What is Suma? Suma is an open-source tablet and web-based assessment toolkit for collecting and analyzing observational data about the usage of physical spaces and services, developed at North Carolina State University Libraries. The tool streamlines existing data collecting activities, enables fast, hassle-free mobile data collection, provides sophisticated data analysis and visualization capabilities for non-technical users, and promotes observational data analysis as an integral part of service and space design and day-to-day planning.

Background Many libraries produce manual head counts or activity counts for physical spaces, but struggle with the difficulties of collecting, organizing, storing, and analyzing such data, significantly limiting its use. The availability of tablet devices has created an opportunity to simplify and encourage the collection of fine-grained data about the use of library services and physical spaces. Suma – which can be used on a tablet or a desktop browser -- streamlines the collection and centralized management of space usage data and enables rapid, sophisticated quantitative data analysis that reduces technical barriers to employing usage data to aid space and service design.

Improving Spaces and Services Suma adds value to observational data analysis in at least four major areas:

1. Improved decision-making vis-à-vis service and space design
2. Error reduction and improved data collection compliance
3. More extensive data collection and analysis possibilities at a reasonable cost in time
4. Cross-departmental availability of data previously encapsulated by departmental silos

Data analysis features Suma’s data analysis tools allow users to explore their data through a web-based interface. Users can easily change settings to view data from different collecting programs, locations, activities, and time periods. Suma currently provides interactive time-series charts, the ability to splice and analyze data from only particular times of day, bar charts of activity and location counts, and a heat map showing temporal concentration of activity over the years or semester.

In addition, Suma allows you to easily export your data in a variety of formats, including:

- PNG images of charts
- CSV export of raw data for import and analysis in spreadsheet applications
- CSV export of useful summary statistics (including counts and percentages by year, month, day of the week, and hour of the day for each locations and activity)

Possible types of collection initiatives Suma can be used for a wide variety of data collection programs. At NCSU Libraries, Suma is used for the collection and analysis of:

- Library head counts
- Detailed activity-annotated head counts during sampling periods
  - Laptop usage
  - Group vs. individual study
- Reference desk tracking (both Learning Commons and Special Collections research transactions)
  - Type of transaction (e.g. “Reference,” “Computing”)
How does Suma change space and service design practices? The primary goal of the Suma project is to integrate data analysis into both tactical and strategic decision-making processes centered around spaces and services. In order to achieve this, the project team has strived to dramatically lower the barriers to entry for both data collection and analysis. Suma eliminates paper-based data collection, which both reduces the costs of hand-coding data and allows for the collection of richer data that would be difficult to represent on a paper-based form. Suma also eliminates spreadsheet-based data management and analysis. By storing all data in a centralized system and in a consistent format, we are able to build powerful and reusable data analysis tools that can be applied to all collecting programs within an institution. Gone are the days of tracking down spreadsheets, performing awkward manual analysis, and dealing with fragmentation both in terms of time and data format.

We feel we have created a system that supports far more sophisticated data collection and analysis at a far lower cost. As a result, this data can now be integrated into day-to-day decision-making about space and service design, technology and furniture selection, staffing, service schedules and locations, and other physical space- and service-related planning discussions.

What do I need to have in order to implement Suma? We’ve attempted to streamline the Suma install and provide good documentation, but Suma is still a PHP-based application that will need to be installed on a web server with a MySQL database. Although the maintenance of the system should be quite low (and primarily limited to software updates), a Suma install does require the involvement of someone with the access and knowledge to install a web-based, database-backed application.

Technical architecture The Suma application stack comprises three major components: data collection tools, a data management server, and a data reporting and analysis framework. The tablet-based data collection application – as well as the data management server – have been shown to be highly stable since pilot testing began in summer 2011, and the reporting and analysis framework includes a rapidly expanding set of sophisticated and highly interactive reporting and visualization tools. All four NCSU pilot initiatives have continued to use Suma in a production capacity after the initial pilot. All application code is released under a permissive open-source license. Because Suma is open source, Suma institutions with software development resources are free to extend Suma by building custom data analysis tools. While we continue to strive to release a variety of powerful analysis and visualization tools, we have also provided flexible APIs to ensure that institutions with needs outside of the packaged tools do not suffer from the inflexibility common among many vended solutions.

Community & contact information

- To download Suma: https://github.com/cazzerson/Suma
- To be kept abreast of Suma developments, code releases, or participate in discussion forums, join our Google Group: https://groups.google.com/d/forum/suma-mobile-library-assessment-toolkit
- For more information about Suma please contact
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  - Joyce Chapman, Community Outreach and Data Analysis specialist: joyce.chapman@gmail.com