HOW WILL ALGORITHMS SHAPE OUR CULTURAL PRACTICES?

The case of Finnish public libraries

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Abstract
This case study describes and critically assesses the current trend of organizing and managing public library collections with the help of algorithms, taking the empirical example of Finland's public libraries that widely use algorithmic collection management. The case study is based on the author's ongoing research project, *Redistribution of Cultural Capital in the Era of Algorithms: A Comparative Study of Finnish Libraries*, which aims to understand (1) how algorithmisation can affect cultural taste and choice and (2) what the increasing use of algorithms eventually means for the redistribution of cultural capital. The case study describes the short history of using algorithms as tools for organising library collections in Finland and discusses the most imminent possible outcomes and risks of such an approach.

Keywords: public libraries, algorithms, collection management, cultural capital, Finland

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Introduction: Libraries in Finland

Public libraries are key institutions that build critical bridges between cultural practices and citizens. At the same time, they are classic landmarks of modernisation and public welfare. Public libraries have been seen as an important stepping-stone for gaining cultural resources through scholarly literature in different fields. Libraries provide free, technically unlimited access to cultural materials to all citizens, and thus they can be considered to directly help accumulate, conserve, and distribute cultural capital to everyone.

Finnish public libraries have for long been a stellar example of these ideal functions of public libraries. In Finland, by legislation, all cities and municipalities have a municipal or city library. The universal, free, and high-quality library services are protected by law. The first Finnish Public Library Act appeared in 1920, with the latest version updated in 2017. The current Library Act (Web reference 1) presents the objectives and duties of libraries in the following way:

> *The objective of public libraries and the information services they provide is to promote among citizens equal opportunities for personal development, literary and cultural pursuits, access to knowledge, the acquisition of personal and civic skills, broadening their worldview, and lifelong learning.*
>
> *Library activities should also aim at promoting the development of virtual and interactive network services and their educational and cultural contents.*

According to many different sources, Finns are particularly avid library users. The Helsinki city library, which is by far the largest of the Finnish libraries and has over 40 service points, gives out approximately 10 million loans per year, while smaller Finnish libraries give out approximately 250,000 loans per year (Web reference 2). In 2016, the United Nations named Finland the world's most literate nation. In 2019, the new Helsinki Central Library Oodi, situated in the very centre of the city, was chosen as the winner of the Public Library of the Year award in the World Library and Information Congress of the International Federation of Library Associations and Institutions (IFLA). In its text for the four shortlisted libraries, Oodi is described as follows (Web reference 3):

> *Soft and light yet rooted Oodi Helsinki Central Library (Finland) earns a solid place among the top 4 libraries. Directly aligned with Finland's Parliament, this house of the people bridges concepts of equality, participation, citizenship and sustainability. Designed together with the city's residents, with a focus on the needs of its future users, this project is one for the ages. Iconic exterior qualities and breathtaking interior spaces host qualities like an entire floor for learning activities and a top floor book*

heaven. With a massive success in visitor numbers in its first months of service, Oodi will lead the way for central libraries throughout the globe.

In recent years, especially since the last financial crisis, the public libraries' role has appeared to be rapidly evolving in line with the many other social transformations brought about by the so-called information age. From a public and democratic sphere offering impartial information and a high culture selected by legitimate experts, libraries are seen to have shifted more towards social hubs providing different services and experiences for different customer groups. Regarding this trend, in the research literature, libraries have been interpreted as becoming new kinds of spaces that could be able to level social hierarchies (Aabø et al., 2010) or advance the integration of different disadvantaged or marginalised groups into society (Summers and Buchanan, 2018).

In the Finnish case, these trends of turning libraries into social hubs able to provide many more services beyond books are mirrored, for instance, in the tremendous expansion of the material to borrow. In addition to books, Finnish libraries lend out sporting equipment such as Nordic walking sticks or kettlebells, board games, electric bikes, or renovation tools. In some libraries, there are dogs trained to encourage small children to read aloud. Libraries also organise many different events, both online and offline. Some libraries loan out tickets to theatres, concerts, or sports events. The national Ask a Librarian service promises to provide answers to absolutely any question online and then send them to the customer by e-mail within three days. Especially in the newer Finnish libraries, there are different and versatile spaces dedicated to things much beyond reading and books. Only in the Helsinki Central Library Oodi, there are, for instance, several cafés and a cinema, a 3D printer and sewing machines, a kitchen, a recording studio with its own control room, as well as photography and video studios.

At the same time, and partly also due to these new functions, libraries are facing many challenges. The paradigms of change that public libraries are going through are also related to demographic and economic changes, particularly digitalisation and budget cuts. On a larger scale, this has meant that libraries have shifted from Habermasian secular and rational public spheres into spaces marked by marketisation and consumption, and they can be interpreted as being trapped in the same vicious circle as other public institutions. They are forced to recast the user as a customer and are expected to provide value for the taxes spent. This, in turn, has meant that different business management discourses are increasingly pushed into the sphere of libraries (see, for instance, Day, 2002). From the point of view of the original purpose and mission of libraries, this has meant a new situation and new questions about what they are meant to do. For instance, the new Helsinki Central Library Oodi has been criticised for having very few books compared to the many other items and activities available on its premises.

The advent of algorithms in public libraries

New kinds of user-oriented and consumption-centred libraries need new kinds of collection management systems. The emergence of algorithmic collection management in public libraries (in Finland, mostly during the last ten years) reflects the larger ongoing changes and challenges. Algorithmic collection management seems to fit well with the idea of making the libraries more 'intelligent' and customer-friendly. At the same time, they are often defended

as a way of saving money and resources, providing rational practicality and a certain concrete value for the public funding invested in them.

What exactly is algorithmic collection management in public libraries, then? Algorithmic collection management refers to a logistic process whereby the books and materials 'float' where they are demanded the most according to users' borrowing habits. Typically, an algorithm-based logistics system operates on the background of such floating, with the idea of easing and balancing the flows of library materials. The ideal is to match better and more efficiently the different customers' cultural practices in every individual library.

The algorithmic collection management process is intended to replace or at least complement traditional, human-led collection management. This was typically marshalled by highly educated librarians, who acted as important gatekeepers in terms of which materials are purchased and how collections are managed, organised, and displayed. When collections are algorithmically 'floated' in a multi-library system, to which public libraries, such as city libraries, usually belong, individual items have no permanent home location, but they move according to users' actions. Library users either physically borrow books from any library in the multi-library network or request books to be brought to the library closest to them. When materials are eventually returned, they are shelved and stored directly at whatever library the customers return them to instead of being returned to their home libraries or transferred to other libraries.

Algorithmic collection management is meant to make the library collections 'fresher' and to help them stay in permanent circulation. In other words, it is meant to provide customer satisfaction but also to ensure greater efficiency for the borrowing of individual materials. Materials that are not needed or for which there is no room (for instance, seasonal overflows and shelf overflow during different kinds of library renovations) are stored at material depositories, from where it is easy to transfer them to different libraries. Finally, when there is no demand for certain materials, when they are physically too worn or outdated in terms of their content, they are sold to clients, donated, or directly recycled.

Technically, the use of algorithm-operated floating collections in public libraries means that the materials available in each library gradually start to reflect actual borrowing trends. Eventually, the algorithm starts to recognise the characteristics of individual libraries, potentially pushing their collections in entirely different directions according to what is borrowed in different neighbourhoods, for instance, by emphasising romance or horror fiction in one library and classical literature or children's books in another (Web reference 4). This risks the Public Library Act's idea of providing high-quality collections freely for all citizens. For instance, to mention again an example from the Helsinki Central Library Oodi, algorithmic collection management has led to the surprising problem that the library has been unable to keep most of their books on the shelves because so many people are borrowing them (Web reference 5). The explanation is simple: Oodi is located in an extremely central place, and many people go through it every day and borrow a book or two. Meanwhile, the books are read at the library users' homes and returned to local suburban libraries instead of the central library. This simple trend has already managed to challenge the ideal of algorithmic collection management.

Nevertheless, in the library studies literature, one finds many direct benefits to using algorithmic collection management. They go much beyond the library customer, who is thought to encounter a 'better' fit for his or her cultural practices. Wendy K. Bartlett (2014) has famously itemised ten 'great reasons to float' library collections:

1. *Floating saves money and resources in general.*
2. *Floating is customer-friendly and increases the circulation of materials.*
3. *Floating saves working time of the library staff (for instance, collection management becomes centralised and fewer selectors are needed).*
4. *Floating improves library collection management in general.*
5. *Floating protects the items on loan (they spend less time being physically handled, transported, and delivered to other libraries).*
6. *Floating saves shelving time, leading to more efficient customer service.*
7. *Floating rationalises the money spent on library collections.*
8. *Floating saves the library staff's time (they spend less time processing materials).*
9. *Collection management is based on the library users' behaviour (instead of the library managers' views).*
10. *Floating makes the collections better and enhances 'client involvement' (customers influence the offerings of each library based on their own activities).*

Libraries that are already managing their collections based on the floating principle have indeed experienced challenges. Withdrawals from this principle have been documented in several studies on the topic. The major challenges identified have been related to the redistribution of materials (for instance, smaller libraries have experienced the accumulation of similar material), collection knowledge (librarians, the professionals that used to be in control over the collections, lose knowledge about them as they are shaped by the customers' borrowing patterns), and the ability to serve all customers equally well (floating collections serve the best tech-savvy and affluent library users, unlike different kinds of minority groups). Clearly, not all librarians and different staff members are uncritically happy with the advent of floating collection management in libraries.

Algorithmic floating collections are a relatively new phenomenon in Finnish libraries. In Finland, most libraries started to float their collections only some time ago, mostly in the 21st century. Floating collections are an invention heavily based in Northern America, where some libraries started using them as early as the 1930s. Apparently, the first floating collection was introduced in the Canadian Fraser Valley Regional Library (Bartlett, 2014). Floating was introduced 'not as innovative approach to housing [...] collections but as an organic outcome of serving patrons in geographically challenging areas on limited budgets' (Bartlett 2014, 13).

In the Finnish case, the first public library started using algorithm-based floating collection management in 2009. It was the Jyväskylä city library that started this practice. Libraries have embraced the trend at varying paces: out of other larger cities, Oulu city library started floating its collections in 2013, Vantaa city library in 2015, and the Espoo and Tampere city libraries in 2016. The Helsinki Metropolitan Area Libraries network started algorithm-based collection management as late as 2019. Most libraries in Finland at least partly float their collections. Some rely more on algorithm-managed floating, and some on its more manual versions. Nevertheless, some libraries in Finland, mostly concentrated in very small and

scarcely populated areas, have still not adopted floating collections and rely on traditional methods of collection management.

Different public libraries use different programs and interfaces (often called Intelligent Material Management Systems, or IMMSs) for floating their collections. For instance, the Helsinki city library uses a system supplied by a Danish logistics solutions company. The total cost of the project has been approximately €900,000 (including both software, implementation, and management for the first four years, which are still ongoing). Helsinki City Library was the first library outside Denmark to use this system, and it is, in this sense, a pioneer. On the company's website (Web reference 6), the floating procedure of the Helsinki City Library was described optimistically and as a success:

> *It was decided to float the collections, but management was fully aware of the pitfalls of floating – where some branches would be depleted, and others flooded with returns.* […] *Several Danish libraries had already benefited from automation in the process of managing the entire practical and logistic process around the physical book, freeing staff time and enabling the institutions to focus on their core task: customer service.*
>
> *Having IMMS™ in the equation would enable the management to fulfill the Oodi vision of serving as a huge reading room and a civic center with only 100,000 books on the shelves. The items are to be continuously replaced by others brought from a 3.5-million-volume active repository/Media hotel located in another part of the city.*

Other Finnish libraries use other systems supplied by other commercial providers, of which there are plenty. For a long time, the IMMSs used for library collection management were mainly domestic, but lately, more and more libraries have adapted to international interfaces, a trend of which Helsinki City Library's decision to use a Danish provider is a good example. The exact content of the algorithms purchased from commercial actors often remains invisible, which reflects well the idea that commercial algorithms are often 'black boxes' protected by numerous patent and trade secret laws, which render a thorough assessment of their long-term effects difficult (see, for instance, Gillespie, 2014). There are alternatives, though: the Oulu public city library is one of the first public libraries to start using Koha, an open-source integrated library software system used worldwide by public, school, and special libraries. The open-source and more affordable Koha is especially common among scientific libraries; in Finland, it is used, for instance, by the libraries of four Finnish universities, nine universities of applied sciences, the Finnish National Library, the Finnish National Repository Library, Statistics Finland, and the National Archives.

The imminent challenges of algorithmic collection management

How should the process of algorithmisation in public libraries be understood, and what kind of scenarios might it lead to? It is well known that cultural practices, whether seen as cultural participation, taste, or knowledge, remain socially stratified in practically all of the Global North. Highly educated, well-off groups have very different lifestyles from their less privileged counterparts. Moreover, active cultural participation is linked to higher education and class position and predicts better future income.

This is directly reflected in the use of public libraries. While the use of public libraries is in general rather common in most European countries, and especially so in the Nordic countries and Finland, reading nevertheless remains a highly distinctive activity. This is also true of Finland (Purhonen et al., 2014), although approximately two-thirds of the population there regularly use libraries (European Commission, 2013). Previous research shows that the use of libraries does play an important role in the transmission of cultural capital. Libraries, along with the family and school, provide a long-term favourable context for reading and being taken to libraries as a child is associated with upward social mobility later in life.

Reading and going to the library are thus highly socially stratified activities, with well-off groups consuming them much more than groups lower on the social ladder. This is further reflected in *what* is read: high-status groups not only read more but also read more heterogeneous material, both regarding fiction and non-fiction and different media texts.

In this context, libraries (as a provider of reading in a large sense) could be understood as generating *cultural capital.* According to Pierre Bourdieu's (1984) famous formulation, cultural capital comes in three forms: it can either be embodied, meaning cultural competences such as talking or acting in the correct way; objectified, meaning the ownership of physical objects such as paintings; or institutionalised, referring to officially acknowledged credentials such as academic titles. One could argue that libraries possess objectified cultural capital (books) meant for acquiring embodied cultural capital (knowledge, linguistic skills), which, in turn, has a key role in obtaining institutionalised cultural capital (educational qualifications). Why is this? Because public libraries not only provide free access to culture to citizens but also frame and curate the cultural objects available in their facilities.

The premise and theoretical starting point for studying the effects of algorithmisation could be that public libraries are an important player in the field of cultural capital. They are 'sites for the production, dissemination and appropriation of cultural capital' (Goulding, 2008: 236). To summarise, libraries possess cultural capital meant for public and free-of-charge use, which implies that the cultural policy support for libraries lies within an ideological background to alleviate social exclusion through the transmission of cultural capital.

There are obvious risks in moving from human-led, professionally organised collections in public libraries towards algorithm-based floating collection management. One of them lies in the possibility that cultural capital, which in the old system trickled more directly from library staff to library users, becomes biased between different libraries due to their different borrowing profiles. If, for instance, in a wealthy area there are more borrowings related to highbrow genres such as modern literature, poetry, or classical music and in a poorer area there are more borrowings related to popular genres such as romantic novels, the algorithm-based interfaces will work in a way that transfers more highbrow genre material to the wealthy area and more popular genre material to the poorer area.

In other words, using algorithms as a tool for collection management in public libraries might potentially result in narrowing down users' cultural repertoires and end up increasing cultural inequalities. In an extreme case, and in the case of a total lack of human-led collection management, this could lead to a scenario in which library collections cease to be heterogeneous and certain library users stop encountering books and other items outside of

their own comfort zone. From the viewpoint of public cultural policy, this puts into question, in an important way, what happens to cultural equality, protected by law in the case of Finnish libraries.

Among other receivers of public cultural funding and providers of cultural services, such as theatres, operas, and symphonic orchestras, libraries have a special role in the sense that they serve on a daily and yearly basis much larger cohorts of people than nearly any other provider of cultural services. Despite their heterogenising role as providers of different services and their new function as social hubs, the most important role of libraries is still to support reading and the thriving of different kinds of multiliteracies. This is, after all, what the Public Library Act says as well. Reading is not only a cultural practice; it is also a survival skill in a society becoming ever more dependent on different information sources. Understanding this is key even in egalitarian countries such as Finland, because one out of seven young people finishing compulsory education there have such poor reading skills that it affects their everyday life (Web reference 7).

Concluding remarks

The algorithmisation happening in Finnish library collection management is thoroughly linked to digitalisation. Namely, a floating collection is essentially a digitalised collection, and the flows of library loans are essentially digital flows. The system configurations potentially made to the algorithms are digital. As the floating collections in Finnish public libraries are still new and there are few or no studies about their effects, partly because the phenomenon has not been going on for long, several questions need to be asked. The first among them relates to whether such a physical space as public libraries is capable of properly benefitting from such a thorough digitalisation. Likewise, we need to ask whether digital technologies can really be trusted for promoting and preserving cultural equalities. In our era, in which different software and computational processes may be taking a constitutive role in ordering, hierarchising and valuating the world and its cultural products for us, it becomes necessary to ask how algorithmisation shapes cultural tastes and choices, as well as what the increasing prominence of algorithms means for the redistribution of cultural capital. Finnish public libraries can be considered an interesting empirical laboratory for observing how algorithmisation is able to shape cultural practices and what that could mean for cultural equality. To that end, this case needs to be researched in great detail, as it will be in the ongoing research project *Redistribution of Cultural Capital in the Era of Algorithms: A Comparative Study of Finnish Libraries*.

References

Aabø, S., Audunson, R., & Vårheim, A. (2010). How do public libraries function as meeting places? *Library & Information Science Research*, 32: 16–26.

Bartlett, W.K. (2014). *Floating Collections: A Collection Development Model for Long-term Success*. Santa Barbara, CA: Libraries Unlimited.

Bourdieu, P. (1984). *Distinction: A Social Critique of the Judgement of Taste*. Cambridge, MA: Harvard University Press.

Day, M. T. (2002). Discourse fashions in library administration and information management: A critical history and bibliometric analysis. *Advances in Librarianship*, 26: 231–298.

European Commission (2013). *Special Eurobarometer 399. Cultural access and participation*. Luxembourg: Office for Official Publications of the European Communities.

Gillespie, T. (2014). The relevance of algorithms. In: Boczkowski, P., Foot, K., & Gillespie, T. (Eds.) *Media Technologies. Essays in communication, materiality, and society* (pp. 167–194). Cambridge, MA: MIT Press.

Goulding, A. (2008). Libraries and cultural capital. *Journal of Librarianship and Information Science*, 40 (4): 235–237.

Purhonen, S., Gronow, J., Heikkilä, R., Kahma, N., Rahkonen, K., & Toikka, A. (2014). *Suomalainen maku: Kulttuuripääoma, kulutus ja elämäntyylien sosiaalinen eriytyminen*. [*Finnish taste: Cultural capital, consumption and the social differentiation of lifestyles*.] Helsinki: Gaudeamus.

Summers, S., & Buchanan, S. (2018). Public libraries as cultural hubs in disadvantaged communities: Developing and fostering cultural competencies and connections. *The Library Quarterly* 88(3): 286–302.

Web references

(1) https://www.finlex.fi/en/laki/kaannokset/2016/en20161492

(2) https://tilastot.kirjastot.fi/index.php?lang=en

(3) https://blogs.ifla.org/public-libraries/2019/05/27/and-the-nominees-for-the-2019-iflasystematic-public-library-of-the-year-award-are/

(4) https://www.hs.fi/kaupunki/art- 2000005972185.html

(5) https://yle.fi/news/3-10584609

(6) https://lyngsoesystems.com/case-stories/helsinkicitylibraries/

(7) https://www.hs.fi/tiede/art-2000008861048.html?share=a3d1ad3c0a7f9d39e10fe0f45849744e&fbclid=IwAR2kZHW9fcQzCH4OUEU4Pg1BU9kHb3j4iTfbf7SLbIcpo30e_ZBtFZPPEO8