeling, categorising and indexing information, and designing a

navigation system to facilitate information searching and browsing (Isa, Noor,& Mehad, 2006).

The present study attempts to examine and analyse the websites of 19 general degree colleges under SKBU. In this connection, website information architectural components have been used to assess how well these colleges are utilising their websites to provide their patrons with quick and easy access to various information, services and facilities.

2. Concept of different website information architectural components

The purpose of this section is to understand and identify different IA components that websites consist of. According to Rosenfeld et al., 2015, the overall website IA is composed of four main systems: organisation, labeling, navigation and searching.

An organisation system is a system or policy that is used to organise information so that it is easy to understand and use. Organisation scheme and organisation structure are two important components of organisation system. An organisation scheme describes the shared properties of content items and influences their logical grouping. The types of relationships between content items and groups are defined by an organisation structure (Morville & Rosenfeld, 2006).

Organisation scheme is of two types: exact organisation scheme and ambiguous or subjective organisation scheme. Exact organisation scheme divide information into sections that are clearly defined and mutually exclusive.. An ambiguous or subjective organisation scheme is influenced by ambiguity of language and organisation. There are four kinds of Ambiguous organisation scheme: topic-wise, task oriented, audience-specific and metaphor-driven scheme (Morville & Rosenfeld, 2006).

Organisation structure is a set of rules and guidelines that play a significant role in website design. It provides the primary ways to easily move around the website. The sub-components of organisation structure are: top-down approach, hierarchical, database-oriented model or bottom-up approach and hypertext model (Morville & Rosenfeld, 2006).

Labeling is an important way of representing content. Labels are assigned for content that represents a chunk of information. There are two types of labels: textual and iconic. Labels can be used as headings to describe chunk of information. Labels can also be occurred as navigation options. Index terms enable more precise searches than traditional full-text searches (Morville & Rosenfeld, 2006).

The navigation system makes it possible to move from one place to another. Developed navigation tools help us to prevent us from getting lost. There are two basic subsystems of navigation system: embedded navigation system and supplemental navigation system. Supplemental navigation system provides complementary ways of finding content, topic or task. A site map provides a broad overview of the website's content and allows for random access to segmented parts of that content (Morville & Rosenfeld, 2006).

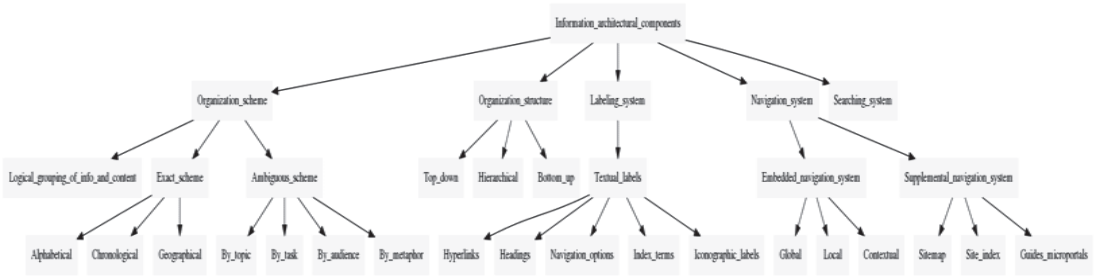

Figure 1: Website information architectural components

Figure 1 represents different components and sub-components of website information architecture. The graph has been prepared by using Graph Visualisation Software (GraphViz).

3. Literature review

Biswas (2019) discussed some basic embodiments for making a library website effective keeping in view the branding and promoting aspects.

Pant (2015) in his study focused on six usability characteristics (i.e. usefulness, efficiency, effectiveness, learnability, satisfaction and accessibility) for presenting an innovative multi-method approach to website usability evaluation. For this purpose, he utilised a standard checklist and questionnaire survey of representative users.

Gullikson, et al. (1999) evaluated the impact of an academic website's information architecture; how information is organised, labeled, and presented, as well as how access and navigation are made easier. Navarro, Sergio and Antonio (2008) looked at two models that are the foundation of websites' formal architecture. They provided a range of software tools that make it possible to see how the website is structured in terms of nodes and links.

Silvis, Bothma and de Beer (2019) provided a framework and heuristics that academic library personnel, web developers, usability specialists may use to evaluate academic library websites and make recommendations for improving their usability.

The related literature of the concerned study reveals that the analysis of website information architecture of general degree college websites through information architectural components is an unstudied field of social science research. The observation, analysis and findings of this study may pave the way for further investigation into this topic.

4. Scope of the study

The study has made an attempt to examine and observe the websites of all 21 general degree colleges affiliated with Sidho-Kanho-Birsha University in Purulia district; but significantly, the link addresses of 2 degree colleges were not working at the time of data collection. As a result, the websites of these 2 colleges have not been included in this study. The rest of the college websites (i.e. 19) are considered for observation and analysis for the study (listed in Table 1).

5. Objectives of the study

In order to accomplish the objective the current study carefully seeks:-

i. To observe the variety of information, services and facilities provided on the websites of concerned colleges

ii. To identify organisation strategy, labeling of content, types of navigation or links, searching techniques etc. presented on the websites

iii. To get ranking of the college websites according to the score earned by them.

6. Methodology of the study

The examination and analysis of textual links, information organisation, presentation style and other factors can be used to assess the importance of webpages or websites. The necessary data for this study have been gathered by utilising web-based survey and observation techniques. Various information architectural components were used to analyse and then tabulate the collected data. The Google search engine has been utilised to gather information from the relevant websites. The process of data collection took place from 26th November to 10th December, 2022.

7. Data analysis and interpretation

All the data collected during the period have been placed in different tables (Table 1 to Table 7) for analysis. Simple statistical calculations are used to analyse the collected data in a systematic way. A ranking table has been prepared to provide the individual score and a clear-cut view of all selected degree college websites under study.

❖ Sidho-Kanho-Birsha University in Purulia

Sidho-Kanho-Birsha University (SKBU) is a public state university located in Purulia district of West Bengal. It was founded on 6th July 2010 by the Sidho-Kanho-Birsha University Act, 2010, which was approved by the West Bengal legislature. The university comprises 31 colleges; among them there are 10 B.Ed. and professional colleges and 21 are degree-granting institutions.

Table 1: List of selected general degree colleges with establishment year and website

Sl No.	Name of Colleges with abbreviation	Year of Establishment	Website Address
1	Achhruram Memorial College (ARMC)	1975	https://amcollege.ac.in/
2	Ananda Marga College (AMC)	1966	http://anandamargacollege.org/
3	Arsha College (AC)	2009	http://arshacollege.org/
4	Bandwan Mahavidyalaya (BM)	2010	http://www.bandwanmahavidyalaya.com/
5	Barabazar Bikram Tudu Memorial College (BBTMC)	2006	http://www.bbtmc.net/
6	Bikramjeet Goswami Memorial College (BGMC)	2009	https://www.bgmcollegejoypur.in/
7	Chitta Mahato Memorial College (CMMC)	2010	https://chittamahatomemorialcollege.ac.in/
8	Government General Degree College (GGDC)	2015	https://ggdcm.ac.in/
9	Jagannath Kishore College (JKC)	1948	https://www.jkcprl.ac.in/home.php

Sl No.	Name of Colleges with abbreviation	Year of Establishment	Website Address
10	Kashipur Michael Madhusudan Mahavidyalaya (KMMM)	2000	https://www.kashipurmmm.org/
11	Kotshila Mahavidyalaya (KM)	2010	https://kotshilamahavidyalaya.ac.in/
12	Manbhum Mahavidyalaya (MM)	1986	https://manbhummv.ac.in/
13	Netaji Subhas Ashram Mahavidyalaya (NSAM)	1985	http://nsamsuisa.org.in/index.aspx
14	Nistarini College (NC)	1958	https://www.nistarinicollege.ac.in/
15	Panchakot Mahavidyalaya (PM)	2000	https://panchakotmv.ac.in/
16	Raghunathpur College (RC)	1961	https://raghunathpurcollege.ac.in/
17	Ramananda Centenary College (RCC)	1971	http://www.ramanandacentenarycollege.in/index.php#ad-image-1
18	Santaldih College (SC)	2008	https://santaldihcollege.org/
19	Sitaram Mahato Memorial College (SMMC)	2013	https://smmcollege.ac.in/

Table 1 reveals the name, abbreviation, year of establishment and website address of the selected general degree colleges under study. The domain name ac.in is common for many college websites.

Table 2: Organisation scheme of general degree college websites (Y=Yes, N=No)

		Information architectural components											
Sl. No.	General degree college websites	Organisation scheme											
		Logical grouping of information and content	Exact scheme			Ambiguous scheme							
			Alphabetical	Chronological	Geographical	By topic	By task	By audience	By metaphor	Total (max.8)		Percentage (%)	
										Y	N	Y	N
1	ARMC	N	Y	Y	N	Y	Y	Y	N	05	03	62.5	37.5
2	AMC	N	N	Y	N	Y	Y	Y	N	04	04	50	50
3	AC	N	N	Y	N	Y	N	Y	N	03	05	37.5	62.5
4	BM	N	N	Y	N	Y	N	Y	N	03	05	37.5	62.5
5	BBTMC	N	N	Y	N	Y	N	Y	N	03	05	37.5	62.5

6	BGMC	N	N	Y	N	Y	Y	Y	N	04	04	50	50
7	CMMC	N	N	Y	N	Y	N	Y	N	03	05	37.5	62.5
8	GGDC	N	Y	Y	N	Y	Y	Y	N	05	03	62.5	37.5
9	JKC	N	N	Y	N	Y	Y	Y	N	04	04	50	50
10	KMMM	N	Y	Y	N	Y	N	Y	N	04	04	50	50
11	KM	N	N	Y	N	Y	Y	Y	N	04	04	50	50
12	MM	N	N	Y	N	Y	Y	Y	N	04	04	50	50
13	NSAM	N	N	Y	N	Y	Y	N	N	03	05	37.5	62.5
14	NC	N	Y	Y	N	Y	Y	N	N	04	04	50	50
15	PM	N	Y	Y	N	Y	Y	Y	N	05	03	62.5	37.5
16	RC	N	Y	Y	N	Y	Y	Y	N	05	03	62.5	37.5
17	RCC	N	N	Y	N	Y	N	Y	N	03	05	37.5	62.5
18	SC	N	Y	Y	N	Y	N	Y	N	04	04	50	50
19	SMMC	N	N	Y	N	Y	N	Y	N	03	05	37.5	62.5
Total (Max. 19)	Y	00	07	19	00	19	11	17	00				
	N	19	12	00	19	00	08	02	19				
Percentage (%)	Y	100	36.84	100	0	100	57.89	89.47	0				
	N	0	63.15	0	100	0	42.10	10.52	100				

Table 2 shows that the information and content of the selected college websites (i.e.19) are not grouped logically by following the criterion organisation scheme. Alphabetical arrangement has been found in the website content of 7 degree colleges out of 19. All the 19 college websites contain chronological scheme for organising their web content in "Notice" or "What's New" section.. The ambiguous scheme "by topic" has been maintained by all selected college websites. The website content of 11 (out of 19) colleges contain task-specific scheme by providing the facility of submitting feedback form, suggestions, complaint, etc.

In some areas of websites, information is arranged according to the needs of a specific user group or audience; for example, the option for user login or admin login can be mentioned. This audience-specific scheme is resided on the websites of 17 colleges. Metaphor-driven scheme has not been followed by any of the selected college websites (Table 2).

Table 3: Organisation structure of general degree college websites (Y=Yes, N=No)

		Information architectural components							
Sr. no.	General degree college websites	Organisation structure							
		Top-down	Hierarchical	Bottom-up	Hypertext model	Total (Max.4)		Percentage (%)	
						Y	N	Y	N
1	ARMC	Y	Y	Y	Y	04	00	100	0
2	AMC	Y	Y	N	Y	03	01	75	25
3	AC	Y	Y	N	N	02	02	50	50
4	BM	Y	Y	N	Y	03	01	75	25
5	BBTMC	Y	Y	Y	N	03	01	75	25
6	BGMC	Y	Y	N	Y	03	01	75	25
7	CMMC	Y	Y	Y	Y	04	00	100	0
8	GGDC	Y	Y	Y	Y	04	00	100	0
9	JKC	Y	Y	N	Y	03	01	75	25
10	KMMM	Y	Y	Y	Y	04	00	100	0
11	KM	Y	Y	N	Y	03	01	75	25
12	MM	Y	Y	Y	Y	04	00	100	0
13	NSAM	Y	Y	Y	Y	04	00	100	0
14	NC	Y	Y	N	Y	03	01	75	25
15	PM	Y	Y	Y	Y	04	00	100	0
16	RC	Y	Y	N	Y	03	01	75	25
17	RCC	Y	Y	Y	Y	04	00	100	0
18	SC	Y	Y	N	Y	03	01	75	25
19	SMMC	Y	Y	N	Y	03	01	75	25
Total (Max.19)	Y	19	19	09	17				
	N	00	00	10	02				
Percentage (%)	Y	100	100	47.36	89.47				
	N	0	0	52.63	10.52				

Table 3 represents the two important sub-components of organisation structure, top-down and hierarchical followed by all degree college websites (i.e. 19) under study. The database model or bottom-up structure has been carried out by 9 (47.36%) college websites. These websites provide the opportunity to search for needed data in staff directory or on another web page.Table 3 also shows the scores attained (out of 4) by each of college websites separately. The websites of 8 colleges attained the highest score 4 (100%) under the component organisation structure.

Table 4: Labeling system of general degree college websites (Y=Yes, N=No)

		Information architectural components								
Sl. No.	**General degree college websites**	**Labeling system**								
		Textual labels								
		Hyperlinks	**Headings**	**Navigation options**	**Index terms**	**Iconographic labels**	**Total (Max.5)**		**Percentage (%)**	
							Y	N	Y	N
1	ARMC	Y	Y	Y	N	N	03	02	60	40
2	AMC	Y	Y	Y	N	N	03	02	60	40
3	AC	Y	Y	Y	N	N	03	02	60	40
4	BM	Y	Y	Y	N	N	03	02	60	40
5	BBTMC	Y	Y	Y	N	N	03	02	60	40
6	BGMC	Y	Y	Y	N	N	03	02	60	40
7	CMMC	Y	Y	Y	N	Y	04	01	80	20
8	GGDC	Y	Y	Y	N	Y	04	01	80	20
9	JKC	Y	Y	Y	N	Y	04	01	80	20
10	KMMM	Y	Y	Y	N	N	03	02	60	40
11	KM	Y	Y	Y	Y	N	04	01	80	20
12	MM	Y	Y	Y	Y	Y	05	00	100	0
13	NSAM	Y	Y	Y	N	Y	04	01	80	20
14	NC	Y	Y	Y	N	Y	04	01	80	20
15	PM	Y	Y	Y	Y	N	04	01	80	20
16	RC	Y	Y	Y	Y	N	04	01	80	20

17	RCC	Y	Y	Y	N	Y	04	01	80	20
18	SC	Y	Y	Y	N	Y	04	01	80	20
19	SMMC	Y	Y	Y	N	N	03	02	60	40
Total (Max.19)	Y	19	19	19	04	08				
	N	00	00	00	15	11				
Percentage (%)	Y	100	100	100	21.05	42.10				
	N	0	0	0	78.94	57.89				

The scores and positions of all college websites under the component labeling system are presented in table 4. It can be seen from this table that all the selected college websites have three sub-components of the labeling system: hyperlinks, headings and navigation options. The presence of index terms has occurred on the websites of only 4 colleges. The websites of 8 colleges (out of 19) contain iconographic labels for organizing their content. Table 4 further represents that most of the college websitesattain a score of 4 out of 5 under the labeling system. The website of MM obtains the top score 5 (100%).

Table 5: Navigation system of general degree college websites (Y=Yes, N=No)

		Information architectural components									
Sl. no.	**General degree college websites**	**Navigation system**									
		Embedded navigation system			**Supplemental navigation system**			**Total (Max.6)**		**Percentage (%)**	
		Global	**Local**	**Contextual**	**Sitemap**	**Site index**	**Guides, micro - portals**	Y	N	Y	N
1	ARMC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
2	AMC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
3	AC	Y	Y	N	N	N	Y	03	03	50	50
4	BM	Y	N	Y	N	N	Y	03	03	50	50
5	BBTMC	Y	Y	N	N	N	Y	03	03	50	50

6	BGMC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
7	CMMC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
8	GGDC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
9	JKC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
10	KMMM	Y	Y	Y	N	N	Y	04	02	66.66	33.33
11	KM	Y	Y	Y	N	N	Y	04	02	66.66	33.33
12	MM	Y	Y	Y	N	N	Y	04	02	66.66	33.33
13	NSAM	Y	Y	Y	N	N	Y	04	02	66.66	33.33
14	NC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
15	PM	Y	Y	Y	N	N	Y	04	02	66.66	33.33
16	RC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
17	RCC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
18	SC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
19	SMMC	Y	Y	Y	N	N	Y	04	02	66.66	33.33
Total (Max.19)	Y	19	18	17	00	00	19				
	N	00	01	02	19	19	00				
Percentage (%)	Y	100	94.73	89.47	0	0	100				
	N	0	5.26	10.52	100	100	0				

Table 5 denotes the scene of each website under study according to navigation system. It is viewed from this table that global navigation system is located on the websites of all (i.e. 19) colleges. Local navigation system contained in the websites of all colleges except BM.

Table 6: Searching system of general degree college websites (Y=Yes, N=No)

		Information architectural components				
Sl. No.	**General degree college websites**	**Searching system**	**Total (Max.1)**		**Percentage (%)**	
			Y	N	Y	N
1	ARMC	N	00	01	0	100
2	AMC	N	00	01	0	100
3	AC	N	00	01	0	100
4	BM	N	00	01	0	100
5	BBTMC	N	00	01	0	100
6	BGMC	N	00	01	0	100
7	CMMC	N	00	01	0	100
8	GGDC	N	00	01	0	100
9	JKC	N	00	01	0	100
10	KMMM	N	00	01	0	100
11	KM	Y	01	00	100	0
12	MM	Y	01	00	100	0
13	NSAM	N	00	01	0	100
14	NC	N	00	01	0	100
15	PM	Y	01	00	100	0
16	RC	Y	01	00	100	0
17	RCC	N	00	01	0	100
18	SC	N	00	01	0	100
19	SMMC	Y	01	00	100	0
Total (Max. 19)	Y	05				
	N	14				
Percentage (%)	Y	26.31				
	N	73.68				

Table 6 clears out the presence of searching system in the websites of the chosen degree colleges under study. This table shows that only 5 (out of 19) college websites provide searching system for users.

Table 7: Ranking of general degree college websites under different information architectural components

Sl No.	General degree college websites	Particulars						
		Information architectural components of websites						
		Organisation scheme (Max. score 8)	Organisation structure (Max. score 4)	Labeling system (Max. score 5)	Navigation system (Max. score 6)	Searching system (Max. score 1)	Total (Max. score 24)	Rank
1	MM	04	04	05	04	01	18	01
2	PM	05	04	04	04	01	18	01
3	GGDC	05	04	04	04	00	17	02
4	RC	05	03	04	04	01	17	02
5	ARMC	05	04	03	04	00	16	03
6	KM	04	03	04	04	01	16	03
7	CMMC	03	04	04	04	00	15	04
8	JKC	04	03	04	04	00	15	04
9	KMMM	04	04	03	04	00	15	04
10	NSAM	03	04	04	04	00	15	04
11	NC	04	03	04	04	00	15	04
12	RCC	03	04	04	04	00	15	04
13	SC	04	03	04	04	00	15	04
14	AMC	04	03	03	04	00	14	05
15	BGMC	04	03	03	04	00	14	05
16	SMMC	03	03	03	04	01	14	05
17	BM	03	03	03	03	00	12	06
18	BBTMC	03	03	03	03	00	12	06
19	AC	03	02	03	03	00	11	07

Table 7 highlights the list of rankings of all selected college websites (i.e.19) according to the score attained by the websites under different information architectural components. It has been observed that the highest rank is occupied by two college websites, MM and PM with a score of 18 out of the maximum score of 24.

8. Findings of the study

The major findings of the study are summarized below:

- The information and content of the selected college websites (i.e.19) are not grouped logically under the criterion organisation scheme;
- Alphabetical arrangement has been found in the website content of 7 degree colleges out of 19. All the 19 college websites contain chronological scheme for organising their web content in "Notice" or "What's New" section.
- The website content of 11 (out of 19) colleges contain task-specific scheme by providing the facility of submitting feedback form, suggestions, complaint, etc.
- The audience-specific scheme is resided on the websites of 17 colleges.
- The websites of 8 colleges (out of 19) contain iconographic labels for organising their content;
- Global navigation system is located on the websites of all (i.e. 19) colleges. Local navigation system contained in the websites of all colleges except BM;
- Only 5 (out of 19) college websites provide searching system for users;
- The highest rank is occupied by two college websites, MM and PM with a score of 18 out of the maximum score of 24 under different information architectural components. The website of AC has been placed at last position because it obtains the lowest score 11 out of 24.

9. Suggestions

Some suggestions for college websites are as follows:-

a) Logical grouping: information or content should be grouped logically in the menu label or any navigation link. Broken links should be avoided.

b) An alphabetical scheme should be there for arranging different contents.

c) Content must be arranged according to the appropriate topic or subject. There should be options for submitting feedback and suggestions, and information should be categorised according to the requirements of different user groups: students, staff, parents, etc.

d) Top-down structure is needed to maintain the hierarchy. The bottom-upstructure will be resided in staff/student, report directory for easy searching.

e) Hyperlinks should be there for connecting a theme or object to another.

f) Top navigation bar and the link of home page should appear on every page of a site. Local navigation system is needed to represent local and important content. In order to explore more on a topic contextual navigation must be there.

g) Searching system with a common search space is necessary for keyword searching.

10. Conclusion

Every organisation or institution is required to pay attention to the World Wide Web as part of its public communication because it has developed into a significant medium for communicating and providing information (Burford, 2010). The process of information design and its ultimate result are both used to describe the term "web information architecture" (Morville & Rosenfeld, 2006). The present study has made an endeavour to observe, analyse and evaluate the existing information architecture of some selected degree college websites. For this purpose, several components of website information architecture have been utilised in this study by consulting related literature extensively. In the concluding line, the study recommends that such evaluations should be conducted frequently in order to keep the college website current with important and relevant information architectural components and meet the needs of its patrons. The study is expected to serve as an example for further research in the area of website evaluation.

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