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Searching with Solr: Using Search Functionality to Improve Website Usability

A successful web experience provides the user with their sought-after information in the fewest number of clicks. With this in mind, the team behind Children's Hospital of Philadelphia's Research Institute website, www.research.chop.edu, knew they wanted to create an experience where faculty, staff and the public found information quickly and easily. However, this would require a complete restructure and redesign of the now former site. The redesign required that the following criteria be met: 1) reduction in duplicative content; 2) simplify navigation; 3) improved user experience (UX/UI); and 4) coherent and intentional communication strategy. So how did they go about achieving such lofty aspirations?

The vision started at the top with a review of CHOP Research Institute's strategic plan, developed by Bryan Wolf, MD, PhD, executive vice president and chief scientific officer, and his Senior Leadership Team. During the planning process, a common theme arose from feedback they received from researchers and administrators: finding and accessing information needed to be efficient and productive in their research endeavors proved difficult, complicated and confusing. Site pages loaded slowly and the search function on the site produced neither meaningful, nor quick, results.

Armed with this feedback, the Web Presence Project team, led by John Knab, senior director, Research Information Services, Angela Knott, director, Creative Services, and Scott Glasser, associate director, Web Strategy set out on a mission to overhaul the web experience, putting these needs of CHOP Research faculty and staff at the forefront of the site's redesign.

The team found the analogy of building a house helpful when describing the process of redesigning the site. "You don't build the first floor, before the foundation is completed," became a frequently used refrain amongst the team. They considered who was going to live in this house and what they would be doing. The Research Institute's site had to house quite a large family, comprised of principle investigators and their staff, administrators, students of all educational levels, outside collaborators, the greater scientific community, and the general public, all looking to learn more about the Research Institute's transitional research mission and breakthrough discoveries. This home of a website not only needed to meet the needs of its current family, but also had to recruit and welcome new faculty, postdoctoral fellows, and staff.

To meet this diverse set of needs, the project team knew the foundation of the site had to be built on content which could inter-relate. This interconnectivity would inform all other design and development considerations.

The team decided the site's search function would provide this fundamental foundation of interconnectivity. It would not simply be a search box in the upper right corner that scans and returns search results based on site content; but "a basis for connecting and displaying

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seemingly disparate content in useful and intentional ways," Glasser explains. A search functionality that would return meaningful, intuitive, and useful results, as lists, page content, and more.

Finding the right tool quickly became the team's next goal. Short-Open-Load Reciprocal, widely known as Solr, won the job. Solr, a search platform known for its speed, provides consistent search results with capabilities to search full text and even downloadable resources, such as PDFs. Solr can also be customized to boost search results based on user feedback and give users the ability to narrow their search results based on site categories. Perhaps its most exciting feature, Solr can combine content from across the site, creating a new page of curated content, such as the COVID-19 response page, or the events and announcements pages. "The new search functionality is a complete game changer," Knott said.

Two RIS Web Service developers, Roger Martinez and Lidiya Grushetska, took on the task of implementing Solr, and configuring it in such a way that it enhanced the rich content framework of the new site. The result, found on www.research.chop.edu, includes not one, but two, types of search functionality within the site. First, the Global search indexes and brings in results from the main website as well as results from other sites within the Research Institute. Second, they configured Solr to provide the foundation for pages that present content related on sitewide categories, such as profiles, labs, services, news, and more.

Some of the Solr highlights from www.research.chop.edu:

- Global Search – The foundation of the entire website, it brings expected and useful results from across Research Institute.
- Research Information Services – The list of services provided by the Research Information Services showcases Solr's ability to pull together related content onto one page and provide the user with the opportunity to further refine the results using search categories.
- Coronavirus Updates - The Research Institute's response to the COVID-19 pandemic utilizes Solr's ability to combine related content into one page and relies on the site to present the content in quickly accessible design.
- Find People – The directory of Principle Investigators utilizes Solr's refined search capabilities, providing users the ability to search only within the directory while also giving them the ability to sort investigators' profiles alphabetically.
- Research Announcements – The list of announcements on the site relies on Solr's ability to pull together related content and refinement of results based on sitewide categories and departments within the Research Institute.

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The work to enhance Solr's capabilities has continued past the launch of the redesigned Research Institute site. Constantly fine-tuning search algorithms, implementing software updates, and expanding the development of custom applications keep both Martinez and Grushetska busy as they work to improve Solr as well as meet ongoing requests of the CHOP research community for additional functionality.

A preview of the exciting new Solr functionality coming to the site includes:

- "Did you mean" – This feature will provide users with terms similar to the one searched.
- Term Boosting – This feature will boost certain commonly search for terms to the top of the search results, allowing more meaningful and accurate results.
- User Feedback – This feature, found on any search results page, allows users to provide the RIS Web Services team with feedback and suggestions on search results.

The debut of Solr, alongside the newly redesigned Research Institute website, showcases the talent and commitment of the RIS Web Services team in meeting the needs of the ever-expanding CHOP Research Institute community, providing them with a user experience that is not only aesthetically pleasing in its design, but also gives faculty and staff access to the information and resources they need with accuracy, speed, and reliability.

A Closer Look:

- [Web Presence Project Communication Portal](#) – Transforming our website; accelerating breakthroughs
- [Research Information Services](#) – Our department and partnership with you
- [RIS Web Services](#) & [Our Team](#) – Our team and what we do
- [CHOP RI Main Website Application](#) – Support and other related service lines
- [CHOP RI Website – New User Experience/User Interface](#)

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