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Library Analytics: Shaping the Future — A Case of Strategic Library Transformation Using Data Analytics: Chalmers University of Technology

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The year 2000 marked a shift for **Chalmers University of Technology in Sweden**. It was the first year that the Library spent more than 50% of their media budget on digital resources. Today, that number is close to 99%.

In 2010, the university's implementation of a discovery tool provided us with the first insights of our digital collection size, as we had to define which sources to include. **Chalmers Library** holds about 500,000 physical items, while the digital collection topped 260 million records. By 2018, the discovery service has increased its scope with millions of records. The president of **Chalmers** mandated in 2004 that all **Chalmers'** scientific publications metadata would be registered in a bibliographic repository and by 2010, the new president mandated that all publications should be registered and published in full-text and Open Access.

It took the library ten years working in a predominantly digital information landscape before we could reflect upon the consequences of changed user behavior and determine the need for a strategic realignment of library services and organization. During those ten years, the value of library services eroded with our stakeholders and the library was being marginalized by the decisionmakers at the University. The library had lost its place at the table.

By the end of 2009, library management challenged the university management on the library's future, resulting in a new mission and platform for developing relevant services. At the core of this challenge was the insight and value of data. All of the services subscribed to or developed by the library left digital footprints of usage that could be aggregated into sets of behavior and analyzed. The data in our catalog, institutional repository and licensed resources could potentially provide us with new insights if we invested in studying and understanding that data. The insights could provide us with information to create new services, but would require the li-

brary to recruit and develop new competencies. Librarians would have to learn and understand their library from a data-centric perspective and be a part of cross-functional teams including developers, interaction designers and users.

That use of data as a new tool to determine value was implemented by library management in early 2010. The challenge became how to refine that tool, but the demand for scholarly metrics and analytics at the campus level became our first method of refining those data tools. The rise of bibliometrics as a measure of academic success and visibility in the surrounding society was a result of non-academics or academic management attempting to simplify a complex system. As a library, we embraced this new focus on bibliometrics for two reasons — to safeguard academia from unfair methodologies and to make sure that bibliometrics were not used in an inappropriate way.

The metrics of a publication does not equal the metrics of success for an individual.

Second, the library understood that we could develop new insights based on bibliographic data. Those insights were not the "Cf:s" or "Jf:s" of bibliometrics, but the relationships that the data could describe between and among subjects, organizations, and networks.

The ability to extract high-quality, timely, actionable insights for researchers, scholarly communicators,

research funders, and management from publication patterns and usage patterns would earn the library a seat at the table as an expert on how to increase the visibility and the impact of research. By working with this data, understanding this data, and having the confidence to analyze and present conclusions of this data, the library became a strategic partner for stakeholders to make better, informed decisions.

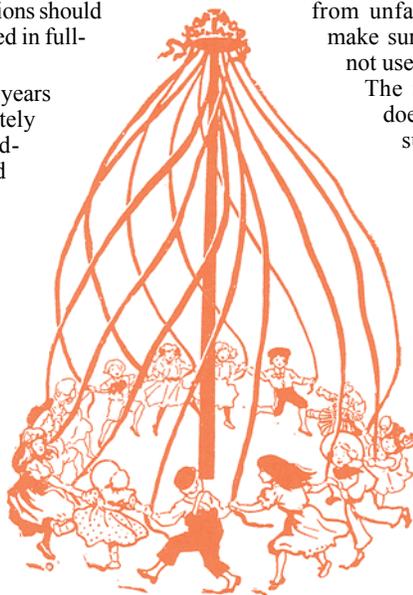
Today's data-intense environment of the academy requires a deep understanding of the research lifecycle. Librarians possess that understanding from a long tradition of serving academia, by following not only their users

from student to professor, but also supporting the research process from disseminating information to the discovery of research output. The librarian can be a multi-disciplinary expert with a deep understanding of academia and the publishing eco-system. This requires library leaders to lead and inspire their librarians with confidence as they develop data-describing skills into data analytics. Librarians have been organizing knowledge for so long, now it is time to analyze this knowledge and promote a data-driven culture that identifies signs of change and drives the transformation of libraries. It is crucial for the perceived value of libraries that we develop talent and drive innovation based upon the data derived from the user behavior of our stakeholders.

It is hard to transform and to adapt. Universities as old, slow organizations (for good reasons) have a hard time transforming and adapting — indeed, the nature of academia is to maintain consistency over time. But society is changing and technology is driving it forward at a fast pace. As employers start to value what you can do and not where you have been educated, the formal education system is threatened to be disrupted. Even today, with current technology, it is easy to find examples of people who have acquired great skills outside of the formal education system. These fundamental shifts in academia offer libraries the possibility to position themselves as trusted advisers based upon an understanding of technology, user behavior, and user needs from a data-centric perspective. The ability to respond to a changing society and usage behavior patterns is what is going to determine whether universities (and libraries) can maintain the trust of our society, a trust that is crucial for the brand of what we do.

Academic rankings are an interesting case for university libraries. There is a lot that can be debated about university rankings (as for scientometric/bibliometrics), but it is apparent that these rankings matter for our stakeholders, as they have an impact on recruiting and the public image of a university. Librarians, with a deep understanding of the academic environment and strong skills in knowledge organization, are in an ideal position to work with university administration and faculty by taking the lead on ranking analytics. By scrutinizing the data behind academic rankings, strategically important insights emerge and allow you to understand how to change your position in such

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rankings. Although this requires confidence in taking the lead on analytic approaches, it is my firm belief that by adopting a data-centric approach, coupled with the unique position of libraries in the university, this is a job for the library and librarian. This means engaging in strategic discussions on the future direction of universities as we strive to increase quality in research and education.

Developing the competences of the staff at **Chalmers Library** has been crucial for the success of the library. But recruiting or training the staff is just one part of it. Management must offer an environment where that talent can excel, by trusting staff to accomplish their goals and avoiding unjustified oversight. It requires humility and trust, and an approach where management's first goal is to remove obstacles for its staff to operate freely within their mandate. The largest risk for success occurs when management interferes or hinders development because they do not understand their role.

For **Chalmers**, the role of the institutional repository has been crucial in the transition to a data-centric culture. A repository that functions as an outlet for research output is important, but the data stored in the repository can often be as valuable. The importance of our repository increased in 2012 when **Chalmers Library** was charged with creating a current research information system (CRIS) with information on research projects. Without already having a successfully implemented repository and the bibliometric data associated with it, this would have been unlikely to achieve.

Following a period of research and benchmarking, we decided to develop a CRIS system that would include publications, biographies, and analytics on the impact/use of our research information, serving as a hub for high-quality data. The goal was to gather publication, project and personal data, then curate that data so it could be re-used for analytics. This would reduce effort and save time for individual researchers who frequently spend too much time answering surveys that could be automated by a smart research-information-system.

Research.chalmers.se is a success story for the research library. By doing our homework around the user experience and understanding how the system could free up time for researchers, administrators, and managers, we were successful in developing a core functionality focused on delivering value for its stakeholders. Developed by a cross-functional team in a true agile fashion, we guaranteed the sustainability of the system by connecting our publications to our projects, to the people involved, and automating workflows, reducing effort and freeing time for stakeholders.

The system provides a tool for disseminating research publications and projects. But more importantly, it provides the university with strong data sets that can be used for strategic business analytics. From the data in the repository, we can provide stakeholders with

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visualizations of research networks, author-networks, subject-networks; by connecting those networks to bibliometrics, we can broaden the study of publication success.

Today, curating research information data (publications, projects, people) for the purpose of dissemination, re-use and analysis is at the core of **Chalmers Library**. By developing these services, we have further developed the talent of our staff, which enables us to drive innovation and re-establish the strategic importance of the University Library. We are back at

the table and our services, insights, and counsel is sought after by all stakeholders.

I have recently departed **Chalmers University Library** to take on a new role as City Librarian of Stockholm. I am very excited to foster a data-driven culture within public libraries as we aim to remain relevant, support societal transformation, develop talent and foster innovation. 🍷