

FROM PULL TO PUSH.

The digital transformation initiatives of FelixArchief Antwerpen.

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Abstract – Starting in 2021 FelixArchief Antwerpen is taking several initiatives as part of its digital transformation. Most initiatives are small steps and modest contributions but are an important part of the jigsaw in meeting the needs of our designated communities.

We focused on simplifying processes and keeping the complexity of information and archival management away from our producers and consumers. Some technological opportunities still remain unexplored territory, but this is mainly caused by the cyber hack of the city of Antwerpen from which we are still recovering. But with the steps taken, we hope to meet the expectations of our designated communities. While improving our services the general public will also benefit from this.

Our digital transformation process has a big influence on the role and the position of FelixArchief Antwerpen as an archival institution. With small steps FelixArchief Antwerpen is transforming into an actor who pulls the relevant information into its archive and pushes it to its designated communities. This is only possible with good knowledge about our users and their needs. Doing so, we try to make the difference.

As a consequence, our focus lies on the quality and transformation of our metadata.

Keywords – Digital Archives – Digital transformation – Designated Communities – Customer journey

I. INTRODUCTION

FelixArchief Antwerpen is the archival institution of the city of Antwerpen. In 2021 the city of Antwerpen established a digital transformation strategy, a strategy to which FelixArchief contributed¹. FelixArchief Antwerpen embraces the leading principles of the digital transformation strategy, such as user centricity and user experience. From 2021 onwards, FelixArchief Antwerpen is taking several initiatives to implement those principles in the daily work of an archival service. Doing so, FelixArchief Antwerpen tries to achieve multiple goals, such as:

- delivering a contribution to the organization-wide ambition of being a data driven organization ('smart city')
- meeting the needs and expectations of its users
- improving the quality of its services.

For FelixArchief Antwerpen digital transformation is not the scope of 1 particular project. For us, it is a process existing of multiple steps and initiatives which go way beyond purely technological innovation. The focus is on end-to-end processes and placing the members of our designated communities central in all aspects of our

¹ Available on <https://magazine.antwerpen.be/digitale-toekomst> (dutch only)

daily work. We combine this with our mission of long term preservation for future generations.

II. DESIGNATED COMMUNITIES

First step in this process was establishing and formalizing the designated communities of FelixArchief Antwerpen². The mission statement of FelixArchief and the goals formulated by the management of the city offered the basis for this exercise. This resulted in establishing 3 designated communities for FelixArchief:

1. the employees of the city of Antwerpen
2. genealogists
3. educational institutions.

Determining the designated communities was only a first step. At least as important was establishing their role regarding the FelixArchief Antwerpen. It is clear that we take their expectations into account when building and offering services to meet their needs, but they are also involved in the planning of our projects and initiatives. For this reason, representatives of the designated communities are part of the advisory board of FelixArchief Antwerpen. An immediate effect of this is the enforcement of each other's initiatives and avoiding the risk of double or unnecessary work. Doing so, we take their initiatives into account setting priorities in the planning of making and improving archival descriptions or digitizing archives.

As we will elaborate further in this paper, their involvement goes beyond a formal advisory role. In our daily and more operational archival tasks we collaborate with our designated communities. In determining what we preserve, setting retention periods, describing records, offering consultation possibilities, digitizing records, etc. we cooperate with our designated communities to find the best solutions. Gradually, the designated communities become important partners of FelixArchief Antwerpen.

III. ARCHIVAL JOURNEY

Starting with the first designated community, we started with an analysis of the archival journey of the employees of the city of Antwerpen. With an

interview based approach we examined their customer journey in their search for information and records. In the interviews we focused on 3 issues:

- What are the expectations?
- What is the actual need?
- What are the thresholds they experience?

We interviewed representatives of city agencies which consult the archives very often, but also of city agencies which barely make use of our services. FelixArchief is the designated archival institution for all city agencies. At this moment, no general transfer period for records is imposed but this will change in the foreseeable future. New Flemish legislation will change this as maximum administrative retention periods are imposed on records with personal data. In Antwerpen, the exception for deleting those records with historical value will be combined with an obligation to transfer into the archives.

The designated community of the employees of the city of Antwerpen is a special user group, as in terms of the Open Archival Information System (OAIS) they are not only the consumers but also the producers of the information. For more than any other user group, FelixArchief is the custodian of *their* information. As a consequence they expect to consult the archived information in its original form as it was during the business processes in which they created, received and used the records. This involves specific needs regarding to file formats, structure and metadata. Transformation into archival standards creates extra thresholds in retrieval and the re-use and of their information and gives them often the impression that transferred archives are lost. As a consequence some agencies are reluctant to transfer records to the archives and they prefer to keep their own 'archive' of information and records.

Nevertheless, there are also agencies with a tradition of transferring their records. They entrust there records with value to FelixArchief. This is not always information with historical or scientific value. However, during their retention period this is essential information with operational value on which multiple business processes of the city administration rely. Managing large amounts of information isn't their core business and they see

² C. Keitel and J. Mitcham, *Defining the Designated Community*, DPC Technology Watch Guidance Note, July 2023 (<http://doi.org/10.7207/twgn23-01>)

FelixArchief as a partner in fulfilling their operational needs.

Another special expectation of this user group is that they want to consult their archived information from their familiar ('original') digital workplace. Switching interfaces and starting a search all over again is perceived as an avoidable threshold, for which nowadays several technical solutions are available. They expect from an archival institution to offer this kind of solutions and want their archive integrated in their daily work environment.

On the other hand, this particular designated community has lots of expectations in common with other users of FelixArchief Antwerpen: digital only, personalized, ease of use, self-explanatory, no wrong door, etc. Finding the metadata or the archival description is not the final destination of their journey. It's only a resource to their end goal: consulting the digital or digitized record when they need it (24/7). Every user has its own personal way of consulting archives. A test panel of students was asked to make a screencast of their visit to the website of FelixArchief Antwerpen searching for a particular record. Every student had its own personalized way of browsing, searching and scrolling. They evaluated only the first search results before starting a new search. Manuals or help pages were entirely skipped. No one contacted the FelixArchief Antwerpen with a demand for help.

Our research learned also that most users consult the archives because they are looking for information about a specific subject (f.i. a person, a house, a location, an event, etc.). They are not familiar with complex or even simple archival structures. Structuring information in functions, series and case files are administrative and archival solutions which are perceived as too complex, not only by external users but even so by employees of the city agencies. The structures we build and maintain to manage a large volume of information are not followed by our users.

These findings raise the question whether a more pro-active approach in bringing the relevant information to our users is not appropriate or even needed nowadays. Bringing the right information to the right users at the right moment is only possible if we know very well what the information needs of our designated communities are.

As our knowledge about the needs of the employees of the city agencies is currently the largest, we focused the past two years on improving

our services to this particular designated community.

IV. TRANSFER OF RECORDS

One of the first steps was optimizing the process of transferring records from the city administration to the archives. As mentioned above, transferring electronic records to the archives was experienced as cumbersome. An analysis learned that a transfer took quite some effort and time for all involved parties. The information managers of the agency had to remove unnecessary items from the case files and had to register metadata about the publicity and copyright of the records. Upon receipt the transferred records and the metadata are checked and processed at the archives.

In lots of cases staff of FelixArchief Antwerpen had to repeat or even correct some actions of the information managers of the agencies. The metadata received from the agencies about publicity and copyright was sometimes wrong and had to be corrected. Also, staff of FelixArchief had to perform extra removal operations. In practice, this led to double work and resulted sometimes in a long period that records were unavailable for its users.

To help the information managers of the agencies to register correct metadata we simplified the way of registration. Instead of asking them to register the future dates on which records became public or copyright free, we asked them to register in a basic Excel worksheet the reason of non-publicity and the name of the copyright holder. Knowledge about the different terms of non-publicity of copyright protection and performing calculations is not needed anymore. Future dates as 'public from' or 'copyright free from' are calculated automatically, such like all other required metadata. Also for the removal of unnecessary items from the case files, the instructions were simplified. All purely technical operations (removing system files, extracting ZIP-files, etc.) on the contents of case files are now performed by a dedicated team of FelixArchief, so this is not any longer a concern of transferring agencies.

To minimize the period that records are unavailable for the employees we decided to stop the regular process of letting city agencies pushing records into the archives. Pushing case files by city agencies towards the archives led to lots of small

transfers waiting for processing by the archives. Instead of letting city agencies pushing their case files, we opted for the scenario in which FelixArchief pulls the selected cases files from the environment of city agencies. This gives us the opportunity to plan a transfer when there's enough processing capacity available in FelixArchief. This is possible because as being a part of the city administration, we can have direct access to the systems and applications of the city agencies. We transfer only records when we have the following days enough time to process them. Doing so, we can guarantee that records are rapidly available through the website of FelixArchief. As transfers are less fragmentary, we can also process larger volumes within less time.

V. ARCHIVAL DESCRIPTIONS

Optimizing the process of transferring records improves the quality of records and metadata and reduces the time that records are unavailable. However, this does not offer a solution for the fact that lots of agencies experience a transfer as a loss of their information as they found it hard to retrieve their own records from the website of FelixArchief.

In the city of Antwerpen, records can be transferred fast to the archives. The average transfer period is way lower than 10 years for instance, in several cases barely a few years or even months. This means that re-use within the business processes of the city agencies is very common. To facilitate this, specific metadata related to case files are required. Archival description standards usually does not contain these specific fields. As a consequence large series are not described according to an existing archival standard. Instead of doing so, a specific finding aid for that series is designed together with the transferring agency. The design of this finding aid is as a matter of fact one of the first topics when a new transfer is initiated and follows the question how the employees search and re-use their records.

For this reasons, the archival management system and the digital repository of FelixArchief is not based on a single metadata model for descriptive purposes but offers several possibilities for differentiation. This is not new, and was already from day one an implementation choice while developing an archival management system and digital repository for FelixArchief in 2005. This lead to

specific finding aids for different series, even when the case files types were very similar and only had a different creator. Considering the subject based search queries of our users, we choose to rationalize the finding aids and combine them for similar series. The link to their different creators is kept by documenting it in the finding aid as a separate metadata field.

The optimization of our specific finding aids is triggered from new transfers of case files to the archives. We take that moment as an opportunity to re-evaluate the existing archival descriptions. We refine the descriptions so we can respond to the current user needs. Lots of different operations can take place: entire branches of our hierarchical archival descriptions conforming the International Standard on Archival Description (ISAD(G)) are transformed into a specific finding aid, fields are added, splitted or removed from finding aids, several finding aids are combined into one, etc. For digital records is the process of updating, expanding or even rebuilding a new finding aid completely automated. This is possible because we preserve the metadata in their original meaning and structure as part of the Archival Information Package (AIP)³. These metadata can be re-indexed any time.

These optimizations are not only a gain for our users. Also FelixArchief benefits from this choices as descriptions in specific finding aids are easier to create and to maintain. There's no need of (complex or sometimes even artificial) structuring of archival descriptions. The analysis of the use of archives helps us further in optimizing our way of processing new archives. Until 2021 we had one general way of describing all paper or digital records. For digital records which are barely consulted we have now the option to make a description on a high level and present an entire folder structure as 1 entity on our website. This differentiation in the level of description helps us to optimize our back office processes.

Although not all necessary technological changes are implemented yet in our website, we are also preparing our data for potential new uses. In descriptions for localizable objects we foresee fields for the GIS-coordinates. We also take account the very personal way of searching: where appropriate we foresee the data so a specific finding aid can be

³ F. Boudrez, *Digital containers for shipment into the future*, Antwerpen, 2005.

(http://www.expertisecentrumdavid.be/docs/digital_containers.pdf; <http://www.edavid.be/xmlschemas>)

(hierarchical) browsed, searched by a search engine, or presented as a scrollable list. Doing so, we foresee foundations for a more personal and customizable access to archived information.

VI. INGEST

On December 6th 2022 a cyber hack on computer systems of the city of Antwerpen was noticed. Some computer systems were compromised and were subject of a security breach. The archival management system and the digital repository are on premise hosted on the same infrastructure as other applications of the city administration. No data or records from FelixArchief were compromised, but as a general security measurement all systems and applications of the city of Antwerp must be rebuilt in a new environment. The digital repository was one of the systems with high priority for recovery which underlines the importance of the repository for the business processes of the city. Nevertheless, the recovery of our repository and system took some weeks.

The scope of the recovery was a minimal level of service, so not all components of our processes were recovered. One of the not recovered services is the transformation of digital records into preservation formats. Transformation was a part of our ingest process. After the recovery, we could execute new ingests of digital records into the repository system. As part of this process we generate fixity information and characterize file formats, but the migration of digital records into their designated preservation format is not operational any more.

Until the cyber attack we migrated digital born records into preservation formats as a part of the ingest process. Records are preserved in their original and preservation file format: both are available for our users⁴. Currently, the digital repository of FelixArchief holds 60 million files (150 TB, 140 different file formats). Format obsolescence is for FelixArchief not the biggest challenge at his moment. The biggest part of our digital holdings is stored in broad supported and documented file formats. At this moment, these formats do not involve a preservation challenge as broad support is available. It's also unlikely that this support will

disappear within the foreseeable future. Only for a very, very small percentage of all our records (< 1%) is viewing the electronic record in its original file format nowadays problematic (f.i. .pod, .rescdata, .ldt, .rlp). For this very particular file formats are no preservation solutions available, neither in the migration nor in the emulation strategy.

The loss of the transformation functionality is also not perceived as problematic by our designated communities, quite the contrary. This is certainly the case for designated community of the employees of the city of Antwerpen. They prefer the consultation of records in their original file formats, or otherwise formulated: in the form they are familiar with or in the format they originally created the information. Consulting archived information in their original file format helps them understanding the information (which is one of the obliged OAIS-responsibilities). For very common formats and only for viewing purposes, all visitors can make use of the viewer of our archival website. For less common formats (e.g. statistical information, AutoCAD, InDesign, GIS) employees of the city of Antwerpen have access to the specific software for viewing or editing purposes. As most of the information in less common formats is currently non-public yet, there's barely any impact for our other designated communities.

A side effect of this loss of transformation functionality is that the ingest process runs faster and that the time needed for ingest shrunk. As a consequence, transferred records are faster available for our users from the digital repository and our archival website.

This lead us to a new insight: we keep on ingesting digital borns without transformation into preservation formats. When the transformation process is recovered and preservation actions are really necessary it is better to foresee this after ingestion and to avoid this bottleneck. In the meantime, the transferred records are available for users.

VII. ACCESS

FelixArchief Antwerpen holds a large volume of paper, digitized and digital born records. However,

⁴ This approach is based on the preservation strategy elaborated in the DAVID-project:

http://www.edavid.be/docs/digitalarchiving_manual.pdf

finding the correct information is often experienced as very challenging for our users. This is not only the case for the employees of the city administration of Antwerpen. It is certainly challenging for them as they are used to work with tailor made systems consisting of their own views on their information. Applying archival methods and standards, upon receipt we map their information into archival concepts and structures. This results in views on metadata and records which are unfamiliar and unrecognizable for them most of the time.

Since 2015 we sought solutions in providing access directly to the relevant finding aids from their own computer systems or offered direct links to their archived case files. We even developed some small search tools which agencies could use beside our public website. With these tools they could perform a subject based search across different finding aids: finding aids for different series and with a different structure were searched for a common topic or subject.

The reconstruction of their archival journey learned that most users search for a particular subject across functions, creating agency, transfer, case, form of the record, etc. and that they find it hard to retrieve the information. We looked for a solution to ease the process of searching information and to provide more tailor made search functionalities. We found a solution in extending our search API. Specific search questions can be added to the search API at any time. Together with users we define search queries and results. In the background we map the query and results with the involved finding aids and fields. This finding aids can have a different scope and structure. This API search is not limited to the archival descriptions, but offers also the possibility to view and download records from the digital repository. All designated communities of FelixArchief Antwerpen can make use of this service. Searching and accessing records is not limited to our own website anymore. With the search API we give access to our archival descriptions and digital records to third parties.

Especially for the designated community of employees we go one step further in providing access to their archived information. We facilitate direct access to their archived records from their own digital workplace. The implementation of Microsoft 365 (MS365) as digital workplace environment offers within products like MS SharePoint and MS Teams multiple ways for

achieving this. Archival descriptions are made available in SharePoint sites and are searched from a central dashboard which leads to the metadata of active (in MS365) and archived (in the digital repository of FelixArchief) case files. From their daily digital workplace environment, employees have direct access to the information stored in the digital repository of FelixArchief Antwerpen. There's no need for them to know where the case files are stored.

Because of this, our the digital repository plays an important supportive role in the business processes of agencies. Users do not have to undertake a separate journey to find archived information: the archived information is pushed to them from an integrated search above multiple sources. One of these sources is our digital repository.

VIII. CONCLUSION – FIRST RESULTS

It is early days yet to have a complete view on the results. However, we already notice some positive effects on the initiatives we are taking. Agencies which were reluctant to transfer their records to FelixArchief Antwerpen asked for a transfer last year. Demolishing some thresholds in transfer and access convinced them. The change in the way metadata are registered as part of the transfer process helps us to avoid data breaches and helps us to protect personal data of citizens and employees.

From a back office perspective we managed to process larger volumes within less time. In general, executing and processing a transfer is carried out within 2 business days. This is the time between the initial removal from the source system until the records are available for our users.

As a consequence we created time to get rid of backlogs in transfers and to improve the quality of our data, operations of which our users benefit directly. Improving our archival descriptions is also necessary to contribute to our organization wide ambition of being more data driven. Re-using our archived information within the business processes of the agencies involves requirements on the structure and the contents of the metadata in our finding aids. As this is the first condition in the process of re-use, our focus shifted to improving the quality of our metadata to facilitate its re-use within current processes. This is for now our first priority.
