Building A Research Inventory to Tell Your Institution's Story

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abstract: Research inventories are interactive tools libraries are uniquely positioned to build and use in order to participate in institutional-level conversations about research priorities and resource investment. They can help build knowledge of past achievements in specific fields, identify local thought leaders, and gauge the size and impact of current research communities. Research inventories can be customized to track additional facets of research items, beyond those found in traditional bibliographies, and often contain robust options for searching or tagging items within them. This paper tells the story of the construction of a nearly 1,000-item research inventory at the University of Dayton focused on artificial intelligence research in Spring 2024. The paper focuses on the logistics and mix of methods used in building a research inventory under conditions of limited time and personnel and discusses narratives that can be unearthed through interpretations of the data gathered.

Introduction

When deciding which way to go, it is wise to consider where one has already been. When potential institutional changes arise, how can the academic library make its voice heard? If the new initiatives are research-focused, libraries might consider the use of a research inventory as a means of informing and advising upper administration, using data from the publishing record to help bolster and justify decisions that are made, or ultimately dissuade from similar actions that have not panned out in the past.

Over the past couple of years, institutions have had to take a good hard look at the topic of artificial intelligence (AI) and the multitude of implications it holds for higher education. From the classroom to the research lab and beyond, it has become increasingly integral for institutions to develop strategies around this technology in order to remain a relevant part of current conversations. After graduation, students face an evolving job market that has found ways to integrate this technology and demand competencies of candidates.

portal: Libraries and the Academy, Vol. 26, No. 1 (2026), pp. 31–39

To this end, the University of Dayton (UD), a mid-sized, Marianist research university in Ohio, convened an AI working group in February, 2024 to analyze our institutional history with, and capabilities around, this technology, and to provide advisory services and recommendations to upper administration. The group, led by the head of UD's Center for Cybersecurity and Data Intelligence (CCDI) was made up of three teams: Research and Scholarship, Curriculum and Pedagogy, and Administrative and Campus Operations.

As the Research and Scholarly Engagement Librarian, I was added to the Research and Scholarship team and tasked with determining what sort of research had been done at UD on AI in the past, aiming to compile as complete of a portrait as possible. The goal of this work would be to identify areas of strength or gaps in our institutional research agenda, as well as to generate a snapshot of our research community focused on this topic.

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The term that emerged to describe what I needed to build was "research inventory," which I was not initially familiar with. Through my membership on this team, I came to learn that research inventories are not just a useful way of chronicling research; they can be used to tell a variety of other stories about our institution, from technological capability to interdisciplinary crossover opportunities, to student involvement in research, and much more. We were given just over three months to complete our work and submit our report to the provost.

In this "Report From The Field," I will discuss my experience constructing and interpreting a research inventory, highlighting the ways these tools have grown more technologically user-friendly, can be used as a way for librarians to contribute to campus-wide conversations, and can be built within tight timeframes with limited resources.

What is a Research Inventory?

After that introduction, you might be asking yourself, "Hey, isn't this just a big bibliography?" There are a few features that differentiate a research inventory, primarily having to do with its flexibility and dynamism. First, while a bibliography mainly consists of a list of citations, an inventory can be customized to include whatever additional information about each publication one might want: citation impact information, finding aids or search terms used to locate each item, usage statistics, and more. The options are pretty much endless, depending on what it is you are hoping to use this tool to measure and the message you are hoping to communicate with it.

A working definition I have arrived at, informed by my work on this project and digging through the literature, is that a research inventory is a highly customizable and searchable tool for compiling research. The scale of the inventory can be adjusted to contain output from specific subjects up through entire disciplines, from individual departments at a single institution to the output of an entire continent. Inventories commonly include clearly defined inclusion criteria, detailed taxonomies for tagging individual items to aid in the search process, and can be growing, living documents,

expanding as additional eligible pieces of research come to light. They can be used as storytelling tools, decision-making aids, or instruments of assessment.

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Inventories have taken on several forms in the research and publishing record over the years. Doing an exact phrase search in WorldCat for "research inventory" brings back 663 results published between 1917 and 2023, split among tools published by government entities, educational institutions, and independent organizations. These inventories cover diverse subject matter, spanning the social and physical sciences.

In more library-oriented literature, notable achievements include the 2014 creation of the European Union's Inventory of Child Health, which combined the efforts of 34 scholars from 24 different European institutions.[1] 2014 also saw the publication of Ju Yeon Lee and Y. Tina Lee's technical framework for searchable inventory tools. This contribution established the need for collaborating with subject experts to decide on inclusion criteria and introduced the concept that an effective inventory is both a repository and a management system working hand in hand.[2] In 2015, in the pages of this very journal, Margaret (Peg) H. Burnette explored the construction of a "research audit" tool that excelled at unveiling interdisciplinary connections at her institution. Burnette's study provided a detailed framework for building such a tool for those specializing in biomedical research.[3] Examples of how these tools have been employed by librarians increased during the 2010s, with methodology moving in more technologically accessible directions during the 2020s. While earlier instances of inventories in research required in-depth feats of computing and technical infrastructure construction, later examples begin to employ widely-used tools such as Excel, Google Sheets, or Access as information containers, and publicly available tools such as Google Scholar as the primary search device

Research Inventory Personnel Requirements

As a member of the working group's Research and Scholarship team, I was placed in charge of the Inventory sub-group, tasked with building this thing, working with two other faculty members from other disciplines: psychology and computer science. The first thing we did was determine each person's role. A limitation the team ran into almost immediately was the availability of the members to work on the construction of the inventory, due to each having full spring semester teaching loads to contend with. Therefore, we had the computer science member of the team, already familiar with AI and its associated concepts, work to develop the inclusion criteria and the vocabulary bank we would use to guide our searches. This faculty member then consulted with their department to expand the list to a more definitive level. As the member of the team most familiar with the search tools we would be using to gather pieces of research, I took on the role of applying the search criteria and loading the results into the inventory spreadsheets. Our representative from psychology served as quality control, deleting

duplicate records that might appear under more than one search term and helping to pull author information from individual item records for the author inventory sheet. I then applied further analysis to each item, adding information about departmental affiliation, and where scholarly research records for each author might be found. It is important to keep in mind that this arrangement worked well, with UD being a mid-size institution. Larger institutions, or tools meant to capture a broader scope of research topics, might necessitate larger teams as well as additional building time.

Building a Research Inventory

As I mentioned, I had never heard of a research inventory when I was asked to create one. Therefore, my approach was admittedly a bit ad hoc, and, while it could be re-applied by librarians at other institutions as-is, it is definitely open for alteration and creative customization. Go wild with it!

The member of our team from computer science returned to one of our sub-group meetings with a list of 63 vocabulary terms related to AI. With this in hand, we decided to move forward using Web of Science as our initial search tool due to its ability to do institutional affiliation searching. Google Sheets was selected as the container for our data due to its collaborative features and general ease of use. We determined that we were also interested in gathering detailed author information tied to each entry, to help determine the heavy hitters and especially productive areas of our campus community. Tables 1 and 2 show the data the team decided to collect for each item.

Having selected the datapoints of interest, we were off to the races. After performing an affiliation search in Web of Science for "University of Dayton," each of the 63 AI vocabulary terms was then plugged into the "Refine Results" box. Within each of these sub-lists of results, the pieces of information listed in the tables were pulled from each item and placed into spreadsheets. Sometimes, publications would appear under more than one searched vocabulary term, which is where the quality control member of the team came in handy. Further oversight was provided by the computer science member of the team, who notified me any time that an article outside of the bounds of what we were looking for might have slipped into the listings.

One nuance to gathering author data was that, while Web of Science provides affiliation data for scholars within each record, additional author data, such as the individual's status as a faculty member, graduate student, or other category, sometimes had to be found by analyzing each piece of research. This was necessary for articles featuring multiple collaborators, who were sometimes from different institutions. To find information about school or college and department affiliation, a few different methods were used. User records were searched in Sierra, UD's ILS system, and theses and dissertations were searched using UD's institutional repository. Commencement documents preserved by the university archives were also consulted, especially in cases where student researchers' departmental affiliation information was not present within Web of Science records. Sierra was also used to determine whether a scholar was currently affiliated with UD. User records within Sierra are provided by the university registrar's office on a regular basis year-round. Thus, we decided that a user with an active, unexpired record in Sierra could be classified as currently affiliated with UD.

Table 1.
Metadata pulled from each Web of Science record

Information Type	Purpose
Article Author	Identifies article authors
Article Title	Identifies article title
Publication Year	Measures periods of productivity
Publication Title	Identifies popular venues of publication
Publication Volume	Finding aid
Publication Issue	Finding aid
Page Range	Helps with tracking down the work
Open Access Status	Determines ease of access, potential shareability
DOI/Link	Quick access to item record
Citations	Measures impact since publication
Web Of Science Usage Numbers	Measures contemporary interest
Keywords Used To Find	Tagging system

Table 2.
Author information for each research item, pulled from Web of Science records or institutional resources

Information Type	Purpose
Name	Identifies author
School/College	Identifies larger campus unit
Department 1	Identifies discipline area
Department 2	Captures dual appointment information.
Rank	Identifies author as faculty, grad student, undergrad, staff, other.
Number of Publications in Database	Identifies repeat researchers, potential thought leaders.
Currently With UD	Helps measure current institutional research interest.
Web of Science?	Place to find scholar's research record.
Google Scholar?	Place to find scholar's research record.
Dimensions?	Place to find scholar's research record.
OrcID?	Place to find scholar's research record.
Also Listed As	Identifies different name listings.

The first round of Web of Science affiliation and vocabulary searching yielded 1,088 records for review. After duplicates were removed, 580 pieces of research remained for the inventory.

The team was aware at the start of the project that, while Web of Science would give us a solid foundation for searching, its coverage was not comprehensive, and other methods would need to be explored to discover research that did not appear within it. Through departmental connections with the head of our working group, our sub-group was able to obtain Watermark (a tool used by faculty for annual self-reporting) records from our College of Arts and Sciences for the years 2021 through 2024. These 1,000 pages of new material dramatically expanded our disciplinary reach to include the humanities and other areas not heavily represented on Web of Science. Calls for contributions were also distributed to faculty from department chairs of the various disciplines on campus. These additional methods netted an additional 384 items for inclusion.

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Outcomes of the UD Inventory

After three months of searching within Web of Science, digging through Watermark records, and multiple self-reporting opportunities, the inventory ended up containing 964 pieces of research related to AI, authored by 457 UD-affiliated scholars. These publications spanned the years 1990 through 2024. The largest number of scholars came from electrical and computer engineering, computer science, and mechanical and aerospace engineering. Representation was found among all schools and colleges on campus, including the College of Arts and Sciences, School of Business, and School of Education and Health Sciences, spanning a total of 32 different disciplines. Seventy-four scholars were affiliated with the UD Research Institute, an off-campus entity primarily concerned with grant and contract-based research.

What Research Inventories Reveal

The searching and gathering phases complete, it was time to see what sort of narratives the inventory revealed about AI research at UD that we could share in our report. The time range and publication frequency data allowed us to confidently report that UD had been involved in AI research for multiple decades and was not simply reacting to the recent generative AI boom. While numbers stayed consistent throughout the 1990s in terms of publication counts, productivity increased throughout the first couple decades of the 21st century, before finally entering triple-digit publication counts for the first time in 2022. Further underlining the current moment as an especially productive time for UD was the discovery that 50.4 percent of all gathered records were published

between 2019 and 2023, with 53 of UD's top 100 cited articles having been published in that same time period. One hundred and four items in the inventory were published in open access outlets, which led to the creation of a special section of our institutional repository dedicated to highlighting this freely available work.

While we expected faculty to be the leading contributors to the research record, we were pleasantly surprised to see contributions from people in staff positions, doctoral students, graduate students, and undergraduate students. In a time when UD is trying to promote its ability to provide experiential learning and research engagement opportunities to prospective students, this document shows that the institution has lived up to this promise for quite some time. Digging for current affiliation data allowed us to get a bird's eye view of what our current knowledge community on the subject looked like, revealing 202 current members of our community involved with AI.

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Finally, the information we gathered, when analyzed by the computer science-affiliated members of our team, allowed us to identify limitations in computing power and available technology on our campus, and to make informed recommendations to the administration as to what steps and investments might need to be taken in order to stay competitive in this particular field.

Limitations

No project is without its limitations, and as described earlier, I was flying by the seat of my pants trying to figure out how to make this whole thing work (in just a little over three months, no less!). So, please keep some of these considerations in mind that might complicate your journey a bit.

As you may have guessed, time was the biggest limitation our team experienced in building the UD AI research inventory. Many of the other members of the working group had full teaching loads to contend with, greatly limiting how many hours they could put into the inventory's construction. To pull this off, I had to invest full weeks' worth of hours reviewing records, loading information into the spreadsheet, or chasing down scholar affiliation information, while balancing daily responsibilities as a librarian. If your library chooses to engage in a campus-wide research evaluation endeavor, consider advocating for a larger presence on whatever working group might be convened.

The tools you select might also restrict the disciplinary scope of research that comes back in search results. Some might say that the problem was right there in the title all along: Web of Science. It is true that the results that came back using our initial methodology heavily favored the STEM disciplines, with few other disciplines appearing unless they had engaged in some sort of interdisciplinary collaboration. This is what necessitated the expansion of our search methods into faculty reports and surveys.

This leads me to the next potential hurdle: inconsistent methods of faculty research reporting. While we were able to pull hundreds of new items from Watermark reports and surveys, the Watermark reports were only for a four-year period, and from a single unit on campus. The UD School of Engineering does not use Watermark for annual reporting, and with the survey being our only means of reaching them, and no enforcement mechanism to get them to reply, who knows how many additional pieces might still be floating around out there?

Tips

If I could offer future librarians any advice, it is the following. Keeping with the 2014 framework posited by Lee and Lee, make a conscious effort to ensure there is at least one subject expert in the field you are investigating whom you can consult when establishing inclusion criteria or search terms. Not only was I new to the concept of a research inventory, but I was also a neophyte when it came to the various academic applications of AI. Having a member of the Computer Science department on hand helping to establish scope and correct mistaken inclusions along the way was invaluable to making sure the tool we submitted to our provost was accurate and credible.

Establishing familiarity with research and evaluation culture at your institution is also important, especially when soliciting participation from faculty. Acknowledge that coming out of nowhere and asking people to submit parts of their research record can sometimes be a stressful request. Make the goals of why you are building an inventory clear. In the case of the UD inventory, I took pains to be clear in our communications that participation was not a form of evaluation, and to try to dispel any concerns about power dynamics. As an assistant professor, I told participants that any submissions would at most be a lateral transmission of information, if not down a chain of command (for associate or full professors), instead of upwards to someone in a position of evaluation.

Communication, transparency, and availability for questions are great principles to embrace throughout. At around the mid-point of the inventory's construction, the CCDI allowed the working group to host a pair of seminars open to the university community, where we could report on our activities and early findings. At the Research and Scholarship team's session, I was able to share in-progress statistics and discuss trends that the data was showing thus far. Attendees were given the opportunity to provide feedback or speak on elements they felt were not fully represented. This allowed me to add additional approaches to the search process and work toward a more accurate representation of our work.

Finally, if you are building an inventory that might have some bearing on the future strategic directions of your institution, advocate for it to be a living document if it ends up leaving your hands. Continuing to capture new research initiatives as they happen allows for your institution to continue conducting assessment on progress toward new goals and saves future practitioners the strain of accounting for years of inactivity within the document should the subject matter be revisited later.

Conclusion

Spearheading this inventory initiative was an extremely educational experience. Focusing on one topic and really digging into how it has been explored taught me about UD's commitment to including scholars of all levels in its institutional research enterprise, areas where interdisciplinary research is blossoming, and, in focusing on AI, painted a reassuring portrait of the topic as one we have history with, as opposed to a new shiny thing we are chasing.

I believe my position as a librarian made me uniquely able to successfully execute this project, as I was able to act as an effective, power-neutral emissary to faculty across many disciplines, while also utilizing my knowledge of search tools and their features and limitations. As the tools continue to increase in accessibility and decrease in technological knowledge demand, research inventories might be a useful resource for librarians to consider using when engaging with the wider university community about issues that shape its strategic future.

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Notes

1. D. Alexander, A. Bourek, J. Kilroe, M. Rigby, and A. Staines, "The RICHE Taxonomy - An Innovative Means of Classification of Child Health Research," *Child: Care, Health & Development* 40, no. 5 (2014), 632–639, https://doi.org/10.1111/cch.12119.
2. Ju Yeon Lee and Y. Tina Lee, "A Framework for a Research Inventory of Sustainability Assessment in Manufacturing." *Journal of Cleaner Production* 79 (2014): 207–218, https://doi.org/10.1016/j.jclepro.2014.05.004.
3. Margaret (Peg) H. Burnette, "The 'Research Audit' Model: A Prototype for Data-Driven Discovery of Interdisciplinary Biomedical Research," *portal: Libraries and the Academy* 15, no. 4 (2015): 645–659, https://doi.org/10.1353/pla.2015.0052.