Communication

The iArt System – a universal collection management system

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On 14–15 September 2023, the *iArt System – from a concept to a tool* conference took place in the Orangery of the Wilanów Palace, featuring an official presentation of the new digital collection inventory system, the iArt 3.0, the result of a project carried out in 2018–2022 by a consortium of six Polish museums and a software house.

The history of this solution began considerably earlier. In the early twenty-first century, characterised by the quick development of digitisation technologies, the Museum of King Jan III's Palace at Wilanów faced numerous challenges concerning the management of the rapidly growing digital collection. One of those was the continuous growth of the Museum's digital image archive, which required better organisation and more efficient inventory. In addition, the Museum also held an archive of analogue images in the form of negatives, diapositives and slides, which also had to be stored and made available in an appropriate manner. Other challenges concerned creating metadata descriptions of the existing files, including basic details about the author and the date of the photograph, previously collected in spreadsheets. The issues with data management were exacerbated by the lack of a central repository, which hindered any attempts at making it more efficient. The combination of these factors significantly hampered access to the archive and the data collected, and thus made it difficult to carry out queries and find specific resources in the archive.

Another issue, which was crucial for the institution, concerned the lack of a holistic approach to the various resources and assets collected and documented by the Museum, including not only the museum artefacts and exhibits, but also its buildings, interiors, natural resources, events, and more. Many institutions have the tendency not to include these resources among their collections and to see them as separate. The King Jan III's Palace Museum at Wilanów prefers a holistic approach; the implementation of that, however, was hampered by the absence of an inventory system that would enable combining these resources and ensure their effective management. This hindered their effective use and complicated the development of coherent narratives for educational activities.

In order to address these issues, the Museum needed to develop a strategy for managing resources that encompassed the growing digital and analogue archives. It also needed a system that would enable storing and indexing metadata in a more efficient manner while providing a consistent user interface to enable easy access to all of the Museum's resources and convenient queries.

To achieve this objective, the Museum of King Jan III's Palace at Wilanów partnered with the Andreas Rubachello company, and the cooperation led to the development of the initial version of the iArt software – a digital

repository for images and metadata, with a simple import feature and a relatively powerful search engine that enabled developing precise queries.

The success of this solution, which has been deployed at several museums and institutions, prompted the Museum to consider further development of the system in order to turn it into an innovative collection inventory module.

What prompted the Museum staff to develop the system for other museum professionals, even though other solutions of this kind were already available on the market? What made this particular product different?

The inventory management solutions available on the market were quite rigid in their approach to inventory practices implemented by their authors; the customisation options were slim, which made adapting the software to the practices adopted by the Museum virtually impossible. Due to their design, these databases also required ongoing service contracts, in some cases even for some administrative tasks, which had a significant impact on their usability and user experience. What is more, due to their sheer age, these solutions were not adapted to the modern inventory practices and regulations concerning copyright management.

With all of this in mind, the Museum set out to develop a solution that could be easily adapted and customised to reflect the needs of the institution and give its administrator a great deal of freedom to adapt its interface and functionality to the ever-changing circumstances.

The year 2016 saw the start of negotiations concerning establishing a consortium and developing the key assumptions for the project. Following numerous meetings and consultations with software development experts, the consortium was formed two years later, comprising the POLIN Museum of the History of Polish Jews, the Lublin Museum (currently renamed the National Museum in Lublin), the Royal Łazienki Museum, the National Museum in Szczecin, and the Castle Museum in Łańcut, with the Museum of King Jan III's Palace at Wilanów managing the project as the leading institution. The Andreas Rubachello company has been appointed as technological partner.

The design and software development work continued until the end of 2021.

The outcome was a versatile tool supporting inventory and management of museum collections, which is based on two key pillars: a digital repository derived from the original solution (iArt 1.0), which is used for collecting and managing images and their metadata, and a digital inventory module that enables managing the physical collections in the broadest sense of the term.

iArt is a browser-based application, which means that any user in the Museum's internal network can log into and use the tool at any workstation. The backend of the application was written in PHP, based on the

Symfony framework, while the frontend was developed with JavaScript, HTML and CSS. The solution is based on a MySQL database, which can be searched using ElasticSearch. The primary runtime environment for iArt is Linux running an Apache server, which is also known as the LAMP stack; however, iArt can also run in a Windows-based environment running the IIS web server, although it must be noted that the latter is a less common deployment and this may cause a variety of issues.

What sets iArt apart from other solutions available on the market is the open application architecture, which enables administrators to configure the main components on their own according to their needs. Some of the features include adding an unlimited number of fields of different kinds, creating simple and complex dictionaries, as well as adding an unlimited number of object card and complex dictionary card templates. Each of these templates can be customised by the administrator in terms of both the layout and the types of displayed fields.

The database is also configured to accept an unlimited number of register and inventory books, which can be assigned various and fully customisable inventory number templates. Additionally, the administrators can specify which of these books are to be taken into account for statistical purposes, and which should be used only as auxiliary or working sources.

The software also features an extensive suite of user permissions, which can be assigned to pre-defined user groups, as well as to individual users. Access rights may concern entire forms and templates, as well as their parts – specific tabs, or even individual fields. All this enables very precise and granular database access management.

The approach to data exchange employed by the iArt system is just as flexible. The software features automated scripts that facilitate the import of multimedia data, as well as manual import features. During import, the software collects metadata from the image files and feeds it into the corresponding fields in the file card. The mapping of the corresponding IPTC template fields and the file card is configurable by the administrator in the file template panel.

The data can be exported to an extensive selection of universal formats, including .xls, .csv, .json, .pdf, .rtf. and .odt. Additionally, data can be imported from Microsoft Excel spreadsheet files.

The iArt system also enables translating the object cards as well as complex dictionary cards, files and dictionaries into more than 200 languages. Using Excel spreadsheets, the users may also import translations concerning multiple objects, complex dictionaries and files at the same time.

The data and file export features that enable interoperability with external applications and websites include sending data to pre-configured external API endpoints, with login details configurable in the administration interface. For each API, any set of fields can be configured for export. Additionally, starting from the moment when the status of the exported

objects is set to 'available on the web' any changes concerning the data in the database are synchronised by the API automatically.

The system features an advanced browser that enables running content queries based on any fields, as well as developing complex queries to enable efficient and accurate searches.

The choice of fields in object templates was based on the British SPECTRUM standard, widely known and appreciated by international museum professionals, which enables gathering the largest possible amount of information about an object (more than 300 units of information) in a single place while offering ways to reduce or change the scope of data depending on the needs of the institution.

Thanks to this approach, iArt offers a great deal of customisation options that enable adapting it to the needs and requirements of its users not only in terms of the interface design, but also in terms of various institution-specific procedures and practices.

Currently, the 3.0 version of iArt has been deployed to a varying extent in six institutions forming the consortium; two of them use it at the administration level, while four also made it available to users. Each institution prepared the data for migration in a different manner, taking into account their previous inventory practices and the tools used, including digital ones. The administrators are particularly happy about the ability to adapt the application's interface to the needs of the institution, extensive dictionary management features, such as term merging and managing inflected forms, as well as activity monitoring tools. The custodians of the collections praise the inventory generator, the precise search engine and the ability to create complex queries, as well as the image repository, which contains high-quality media and can be searched independently, without having to submit a request to the documentation department.

Following the conclusion of the project, the deployment phase started at all the participating institutions and progressed at different rates; however, this does not mean that the development work is over. The software is continuously improved and new features are worked on. The work also concerns a mobile application that can be linked to the system, which may be used for location checks, for reporting incidents requiring conservation interventions and for carrying out audits. With its simple, intuitive design and availability on mobile devices, it will extend the working environment of inventory managers, conservators and collection custodians.

In spite of the fact that the project has been concluded, the developer still plans to add some additional features, including the option to allow users to customise certain user interface features. Other planned features also include saving queries in the browser and sharing them with other users. Given the features of the browser, this functionality would make

collaboration and working with the same data sets and criteria by many employees much easier.

One of the major advantages of working with a consortium – especially as large as the one responsible for the iArt project – is the opportunity to build tightly knit teams while fostering an atmosphere conducive to the continuous exchange of experiences. Eventually, this exchange will be facilitated by an online user forum, where the users will be able to find information on the system's features, configuration and operation, as well as find help with troubleshooting provided not only by the development team, but by other users as well. The forum will hopefully be established in the near future, and there are hopes that the interactions between software users might result in new ideas for improvements and features.

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