Between Creators and Keepers

How HNI Builds its Digital Archive

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Abstract

In 2017 Het Nieuwe Instituut (HNI) – Dutch agency for architecture, design and digital culture started a research project leading to the implementation of a digital archive for its architecture collection at the end of 2018. Looking at the changes caused by progressing digitization that over the last decades have affected the profession of the architect the institute shapes its approach to collecting born-digital material in architecture. The implementation of the digital archive with the related policies and workflows will thus stem out from the results of this on-going project. What is possible to ensure better preservation of digital material by the creators, and what is feasible to preserve and make available to the users are crucial questions for HNI. This paper presents the ongoing research and the starting process of its translation into the implementation of a digital archive at HNI.

Themes of the conference addressed

Collaboration and capacity-building, Mapping out sustainable digital preservation approaches and communities

Keywords

architecture, design, digital preservation, digital archive, creators, keepers

Introduction

Het Nieuwe Instituut (HNI) – Dutch agency for architecture, design and digital culture holds one of the largest architectural collections in the world and the largest in the Netherlands. The State Archive for Architecture and Urban Planning, which it manages, contains 600 archives and collections of Dutch architects, urban planners, professional associations and educational institutions, comprising a total of some 4,000,000 documents recording 150 years of progressive thinking in architecture.[1] Its born-digital collection currently consists of approximately 60,000 files and continues to grow in the face of the changing nature of the architectural profession. Up to this date HNI acquired the digital archives of Carel Weeber with material from the 60's and 70's, MVRDV with 5 TB of diverse digital material and media, and Crimson Architectural Historians containing 155 GB of various documents. In order to facilitate the implementation of a digital repository with the related policies and workflows the institute has undertaken steps not only to arrange the necessary facilities, but also to gain a better understanding of the changes caused by digitization in the architectural practice, and how they are reflected in the archives. In order to form its new collection and preservation policies for the born-digital material it conducts research and actively develops a stronger relationship with the archive creators. One of the many challenges in this process, which necessitates close collaboration with architects, is HNI's focus on the design process and the way architecture responds to important societal changes and needs.[2] The understanding of these aspects is difficult if not impossible by looking at those archives with a human eye. The overwhelming size and scope of the digital archives make context, active acquisition and close collaboration with the creators necessary, not only for appraisal and selection, but also for providing access.

Understanding the future archive

In 2017 Het Nieuwe Instituut has initiated the research project *Inrichting digital archief* (Implementing the Digital Archive) with the aim to get a better understanding of the material to be included in their future digital archive. It is conducted in close collaboration with six acclaimed Dutch architecture practices, which fall under the criteria of acquisition policy of

HNI and have seen the emergence of the digital tools in their practice mostly since the late 80's and early 90s. It also builds upon an earlier research, which took place in 2008, where four architectural practices were interviewed based on a questionnaire on their design and archiving practice.[3] Two of those offices also take part in the current research allowing a reflection on changes caused by progressing digitalization and how they have affected the profession of the architect in the last decade. The implementation of the digital archive will thus stem out from the results of this on-going project and gradually shape the institute's approach to collecting born-digital material in architecture. With the currently conducted research we are learning directly from the archive creators about the challenges that the keepers will be facing in the future.

The six practices, which agreed to anonymously participate in this research, were selected based on a number of criteria. Firstly, the aim was to focus on established practices that exist already from 20 to 40 years, which begun to use and experiment with the digital tools early on. The reason for that is twofold. One is that they fall under the acquisition policy of HNI. Second, that the material, which can be found in their archives, is at the immediate risk of digital obsolescence and requires urgent attention if it is to be acquired and preserved in the coming years. The third set of criteria focused on finding a good mix of practices, where both experimental and more traditional approaches could be seen among bigger and smaller practices in order to include a diversity of approaches to design process as well as archiving. Lastly it was important to look at practices focusing on various scales of design, thus not only architecture, but also urban planning and landscape architecture.[4] Some of the selected offices also design products as well as interactive multimedia installations, which provide an interesting case to include in the spectrum that broadly understood architectural design currently entails.

All of the participants were asked to take part in a series of three interviews. The first one focused on the profile of the practice, the design process and its reflection in the archive. The second based on a questionnaire explored technical and structural aspects of the archives and how they grew. The last interview provided insight into the research results and feedback on areas for improvement, as well as explored possibilities for further collaboration. The series sought to investigate what is the influence of the growing digitalization on the design process at architecture offices. More concretely, in which way do the digital tools and technology influence the design process, and what effect does it have on the results of this process. What can HNI as the collecting institution learn from the current state of the archives of the selected practices? What challenges will it face concerning archiving born-digital material? – Keeping in mind that the design process is central to the acquisition policy of the institute. And what does it mean for the long-term preservation and access to the acquired born-digital collections?

Digitization and changes in the design process

Currently it is not only the creation and documentation of an architectural object that takes place digitally, but more commonly the entire design process becomes digitized, including the fabrication of building components or entire structures. Digitization has made the architectural design process faster, more complex, fragmented, dispersed and difficult to archive. In order to understand the challenges that we as keepers are facing, we need to learn directly from the creators and at the same time look for possibilities of raising awareness about digital sustainability among architects, as it is still relatively low when it comes to application in practice.

Three steps of development in the use of digital tools can be distinguished among various practices, namely: digitization of the design (e.g. CAD drawing), digitization of the design process (e.g. BIM) and digitalization of fabrication (e.g. parametric optimalisation). Out of the research it seems that these steps can serve as a broader framework to reflect on how architects and designers use digital tools in their practice. Whereas the digitalization of the drawing is a fact across all practices, early adopters and more experimental practices have been able to reach the two other steps.

Because more processes can be now conducted in parallel, the design process has become much more intricate and non-linear. The designers can implement adjustments instantly and easily test numerous options, which result in creation of multiple versions of the same drawing or model. They are difficult to tell apart and become thus a challenge for appraisal, selection and description. The use of BIM is often mentioned as a way to manage this complexity better, faster

and more cost-effectively. It can also be connected to implementation of digitally fabricated solutions that might focus on aspects such as sustainability (for instance optimisation of energy efficiency) or custom building components (for instance façade elements, windows, structural elements). It's interesting to note that the digital tools used by architects are not always chosen because they suit a specific practice well and serve their creative process, but because they are a requirement of the industry, client or project partners.

Researching architectural records

Next to the interviews a more hands-on research has been conducted on the archive of Dutch architecture practice MVRDV as a case study. This archive has been acquired by HNI in 2015 and consists of 5TB of material from about 400 projects as well as backup tapes and a number of old storage media – the content of which in theory should have been migrated to the archive server, but the practice shows that this is not always the case. This research was conducted on one selected project and included comparison of the material stored on the main hard drive and backup zip drives, where much earlier material was found, revealing the lack of a systematic approach to archive creation and backup. Since currently HNI has operational hardware available only to read some of the storage media acquired from MVRDV, reading and securing all the material they contain will become a task of it's own for which a lab environment will be developed in the coming time.

Based on the studio visits and interviews with the six project participants it is safe to say that MVRDV's archive in its contents and structure can be considered representative for a large section of the architectural practice and therefore makes a good and rich case study. It is vast in terms of information it contains, it has varying levels of organization that change per project and over time, it is incomplete due to broken dependencies, and contains substantial amounts of legacy file formats, including some that are difficult to recognize. There are a lot of files of various kinds often placed randomly in and outside of folders, which doesn't make it easy to understand. For instance: how many different versions of one drawing can be found in a specific project phase. Large amounts of files are connected through various dependencies (such as links and x-refs) often defined with absolute paths, which are broken. In some projects the folder structure was changed so it's also impossible to find the places to which these paths point. Since MVRDV has been experimenting with digital tools quite a lot the number of file formats is immense. One animation for instance could have been created between at least three different types of software on different computers with different operating systems. It is therefore very difficult to get an overview of the contents of the archive and tell which parts are important and which not.

Identified risks

As a preliminary conclusion of the research four main clusters of risk areas in relation to acquisition of digital architectural archives were identified: incompleteness and readability, dependencies, trustworthiness, time and effort required to process the archives.

The acquisition of old storage media creates the risk around the readability of obsolete formats that relates both to unreadable files as well as media (cd's, old types of tapes and drives etc.). There is hardware, software and knowledge needed within the institution in order to manage such an archive and to make it accessible. Incompleteness of files caused by broken dependencies defined with absolute paths, as well as missing structure in the relationship between paper and digital archive, form a serious risk for the general readability of the material. Such an incomplete archive ultimately poses limits to research.
Dependencies form risks not only as broken internal links between files within the archive, but also as an important aspect of the design process in which many stakeholders take part, such as co-architects, structural engineers or architectural engineers. The design process consists of multiple non-linear feedback loops between the different parties and not all of its contents will be a part of the archive of the architects. Concurrently architects and their partners work with proprietary software often switching between diverse types of programs and thus making the archives complex in terms of multitude of very specific file formats and versions.

All studied archives are organically grown and therefore quality differences can be seen in a single archive across projects and time. A general lack of knowledge among creators on best practice in archiving and learning by doing led to limited levels of archive management, limited knowledge on who worked on what, what software versions and operating

systems were used as well as what kind of material exists in general. The knowledge within design practices is also not sustainably transferred, so its availability is highly dependent on people who still remember the old projects. Without the help of the creators it is thus difficult to read the archives and to understand the value of specific elements that constitute it. Lack of standards for archiving leads to problems in assessing originality and trustworthiness of the archives. – Are the files what they say they are and what is the difference between them (when there are several files with the same file name saved in different folders)? We often don't know who is the creator or whether the file could have been changed after it was archived.

Lastly, size and scope of the digital archives of architects make their processing (by humans) extremely time consuming and require highly specialized knowledge, which as consequence requires substantial financial resources both for staff as well as technical equipment. It poses not only financial risks but also questions as to what extent are such enormous archives accessible to users? Since the archives are poorly structured and complex appraisal, selection and description will be laborious, due to the lack of clarity in the directory structure, file naming, file versions, availability of software, missing context, difficulty to compare etc. How to bring them closer to the user will definitely be a challenge for the years to come.

Way forward

While the institutions collecting born-digital architectural archives still have to find out how to deal with the quality and scope of the archives that currently become parts of their collections, they can and should be working towards better archive creation among architects in the future. Active acquisition is necessary and we need to engage the creators in the acquisition process as soon as possible.[5] Even though it is unclear what kind of collaboration with the creators could lead to actual improvement in the quality of their archives, it is crucial to build mutual understanding and make it a common case. It is clear that overall architects do not have enough incentive to invest time and money in order to conform to standards of sustainable record keeping. The research The Archives @ the Architects[6] conducted by Architectuurarchief Provincie Antwerpen (APA) and Centrum Vlaamse Architectuurarchieven (CVAa) showed that, while architects are interested in knowledge that could help them improve their archiving practice, they are usually not willing to invest in order to engage in this process. Alexander Ball in his report Preserving Computer-Aided Design as well as the participants to the Architecture, Design and Engineering Summit organized by the Library of Congress in November 2017 stressed the need for a business case that would incentivize better archive creation in architecture.[7] It also seems clear that architecture won't be seeing coalitions like LOTAR anytime soon.[8] Therefore coalitions between institutions become even more important to create a stronger common agenda for sustainable record keeping. Another step that the keepers could be making is to build stronger relationships with future archive creators through education and research.[9]

The keepers will inevitably be challenged to create new approaches and policies related to appraisal and selection, but also to preservation. Should we create digital archives based on a selective approach in which we define milestone projects to be kept safe, or could we introduce a more systematic approach? Because of the enormous volumes of the digital archives we have to make decisions. Making no decisions will end up in calling upon a final approach, that of digital archaeology. HNI will, most probably, take a two-step approach in which large volume archives will be preserved on bit-level, and carefully selected milestone projects will be preserved actively. This leaves us with new questions: What influence does this decision have on the users and the usage of the digital archive? Can they navigate through the archive the way it is? To what extent can we automate processes at the level of ingest, appraisal, selection, description and where human input is necessary for a qualitative result? What will be the new relationship between the machine reading and the human reading of the born-digital archives? And what new forms or directions of research can emerge? – Those are still open yet thrilling questions to work on in the near future.

Especially regarding the relationship between the collection policy (appraisal and selection) and research we still have a lot to learn. In the forthcoming years HNI will experiment with this question in the framework of new collection policy Keuzes Maken 2.0, which will focus on the topics such as influence of the digitization on the design process (and the design practice), the changing role of the architect, cross pollination between architecture and other disciplines as well as the development of the data based design in the Netherlands.[10] What can we learn from digital archives in terms of

creating new approaches to collecting? What does it mean for creating a more collective approach for collaborations between institutions? What new forms and directions of research can emerge for digital architectural archives and what can we do now to stimulate and facilitate them? A good example is to be found in the Archaeology of the Digital project of the Canadian Centre for Architecture where a well-curated selection of 25 projects became a testing ground for creating new workflows and policy.[11] Research and hands on experimentation were conducted in direct relationship with exhibition projects and publications that immediately brought the collection to a broader audience. Our ambition is to use this experimental approach to see how can learning by doing lead HNI to a systematic build up of new policies and institutional approaches in relation to its growing digital collection.

Conclusion

Facing this complex task, keepers, within their capacity, will need to find ways to create incentives for more sustainable record keeping among architects, because they run a higher risk related to fulfilling their mission as well as financial consequences of working with vast, poorly structured, incomplete archives. At the same time, the potential these archives offer for future research is great and collaborations play here a crucial role. Developing tools for access to these archives will definitely be a challenge, but we have to keep in mind that a collaborative approach both between institutions, educators, as well as between keepers and creators is key in moving forward. Finding ways to draw relationships between the content of the archive to research for instance tendencies in development of the discipline or collaborative networks are truly fascinating paths to explore and we have to engage with them now, because in ten or twenty years we might already have lost them.

Acknowledgements

References

[1] For more information on the collection policy of Het Nieuwe Instituut please refer to the collection section of the HNI website, available online at https://collectie.hetnieuweinstituut.nl, accessed 10 April 2018

[2] Suzanne Mulder, Keuzes maken: Nieuwe perspectieven bij het archiveren van architectuurcollecties, in *Boekman* 110, Culturele archieven, (Voorjaar 2017), pp. 30-33

[3] The research conducted in 2008 at HNI concluded with an internal report the results of which are not available for the public. The current research has not been published yet, but both an internal and an external rapports will be made before the end of 2018. For more information please consult the results of a project conducted by APA and CVAa The Archives @ the Architects which had similar conclusions and is publicly available, available online at https://www.architectuurarchiefvlaanderen.be/nl/artikel/project-the-archives-the-architects, accessed 10 April 2018

[4] Throughout the paper I refer to the research participants as architects, but what I actually mean is the broad spectrum of the practice including all of the scales, thus also urban and spatial planning, landscape architecture, architectural installations and the like. The term architecture is here thus treated as an umbrella for a number of disciplines the deal with design on various scales.

[5] Ole Bouman, Behrang Mousavi, Suzanne Mulder, Keuzes maken: nieuwe principes voor het acquisitiebeleid van de NAi collectie, Nederlands Architectuur Instituut, Rotterdam, 2012, pp. 5-7

[6] The Archives@ the Architects, pp. 44-45, available online at https://www.architectuurarchiefvlaanderen.be/nl/artikel/project-the-archives-the-architects, accessed 10 April 2018

[7] Aliza Leventhal, Designing the Future Landscape: Digital Architecture, Design & Engineering Assets, report on the Architecture, Design and Engineering Summit, Library of Congress, 2018, pp. 18-20

[8] Ibid, p. 18

[9] This and other topics have been discussed during the Expert Meeting organized by HNI on 20.03.2018 in Rotterdam with Tim Walsh and Stefana Breitweiser from the CCA as well as representatives of many local institutions. For more

information please consult the report (in Dutch) on the website of HNI (an English version will soon be published) available online at https://collectie.hetnieuweinstituut.nl/bewaren/expertmeeting-archiving-digital-architectural-heritage, accessed 13 April 2018

[10] For more information on new collection policy of HNI Keuzes Maken 2.0 please refer to this article on the website of the institute, available online at https://collectie.hetnieuweinstituut.nl/bewaren/keuzes-maken-20-nieuwe-aandachtsgebieden-verzamelbeleid, accessed 12 April 2018

[11] Greg Lynn (ed.), *The Archeology of the Digital*, Sternberg Press, Berlin; Canadian Centre for Architecture, Montreal, 2014