

EVALUATION OF A COMPUTER SUPPORT-BASED CROSS DISCIPLINE RESEARCH CONSORTIUM

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Abstract: This paper presents the results of a survey of users of services of a computer support-based cross discipline research consortium. Usage statistics of the consortium resources is also presented. An ishikawa diagram and analysis for improving the services is also provided. The major challenge of the consortium is improving the visibility of its services and resources. The majority of the respondents had not heard of the consortium, while some who did know of the consortium were not aware of what it can offer. Some respondents were also concerned that the resources were not specific to their area of interest. However, the majority (84%) of the respondents who had used the resources were satisfied.

1 INTRODUCTION

This paper presents a follow-up to a paper presented at CSEDU'10 (Frakes et al., 2010). The previous study presented a cross discipline Research Methods Consortium for the Virginia Tech National Capital region (NCR-RMC). Part of the NCR-RMC services include web based, freeware, and other tools to support the effort in an off-campus setting, with several locations and many part-time professional students. The purpose of the NCR-RMC is to provide better support for research at the Virginia Tech., National Capital Region (VT-NCR) by coordinating research resources across colleges.

VT-NCR was established in 1969. Currently within a 50 mile radius, there are about 18 recognized centers representing six colleges of VT-NCR at the National Capital Region: Architecture and Urban Studies, Business, Engineering, Science, Liberal Arts and Human Sciences, and Natural Resources. More than 45 graduate degree and certificate programs are offered at VT-NCR currently. For the current academic year, there are about 1,100 students enrolled with about a quarter of them being full-time; the rest being part-time. The part-time students are mostly working professionals and generally spend limited time on campus. VT-NCR has currently 120 full-time faculty members. In fiscal year 2007, VT-NCR reported \$15.6 million in sponsored research (NCR History NCR Virginia

Tech. 2010).

2 RESOURCES

NCR-RMC resources available to the faculty and students of VT-NCR are discussed in this section. A mindmap of the resources is also shown in Figure 1.

2.1 Website

A website was built on the WordPress blogging platform (WordPress > Blog Tool and Publishing platform, 2010) to support consortium activities. The URL for the website is <http://rnc.ncr.vt.edu>. The website is running on a regular desktop computer (Dell, Intel Pentium 4, 3.2GHz processor), with a standard freeware LAMP platform, using Ubuntu Linux, Apache, MySQL and PHP (Frakes et al., 2010). The website contains information about research courses, funding sources, cross-discipline research, and tools and methods for research.

2.2 Forum

An online forum was created using the platform - Simple Machines Forum (Home of SMF: Free PHP and MySQL forum software, 2010). The forum was created to provide an environment where users could not only share resources but also debate and ask for

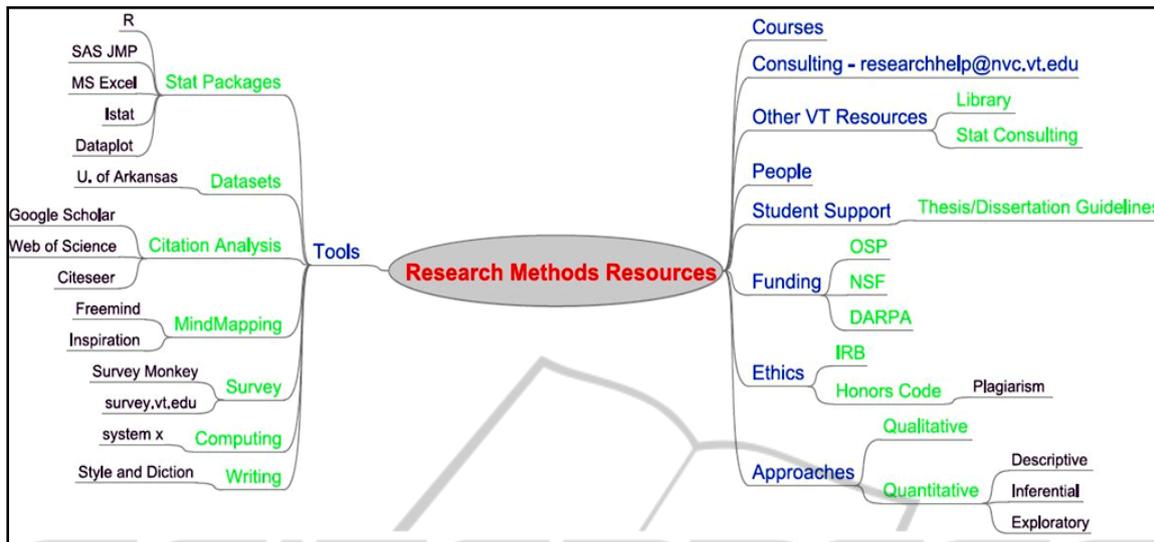


Figure 1: Mindmap of the NCR-RMC resources (Frakes et al., 2010).

help on any research-related topic (Frakes et al., 2010).

2.3 Support Person

A full-time Ph.D. student at the university with sufficient background experience in computer science, statistics, and research methods was employed and given an office a desktop computer and a laptop computer. The support person is responsible for administration and maintenance of the website and the forum. The support person also acts as a consultant on statistics and statistical tools such as R (The R Project for Statistical Computing, 2010), Microsoft Excel®, and SAS JMP (JMP Software, 2010). Students also use the support person for help in thesis and dissertation formatting, as well as for the analysis of their data. The support person is a teaching assistant for at least four different graduate courses offered in the region. The support person serves as a point of contact to the RMC resources (Frakes et al., 2010).

3 SATISFACTION SURVEY

A survey was conducted to evaluate the satisfaction of faculty and students with the resources and services provided by the NCR-RMC. The respondents were also asked to provide feedback on the challenges involved in accessing the resources. The respondents gave suggestions on improving the services of the NCR-RMC.

The questionnaire was built using an online survey tool – SurveyMonkey (SurveyMonkey: Free online survey software & questionnaire tool, 2010). The online questionnaire was pre-tested with 3 full-time students, 2 part-time students, 2 alumni, and 1 faculty member. The questionnaire was made accessible to the faculty and students by announcing it through three consecutive VT-NCR weekly newsletters. Every faculty member and student joining the VT-NCR is by default subscribed to the newsletter at the time of admission, with an option to unsubscribe. The questionnaire was also sent to the faculty and student e-mail list servers. Personal emails were also sent by the support person to the faculty and students.

There were a total of 58 responses. The demographic information including contact information and position held at VT-NCR was made optional to answer. Hence, only 45 of the 58 respondents revealed their position held at VT-NCR. The distribution of respondents' position at VT-NCR is as shown in Figure 2.

Respondents provided their purposes for accessing the NCR-RMC resources. The respondents could choose more than one purpose and about 30% of them did so. The distribution is as shown in Figure 3. At least half of them had not used any resource from NCR-RMC. Of those who used the resources, they were primarily for their research work or as part of their course work. The respondents who used the RMC resources also ranked the resources in terms of the frequency of using them. Usage frequency is shown in Figure 4.

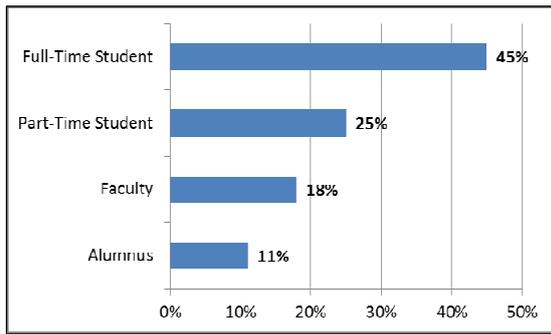


Figure 2: Distribution of the position held by the survey respondents.

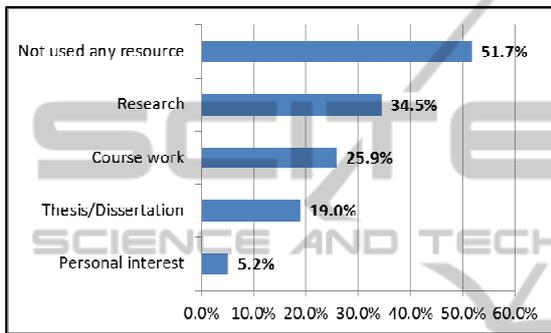


Figure 3: Purpose of accessing the NCR-RMC resources.

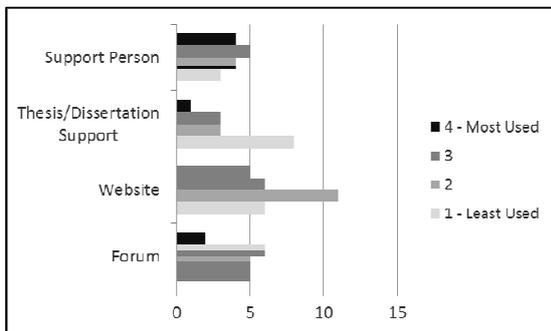


Figure 4: Ranking of the frequency in accessing the NCR-RMC resources.

The website and the forum were the most used. The support person was also used fairly frequently. The thesis/dissertation support group was the least used.

Figure 5 shows the feedback on the challenges involved in accessing NCR-RMC resources. A fourth of the respondents said they had never heard of NCR-RMC before they took the survey. About half of them, who have heard of NCR-RMC were not aware of the RMC activities and the services it can offer. Among the respondents who had not used any resources, 37% of them had not heard of RMC. Half of them had heard of RMC, but were not aware

of what RMC can offer. A comment box was also provided for feedback on this question. A student responded that he/she had not heard of RMC until it was introduced as part of one of his courses. A faculty member mentioned having “not enough time to explore.” A couple of them also mentioned that it was hard to locate the required material within the website and the forum.

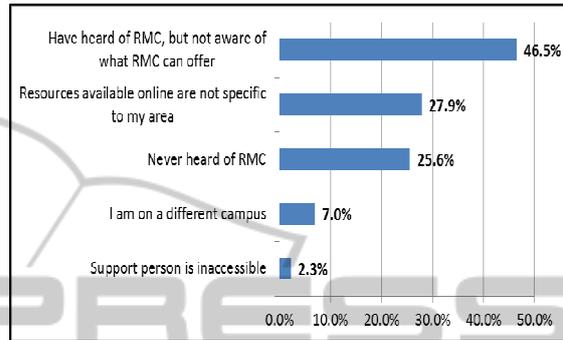


Figure 5: Challenges in accessing the NCR-RMC resources.

The respondents were asked to rate their satisfaction with the NCR-RMC resources on a 5-point scale (0 being very dissatisfied and 4 being very satisfied). Forty seven of the 58 respondents provided a ranking. Nine of the 11 who did not provide a ranking of satisfaction had not used any of the resources. The distribution of satisfaction rating is shown in Figure 6. More than half (59.6%) responded as being “neither satisfied nor dissatisfied”, but three-fourths of these had not used any resource from NCR-RMC. One subject who had responded “somewhat dissatisfied” also mentioned that he had “heard of RMC, but was not aware of what it can offer.” Another subject who responded “somewhat dissatisfied” had used the RMC website, forum and support person as part of his/her coursework. However, the respondent was unhappy that the resources were not specific to his/her area. The respondent wanted more tutorials and materials, similar to the ones on the website and forum, related specifically to his/her field of work.

About 35% of them were “somewhat satisfied” or “very satisfied” with the resources. The satisfied respondents had primarily used RMC resources for research (81%) and course work (56%). The distribution of the resources used by these respondents is shown in Figure 7. At least three-fourths of them had used the website and more than half had used the forum and the support person. Among the respondents who had used at least one resource frequently, 84% of them expressed

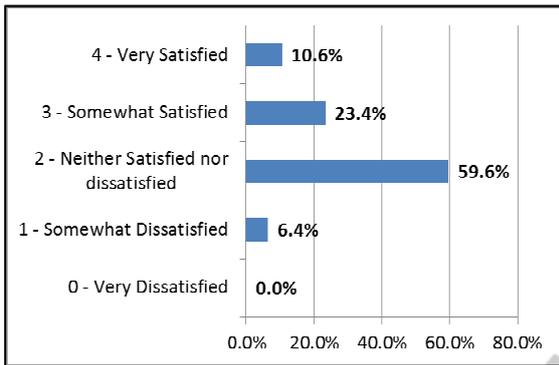


Figure 6: Satisfaction rating of the NCR-RMC resources.

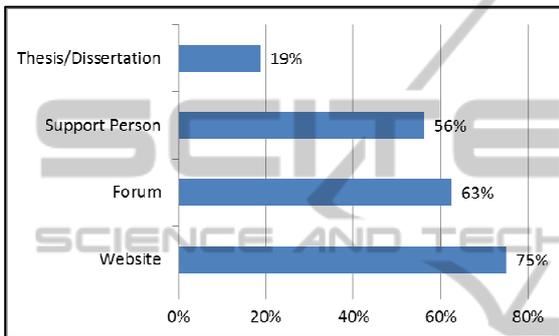


Figure 7: Distribution of resources used by the satisfied respondents.

“somewhat satisfied” or “very satisfied” and 12% expressed “neither satisfied nor dissatisfied”.

An open ended question was also provided for the respondents to provide feedback on improving the accessibility of the resources. Of the 25 respondents who provided feedback, at least two-thirds of them said that visibility and awareness of the resources available should be increased, and some suggestions were also given along these lines. The most prominent suggested more active advertising and improvement of publicity. Some also suggested we hold more sessions to market the resources. One-fourth suggested that the website should be improved to provide news of most recent activities and include more resources.

4 USAGE STATISTICS

4.1 Website

The NCR-RMC website was monitored using the analytics tool from google (Google Analytics 2010). The statistics provided are for the period September '09-August '10. During this period the website had

3,034 visits from 98 different countries/territories; an average of 8.3 visits per day. Table 1 shows the summary of statistics for the website. NCR represents the National Capital Region composed of Virginia, Maryland and the District of Columbia.

Table 1: Summary of usage statistics for the NCR-RMC website.

Parameter	Overall	USA	NCR
Visits	3034	2386 (78.6%)	1533 (21.4%)
New Visitors	64%	58%	43%
Returning Visitors	36%	42%	57%
Avg. pages/visit	1.9	1.89	2.06
Avg. time spent	1:30	1:36	2:00

More than three-fourths of the overall visits were from within the USA. Almost two-thirds of the visits within USA were from the NCR. The website has overall returning visitors close to 36%. The majority of them are from the USA and particularly NCR. However, the average pages visited is comparatively similar (about 2 pages/visit).

4.2 Forum

As of October 01, 2010, the forum had 77 members. On average there are about 4.3 users online per day. At least an average of 400 page views is done per day. The forum has, on average, a new post every four days. Figure 8 shows the number of visits on the forum on a monthly basis. The maximum number of visits was in Jan'10 (63,648) and the least in Feb'10 (24,852). The forum has 23 boards of discussion in 9 categories. The top 10 boards of discussion are shown in Figure 9.

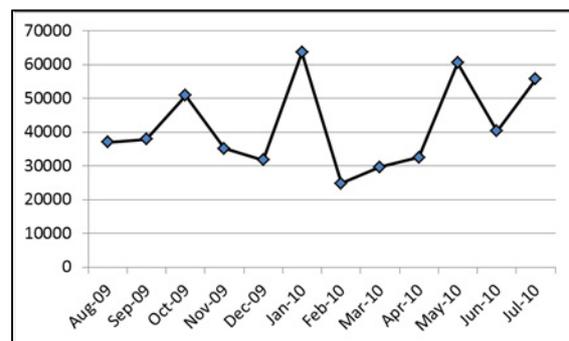


Figure 8: Forum visit trend over a year.

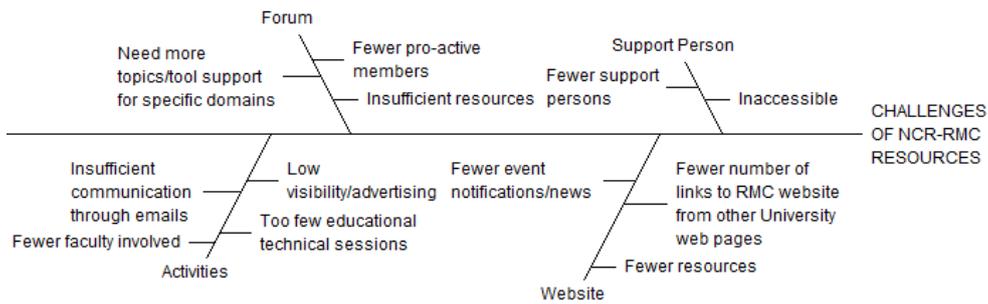


Figure 9: Ishikawa diagram for challenges involved in improving NCR-RMC resources.

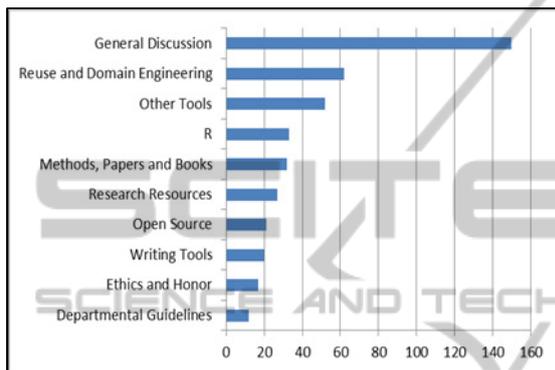


Figure 10: Top 10 discussion boards in forum.

4.3 Support Person

The support person has been the teaching assistant for at least five courses (4 in computer science and 1 in Educational Research) with an average of 2 classes per semester. Statistical packages such as R, SAS-JMP and |stat are introduced. Assignments on these are also given and graded. Online survey tools are also presented with demos. Introduction to multivariate statistics is given in some course works.

The support person had helped a faculty member from the Business School in two projects involving statistical analysis using SAS-JMP. Nine students used the support person for analysis of their data for their theses/dissertations. Many of them were also guided on formatting their work for final electronic submission. The support person is also frequently visited by students for help on statistical packages, particularly SAS-JMP and R.

5 SUMMARY & CONCLUSIONS

As a follow up to the paper presented by Frakes et al at CSEDU-10 (Frakes et al., 2010), this paper presents an evaluation of the usage of NCR-RMC resources. A survey study is presented on the

satisfaction of the users. More than half the respondents were “neither satisfied nor dissatisfied”. This was primarily because the majority of them had not heard of the NCR-RMC. Also, many had heard of NCR-RMC but were not aware of its services and had not used any resource. One respondent who was “somewhat dissatisfied” had not used any resource. Another “somewhat dissatisfied” respondent was unhappy the resources were not specific to his/her research area. However, among the respondents who have frequently used the resources, the majority (84%) were satisfied.

The survey study examined the challenges involved in improving the services of the NCR-RMC. The challenges involved for NCR-RMC resources are summarized in the ishikawa diagram shown in Figure 10. The survey respondents also provided feedback and suggestions to improve the services and activities of the NCR-RMC. The suggestions by respondents for improving the services are shown in Figure 11.

The major concern among the respondents was with the visibility of NCR-RMC. Among the respondents who had not used any resources, 37% of them had not heard of RMC. Half had heard of RMC, but were not aware of what RMC can offer. This might be because there was insufficient communication through email list servers, less advertising, and lesser involvement of the faculty. However, the RMC was introduced to the faculty in at least three faculty meetings. The students are introduced to the RMC during their new student orientation. Also, all activities of RMC are announced through the weekly newsletters and flyers are put up on the bulletin boards for RMC events. Even though the support person had introduced the RMC, and the statistical tools and packages, as the teaching assistant in course works, some subjects wanted technical sessions on statistical packages to be organized more frequently which would provide more visibility. An introductory session on SAS-JMP and R was

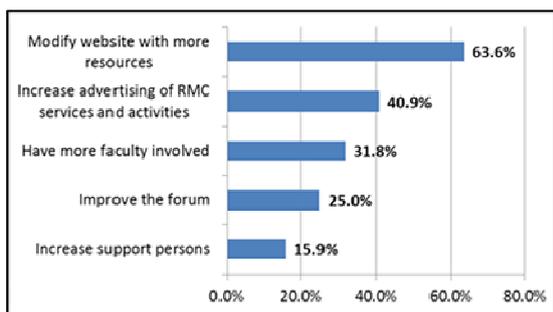


Figure 11: Responses on how to improve RMC resources.

recently held. 3 faculty members, 5 full-time and 3 part-time students participated.

Many respondents also wanted to modify and improve the website. One major concern raised was that other web pages of the university do not have a link to the NCR-RMC website. For example, one respondent pointed out that the main library website does not have a link to the NCR-RMC website. However, the main website of VT-NCR (Northern Virginia Center Virginia Tech. 2010) has a link to the RMC website. The website also needs to be updated constantly with more additional resources.

The number of hits for the forum is high. Almost 90% of the posts are by two administrators of the forum. This shows that the visitors are primarily for viewing content only and do not contribute to the discussions. One way of improving contribution from members is to encourage more faculty members to get involved. Currently, the NCR-RMC is being introduced and providing support in only five courses. With more faculty involved, more courses could be supported by RMC and have more people contributing to the forum.

Another concern raised by the respondents was that the “resources are not specific to their area.” This is a broader issue as it is very difficult to have a centralized service covering interests of all the people. However, the areas of services could be broadened if more faculty members were involved.

The support person is less extensively used than the website or the forum. This is because the campuses are widespread in the region and the support person has an office only in one of the campuses. Some respondents suggested increasing the number of support persons, but none of those who suggested had ever used the support person. Even though the support person is approachable through email or telephone, the respondents may in-person consultation. One respondent mentioned the support person as being inaccessible. However, the respondent had also mentioned that he/she had not heard of RMC before.

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REFERENCES

- Frakes W. B., Belli G., Urbano J., and Anguswamy R., 2010. Computer support for a cross discipline research consortium. In *CSEDU'10, 2nd International Conference on Computer Supported Education*, Valencia, Spain.
- Google Analytics 2010, viewed: 12 Oct 2010, <http://scholar.google.com>
- Home of SMF: Free PHP and MySQL forum software 2010, viewed: 12 Oct 2010, <http://www.simplemachines.org>
- JMP Software 2010, viewed: 12 Oct 2010, <http://www.jmp.com>
- NCR History NCR Virginia Tech. 2010, viewed: 12 Oct 2010, <http://ncr.vt.edu/History/>
- Northern Virginia Center Virginia Tech. 2010, viewed: 12 Oct 2010, <http://ncr.vt.edu/History/>
- The R Project for Statistical Computing 2010, viewed: 12 Oct 2010, <http://www.r-project.org>
- SurveyMonkey: Free online survey software & questionnaire tool 2010, viewed: 12 Oct 2010, <http://www.surveymonkey.com/>
- WordPress > Blog Tool and Publishing platform 2010, viewed: 12 Oct 2010, <http://wordpress.org>