Performance analysis of Indian Central university websites established before 2004: A critical study and proposed guidelines for efficient design

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Abstract: *Information has been identified as one of the pivotal resources needed for bridging the gap between institutions of higher learning and users. However it is very important to keep the information up-to-date in order to give appropriate information to users. The higher education institutions need to provide information for prospective students, current students, parents of students, Faculty and Alumni. They often need to include reams of information in a way that makes everything easy to explore which is a great challenge to accept. A key feature of the ongoing growth of Worldwide Web over the past decade has seen proliferation of web portals and mobile applications that focus on supporting education. The purpose of this research work is to highlight some points which will show the importance of higher education websites. The paper will be helpful for the higher authorities and the web developers to analyze the significance of the website of higher education institutes and its usability.*

Keywords:
Central university, Websites design, performance, higher education, load time

Introduction:

Now-a-days the need for higher education institutions to a have a reliable, effective and attractive web presence is increasing as online technology is becoming an important part of the educational process[1]. The higher education institutions play a vital role in the development of a society while higher education websites play a vital role in bridging the gap between the institution and stake-holders[2]. Institutions of higher learning websites provide a platform for efficient communication and access to public information. These websites are a useful tool to enhance transparency as they enable different stakeholders to interact with different institution of higher learning[3].

A prospective student or a stake holder explores the website of a university or any institution of higher learning to get information about university's vision, mission and other academic or research related information. The information available on university websites is not only useful for internal users rather the information is very important for external users as well[2][4]. The internal user like a student, faculty or employee who are physically well and those are visually impaired can get information about their daily activities, proformas, university news and other miscellaneous information[4]. Similarly, an external user can get detailed information about the university, courses available, research domains, award & achievements, upcoming events and other related information from the university website the design of the website should be so pleasing that the visitor may attracted by the way the information is being presented with ease of menu item identifiers and search filters provided within the container webpage.[5,6,7]

In India, UGC (University Grants Commission) is a central body which is directly monitoring, managing and preparing institutions of higher learning. The UGC has divided the institutions of higher learning in different categories and the same is given ;

Central Universities
Institutions of National Importance
State Universities
State Legislature Universities
Deemed Universities
Private Universities

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Central universities or Union universities are established by an Act of Parliament and are under the purview of the Department of Higher Education in the Union Human Resource Development Ministry[8]. All the central universities are established and funded by the Central Government of India. In general, universities in India are recognised by the University Grants Commission (UGC), which draws its power from the University Grants Commission Act, 1956. In addition, central universities are covered by the Central Universities Act, 2009, which regulates their purpose, powers governance etc. However, it would not be surprising to see different central universities having different nomenclature of

websites while providing information to different internal and external users/stakeholders. Keeping in mind the similarities in working, governing, managing, monitoring and controlling of central universities, a similar nomenclature of website for all central universities can work as a helping hand in enhancing the information penetration to the masses.

As per the data available on UGC website the existing list of central universities is given below[9]:

S.No.	Name of Central University	Year Established
1.	Rajiv Gandhi University, Itanagar	1985(Central w.e.f. 2007)
2.	Assam University, Silchar-788011	1994
3.	Tezpur University, Tezpur-784028	1994
4.	Central University of South Bihar, Patna-1.	2009
5.	Mahatma Gandhi Central University, North Bihar	2014
6.	Nalanda University, Rajgir, Dt. Nalanda, Bihar	2010
7.	Guru Ghasidas Vishwavidyalaya, Bilaspur-495009	1983(Central w.e.f. 2009)
8.	Central University of Gujarat, Gandhinagar-382007	2009
9.	Central University of Haryana,	2009
10.	Central University of Himachal Pradesh	2009
11.	Central University of Jammu & Kashmir, Saderbal, Srinagar-190006	
12.	Central University of Jammu, Jammu.	2009
13.	Central University of Jharkahnd, Ranchi-9,	2009
14.	Central University of Karnataka, Gulbarga-585106	2009
15.	Central University of Kerala, Trivandrum-695017,	2009
16.	Dr. Harisingh Gour Vishwavidyalaya, Sagar-470003.	1946(Central w.e.f. 2009)
17.	The Indira Gandhi National Tribal University, Amarkantak, Madhya Pradesh.	2008
18.	Mahatma Gandhi Antarrashtriya Hindi Vishwavidyalaya, Wardha.	1997
19.	Central Agricultural University, Imphal-795004.	1993
20.	Manipur University, Imphal-795003.	1980
21.	North Eastern Hill University, Shillong-793022.	1973
22.	Mizoram University, Aizawal-796012.	2000
23.	Nagaland University, Nagaland-797001.	1994
24.	Central University of Orissa, Camp Office 28/6, Betin Pal Road Extn. PO Kalighat, Kolkata-700026.	2009
25.	Central University of Punjab, PO Box 55, Bathinda, Punjab-151001.	2009
26.	Central University of Rajasthan, Main Building, Secretariat, Jaipur, Rajasthan-302005	2009
27.	Sikkim University, Gangtok	2007
28.	Central University of Tamil Nadu, Tiruvarur-610001, Tamil Nadu.	2009

29.	Indian Maritime University, Chennai-600119.	2008
30.	Hyderabad University, Hyderabad-500046.	1974
31.	Maulana Azad National Urdu University, Hyderabad-500032.	1998
32.	The English and foreign Languages University, Hyderabad-500007.	1973(Central w.e.f. 2007)
33.	Tripura University, Agartala-799130.	1987
34.	Aligarh Muslim University, Aligarh-202002.	1920
35.	University of Allahabad, Allahabad-211002	1887
36.	Babasaheb Bhimrao Ambedkar University, Lucknow-226025.	1996
37.	Banaras Hindu University, Varanasi-221005.	1916
38.	Rajiv Gandhi National Aviation Universrity, Raibareli.	2013
39.	Hemwati Nandan Bahuguna Garhwal University, Srinagar-246174	1973(Central w.e.f. 2009)
40.	Vishwa Bharati University, Shantiniketan-731235.	1951
41.	Delhi University, Delhi-110007	1922
42.	Indira Gandhi National Open University, New Delhi-110068.	1985
43.	Jamia Millia Islamia University, New Delhi-110025.	1988
44.	Jawaharlal Nehru University, New Delhi-110067.	1969
45.	South Asian University, New Delhi-110067.	2010
46.	Pondicherry University, Pondicherry-605014.	1985

Importance of common template in websites of central universities

The higher education websites need a great attention in terms of its design and development. The website must appeal to the university's interests, which are primarily the sources of presenting their objectives to the end-user in general and those interested in seeking information in particular[2,3,4,7,10] All the components which are plugged into the different web pages of any website needs smooth and unambiguous flow in its constituent components so that more and exact information can be located and then retrieved in less time[11,12]. The following points justify the importance of university websites in penetrating to masses by providing appropriate information to all end-users and stake holders.

- ✓ Every institution of higher learning requires to develop and publish its all information in the form of a website on internet.
- ✓ The website of an academic institution helps in attracting new prospective students and helps in monitoring and management of academic data related to all stake holders.

- ✓ Nowadays websites play the most important and motivational role to forecast better prospects of any educational institute.
- ✓ The websites helps an institution to provide accessibility to the academic and research activities carried out across the globe.
- ✓ Websites of higher education institutions helps the administration of the university in monitoring, managing the academic and research activities of the university in general and scientific community in particular.
- ✓ The websites of higher education also helps in ensuring quality of education in the university.
- ✓ The website of higher education helps the regulatory authorities in monitoring and managing academic and research activities to ensure quality of the education system.

Every central university needs to promote usage of online services for managing and monitoring of all activities in an university. The website of an university is a platform which can help in achieving this target. This will result in implementing governance within an university online.

Guidelines for designing websites for central universities [13,14,15]

Preparing the details of website by seeking answers for the following questions

1) Who is the targeted audience? Identify the audience clearly which will help the website designed to start the design based on the requirement of the audience. For example in case of a student the content for the website needs to developed keeping in mind the needs of the student.
2) How important is the content for the identified audience?
3) Can university create the content or does the university need to outsource content creation.
4) Does the university publish quality content?
5) Are the targeted audience able to find the content they are looking for?

Basic design guidelines once the content is ready are given below:

i) University should be identified on every page of the website.
ii) Images displayed on websites should reflect university values and priorities.
iii) The content available on About Us page should increase publicity and innovative.
iv) Strengths and Achievements should be highlighted on the website.
v) The website interface must be easy to use. Users should be able to view a list of majors and programs
vi) Clearly show the application deadlines.
vii) Provide detailed information about the process of submission of application process online.
viii) Keep track of the main tasks of audience.
ix) Prepare university website in order to enhance hit ratio in search results.
x) Try to make your website precise, concise and simple.

University should be identified on every page of the website:

The name of your university should be clearly visible on every page of the website. Every user will not necessarily start accessing from the index page whiles as users may access the website from any page. Therefore, visibility of university name should be displayed on every page of the website. The visibility of university name on each and every page of the university will enable a user to easily identify the university he/she is looking for.

Images displayed on websites should reflect university values and priorities:

Users generally make judgements about an institution based on the images that are displayed on a web page or a website. Therefore, it is very important to select images which need to be displayed on a website.

The content available on "About Us" page should increase publicity and innovative:

The "About Us" page given an overview of the University's vision, mission and profile. This page generally becomes a deciding factor for a user to see whether the website fulfils the user requirements. The contents on this page should be information and should give summary of the university.

Strengths and Achievements should be highlighted on the website:

The first information that a user wants to know about a university is about the speciality of a university or what are the achievements of a university. In general no user wants to read the full text pages of a university rather they are interested in summarized explanations, figures, statistics, rankings and awards.

The website interface must be easy to use:

Users should be able to view and list programs available and other related information easily. Website of any university should be easy to interact with. The user interface designed should be brief, precise and concise.

Clearly show the application deadlines:

The online activities in relation to admission should clearly display the deadlines in order to ensure timely submission of application forms.

Provide detailed information about the process of submission of application process online:

Information about the process of submission should be given to facilitate end user in a sequence of step to improve understandability.

Keep track of the main tasks of audience.

A component of a website should keep track of the main tasks that are frequently accessed by different users. This will help in preparing modifications of a website from the user perspective.

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Results and Discussions:

After analysis all the websites of central universities and other higher learning institutions a list of basic requirements was prepared which needs to be included in an educational institute of higher learning. the list of attributes which needs to be included as the bare minimum requirement for an higher learning institution is given in table 1.1.

Table 1.1: List of basic required attributes of an educational institute website

External User: (prospective student/faculty or parents)
Prospects;
Courses offered;
Mission & Vision of the university;
Faculty details and contact information;
Facilities available;
Scholarships/fellowships/financial aids;
Placement record;
Contact (city information, weather, transportation);
Residential facilities (Hostel Information);
Library (online resources and catalogue);
Alumni;
Job openings;
University Acts and Statutes;
Transparency Portal;
Faculty research information;
Information about Support services (Medical, transportation, residence, counselling, schools, child care etc);
Faculty contact information;
Online registration (UMS);
Student clubs;
Information about student organizations;
Help, Disability Support, present on Social networking.
Internal User: (student/employee/staff)
University News, Orders, Events, Notifications, Calendar;
Employee corner;
Transparency Portal;
Library catalogue (issue and return of books online)
Academic calendar with list of holidays, Important dates;
Different activities of University;
Grievance redressal information system;
Facilities (infrastructure/sports/ etc);
Feedback;
Important links (UGC, Anti-ragging, sexual harassment, free resources, online study material, research information etc);
Common resources for both internal and external user:
Search facility (web search/ internal search);
How to reach;
Sitemap;
Loading time;
Look & feel;
Language (Engilish/Hindi/ one optional language)
Gallery;
Frequent updation.
Visitor Counter
RTI
Transparency Portal
Digital repository

In order to develop a template with uniform guidelines for developing websites for central universities the basic architecture is given in figure 1.
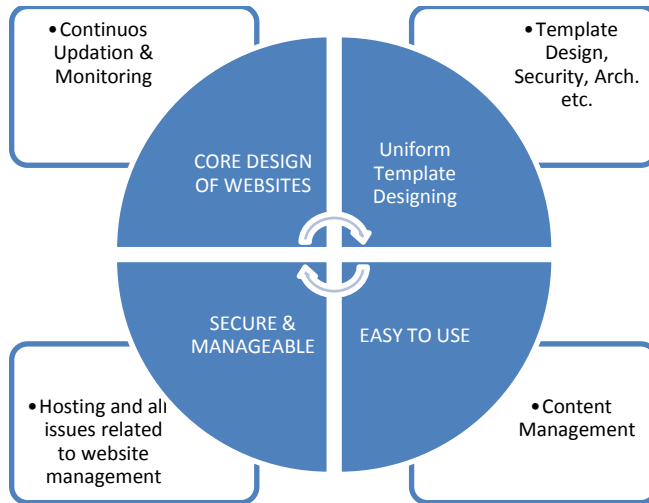

Figure 1: Basic architecture for designing and development of educational websites.

This research work is focused on identifying a representative sample of websites of different Central Universities in two groups: first the group of central universities established prior to 2004 and the second group corresponds of Central Universities established after 2004. All the websites of central universities established prior to 2004 were analysed and performance of the websites was checked using pingdom tool online on https://tools.pingdom.com/ website[16]. The results retrieved using the pingdom tool are given in table 1.2 below.

The details of the results is given below in table 1.2

Table 1.2: Performance of Central University websites established prior to 2004				
	Grade	Request	Load Time	Page Size
www.rgu.ac.in	87	23	1.48sec	229.9kb
www.aus.ac.in	82	43	4.95sec	1.3mb
www.tezu.ernet.in	81	64	6.02sec	1.0mb
www.ggu.ac.in	71	90	7.27sec	7.7mb
www.**hindi**vishwa.org	86	49	3.21	2.5mb
www.cau.ac.in	92	107	60.00	53.2mb
manipuruniv.ac.in	93	38	2.60	1.2mb
www.nehu.ac.in	81	10	8.87	132.9kbs
www.**mzu**.edu.in	73	85	8.55	1.7mb
www.iu**nagaland**.edu.in	82	35	2.72	1.1mb
www.uohyd.ac.in	78	60	8.31	9.9mb
www.manuu.ac.in	80	64	7.17	3.19mb
www.**tripurauniv**.in	90	6	1.83	47.5kb
www.**amu**.ac.in	70	93	15.78	3.3mb
www.alld**univ**.ac.in	79	58	10.63	6.5mb
www.**bbau**.ac.in	68	59	6.80	1.7mb
www.**bhu**.ac.in	86	40	7.17	1.2mb
www.**visvabharati**.ac.in	78	95	7.59	11.6mb

www.**du**.ac.in	72	26	6.90	1.4mb
www.**ignou**.ac.in	76	93	3.57	1.0mb
jmi.ac.in	87	87	5.32	663.8kb
www.**jnu**.ac.in	80	39	4.96	2.9mb
www.pondiuni.edu.in	78	106	10.18	13.0mb

Conclusion:

Universities all across the globe face large organizational challenges, including limited budgets and dauntingly large sites that can be hard to manage. But these guidelines are all things universities can assess and improve. The "Best" is always the enemy of "Good", therefore, continuous improvement is the bottom line for any effective website. Keeping in mind the youth population in India it is very important for all central universities to follow a common template in order to increase uniformity of the information available for prospective students. Students generally observe information available on university websites for facilitating them in decision making regarding admissions. All the central universities established prior to 2004 have different websites with different user interfaces. The need of the hour is to establish a basic template which will be common to all the central universities which will result in uniformity in the information available on central universities websites in India. However, the design of central university template, website-homepages and website-pages need to be evaluated periodically using established yardstick which will help to improve website according to the end-user's requirements.

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