Problem statement

CU Boulder’s Laboratory for Atmospheric and Space Physics (LASP) recently celebrated 70 years of service to the public in space exploration. The research institute is the only body of its kind that has sent scientific instruments to all eight planets in the solar system, plus Pluto, the sun and a host of moons.

Recent record-setting research awards granted to CU Boulder include a solar instrument package designed and built by LASP – a contract valued at over $90 million.

As established innovators, LASP’s administrators realize that there are always additional opportunities to enhance their public web presence.

Scholarly publications – journal articles, conference proceedings and books – provide a foundational underpinning to any research institute. Publicizing a robust portfolio of research publications attracts not only top-notch graduate students and industry collaborators, but research dollars to boot. How does LASP stay up-to-date on promoting the thousands of publications generated by its 400+ research faculty?

Today, if a unit has a publication site, administrators often discover new publications “by hand” – using Google. If found, publication information is typed into static web pages. It’s a time-consuming process – tedious and tough to stay ahead of, particularly with the volume and variety of research happening at CU Boulder. Moreover, this “by hand” approach misses key opportunities to highlight research keywords, co-author relationships and publication altmetrics (metrics and qualitative data that are complementary to traditional, citation-based metrics).

Proposed solution

Since 1994, the Faculty Information System (FIS) team, prides itself on creating web applications that serve to promote and support the university’s most valuable asset – our faculty, including LASP scientists and engineers.

One core FIS offering is CUBE – CU Boulder Elements – a metadata repository hosting over 100,000 scholarly and creative works of CU Boulder faculty. Behind the scenes, CUBE uses automated feeds from industry-standard, “source of truth” data sources such as CrossRef, Web of Science, ORCID, PubMed, Altmetric and others to gather, disambiguate and organize structured publication metadata. CUBE then links these metadata with the appropriate authors, collaborators and editors across CU Boulder.

Realizing the value of data reuse, the FIS team developed feeds of this linked publication metadata from CUBE to CU Experts, the public online research and expertise discovery website for the CU community and beyond. CU Experts is home to over 2,100 automated faculty profiles including photos, vitas, research interests and more. And now publications from CUBE are visible on CU Experts.

Here’s where a solution emerges. Can this high-quality publication metadata be reused once again? This time on LASP websites – without manual data re-entry – or additional “high-touch” curation?

The FIS team, partnering with colleagues in the Office of Data Analytics (ODA) and collaborators in the Office of Faculty Affairs (OFA) and LASP, proposes to conduct an Innovation Buffs experiment: deliver a customizable web-based tool that will help attract, promote and retain the best faculty and graduate students.

Meet CU Experts Direct.

Required resources

Building on groundwork laid, we envision CU Experts Direct as leveraging investments made in the Elasticsearch open-source search and analytics framework that powers CU Experts. In a
proof of concept, LASP collaborators working with a FIS lead architect developed a “quick and dirty” demonstration of the power of this approach.

We see potential to provision LASP-related publication metadata for consumption as data services or web components. What does this mean for our partners at LASP?

It means they can select the researcher information they want to include on their websites – as well as how results are displayed. For instance, LASP can opt to embed a search box in their web site that shows publications for a particular group of researchers. Or they can add a tag cloud with research keywords for scientists working together on a grant-funded project.

With Innovation Buffs funding in place, LASP technical staff can use CU Experts Direct to display trustworthy CUBE data, seamlessly on LASP web pages – in the way that works best for LASP.

As in the past when implementing these sort of services to the campus, our team anticipates working closely with partners at the Office of Information Technology (OIT) to assist with ramp-up and build-out of pre-production and production pipelines to deliver a secure, robust and highly-available solution.

One thing to note: our approach is intrapreneurially oriented. We view LASP not only as collaborators, but also as customers. Thus, our team aims to provide a “value-add” to LASP researchers and administrators. Hence, a key resource required for the successful implementation of CU Experts Direct is the mindshare of product owners at LASP, and their willingness to provide open feedback to refine this offering.

**How success will be measured**

Being customer-focused and data-informed, we anticipate using several tools, both quantitative and qualitative, to evaluate the of success this Innovation Buffs experiment. In collaboration with Institutional Research, surveys will assess the attitudes and needs of LASP faculty and staff regarding CU Experts Direct.

An initial survey will introduce the proposed approach and pinpoint desired features as well as potential concerns, enabling us to create a better product. After the initial launch of CU Experts Direct, a follow-up survey will examine satisfaction with and utilization of CU Experts Direct among LASP faculty and staff – to ensure that stakeholders needs are being met by the proposed solution.

Success of this experiment will also be measured on the quality of new publication data provided, as determined by LASP researchers. Other metrics include service up-time, online usage, adoption rates, and timeliness of data feeds.

Taken as a whole, this valuable feedback informs further improvement and refinement of CU Experts Direct. Should the stars align, our team believes that it is possible to deploy CU Experts Direct to other eager campus customers (Institute of Behavioral Science, INSTARR, CIRES) – well within the one-year experimental window. Indeed, given proper support, it’s hard to come up with a solid argument against expanding CU Experts Direct university-wide – including integration with CU Boulder’s Web Express campus-wide web-publishing platform.

**Involved organizations and individuals**

Sarah Banchefsky, PhD, Survey Design & Assessment Analyst, Institutional Research
Michael Bryant, Webmaster, Laboratory for Atmospheric and Space Physics
Don Elsborg, Lead Architect, Faculty Information System
Vance Howard, Principal Enterprise Solutions Architect, Faculty Information System
Grant Matheny, Senior Systems Administrator, Institute of Behavioral Science
Randy Pyers, Faculty Data & Reporting Specialist, Office of Faculty Affairs
Matt Ramey, Scholarly Impact Liaison, Office of Faculty Affairs
Alex Viggio, Interim Executive Director, Faculty Information System
**Investment required**

Resources required to fund the CU Experts Direct experiment.

*Fixed (based on a one-year commitment):*

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
<th>Person Hours/FTE/$$$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODA Developer</td>
<td>Configure new elasticsearch cluster, develop extract-transform-load processes, set up KPI tooling</td>
<td>120 Person Hours</td>
</tr>
<tr>
<td>Web/UX</td>
<td>Web user experience developer to create and test search box, tag cloud and tickler web components</td>
<td>0.5 FTE</td>
</tr>
<tr>
<td>ODA Program Manager</td>
<td>Coordinate development, testing and implementation</td>
<td>0.2 FTE</td>
</tr>
<tr>
<td>OIT Infrastructure</td>
<td>Elasticsearch cluster</td>
<td>$1200/Month</td>
</tr>
<tr>
<td>OIT Operations</td>
<td>Monitoring, security, backup/recovery</td>
<td>Included in OIT infrastructure costs</td>
</tr>
</tbody>
</table>

*One-Time (based on a one-year commitment):*

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
<th>Person Hours/FTE/$$$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LASP Web Developer</td>
<td>Integrate CU Experts Direct feed into LASP website</td>
<td>0.25 FTE</td>
</tr>
<tr>
<td>LASP Stakeholder</td>
<td>Point of contact and LASP product owner</td>
<td>80 Person Hours</td>
</tr>
<tr>
<td>ODA Surveys</td>
<td>Conduct and analyze pre- and post-experiment surveys</td>
<td>80 Person Hours</td>
</tr>
<tr>
<td>OFA Communicator/Trainer</td>
<td>Handle increase in publications questions, curation, training, work on issues to expand user access to CUBE and CU Experts</td>
<td>0.5 FTE</td>
</tr>
</tbody>
</table>

*Variable (for potential university-wide rollout – based on costs per academic unit):*

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
<th>Person Hours/FTE/$$$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Webmaster</td>
<td>Integrate CU Experts Direct feed into unit website</td>
<td>40 Person Hours</td>
</tr>
<tr>
<td>Unit Stakeholder</td>
<td>Point of contact and unit product owner</td>
<td>20 Person Hours</td>
</tr>
</tbody>
</table>