

University Websites: A Comparative Study of Universities in Karnataka

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ABSTRACT

Government websites provide a platform for efficient communication and access to public information. They are a useful tool to transparency and democracy because they enable stakeholders to easily interact with their service providers. The paper proposes to evaluate the websites of Universities in Karnataka State in terms of their compliance to the W3C guidelines, Guidelines for Government of India, and Proactive Disclosures according to Section IV of the Right to Information Act, 2005 of Government of India. Student-centric metrics are also introduced for evaluation. International guidelines, Government of India and RTI guidelines are essential guidelines for information dissemination to stakeholders of the Universities in Karnataka and hence are considered. For the purpose of investigation, the Universities in Karnataka are classified into five categories: Central Government Institutions, Traditional State Universities which are more than ten years old, Traditional State Universities which are less than ten years old, State Mono discipline Universities, and Private Universities. The classification is based on the scope, geographical area spanned, and the age of the University. The State of Karnataka is chosen for analysis as most of the classifications suggested are available in the State. It was found that Central Institutes and Private Universities adhere more to these guidelines than State Universities.

General Terms

e-governance, Website comparison, Right to Information

Keywords

W3C, RTI, operability, Government of India guidelines

1. INTRODUCTION

UNDP refers to e-governance as the multi-faceted use of ICT for improving collective governance that includes making delivery of services more accessible, efficient, and responsive [1]. It is also the process of empowering the human race [2]. e-governance procedures automatically guarantees data or content in digital form, making them more amenable for future knowledge-management or data-mining exercises [2]. Generally there are four levels or stages of development of e-government services: 1.publishing 2.interacting 3. transacting, and 4. transforming [2, 3]. ‘Publishing’ means to provide information to the citizens, ‘interaction’ means to have a two-way communication between the citizen and the Government electronically, ‘transaction’ means to make online transactions between the Government and the citizen or vice versa, and ‘transform’ is to transform business paradigms.

Information publication is the basic activity of e-governance. In order to facilitate easy information access to its citizens, the Federal Government of India (GoI) enacted the Right to Information Act in 2005 which is called RTI Act, 2005 [4]. The act mandates timely response to citizens’ requests for

government information. The act also directs all the governmental and government-supported organizations to publish information about the organization such as functions and duties of organization and the employees, rules, regulations, instruction manuals held in its control, directories of its employees, budget facilities available, execution of programs of the Organization and several such information about the Organization. Bangladesh introduced the RTI in 2009 [5]. The RTI Act ensures transparency and accountability in public or private organizations financed by government or foreign funding increases; it ensures that citizens are empowered, that corruption is decreased, that democracy is strengthened, and that good governance is promoted [5]

One of the important methods of publishing the data about an Organization is through the Organization’s official website. They are a useful tool to transparency and democracy because they enable citizens to easily interact with their governments [6, 7]. The advantages from availability of information can help citizens by substantially improving the following aspects of public service delivery: Planning, Execution, Monitoring, and Evaluation [8]. Since social disparity is very high in India, website design needs careful observation. This implies that the interface must be usable by rich or poor, disabled or elderly people, and understandable by low literacy or non-native language people, etc., [3]

Till this time, many works had been undertaken by various groups to analyze the websites of government organization using various parameters. 1667 government websites in 198 nations were evaluated using 18 measures that focus on the amount of information available and the extent of interaction with users [9], 17 websites of the Nepal government were evaluated according to four criteria: transparency, interactivity, accessibility, and suitability [10], South African Police Service websites were evaluated focusing on content, architecture, technology, style, and service delivery [11], and Municipal web pages in the Nordic countries were evaluated for process of innovation, with the objective of identifying factors that contribute to innovative, citizen-oriented procedures [7].

Here, fifteen Universities in Karnataka are considered for evaluation. Table 1 lists the universities, the year of establishment, website address, and type of the university. The State of Karnataka’s population is 61 million, the literacy rate is 75.60% (Male 82.85% and females 68.13%), the urban population is 33.98%, the Gross Enrollment Ratio in Higher Education is 12.2% and the official language is Kannada. Fifteen universities are grouped into five categories Central Government Institutions (ci), Traditional State Universities which are more than ten years old (sou), Traditional State Universities which are less than ten years old (snu), State Mono Universities (mu) and Private Universities (pu) based

on the scope, geographical area spanned by the university and the age of the university. Traditional Universities offer courses in Science, Social Science, and Humanities. Mono Universities offer courses in one discipline, such as Engineering, Medicine or Agriculture. State Universities are governed by the State of Karnataka whereas Central Institutes are governed by the Federal Government of India (Central Government of India). The new Universities are carved out of the existing Universities with an intention to reduce the burden of the existing universities and to increase the efficiency of university administration. The Mono Universities are established to handle a particular discipline. Private participants are allowed to establish private universities and they have been given autonomy in administration and academic matters. Education is in the concurrent list of the Constitution of India. Both State Legislature as well as the Parliament has powers to enact laws if the subject is in the concurrent list. The State of Karnataka is chosen for analysis as institutes under the classifications suggested are available for analysis.

their identity; ‘Building Confidence’, that is content copyright, content hyperlink, terms and conditions and privacy policy should be stated clearly; ‘Scope of content’, that is Organizations/Departments should compile their own list of contents/sub-contents which they feel should be displayed to their intended audience; ‘Quality of content’, that is the web content should be meaningful and presentable, and ‘Design’, where the website design should be visually appealing and enhance the user experience by presenting the content in a form that is easily understandable, navigable and searchable.

Among the RTI guidelines, metrics such as the availability of particulars of the Organization, function and duties of the Organization, rules and regulations, instruction manuals of the Organization, directories of employees/officials, monthly remuneration of employees, budget allocation, and the names and designations of public information officials are verified.

Table 1: List of Universities or Institutes in Karnataka Considered for the study

University/Institution	Estd.	Website	Univ. Type
Indian Institute Of Management Bangalore [16]	1973	www.iimb.ernet.in	Central Institutes
Indian Institute of Science [17]	1909	www.iisc.ernet.in	Central Institutes
National Law School of India University [18]	1987	www.nls.ac.in	Central Institutes
Bangalore University [19]	1964	www.bangaloreuniversity.ac.in	Old Univ.
University of Mysore [20]	1916	www.uni-mysore.ac.in	Old Univ.
Mangalore University [21]	1980	www.mangaloreuniversity.ac.in	Old Univ.
Gulbarga University [22]	1980	www.gulbargauniversity.kar.nic.in	Old Univ.
Karnataka University [23]	1950	www.kud.ac.in	Old Univ.
Tumkur University [24]	2004	www.tumkuruniversity.in	New Univ.
Karnataka State Women's University [25]	2003	www.kswu.ac.in	New Univ.
Visvesvaraya Technological University [26]	1998	www.vtu.ac.in	Mono Univ.
Rajiv Gandhi University of Health Sciences [27]	1996	www.rguhs.ac.in	Mono Univ.
University of Agricultural Sciences [28]	1964	www.uasbangalore.edu.in	Mono Univ.
Christ University [29]	2008	www.christuniversity.in	Private Univ.
Manipal University [30]	1993	www.manipal.edu	Private Univ.

The website is first looked at to verify whether the Universities in Karnataka are following the guidelines of the RTI Act, 2005. It is also to be verified whether the Universities follow the international guidelines for designing the website, W3C [12], which lays down four broad principles namely, perceivable, operable, understandable, and robust. Government of India [13] specifies the guidelines for the primary content, and secondary content. Evaluation is also carried out on student-centric information provided by the Universities or Institutes.

Among the W3C guidelines, the metrics -- perceivable, operable, understandable, and robust were used. ‘Perceivable’ means that information and user interface components must be presentable to users in ways they can perceive; ‘operable’ means that user interface components and navigation must be operable; ‘understandable’ means information and the operation of user interface must be intelligible, and ‘robust’ means contents must be robust enough that it can be interpreted reliably by a variety of user agents, including existing technologies [12].

The Government of India identifiers are the following: both public and private sector Organizations should display their official logo on the Homepage of the website to emphasize

Among student-centric metrics, the availability of Course syllabi, examination time-table, calendar of events, fee structure, seat matrix, eligibility criteria, results, information on Alumni, seminars/Workshops/Conferences details, research areas, scholarships, Endowments, and information on convocation are used for evaluation.

In the present analysis, in total, 28 metrics are considered for evaluation of the University websites, 4 metrics of W3C guidelines, 5 metrics of Government of India guidelines, 6 metrics of RTI, and 13 metrics of student-centric guidelines. Equal weightage is given to RTI guidelines, W3C guidelines, the government of India guidelines and student-centric information. Student centric metrics are introduced because none of the other guidelines lay any guidelines on student-centric information. Table 2 describes the groups and metrics used for investigation.

Table 2: Groups and Metrics considered for the work

Group	Count	Parameters
W3C	4	perceivable (W3C ₁), operable (W3C ₂), understandable (W3C ₃), robust (W3C ₄)
GOI	5	Organization identifiers (GoI ₁), Copyright information (GoI ₂), scope of content (GoI ₃), quality of content (GoI ₄), design parameters (GoI ₅)
RTI	6	particulars of organization, function and duties of organization (RTI ₁), rules, regulations, instruction manuals of organizations (RTI ₂), directories of employees/officials (RTI ₃), monthly remuneration of employees (RTI ₄), budget allocation (RTI ₅), and name and designation of public information officials (RTI ₆)
STU	13	Course syllabi (STU ₁), Exam time-table (STU ₂), Calendar of events (STU ₃), Fee Structure (STU ₄), Seat Matrix (STU ₅), Eligibility Criteria (STU ₆), Results (STU ₇), Information on Alumni (STU ₈), Seminars/Workshops/Conferences details (STU ₉), Research Area (STU ₁₀), Scholarship information (STU ₁₁), Endowments (STU ₁₂), Information on convocation (STU ₁₃)

The survey was conducted between January 2012 and December, 2012. The survey was conducted manually checking for compliances for a guideline. A website was visited several times during the survey to look for information and evaluation. For each metrics of a guideline a score between 0 and 1 was assigned. A total score was calculated for each guideline. The total score was normalized to 4 for each guideline to assign equal weightage to all guidelines. The relative performance of Universities/Institutes was thus evaluated.

2. METHOD

Let $w_{g_i}^x$ be the weightage assigned to a University, x, for a the i th metrics of a guideline.g. Let W_g^x be the total weightage assigned to a x, for all the metrics of a guidelines g. The following can be defined:

Weightage for W3C guideline as:

$$W_{W3C}^x = \sum_{i=1}^4 w_{W3C_i}^x \quad (1)$$

Weightage for GOI guideline as:

$$W_{GOI}^x = \sum_{i=1}^5 w_{GOI_i}^x \quad (2)$$

Weightage for RTI guideline as:

$$W_{RTI}^x = \sum_{i=1}^6 w_{RTI_i}^x \quad (3)$$

Weightage for STU guideline as:

$$W_{STU}^x = \sum_{i=1}^{13} w_{STU_i}^x \quad (4)$$

If the scores assigned to each of the metrics is between 0 and 1, 4 metrics are considered for W3C, 5 for GOI, 6 for RTI, and 13 for STU. For comparison of various guidelines, the total score has to be brought and normalized to the same scale. Assuming that k is the number of metrics used in a guideline g, for a university,x. The normalized score is computed as follows:

$$W_g^x = \frac{4}{k} * W_g^x \quad (5)$$

This normalized score is used for comparison.

Let μ_g be the mean weightage of all universities for a guideline g. We define mean for W3C, GoI, RTI, and STU as μ_{W3C} , μ_{GOI} , μ_{RTI} , and μ_{STU} respectively. Let σ_{W3C} , σ_{GOI} , σ_{RTI} , and σ_{STU} be standard deviation of W3C, GoI, RTI and STU respectively. Grade r_g for a guideline g where $g \in \{W3C, GOI, RTI, STU\}$ for a university x can be defined as follows:

$$r_g = \begin{cases} \text{fair(F)} & \text{if } \mu_g - \alpha_g \leq W'_g \leq \mu_g + \alpha_g \\ \text{good(G)} & \text{if } W'_g > \mu_g + \alpha_g \\ \text{poor(P)} & \text{if } W'_g < \mu_g - \alpha_g \end{cases} \quad (6)$$

3. ANALYSIS

Table 3 shows the weightage of universities for W3C guidelines. Manipal University website has scored the highest weight points with $W'_{W3C} = 3.9$. The University has scored maximum points for perceivable, operable and understandable metrics. Rajiv Gandhi University of Health Sciences website scored the lowest weight points with $W'_{W3C} = 1.4$. The University website scored 0.3, 0.3, 0.4, and 0.4 for perceivable, operable, understandable and robust respectively. The mean of the weight point $\mu_{W3C} = 2.79$ and the standard deviation $\sigma_{W3C} = 0.7$ for all Universities. Two private universities' websites, Christ University and Manipal University were graded Good, and Rajiv Gandhi University website is graded Poor, and the rest of the universities websites were graded Fair.

Table 4 shows the weightage of universities for GOI guidelines. The mean of the weight point $\mu_{GOI} = 3.0$ and the standard deviation $\sigma_{GOI} = 0.59$ for all Universities. All the Universities have complied with the "Organization Identifiers" parameter and have got maximum weightage. Manipal University website with $W_{W3C} = 4$ scored maximum points for all the parameters. Indian Institute of Science, Indian Institute of Management, National Law School of India University, Bangalore University, Karnataka University, Agricultural University, Christ and Manipal University websites have obtained the grade Good, Gulbarga, Tumkur and Rajiv Gandhi University of Health Sciences websites obtained the grade Poor and the rest of the university websites obtained the grade Fair.

Table 3: Points earned by Universities for W3C guidelines

University/ Institution	W _{WC3_1}	W _{WC3_2}	W _{WC3_3}	W _{WC3_4}	W _{W3C}	Γ _{W3C}
Indian Institute of Management, Bangalore	0.8	0.8	0.9	0.8	3.3	G
Indian Institute of Science	0.9	0.8	0.8	0.8	3.3	G
National Law School of India University	0.9	0.9	0.9	0.8	3.5	G
Bangalore University	0.8	0.7	0.8	0.7	3.0	G
University of Mysore	0.7	0.7	0.7	0.7	2.8	F
Mangalore University	0.5	0.6	0.7	0.7	2.5	F
Gulbarga University	0.6	0.6	0.7	0.6	2.5	F
Karnataka University	0.7	0.8	0.8	0.7	3.0	G
Tumkur University	0.6	0.6	0.6	0.6	2.4	F
Karnataka State Women's University	0.6	0.5	0.6	0.6	2.3	F
Visvesvaraya a Technological University	0.7	0.7	0.8	0.7	2.9	F
Rajiv Gandhi University of Health Sciences	0.3	0.3	0.4	0.4	1.4	P
University of Agricultural Sciences	0.8	0.8	0.8	0.8	3.2	G
Christ University	0.9	0.9	0.9	0.9	3.6	G
Manipal University	1.0	1.0	1.0	0.9	3.9	G

Table 5 shows the weight for RTI guidelines. The mean of the weight point $\mu_{RTI} = 2.24$ and the standard deviation $\sigma_{RTI} = 1.93$ for all Universities. The large standard deviation signifies that the deviation from the mean for some universities is large. Since the data is skewed, it is difficult to consider the range for Good, Fair, and Poor as proposed by equation (6). A modified accepted range is proposed for the skewed data. Following is the modified accepted range:

$$r_g = \begin{cases} \text{fair(F)} & \text{if } \mu_g - \frac{1}{2}\alpha_g \leq W'_g \leq \mu_g + \frac{1}{2}\alpha_g \\ \text{good(G)} & \text{if } W'_g > \mu_g + \frac{1}{2}\alpha_g \\ \text{poor(P)} & \text{if } W'_g < \mu_g - \frac{1}{2}\alpha_g \end{cases} \quad (7)$$

The assigned grades are shown in Table 5.

Nine Universities were assigned Good grade and six were assigned Poor grade. For RTI compliance, Universities have either adhered to the compliance or have not bothered to follow RTI guidelines. As many as six universities have totally ignored RTI guidelines.

The score sheet for student-centric information is not shown for want of space. The mean of the weight point $\mu_{W3C} = 2.51$ and the standard deviation $\sigma_{W3C} = 0.64$ for all Universities. The National Law School of India University, Christ and Manipal Universities websites were awarded the grade, Good, Indian Institute of Management, Gulbarga University websites were awarded the grade, Poor. Other University websites were awarded the grade, Fair.

Total Weightage assigned to a University, x as WT^x for guidelines g from 1 to 4 is defined as follows:

$$WT^x = \sum_{g=1}^4 WT_g^x \quad (8)$$

Table 6 shows the total weightage and the relative Rank of Institutes/Universities. The University with the maximum WT score is assigned the first rank and university with the minimum score of WT is assigned rank 15. The National Law School of India University website with $WT = 14.7$ is at the top of list and the Bangalore University website with $WT = 8.40$ is at the bottom of the table.

Table 7 lists the mean for various categories of institutes for different guidelines. μ_T^{CAT} is the total mean for a category. Where $CAT \subset \{ci, sou, snu, smu, pu\}$.

Ranks to the category websites were assigned based on the values of μ_T^{CAT} . The Central Institutes' websites with $\mu_T^{CAT} = 13.4$ ranked 1, followed by State New Universities website, Private universities websites, state old Universities website, and State Mono Universities website. It was found that for WC3 guidelines, $\mu_{W3C}^{pu} > \mu_{W3C}^{ci} > \mu_{W3C}^{sou} > \mu_{W3C}^{smu} > \mu_{W3C}^{snu}$ clearly Private University websites and Central institutes websites are designed better for W3C guidelines. For GoI guidelines, $\mu_{GOI}^{pu} > \mu_{GOI}^{ci} > \mu_{GOI}^{sou} > \mu_{GOI}^{smu} > \mu_{GOI}^{snu}$ again Private University websites and Central institutes' website adhere to GoI guidelines. For RTI guidelines, it was found that $\mu_{RTI}^{ci} > \mu_{RTI}^{snu} > \mu_{RTI}^{sou} > \mu_{GOI}^{smu} > \mu_{GOI}^{pu}$, Central University websites, and State New University websites adhere to RTI guidelines. It was noted that Private Universities have not adhered to RTI guidelines. For student-centric activities it was found that $\mu_{STU}^{pu} > \mu_{STU}^{sou} > \mu_{STU}^{smu} > \mu_{STU}^{snu} > \mu_{STU}^{ci}$; Private and State Old University websites are more student-friendly.

Table 4: Points earned by universities for GoI guidelines

University/ Institution	W _{GOI1}	W _{GOI2}	W _{GOI3}	W _{GOI4}	W _{GOI5}	W _{GOI}	W' _{GOI}	r _{GOI}
Indian Institute of Management, Bangalore	1.0	1.0	0.9	0.7	0.9	4.5	3.60	G
Indian Institute of Science	1.0	1.0	0.9	0.7	0.9	4.5	3.60	G
National Law School of India University	1.0	0.8	0.8	0.8	0.8	4.2	3.36	G
Bangalore University	1.0	0.7	0.7	0.7	0.7	3.8	3.04	G
University of Mysore	1.0	0.7	0.7	0.7	0.6	3.7	2.96	F
Mangalore University	1.0	0.6	0.7	0.7	0.6	3.6	2.88	F
Gulbarga University	1.0	0.0	0.7	0.6	0.6	2.9	2.32	P
Karnataka University	1.0	0.5	0.7	0.7	0.7	3.6	2.88	F
Tumkur University	1.0	0.5	0.5	0.6	0.5	3.1	2.48	P
Karnataka State Women's University	1.0	0.5	0.5	0.6	0.6	3.2	2.56	F
Visvesvaraya Technological University	1.0	0.6	0.8	0.8	0.7	3.9	3.12	F
Rajiv Gandhi University of Health Sciences	1.0	0.0	0.5	0.5	0.5	2.5	2.00	P
University of Agricultural Sciences	1.0	0.8	0.7	0.7	0.6	3.8	3.04	F
Christ University	1.0	1.0	0.9	0.9	1.0	4.8	3.84	G
Manipal University	1.0	1.0	1.0	1.0	1.0	5.0	4.00	G

Table 5: Points earned by Universities for following RTI guidelines

University/ Institution	W _{RTI1}	W _{RTI2}	W _{RTI3}	W _{RTI4}	W _{RTI5}	W _{RTI6}	W _{RTI}	W' _{RTI}	r _{RTI}
Indian Institute of Management, Bangalore	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Indian Institute of Science	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
National Law School of India University	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Bangalore University	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	P
University of Mysore	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Mangalore University	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	P
Gulbarga University	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Karnataka University	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Tumkur University	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Karnataka State Women's University	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
Visvesvaraya Technological University	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	P
Rajiv Gandhi University of Health Sciences	1.0	1.0	1.0	1.0	1.0	1.0	6.0	4.00	G
University of Agricultural Sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	P
Christ University	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	P
Manipal University	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	P

Table 6: Overall Ranking of the Universities

Institute/University	W _{w3c}	W' _{GOI}	W' _{RTI}	W' _{STU}	WT	Rank
National Law School of India University	3.5	3.36	4.00	3.84	14.70	1
University of Mysore	2.8	2.96	4.00	3.38	13.14	2
Indian Institute of Science	3.3	3.60	4.00	2.09	12.99	3
Karnataka University	3.0	2.88	4.00	3.08	12.96	4
Indian Institute of Management, Bangalore	3.3	3.60	4.00	1.60	12.50	5
Karnataka State Women's University	2.3	2.56	4.00	2.77	11.63	6
Tumkur University	2.4	2.48	4.00	2.46	11.34	7
Manipal University	3.9	4.00	0.00	3.37	11.27	8
Christ University	3.6	3.84	0.00	3.68	11.12	9
Gulbarga University	2.5	2.32	4.00	2.02	10.84	10
Rajiv Gandhi University of Health Sciences	1.4	2.00	4.00	2.46	9.86	11
University of Agricultural Sciences	3.2	3.04	0.00	3.38	9.62	12
Mangalore University	2.5	2.88	0.00	3.38	8.76	13
Visvesvaraya Technological University	2.9	3.12	0.00	2.40	8.42	14
Bangalore University	3.0	3.04	0.00	2.36	8.40	15
Average	2.9	3.04	2.40	2.81	11.17	

Table 7: Points scored by institutes (Univ. type wise)

University/Institution	μ _{w3c}	μ _{GOI}	μ _{RTI}	μ _{STU}	μ _T ^{CAT}	Rank
Central Institutes (ci)	3.37	3.52	4.00	2.51	13.40	1
State New Universities (snu)	2.35	2.52	4.00	2.62	11.49	2
Private Universities (pu)	3.75	3.92	0.00	3.53	11.20	3
State Old Universities (sou)	2.76	2.82	2.4	2.85	10.83	4
State Mono Universities (smu)	2.50	2.72	1.34	2.75	9.31	5

4. CONCLUSION

Fifteen institutions/universities' websites located in the State of Karnataka have been evaluated. Universities were grouped as Central Institutes (ci), State Old Universities (sou), State New Universities (snu), State Mono-Universities (smu) and Private Universities (pu). The evaluation was based on 28 metrics from W3C, GoI, RTI and Student-centric guidelines. Ranks were assigned to websites on the performance of individual universities and groups. Grades: Good(G), Fair (F), and Poor(P) for university websites for compliance with each of the guidelines were also assigned. It was found that the Central University websites performed much better than those of others. The State Mono University website is inferior to all others. The National Law School of India University website with total weight score of WT = 14.7 is ranked 1. The Central Institutes' websites with mean score $\mu_T^{ci} = 13.4$ has adhered to all guidelines. State owned university, Mysore University's website with WT = 13.14 is ranked 2, which is the highest rank for any state owned universities website. The mean of the weight point $\mu_{RTI} = 2.24$ and the standard deviation $\sigma_{RTI} = 1.93$ shows a large deviation in scores for RTI guidelines. Many university websites have not adhered to RTI guidelines and have scored 0 and some websites have scored a maximum value 4. Almost all the university websites are still in the "Inform" stage of e-governance and have to move from 'inform' stage to 'interact' and 'transact' state. It was also found that none of the Institutes have attempted to disseminate information in the local language.

The following recommendations are made to improve University websites: 1. The websites can be designed for the personalized use of students, parents, alumni, teachers and general public. 2. Since digital divide caused by e-governance will actually weaken democracy, not strengthen it [2, 14], a university website must be designed for local public consumption in the local language. 3. The website can be designed for mobile phones as mobile penetration is more in India than the broadband penetration. 4. Web-enabled applications and tools such as blogs, microblogs, podcasts, Really Simple Syndication (RSS), social networking sites, video sharing, web chat, and wikis [15] can be used to enhance the social participation. The work can be extended for a server-side analysis that includes features such as visibility assessment, hit counts, page-loading speed, and interface design [10] as additional metrics for evaluation.

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