

U.C. BERKELEY WEB DESIGNER & DEVELOPER SURVEY 2006

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The purpose of this survey is to understand computing and programming employees at U.C. Berkeley. Specifically, it aims to understand the characteristics of web application and web site designers and developers. We investigate the technical skills of this population, where these employees are allocated across campus departments, their job function, and what resources they access to support web development and design.

We thank Tim Dennis and David Hong for their contributions to this analysis. We particularly thank our advisor and Director of Center for Document Engineering, Bob Glushko, for his guidance on this paper and our project in general. Finally, we would like to thank the Program Office of the U.C. Berkeley CIO for their generous support of our project.

EXECUTIVE SUMMARY

This survey was conducted by graduate students in the School of Information Management & Systems with a grant from e-Berkeley and in cooperation with the office of the Associate Vice Chancellor of Information Technology / Chief Information Officer.

The purpose of this survey is to understand computing and programming employees at U.C. Berkeley. Specifically, it aims to understand the characteristics of web application and web site designers and developers. We investigate the technical skills of this population, where these employees are allocated across campus departments, their job function, and what resources they access to support web development and design.

Key Findings

- A large number of staff in non-technical positions regularly perform technical job functions they were not originally hired to do.
- One-third of non-technical staff regularly spend at least 30% of their time on web design and development tasks.
- Developers on campus are aware of and interested in User Interface Design Patterns, and feel they would benefit from a User Interface Design Pattern library.

SURVEY POPULATION & SAMPLING METHODOLOGY

Survey Instrument

The survey instrument was a web-based, survey package called Unit Command Climate Assessment Survey System (UCCASS). A request for participation was distributed from Shel Waggener, Chief Information Officer, through eleven computing-related e-mail lists (See Appendix A) . The survey was e-mailed to the all registered users for each list. The response rate, adjusted to remove duplicate members across lists, is 13.25% (228 out of 1721).

The survey consisted of 38 questions. The question format varied from open-ended, multi-select, single-select and 10 point scale. The survey is available as Appendix C.

Data Correction & Normalization

The raw data was reviewed and corrected for typos and misspellings. Some data was recoded from string to numeric values for ease of analysis. Categorical data such as job title, department, and job role were normalized, using campus resources, such as the *Staff Title and Pay Plan Website*, berkeley.edu, and campus organizational charts.

SURVEY RESULTS & ANALYSIS

General Demographics

Job Title

We asked the respondents to report their job title. We then normalized the results for inconsistent spelling and abbreviation. Similar titles were collapsed into one category. For example, Programmer/Analyst I, II, III, and IV were recoded to Programmer/Analyst. We collapsed titles that individually accounted for less than 1% (only 1 or 2 respondents) into the "Other" category. In the following table, the largest grouping by far is the Programmer/Analyst. However, there is a broad diversity of other job titles that responded to the survey.

Job Title	Count	Percent of Total
Programmer/Analyst	80	35.09%
Graduate Student	20	8.77%
Professor	16	7.02%
Administrative Analyst	15	6.58%
Librarian	12	5.26%
Editor	6	2.63%
Library Assistant	6	2.63%
Computer Resource Specialist	4	1.75%
Lecturer	4	1.75%
Computer Resource Manager	3	1.32%
Program Representative	3	1.32%
Student Affairs Officer	3	1.32%
MSO	3	1.32%
Other	53	23.25%
Grand Total	228	100.00%

Department or Division

Using Calnet Directory Services and our knowledge of how campus units are organized, we merged responses into larger aggregates. We collapsed all departments that accounted for less than 1% (only 1 or 2 respondents) into "Other." While this distribution shows that respondents came from all over the campus, there are three departments or divisions that stand out. Interestingly, departments in Letters & Sciences had the most participation, followed closely by Information Systems & Technology (IST) and more distantly by Library.

Department or Division	Count	Percent of Total
Letters & Science	52	22.81%
Information Systems & Technology (IST)	44	19.30%
Library	27	11.84%
Engineering	11	4.82%
Business & Administrative Services	10	4.39%
Student Affairs	10	4.39%
Public Health	8	3.51%
Haas	7	3.07%
University Relations	7	3.07%
International & Area Studies	4	1.75%
Undergraduate Education	4	1.75%
Chemistry	3	1.32%
Energy & Resources Group	3	1.32%
Law School	3	1.32%
Other	27	11.85%
No Response	8	3.51%
Grand Total	228	100.00%

Technical and Non-Technical Employees

Based on respondents' self-reported job titles, we categorized them as either technical or not. Individuals managing technical employees were categorized as technical, although we realize they may not always have specialized technical skills.

Respondent Type	Total	Percent of Total
Non-Technical	121	53.07%
Technical	107	46.93%
Grand Total	228	100.00%

Project Role

We asked respondents to choose a primary role from 9 choices that spanned the life cycle of web development. Of those who chose "Other," we separated out a group of 24 who explained that they were responsible for all aspects of web design and development. We called this group the "Swiss Army" because, like a Swiss Army knife, they do everything. The results show that our respondents fill all the roles in typical web projects in a predictable way, with the possible exception that graphic designers are underrepresented in the sample.

Role	Count	Percent of Total
Web Developer	44	19%
Application Developer	37	16%
Content Creator	33	14%
Project Manager	24	11%
Swiss Army	24	11%
Editor	16	7%
System Administrator	12	5%
Graphic Designer	4	2%
Other	34	14%
Grand Total	228	100%

Role by Technical and Non-Technical Respondents

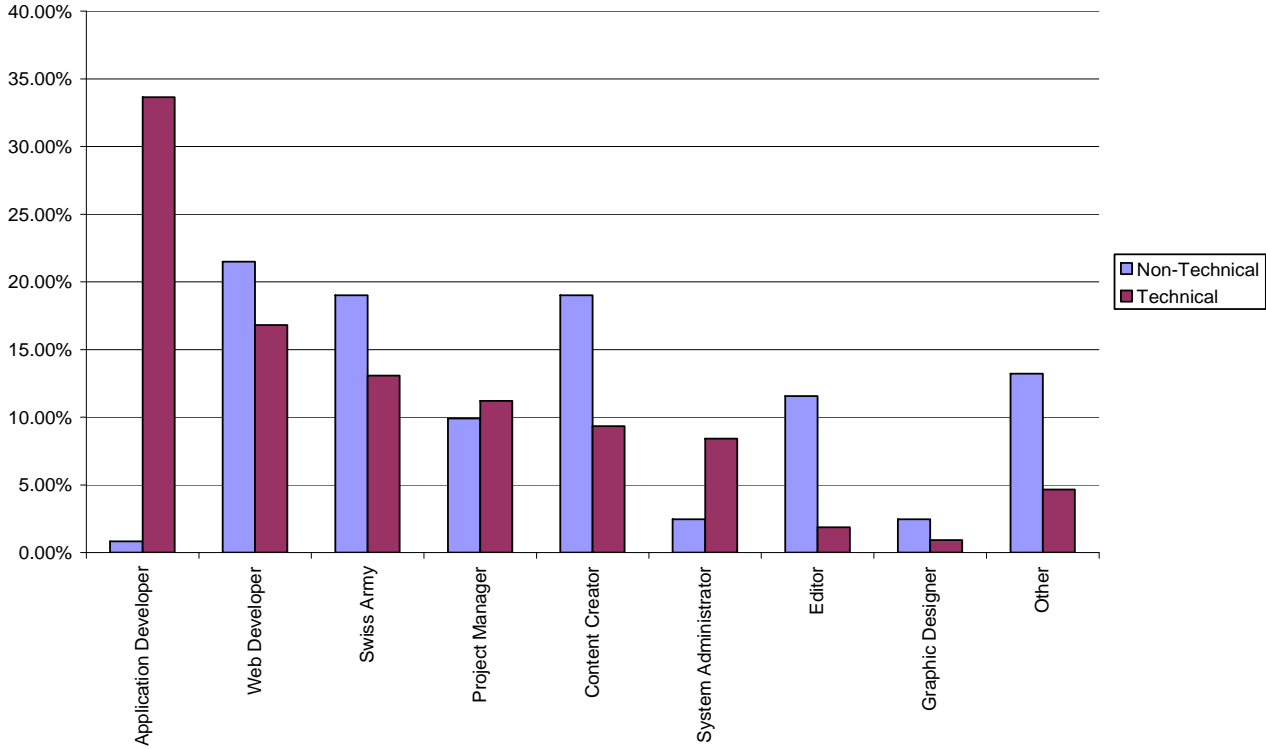
However, when we broke the numbers down into technical versus non-technical job titles, the results were rather surprising. The chart below shows that 21% of non-technical people identified their role as "Web Developer", and 19% are in the Swiss Army group, or all-purpose role, which includes multiple technical job responsibilities. It is also interesting that over 10% of respondents in technical job roles consider their primary role as that of content creator or editor.

Comments by respondents supports this finding:

"I, with the help of various work-study students, have had to try and maintain a web site by the seat of our pants. Small department, with no on-site technical assistant due to budget cuts."

"I shouldn't have to do any of this, but there's no support and we don't have enough staff to do what's needed. Another case of faculty having to spend a great deal of time doing inefficiently what a knowledgeable staff person could do quickly and efficiently."

Role of Non-Technical and Technical Respondents



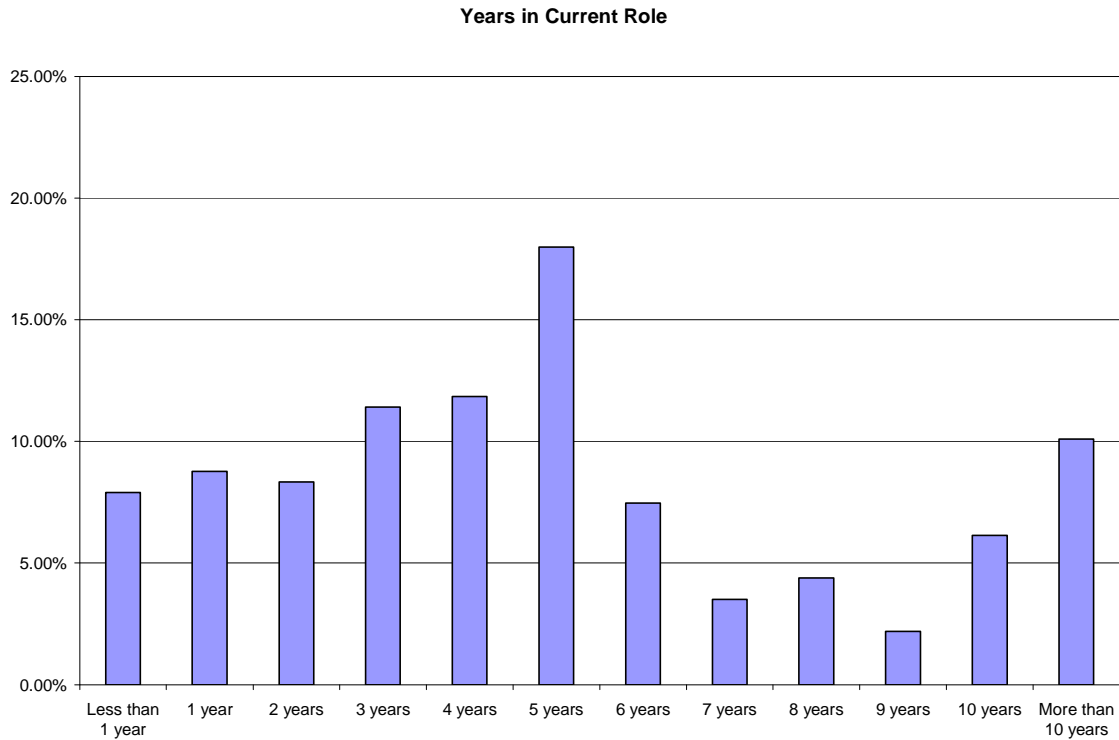
We provide this same data in a table format for closer inspection.

Role	Non-Technical	Technical	Grand Total
Application Developer*	0.83%	33.64%	16.23%
Web Developer*	21.49%	16.82%	19.30%
Swiss Army*	19.01%	13.08%	16.23%
Project Manager	9.92%	11.21%	10.53%
Content Creator	19.01%	9.35%	14.47%
System Administrator*	2.48%	8.41%	5.26%
Editor	11.57%	1.87%	7.02%
Graphic Designer	2.48%	0.93%	1.75%
Other	13.22%	4.67%	9.21%
Grand Total	100.00%	100.00%	100.00%

* Non-technical staff are performing a number of technical job functions.

Number of years at Current Role

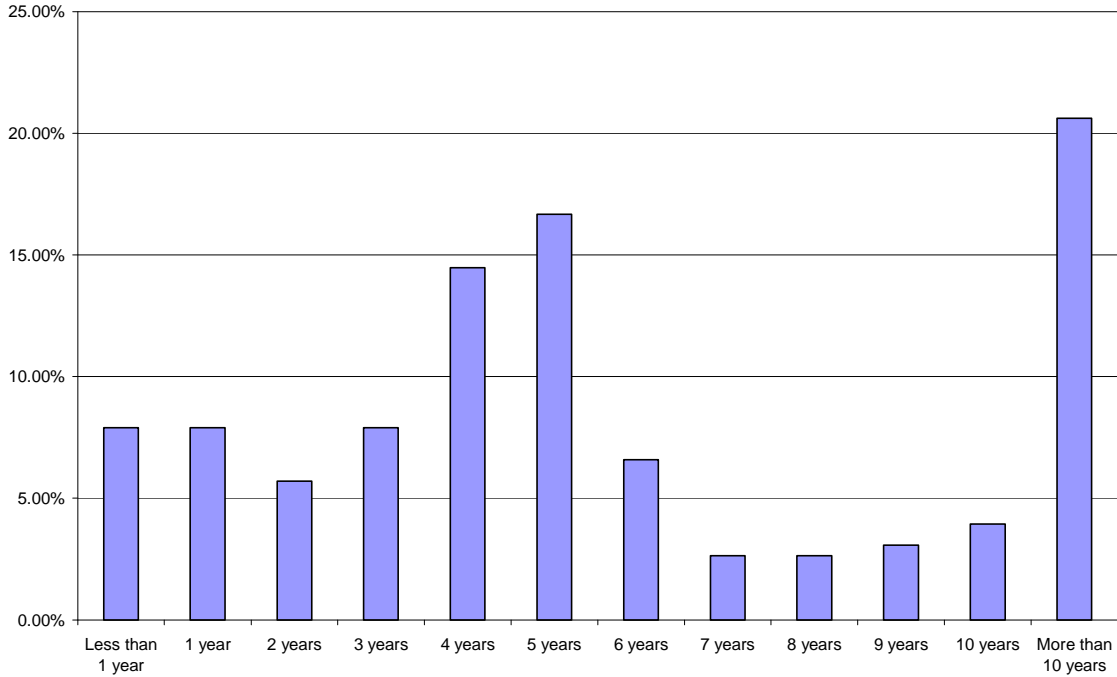
This chart displays the number of years respondents have performed their current job role. Job role is independent of job title.



Number of Years in Current Position at U.C. Berkeley

This chart displays the number of years a respondent has been in their current position. The greatest number of employees have 4-5 years in their current position at the university. This survey instrument did not allow respondents to distinguish beyond 10 years in a current job. As a result, the "More than 10 years" category is deceptively larger.

Years at Current Position



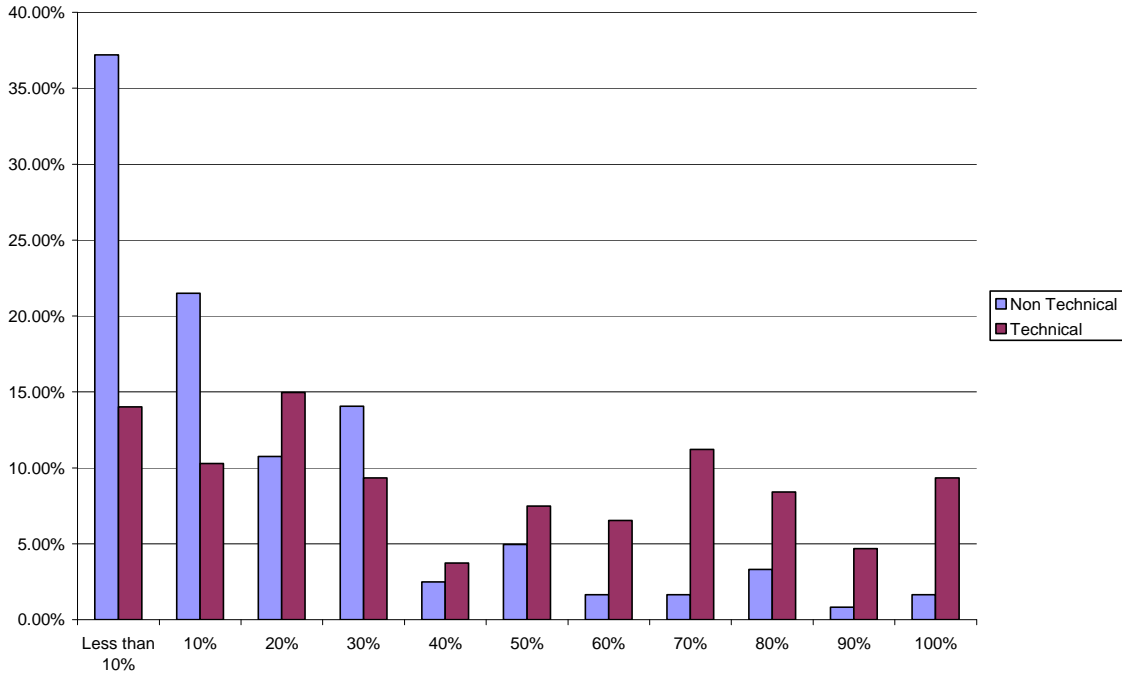
Roles vs. Current Position

When we compared the above chart to the "Years in Current Role" chart, we found that people had been in their current position longer than they had been in their role on web projects. People are doing work they were not originally hired to do and that their responsibilities have grown without a change in position or title.

Percent of Time Spent on Web Related Projects

It is interesting that on the chart below, we see that most non-technical respondents spend less than 10% of their time on web design and development. One-third spend 30% or more of their time on web design and development. About 45% of the technical people spend less than 20% of their time on web development. That may be because they are working on system administration or other back-end work. This finding suggests the need for future research into what exactly they are doing.

% Time Spent on Web Projects by Technical and Non-Technical Respondents

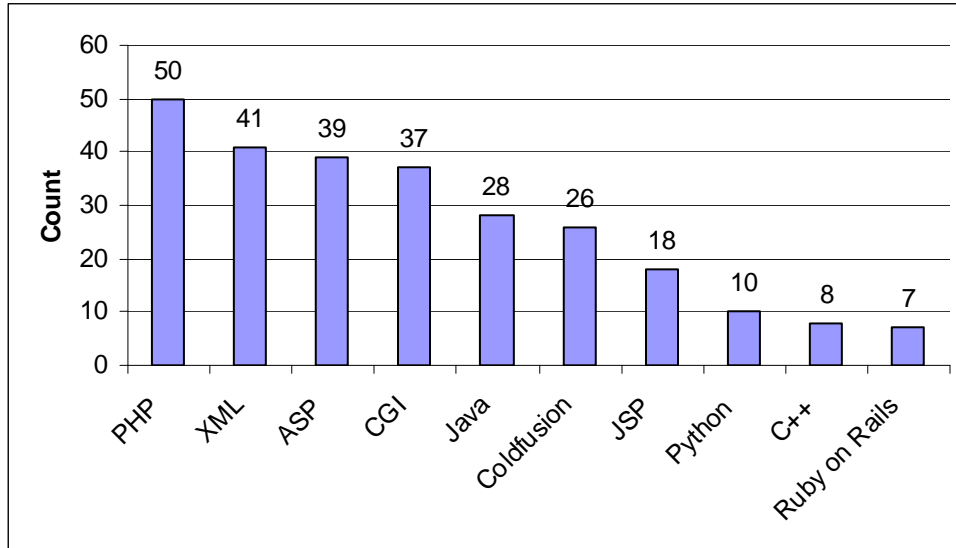


Technical Practices & Knowledge

The following tables were compiled from questions about best practices for web design and development.

Knowledge of Programming Languages

We asked the participants to select all programming languages they use regularly. A large number of respondents still use CGI, an older technology.



Modularized Coding Practice

Nearly 70% of respondents sometimes or always modularize their code to facilitate reuse. Code modularization is an efficient practice which the Berkeley community seems to adhere to. The negative response rate of 30.26% is due to the constraint of response choices. Individuals for whom this question does not apply were required to respond no. Further analysis by job role and job title would help to identify individuals who should be using a modularizing code but responded no.

Modularize Code	Total	Percent of Total
No	69	30.26%
Sometimes	67	29.39%
Yes	92	40.35%
Grand Total	228	100.00%

Code to Web Standards

However, coding to web standards and using a web style guide are the kinds of best practices that must always be followed for a benefit to accrue. Sixty-four percent code to web standards, at least in part. But only 25% always code to standards due to the constraint of response choices. Individuals for whom this question does not apply were required to responded no. Further analysis by job role and job title would help to identify individuals who should be using a web standards but responded no.

Use Web Standards	Total	Percent of Total
No	79	35.59%
Sometimes	87	39.19%
Yes	56	25.23%
Grand Total	222	100.00%

Use of Web Resources

Use of Web Style Guide

Forty five percent of respondents use a Web style guide. The high negative response rate of 54.91% is due to the constraint of response choices. Individuals for whom this question does not apply were required to responded no. Further analysis by job role and job title would help to identify individuals who should be using a web style guide but responded no.

Use Web Style Guide	Total	Percent of Total
No	123	54.91%
Sometimes	59	26.34%
Yes	42	18.75%
Grand Total	224	100.00%

Reported Web Style Guides

Respondents that use a web style guide were asked to provide their source. The largest number of people (11) who use style guides use one they developed themselves, followed by 10 individuals who use the Library style guide. Only one person used the campus web style guide. What is apparent from this data is the variety of web style guides on campus that seem specific to departments or schools.

Source	Total
Self-Created	11
Library	10
School-Specific*	9
Named Individual**	5
Haas	3
Copy a Template	2
Book	1
Campus Web style guide	1
forrest.apache.org	1
Sakai	1
W3C	1

Other	7
Grand Total	52

* This includes Departments, Schools and Units. Haas was kept separate as it received several mentions.

** Specific individuals were named in the response.

User Interface Design Patterns

The following results show this populations' interest in and knowledge of User Interface Design Patterns.

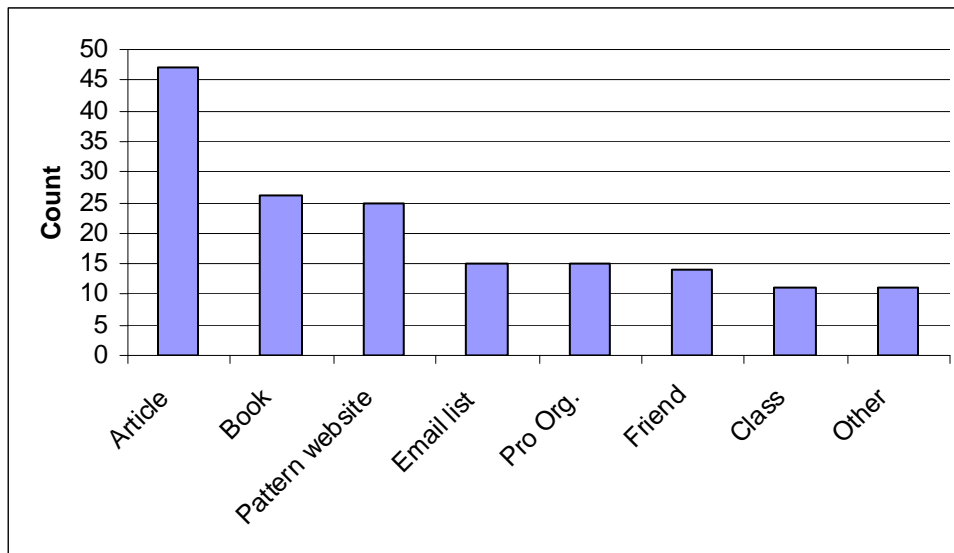
Have you heard of UI Design Patterns?

Two-thirds of the respondents have not heard of UI design patterns. This is not entirely surprising since most UI design pattern literature indicates this type of resource has not gained much traction in the UI design community. As a result, we interpret the rate of 1/3 who have heard of UI design patterns as high.

	Total	Percent of Total
No	152	66.96%
Yes	75	33.04%
Grand Total	227	100.00%

If you answered yes to the previous question, how did you hear about UI design patterns?

Respondents were asked to check all applicable sources.



Would an online library of design patterns be a useful resource to you?

Two-thirds of respondents said a pattern library would be a useful resource. It is clear people need help and supports any user interface design pattern project initiative.

	Total	Percent of Total
Don't Know	69	30.26%
No	8	3.51%
Yes	151	66.23%
Grand Total	228	100.00%

APPENDIX A: EMAIL DISTRIBUTION OF SURVEY

E-mail List Description	List Name
Infrastructure and Central Applications Staff	cica-staff@listscampus
Calnet Developers	calnet-developers@lists
Administrative Web hosting customers	arachneusers@lists
Academic web hosting customers	
IST-ASD-DTS staff, dept. web app development staff	dts-staff@lists
Library-wide web development/production	Webwrk@library
Web accessibility issues group	Webaccess@lists
Campus web developers/managers community	Webnet@library
Library web site managers	Webheads@library
Library web advisory group	wag@library
Library Systems Office Staff	Lso@library

APPENDIX B: OTHER FINDINGS

Responses by Type of Organization

Based on respondents' self-reported departments, we categorized them as one of three categories:

- Administrative - includes all operations, facilities, computing and business organizations at the university.
- Academic - includes all graduate, professional and undergraduate programs.
- Research Centers – includes those facilities that are research focused, not instructional.

Organization Type	Percent of Total
Academics	45.00%
Administration	49.55%
Research Center	5.45%
Grand Total	100.00%

Preferred Method of Web-Editing

Respondents were asked to check all applicable methods. Response choices included an example for clarification in the following manner:

Web page editor (e.g. Dreamweaver, BBEdit)

Text editor (e.g. Notepad, Emacs, Vi)

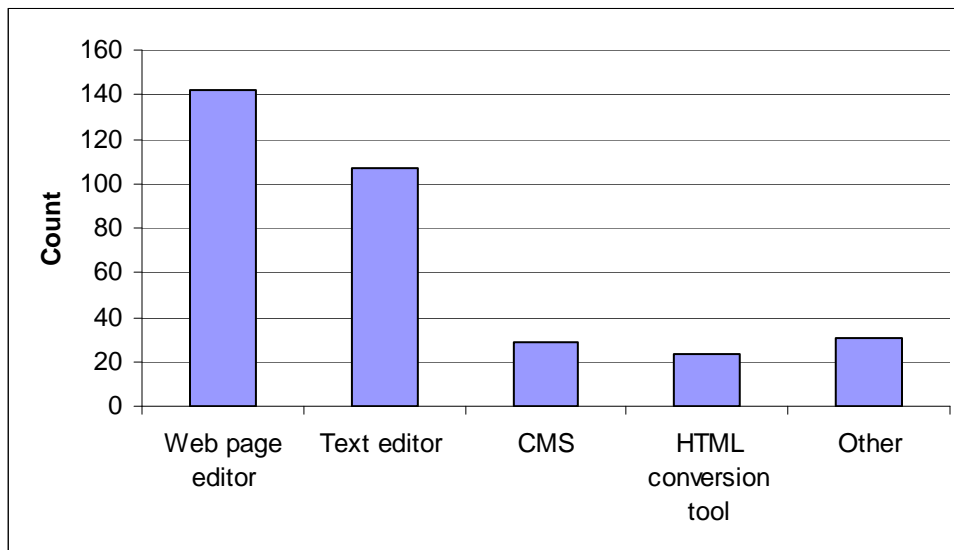
Content Management System (e.g. blog, wiki, or portal software)

HTML conversion tool (e.g. Save as HTML in MS Word)

Not Applicable

Other

It is interesting to note the large number of text editor responses which may indicate some individuals are hand coding web pages in whole or in part.



APPENDIX C: SURVEY

1. What is your current job title?

[OPEN ENDED]

2. For what department do you currently work?

[OPEN ENDED]

3. What one role best describes your job related to developing web sites and applications?

[SINGLE SELECT]

Application Developer

Content Creator

Editor

Graphic Designer

Project Manager

System Administrator

Web Developer

Other

4. If you selected 'other' for Question 3, describe your job role here.

[OPEN ENDED]

5. How long have you performed that job function/role?

[SINGLE SELECT]

Less than 1 year

1 year

2 years

3 years

4 years

5 years

6 years

7 years

8 years

9 years

10 years

More than 10 years

6. How long have you held your current position at the university?

[SINGLE SELECT]

Less than 1 year

1 year

2 years

3 years

4 years

5 years

6 years

7 years

8 years

9 years

10 years

More than 10 years

7. Are you responsible for designing pages and/or laying out content?

[SINGLE SELECT]

Yes

No

Not Applicable

8. What percent of your time is spent doing web related work?

[SINGLE SELECT]

Less than 10%

10%

20%

30%

40%

50%

60%

70%

80%

90%

100%

9. How do you create web pages? (check all that apply)

[MULTIPLE SELECT]

Web page editor (e.g. Dreamweaver, BBEdit)

Text editor (e.g. Notepad, Emacs, Vi)

HTML conversion tool (e.g. Save as HTML in MS Word)

Content Management System (e.g. blog, wiki, or portal software)

Other

Not Applicable

10. On a scale of 0-10, rate how familiar you are with HTML.

[OPEN ENDED, NUMERIC]

11. On a scale of 0-10, rate how familiar you are with CSS - Cascading Style Sheets.

[OPEN ENDED, NUMERIC]

12. On a scale of 0-10, rate how familiar you are with Javascript.

[OPEN ENDED, NUMERIC]

13. On a scale of 0-10, rate how familiar you are with Flash.

[OPEN ENDED, NUMERIC]

14. What programming languages do you use regularly? Check all that apply.

[MULTIPLE SELECT]

Coldfusion

ASP/ASP.NET

CGI scripting

C++

Java

JSP

Python

PHP
Ruby on Rails
XML, XPath, XSLT, XML Schema

15. How much experience do you have with graphic design in general?

[SINGLE SELECT]

Less than 1 month

1 - 6 months

6 - 12 months

1 - 2 years

2 - 3 years

3 - 4 years

4 - 5 years

5 - 10 years

10 - 15 years

15 - 20 years

20+ years

None

Not Applicable

16. How much experience do you have designing web pages or web sites? (e.g. creating graphics, choosing colors, arranging layout)

[SINGLE SELECT]

Less than 1 month

1 - 6 months

6 - 12 months

1 - 2 years

2 - 3 years

3 - 4 years

4 - 5 years

5 - 10 years

10+ years

17. Do you break up your web pages into separate code files to build headers, footer, menus, etc?

[SINGLE SELECT]

Yes

Sometimes

No

18. Do you reuse designs or layout that you've made in the past?

[SINGLE SELECT]

Yes

Sometimes

No

19. Do you reuse any designs or layouts from other people or sources?

[SINGLE SELECT]

Yes

Sometimes

No

20. Are graphic designers available to you for consultation or help?

[SINGLE SELECT]

Yes

Sometimes

No

21. Would you like more graphic design support for your projects?

[SINGLE SELECT]

Yes

Maybe

No

22. Indicate the total number of people in your department who do web programming, graphic design or content updates.

[SINGLE SELECT]

1

2- 3

4 - 8

9 +

23. Graphic style guides provide consistency on the use of graphic elements, for example how to use a logo or what approved fonts are. Do you use a graphic design style guide?

[SINGLE SELECT]

Yes

Sometimes

No

24. If you answered yes to the previous question, who maintains the graphic design style guide? (If possible, provide a department name or URL)

[OPEN ENDED]

25. A web style guide provides guidance and consistency on visual or technical aspects of a web page like what page headers look like or link colors. Do you use a web style guide?

[SINGLE SELECT]

Yes

Sometimes

No

26. If you answered yes to the previous question, who maintains the web style guide? (If possible, provide a department name or URL)

[OPEN ENDED]

27. Do you use web standards to ensure reusability, interoperability, platform independence, accessibility or other characteristics? (e.g. W3C)

[SINGLE SELECT]

Yes

Sometimes

No

28. If you answered yes to the previous question, what standards do you comply with? (If possible, provide a department name or URL)

[OPEN ENDED]

29. Do you share design issues and ideas with other web designers and developers on campus? (e.g through webnet or other email lists)

[SINGLE SELECT]

Yes

No

Don't Know

30. A UI design pattern contains example design implementations for a specific design problem. For example, it might describe how to use orientation features so that users know where they are in a site. Have you heard of or used a user interface (UI) design pattern?

[SINGLE SELECT]

Yes

No

31. If you answered yes to the previous question, how did you hear about UI design patterns? (Check all that apply)

[MULTIPLE SELECT]

Article

Book

Class

Design pattern website

Email list

Friend

Professional organization

Other

32. Would an online library of design patterns be a useful resource to you?

[SINGLE SELECT]

Yes

No

Don't Know

33. If you have any thoughts, concerns, or comments, please feel free to address them here.

[OPEN ENDED]

34. Thank you for your submission. Your survey is complete. We are offering a gift incentive for respondents chosen to participate in future user research. May we contact you for this purpose?

[SINGLE SELECT]

Yes

No

35. First and last name

[OPEN ENDED]

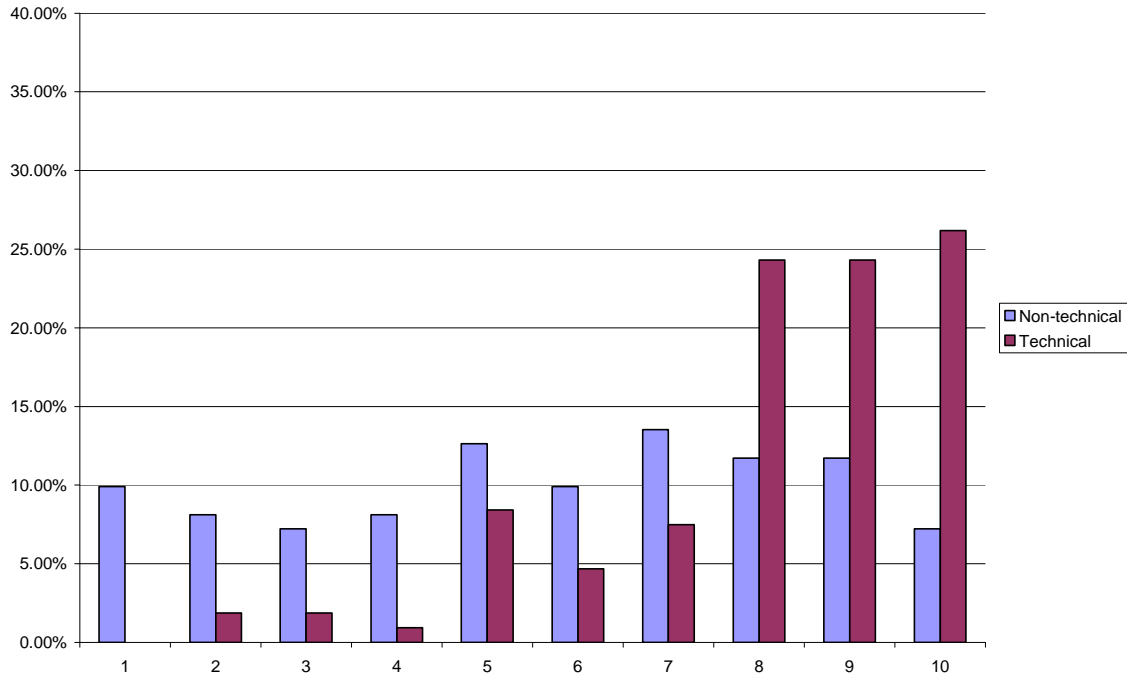
36. Email
[OPEN ENDED]

37. Phone Number
[OPEN ENDED]

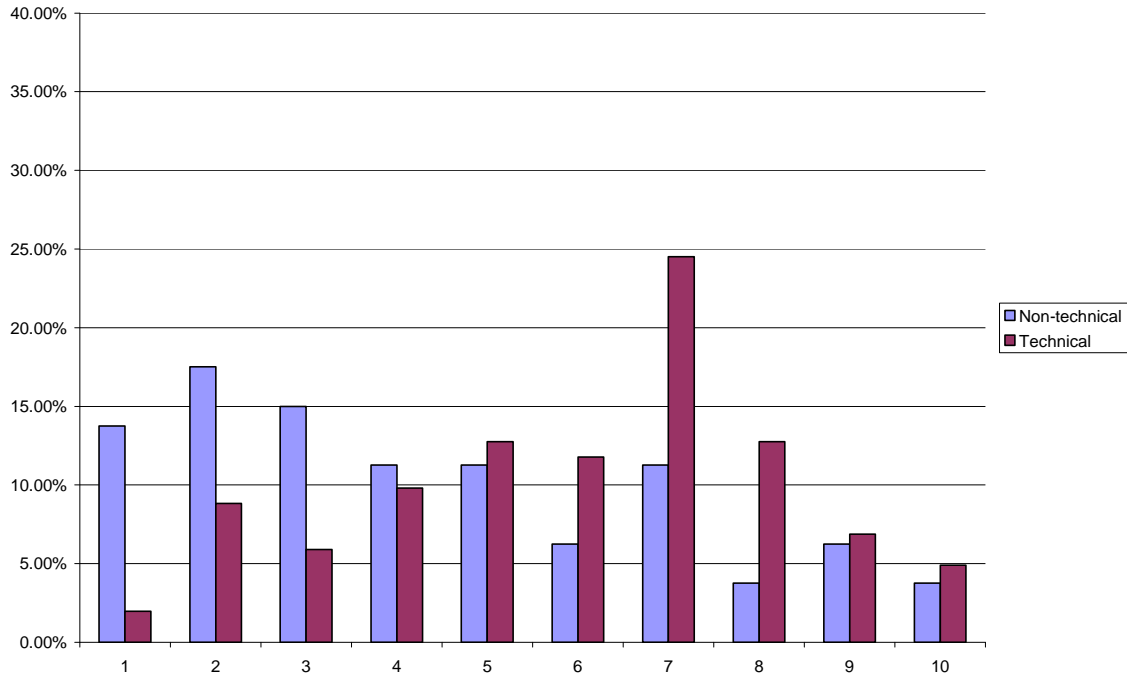
38. Best time to contact you
[Single Select]
Day
Evening
Anytime

APPENDIX D: FAMILIARITY WITH WEB DEVELOPMENT LANGUAGES

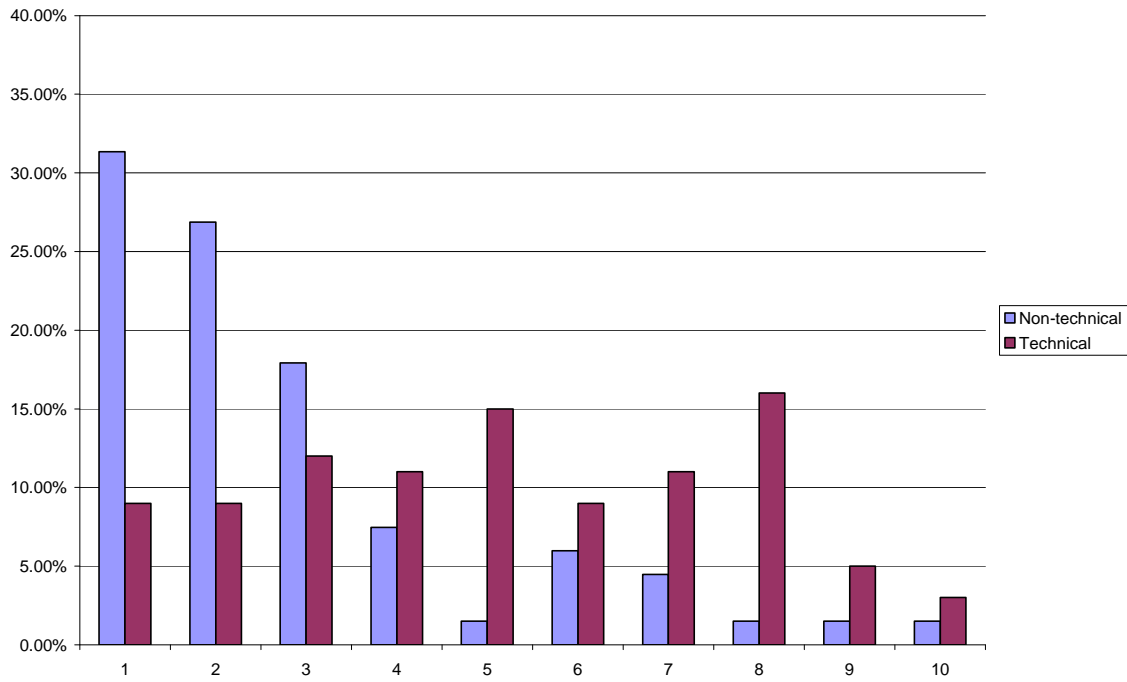
Familiarity with HTML on a Scale of 1-10



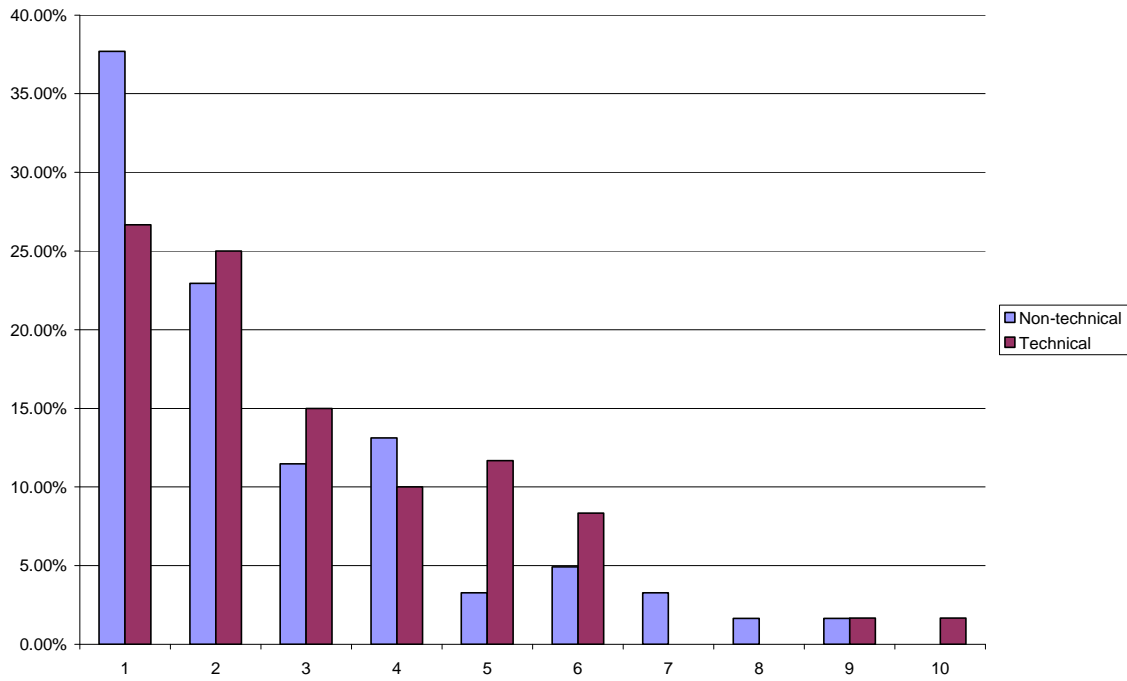
Familiarity with CSS on a Scale of 1-10



Familiarity with Javascript on a Scale of 1-10



Familiarity with Flash on a Scale of 1-10



APPENDIX E: COMMENTS FROM RESPONDENTS

There certainly seems to be a need to have centralized, competent and reasonably priced web resources for campus staff.

Thanks for doing this survey. I have long been interested in using more standards and being more organized in web development.

some of us in our department would like to have standards for graphics and web design, but we haven't been able to get the go-ahead from above to set them up and enforce them

PART OF MY PROBLEM IS THAT I RECEIVED HELP FROM EDUCATIONAL TECHNOLOGY TO BUILD MY SITE BUT SUCH HELP IS NO LONGER AVAILABLE. I have little technical expertise but know exactly what I want, with technical assistance!

It would be very useful to have a resource on campus that would help with overflow web projects, and be available to consult on technical issues we come up against. Our IT unit isn't helpful in this regard.

I, with the help of various work-study students, have had to try and maintain a web site by the seat of our pants. Small department, with no on-site technical assistant due to budget cuts. Short term student assistants. We use a rather simple program trying to maintain the site as you would word processing. Not an easy way to go about things, but it works.

I would LOVE there to be more reliable web editing, and editing resources, across campus. I know standards have been established, but it's the meeting of those standards that is so erratic from site to site, etc. Our own site redesign attempted to bring an extremely outdated and poorly designed site into the early 21st century, but I know it's still pockmarked here & there.

Readily available templates, perhaps, and a centralized online source of borrowable stuff--code, maybe, graphics, the UI stuff noted above, etc., would be great. But our dep't director needs to comprehend the value of a well-designed site, and needs to get it that resources must be channeled to its upkeep. So I'd also say that some kind of clear PR campaign that got the idea into directors or managers' heads, ideally from ABOVE their heads, would help a lot of these improvements take hold.

'Til we have more than one or two people dedicated stolen moments from their other jobs on this work (which is what we have here), we'll have a hard time meeting our own ideals.

I shouldn't have to do any of this, but there's no support and we don't have enough staff to do what's needed. Another case of faculty having to spend a great deal of time doing inefficiently what a knowledgeable staff person could do quickly and efficiently.