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| Campus Web Toolbox Campus-Wide Web UI & Content Management Tools  Proposal for  2011 University of California Larry L. Sautter Award  for Innovation in Information Technology |

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# Project Information

The following information is being submitted for consideration for the 2011 University of California Larry L. Sautter Award for Innovation in Information Technology.

## Project Title

**Campus Web Toolbox** – Self-service campus web UI and content management tools for easily creating and maintaining consistent campus-wide websites, user interfaces, web and mobile applications.

## Submitters’ Name, Title, and Contact Information

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* **10 campus areas** involved in setting the campus-wide look and feel, <http://cwo.ucsd.edu/about>
* **7 campus IT areas** involved in defining the campus-wide mobile framework: ACT, ACMS, Colleges, Libraries, Student Affairs, SIO, Biological Sciences
* **UC Mobile Collaboration Group**: UCB, UCI, UCLA, UCSB, UCSD, UCSF, <http://mwf.ucla.edu/getting-involved>
* **UC CMS Collaboration Group**: UCD, UCI, UCR, UCSB, UCSC, UCSD

# Summary of Significance of Project

Universities as large, diverse, and innovative as the UCs dedicate a great deal of effort creating websites, writing web applications, and creating technology solutions for specific needs across the entire campus. But the problem is, developers can’t just focus on the main content or functionality – they also have to consider the visual appearance, campus branding, usability, accessibility, and best practices for every application. How can we streamline or consolidate this kind of effort that is happening simultaneously across many campus IT groups, using varied technologies and methodologies?

We asked the question “What do most campus websites have in common?” then purchased and developed solutions and made them available to the entire campus via this **Camps Web Toolbox**. This toolbox contains many essential timesaving tools for campus web developers:

* [Content Management System](http://cwo.ucsd.edu/cms) for easily creating and maintaining campus-branded websites
* [Mobile framework](http://uxt/mobile) for easily creating campus-branded mobile websites and mobile web applications; based on the UCLA MWF
* [Decorator](http://uxt.ucsd.edu/stylesandwidget/decorator/decorator.html) theme and campus template for all websites and web applications
* [HTML style library](https://pascal.ucsd.edu/sample/styled/styled.htm) a plethora of standard styles and components to choose from
* [Icon library](http://uxt/appstandardsandguidelines/uielements/icon_library.html) common set of icons
* [Forms](http://uxt/stylesandwidget/styles/form.html) & [Widgets](http://uxt/appstandardsandguidelines/uielements/widgets.html) incorporate best practices in form layout and dynamic web elements

The significance of this **innovative** “self-service” toolbox model is that hundreds of IT developers across the campus can now eliminate thousands of hours of duplicate effort, **share resources**, and deliver consistently-branded web and mobile products **improving usability/accessibility**. Based on **standards**, it is **sharable** and **interoperable** across all UCs. Considering the entire toolbox, we project a cost savings of about **$650,000 annually** with participation of a handful of campus groups. As this participation increases, so do the cost savings.

# Project Description

|  |  |
| --- | --- |
|  | What does every University have an abundance of? |
|  | Websites, Web pages, and Web applications! |
|  | |
|  | What does every University have a shortage of? (especially these days) |
|  | Web designers, Web developers, and Web tools! |
|  | |
|  | |

There are hundreds of thousands of web pages being served under the UCSD domain. Collectively, the amount of time and effort dedicated to building and maintaining these sites over the years can add up to many FTE positions, enough to power a small Silicon Valley tech company.

The UXT Toolbox plugs this FTE leak via two major tool offerings:

1. Content Management System (CMS)
2. Web application UI frameworks and decorators

## First Came the CMS

We embarked on this endeavor almost 3 years ago, after identifying a need for a centrally-managed content management system, offered as a **free** service to the entire campus. After much evaluation, we selected Hannon Hill Cascade Server as the [campus CMS tool](http://cwo.ucsd.edu/cms/index.html). The reasons for implementing this solution were clear and numerous:

1. Save the campus money by eliminating redundancy by:
   * Eliminating duplicate software licensing
   * Providing central website hosting, thus reducing the need for additional campus servers
2. Offer consistent Web templates that:
   * Provide continuity & brand management
   * Incorporate usability best practices
   * Speed time-to-market through automation
   * Help ensure Section 508 and ADA (Americans with Disabilities Act) compliance
3. Protect campus Web data through server redundancy and disaster recovery
4. Easily deploy emergency communication to the campus community and beyond
5. Provide cohesive analytics to better understand users' browsing habits
6. Facilitate content sharing and data management

This packaged campus CMS solution provided these direct benefits to campus clients:

* Allowed people with little or no experience to build and maintain professional Web sites, using the campus templates.
* Created a more coherent Web presence across the campus Web space.
* Provided access to centralized consulting and training.
* Saved departments money - Did we mention, it's **free** for campus units?

Over the past 3 years, [42 campus websites](http://cwo.ucsd.edu/cms/clients.html) have taken advantage of this tool, with an average of about 2 campus units being brought onboard to the CMS each month.

### Campus-wide Web Template

Part of the CMS implementation entailed identifying the most visible common website elements and offering [templates that reflect UC San Diego branding](http://cwo.ucsd.edu/cms/templates.html) and include configurable content types. The templates include these common elements:

|  |  |  |
| --- | --- | --- |
| Header: | Body: | Footer: |
| * Link to Campus home page * Website title * Main navigation (menu) bar * People search * Site search * Breadcrumbs | * One-, two-, or three-column layout * Ajax-enabled “drawer” template for complex content * Content blocks that can be shared between pages * Side navigation | * Campus branding * Feedback link * Copyright information * Terms and Conditions |

### UC Collaboration

Besides UC San Diego, 5 other UCs have adopted Cascade Server as their campus CMS tool. Because of this collaboration, all UCs can enjoy a 15% license fee discount. In addition, campuses can collaborate and share tips on CMS usage through a monthly UC-wide CMS teleconference.

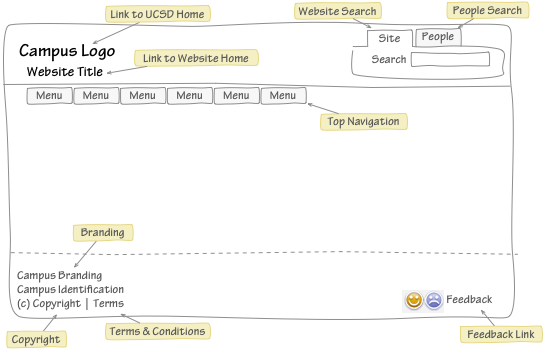
### Cost Savings

At UC San Diego, we estimate cost savings of almost **$200,000** per annum for the centralized CMS system because non-technical staff can maintain their websites. If we assume that UC San Diego needs 1 technical FTE for every 10 websites, and that technical FTE earns $80,000/year, and we onboard 2 websites each month, the cost savings equates to 2.4 FTE / year or $192,000.

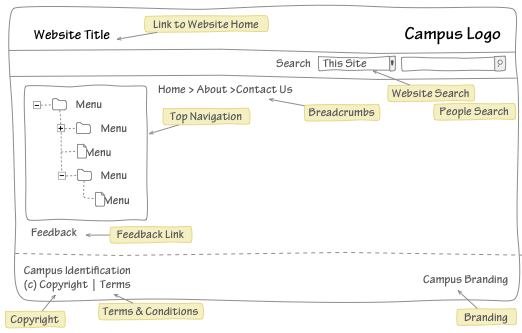
## Then Came UXT

The CMS solution handled basic web page content beautifully, but what about more complex, dynamic and interactive web forms and applications? We applied the same concept of distilling down the common elements and creating a centralized campus tool and template model to the web application realm, and the **UXT (User Experience & Technologies) Toolbox** was born: <http://uxt.ucsd.edu>.

Some web applications looked like this:

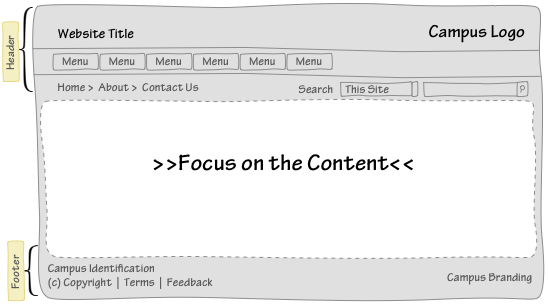


Others used a different layout, like so:



### The Decorator

To save developers the time and grief of “decorating” the pages, we categorized the most visible common elements into a “header” and a “footer” area on the web page, referred to as the “[decorator](http://uxt.ucsd.edu/stylesandwidget/decorator/decorator.html)”. This “decorator” shares the CMS campus-wide template. Managing these decorators centrally eliminates duplicate work and effort across the campus web development community and allows developers to simply **>>Focus on the Content<<**.



Although the power of the decorators lies in their grouping of common elements and reusability, it’s not always possible to meet everyone’s needs with just **one** decorator. The UXT Toolbox offers “Decorator Families” based on the type of application. For example, we offer a decorator for Financial applications, one for Student applications, one for Research applications, one for Employee applications, one for Mobile applications, and so forth. There are just enough to allow flexibility but still remain maintainable.

### Styles

The next step was to find the common elements within the context of web applications and centralize them as well. **The developer shouldn’t have to think about what size or color to make page titles, where to place buttons, what kind of button to use, what set of icons to use, where to put labels for forms, or what error messages should look like. The developers should focus on implementing the business logic and the business requirements for a solid and well-tested system!**

To address this, the UXT Toolbox provides:

* [HTML style library](https://pascal.ucsd.edu/sample/styled/styled.htm) (a plethora of standard styles and components to choose from)
* [Icon library](http://uxt/appstandardsandguidelines/uielements/icon_library.html) (common set of icons)
* [Forms](http://uxt/stylesandwidget/styles/form.html) (best practice field and form layout and components)
* [Web App Standards](http://uxt.ucsd.edu/appstandardsandguidelines/index.html) and guidelines

### Collaboration & Cost Savings

The significance of this “self-service” toolbox model is that hundreds of IT developers across campus can now eliminate thousands of hours of duplicate effort, share resources, and deliver consistently-branded products. Considering a small number of participating units, we estimate an annual cost savings of **$440,000**.

The cost avoidance/savings are based on:

* UXT Framework has a potential cost savings of **$160,000**/year (considering 20 participating developers) via:
  + 10% reduction in development effort by using UXT toolbox for front-end web development. For every 10 developers working on web applications, there is a cost savings of 1 FTE, or about $80,000/year.
  + Elimination of development bottlenecks by providing a self-service model of packaged technologies
  + Elimination of dedicated UI developer for each front-end web development
* Mobile Web Framework has a potential cost avoidance/savings of **$280,000**/year (considering 7 participating units) via:
  + Eliminating the need for campus departments to investigate, setup, host, and manage their own mobile framework servers for developing department mobile applications. Calculation based on average ½ FTE to cover support, development and hardware costs, per participating department, and assuming about 8 participating departments, average FTE $40/hour, and ~1750 hours per year is 1750/2 x $40 x 8 = 280,000
  + Potential reuse and sharing of mobile applications and technologies across UCs

# Technology Used

The following lists the technologies used for the toolbox and the benefits of those technologies.

### CMS Technology Stack

|  |  |
| --- | --- |
|  | **Cascade Server**: Open standards CMS focused on content, UC-wide collaboration, scalable |
| **CSS, HTML, JavaScript**: lightweight, standard, and client-side technologies |
| **Velocity**: clean separation between the view layer and the model/control layers, open standard |

### UXT Technology Stack

|  |  |
| --- | --- |
|  | **jQuery**: abstractions for low-level interaction, advanced effects, themeable widgets, interactive web applications |
| **JSP**: rapidly develop and easily maintain dynamic web pages, platform independent |
| **CSS, HTML, JavaScript**: lightweight, standard, and client-side technologies |
| **Spring MVC**: enterprise java app framework, clean division between controllers, models, and views, open standard |
| **SiteMesh decorator framework**: clean and effective way of separating web content from look and feel |
| **UCLA Mobile Web Framework**: lightweight, standards-based, UC-wide collaboration |

# Timeframe of Implementation

We initiated the Campus CMS project in June 2008 and went through the complete lifecycle of product research, comparison & discovery, proof-of-concept, pilot, and full-campus rollout. The first sites, including the Campus Website, Prospective Students, Current Students, Parents & Families, Friends & Visitors, the Libraries, and Sixth College were launched in March 2009.

We initiated the UXT toolbox in July 2009 and went through the complete lifecycle of technology research, comparison & discovery, proof-of-concept, pilot, and full-campus rollout. The UXT toolbox (uxt.ucsd.edu) was launched in January 2010.

We keep these technologies up to date via timed and systematic releases.

# Supporting Documents

See the following links for supporting details of the various areas addressed within this document:

|  |  |  |
| --- | --- | --- |
| CMS: | UXT: | Mobile: |
| <http://cwo.ucsd.edu/cms> | <http://uxt.ucsd.edu/> | <http://uxt.ucsd.edu/mobile> |

# Success Factors

The following measurable success factors were defined, and the results successfully achieved.

|  |  |  |
| --- | --- | --- |
| Success Factor | Results |  |
| Onboard 12 major campus websites into the CMS within first year of launch | **Success.** Onboarded **18+** major campus websites into the CMS within first year of launch. 42 sites launched to date, and **8+** others are in progress. |  |
| Provide self-service model for UI development – eliminate contractor position | **Success.** Through training and extensive website (toolbox), eliminated need for UI developer contractor. |  |
| Launch 5 large web application projects using the UXT stack within first year of launch | **Success.** Implemented **6** large web applications using the UXT stack within first year of launch. Many other projects have been launched since then and still more are in the development stage. |  |
| Eliminate Mobile application license (Blackboard/Terribly Clever) | **Success.** Will not renew license in coming year as all mobile initiatives will be managed via the UC-wide MWF. |  |
| Launch 5 major campus mobile applications within first 6-8 months of Mobile framework launch. | **On target.** 1 campus unit has launched a mobile application. Many campus units are in review and development stage. |  |
| Collaborate, contribute, and share technologies and tools with campus departments, other UCs, and other Universities. | **On target.** We are involved in UC CMS collaboration, UC Mobile collaboration, and have shared and streamlined campus-wide web development efforts with 10+ large campus IT departments. We think there is always room for more collaboration! |  |

# Objective Customer Satisfaction Data

Below is a sampling of the many positive client responses received following the toolbox rollout and usage. The names have been omitted and replaced by titles.

|  |  |  |
| --- | --- | --- |
| “ | The new CMS is so easy to learn and use. There’s much more flexibility in page layouts that suit my needs. I love being able to “stage” pages for my customers to review exactly as they’ll appear on the live site. I can turn around change requests in as little as 2 minutes instead of 2 hours. Because the Campus Web Office offers excellent training and timely support, I don’t have to worry about bugs and downtime slowing me down. | ” |
| -- Writer, Auxiliary & Plant Services | | |

|  |  |  |
| --- | --- | --- |
| “ | I loved the use and flexibility of new UI technology and its usability.  I think the look and feel so far is simple, clean and the departments will love it. I’m excited to continue working with your tools for our next project too! | ” |
| -- Business Project Manager, Office of Post Award Services | | |

|  |  |  |
| --- | --- | --- |
| “ | It is a weight off my shoulders to know that the UI is being designed by a team with expertise and knowledge of best-practices.  I think the service you and your team provide is very beneficial and much needed (and certainly much appreciated!). | ” |
| -- Technical Project Manager, Administrative Computing & Telecommunications | | |

|  |  |  |
| --- | --- | --- |
| “ | The campus Mobile Framework is amazing. Our existing application just simply displays another view, a mobile view.  The server handles the business logic and data. All of our code on the server can be reused. Because of this, it took our student intern under a week to create a mobile version of our tours application! | ” |
| -- IT Director, Student Affairs | | |