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Investing in your future

Jill Cousins, Director & CEO of The Hunt Museum.
KEYNOTE: The Three Platforms

Jill Cousins is Director & CEO of The Hunt Museum, Ireland since April 2018. She founded Europeana with the European Commission and EU Ministries of culture based on her work to create The European Library. Working now in the museum sector makes use of her entrepreneurial skills and understanding of the possibilities created by technologies for cultural experiences, participation, and communication. She believes that a modern museum has to work on three platforms: the Human with its networks, professionals and volunteers; the Physical in care and innovative display of its collections and the Virtual making use of digital to reach the wider world.
Her past experience includes the commercial publishing world as European Business Development Director of VNU New Media and scholarly publishing with Blackwell Publishing running their online journals service. Prior to publishing she had a variety of marketing and research careers in the information field. These ranged from being the Marketing and Event Director for Learned Information (Online Information) to managing her own research company, First Contact. All of which is very deviant from her first career as a Middle Eastern Map Researcher for the Ministry of Defense. Jill holds a Ph.D in Geography on Sixteenth Century Arabic and Turkish Sea-charts.

KEYNOTE: The Three Platforms
A modern museum needs to operate on three platforms: physical, virtual and human. Its building and collections; the digital world and the networks or community. Developing a symbiotic relationship between them to deliver a strategy of growth is theoretically achievable but requires a change in ways of thinking and patterns of work. Each platform clamours for attention for different reasons and often at the same time. They require different skills and knowledge. Skills can be taught, knowledge acquired but changing the way we think and do something and understanding why, is more likely to deliver the experiences and impacts we need from our museums. Halfway through delivery of the Hunt Museum Strategy 2025 is a good time to reflect on what could be done differently and better in its implementation and to check if the strategy still has legs.

Indrek Ibrus, Professor of Media Innovation at Tallinn University
KEYNOTE: Web 3.0, culture and heritage

Indrek Ibrus is Professor of Media Innovation at Tallinn University's (TLU) Baltic Film, Media and Arts School (BFM), Estonia. He curates also BFM's doctoral programme. He as been previously an advisor to the Estonian Ministry of Culture on audiovisual arts and media. In that role he represented Estonia at the EU Council Audiovisual Working Party, at the European Commission and at the Council of Europe. He continues to consult Estonian government on digital culture and media affairs. He is currently also a member of Estonia's Digital Cultural Heritage Council.

His research interests include media innovation, the evolution of cross-platform and ubiquitous web, evolution of contemporary metadata formats, the broader evolution of modern creative industries, and the implications of cultural heritage digitisation. His current primary research projects focuses on the ways to produce public value by reworking cultural databases using semantic web and blockchain technologies and publishing cultural data in various open formats. He has previously published extensively on mobile media, media innovation/evolution, metadata, transmedia and cross-media production. He is a co-editor (together with Carlos A. Scolary) of Crossmedia Innovations (Peter Lang, 2012), editor of Emergence of Cross-Innovation Systems (Emerald, 2019) and co-author (with John Hartley and Maarja Ojamaa) of On the Digital Semiosphere (Bloomsbury, 2021). He is also a co-editor of the journal Baltic Screen Media Review and Cultural Science Journal.

KEYNOTE: Web 3.0, culture and heritage

Aparna Tandon, Senior Programme Leader First Aid and Resilience for Cultural Heritage in the Times of Crisis
KEYNOTE: Safeguarding Heritage in a Digital Domain in Times of Conflict

Aparna Tandon is Senior Programme Leader First Aid and Resilience for Cultural Heritage in Times of Crisis| Sustaining Digital Heritage, ICCROM, Rome, Italy

Aparna Tandon specializes in crisis response and disaster risk reduction for all forms of heritage. She has led emergency response, post-event damage and risk assessments and in-crisis training in Lebanon (2020), Croatia (2020), India (2020, 2018), Northern Iraq (2017), Myanmar (2016), Nepal (2015, 2016), Philippines (2013), Haiti (2010). Additionally, she has held workshops for protecting heritage in conflict-afflicted countries including Syria, Lebanon, Libya, Egypt and Iraq. Aparna has trained military personnel, civil protection teams and humanitarians for providing first aid to cultural heritage during emergencies.
Aparna has an MA in Art Conservation from the National Museum Institute, India. She has received advanced level training in Paper Conservation from the Straus Center for Conservation, Harvard University Art Museums, USA. In 2001-2002 she enhanced her professional experience first, as the Fulbright Arts Fellow at the Preservation Directorate of the Library of Congress in Washington, D.C., and then as a Conservation Guest Scholar at the Getty Conservation Institute, Los Angeles, USA. From 1998 to 2004, she worked as the Curator-Conservator at the Amar Mahal Museum and Library in Jammu & Kashmir, India.

KEYNOTE: Safeguarding Heritage in a Digital Domain in Times of Conflict

Using case examples from Iraq, Syria, Yemen and Ukraine, this presentation will highlight risks to digital documentation and heritage that stem from violent conflicts. It will point to measures that can help mitigate some of these risks, as well as enhance preparedness among heritage instutions and custodians. The presentation will also discuss moral and ethical dilemmas related to safeguarding heritage amidst violence, loss and displacement.

Mika Nyman, Minar AI Artificial Intelligence Technologies Ltd
Lighting the Campfire - A Low-Tech Approach for Museums
Keywords: Themes, Narratives, User Experience
Session: Planning and implementing strategies

One megatrend in digital technologies is the pursuit of enhanced user experiences (UX) in the digital space. Means for this pursuit are real life like virtualizations of museum objects and even whole museums. This trend complements the still dominant main trend which focuses on leveraging digitized cataloging metadata through aggregation, and search systems reaching into those aggregations. Artificial Intelligence has now stepped in with a promise to enhance all these technologies. While museums become more technology-oriented, they simultaneously develop a dependency on technology partners, leading to hostage situations where they no longer have the means to control their digital assets. For a while, the high-tech approach brings great rewards through the sensation (or illusion) of being at the forefront of development, and the personal prestige that this entails. The satisfaction ensuing from technology addiction can be compared to drug addiction. While the addiction is in a high phase, the addicts have no motivation to change their course.

This paper presents a low-tech approach that is aimed at those that are starting to have doubts about their current situation, who may have lost control of their data due to spiraling costs, the loss of a technology partner, the antiquation of their technology platform, or who just want to find a sounder way of living as a museum. This approach is based on connecting existing digital resources with narratives, and publishing them on a low-tech platform that is conformant with long-term preservation and restores control of digital resources to museums.

Myrto Koukouli, Akrivi Katifori,Yannis Ioannidis
Athena Research and Innovation Center; University of Athens

SKOS vocabulary without SKOS training. A tool for everyone
Keywords: SKOS, Controlled Vocabularies, Linked Data
Session: Planning and implementing strategies

Controlled vocabularies play a crucial part in most, if not all, activities connected to Cultural Heritage. Advances in Linked Data and Semantic Web technologies made it possible for vocabularies to be shared and reused. Today, a variety of well structured and accessible vocabularies, such as the Getty Art & Architecture Thesaurus, are available for experts and organizations to use. These are often quite extensive so, in most cases, a subset of the vocabularies is used. Furthermore, since controlled vocabularies are considered best practice in a wide variety of activities, the experts or organizations often rely on more than one sources to create their own vocabularies to better cover their specific domain or the scope of their application. The creation of such custom vocabularies in the form of Linked Data requires at least some understanding of the Semantic Web technologies.

To face this problem, we present a software application that enables any user to create a SKOS vocabulary without prior knowledge of RDF, SKOS or Linked Data. The users can easily build a hierarchical vocabulary from scratch, view the concepts tree and add extra attributes to each concept. Since this project is still in the development stage, our goal is to present its current status, hoping to receive feedback and maybe provoke discussions about the part of Cultural Heritage that remains “hidden" from the Semantic Web.

An art historian reflection on digital curation

Béatrice Gauvain, University of Basel

Keywords: digital collections, digital art history, digital storytelling, digital curation, curation cultural heritage, digital cultural heritage
Session: Planning and implementing strategies

One of the biggest challenges of the 21st century is how to handle and take advantage of the massive and ever-growing amount of data. Cultural heritage institutions have been increasingly converting their collections into the digital space as the pressure towards digitization and open access rises.
By transitioning into the digital space, cultural heritage institutions have been facing challenges when it comes to data quality, long-term storage and life-cycle management. The demand for openly accessible and interoperable data is growing fast. Digital curation addresses most of these issues; it supports reproducibility, reusability and valorization of data, data management from creation to termination and ensures accessibility, preservation, authenticity and integrity over time.

For the public to be interested or engage with digital cultural heritage, it does not suffice to simply apply digital curation and open access strategies to the collections. In an analog world, curators in art museums and galleries create meaning through curation, which involves contextualization, linking objects and storytelling. For long-term interest and visibility, these methods should be applied to cultural heritage in digital space as well, not just to physical collections in institutions. Projects that focus on storytelling are increasingly emerging, one of the most successful examples is the Rijksstudio which allows for user interaction and engagement.
This disposition towards curated content in digital space shows the need for a more comprehensive theoretical understanding of digital curation, that unifies technical and curatorial aspects in digital cultural heritage. This paper aims to define this term and discuss its applications.

Lara Corona, Universitat Internacional de Catalunya
Digitising to Increase the Visibility of Collections
Keywords: long term-preservation, accessibility, storage
Session: Planning and implementing strategies

There are more than 95,000 museums worldwide. A great part of museum collections is kept in storage due to several reasons, such as the poor documentation. The collection is the “very heart” of a museum. Therefore, it is supposed to be made accessible to the public. This paper aims to highlight the results of a worldwide survey conducted between December 2020 and January 2021, to investigate the state and use of stored collections of museums. The survey findings highlight that most of the respondents hold ninety per cent of their collections in storage. Results evidence that museums have been trying to find solutions to make their stored collections accessible through different strategies, such as visible storage, and so on. However, actually visibility remains limited to those visiting the physical locations.

An important option to increase the visibility is digitising. This solution is relevant because it represents the digital documentation of museum collections, allowing access to all objects including those that cannot be displayed because of light-sensitivity or fragility. Digitisation can be considered a paramount strategy for museums since it overcomes the historical conflict between accessibility and preservation.

Because more collections will be accessible in a short time, the study evidences the key role of documentation of collections through digitisation to increase accessibility while contributing with long-term preservation of physical objects. Therefore, digitising might represent a significant strategy for museums so that all museum missions are ensured.

State of documentation in Iberoamerica preliminary results
Trilce Navarrete, Erasmus University Rotterdam

Keywords: inventory, Iberoamerica, documentation survey
Session: Planning and implementing strategies

The working group DOMINO has identified a series of action lines to guide its activities in the coming year. One such action line involves the inventory of the state of documentation in Iberoamerican museums in order to better understand the current situation, the challenges, and the most immediate needs that the community are working on.

For this action line, three activities have been defined. First, we will reach out to the community to identify previous experiences in survey the region, and when relevant reports are encountered, the current data available from ministries and research bodies about museums will be gathered. This will also help DOMINO to reach out to the community of documentalists in museums in the region.

A second step will be to develop a survey for museums which will harmonize the experience of other projects, including national and international inventories such as Enumerate, Egmus, and Unesco reports. It is expected that the initial mapping of experiences will lead to existing surveys.

Some things to consider are the various levels of technological availability (hardware, software, skills) as well as the context within which documentation of collections takes place (from own initiative or responding to external mandates). The usual type and size of collection, inclusion of metadata and images, knowledge of and use of standards, and online publication will be included in the survey.

Digital presence and omnichannel approach for the promotion of the artistic and historical itineraries of Castelli ceramics.

Eko Saputra, University of Teramo

Keywords: omnichannel, open-source tools, digital heritage, maiolica ceramics, Gentili archive
Session: Planning and implementing strategies

The artistic tradition of ceramic handicrafts characterizes the local culture and economy of a relevant part of European history, contributing to the reproduction and development of highly competent production systems, which reflect themselves into a cultural and social capital of great importance for local communities, such as that of Castelli, a centre that plays a key role in the history of Italian maiolica production, also remark as one the highest cultural and its ornament varieties that have distinctive aesthetic value especially in the period from the 16th to the 18th century.

Intrigued by the idea of developing a digital channel for the heritage archive, through this PhD project the open-source digital approach to developing omnichannel experience in small-medium management is conducted with the focus on Gentili Archive. The heritage archive can take a digital form, ranging from clearly defined spaces at the virtual exhibition or independent website to joint collaborations including third-party portals such as Google Art Culture. By providing different types of interaction with heritage material, it can be intended as an exceptional opportunity to offer innovative and alternative approaches to individuals to interact with cultural heritage assets, which can accomplish not only entertaining but also hoped that digital applications promote an understanding of heritage, as well as encouraging users to value and appreciate the heritage.

Using Anti-Racist Change Management Techniques in Digital Transformation at the Fine Arts Museums of San Francisco

Adele Barbato, Fine Arts Museums of San Francisco

Keywords: digital transformation, workflows, anti-racism, change management, collection management system CMS
Session: Planning and implementing strategies

The Fine Arts Museums of San Francisco (FAMSF) began a major digital transformation right as the world shut down for the COVID 19 pandemic. Where FAMSF had been working in silos, utilizing more than 90 individual bespoke and homegrown databases to track collections-based activities, they were now merging everyone's work into a single, collaborative, integrative system. That amount of change requires not just years of effort on the data end, but a real cultural shift for how staff work together.

At the same time the global anti-racist movement began gathering heat, sweeping through museums like a wildfire---particularly in the United States---ignited by the underlying white-dominant structures that govern the very origin stories of many of these institutions. These structures manifest in many ways in a museum (such as staff working in silos, and power and decision-making abilities hoarded with a single individual, to name only a few), including in how infrastructure, workflows, and documentation are created, communicated, and enforced.

What the anti-racist movement also did was to provide invaluable tools for how to build inclusive and equitable collaborations among people from a diversity of backgrounds and influences. These tools were immediately transferable and relevant in the context of shepherding FAMSF's digital transformation project, and were heavily relied upon to help ingrain equity and collaboration into the infrastructure and workflows of its new CMS. The resulting implementation has been slow and ongoing, and even emotionally challenging at times, but with truly meaningful successes in sustainability, flexibility, and camaraderie.

Collaborative Document Management: The CIDOC Approach
Stephen Stead, Paveprime Ltd

Keywords: Document Management, Collaboration, CIDOC
Session: Planning and implementing strategies

CIDOC centrally and through its Working Groups, creates a range of standards, recommendations, press releases, documents, presentations, and videos.
A constant over the last 30 years has been the difficulty in keeping track of these intellectual products and of supporting their creation. The global pandemic has sharpened the need for remote collaboration and made document sharing a "must have". However, the path to true collaborative document production is not always straightforward and can create some issues that are time-consuming to correct.

This paper lays out the approach adopted by CIDOC in tackling these challenges in 2021 and presents the initial experiences with the proposed solution. It includes the technical solution, reasoning, lessons learnt and budget.

A challenge of the Italian University Museums Network: educating to scientific culture through digital technologies

Elena Corradini, Università di Modena e Reggio Emilia

Keywords: Scientific Culture, Educational Paths, Italian University Museums Network
Session: Planning and implementing strategies

Educating people about scientific culture is the raison d'être of University Museums, created in the 18th century with the aim of teaching students about various scientific disciplines. Now University Museums can recover a new vitality with the use of digital technologies supporting, in an innovative and effective way, the exercise of the Third Mission of Universities, traditionally the most sacrificed, that is its educational and cultural dissemination action in society and in the territory.
We intend to critically present a project of educational paths dedicated to several scientific themes, carried out by the Italian University Museums Network, coordinated by the University of Modena and Reggio Emilia, and consisting of 62 museums, 54 collections and 12 botanical gardens. The educational paths, linked to three general areas, biodiversity, color, time, are intended for students in the last three classes of high school and they can also be useful for their career orientation towards science, as set out in the "national guidelines for permanent orientation" published by the Ministry of Education. The decision to use multimedia tools for the educational paths, published in the Network's web portal (www.retemuseiuniversitari.unimore.it), was dictated by the need to share both the common process by which the paths were organized and the scientific content, with the possibility of updating and deepening them in synergy with teachers. The project, born and developed before the pandemic, has been fundamental after the museums closure because it allowed continuity to their educational activities and updates for the educational workshops reorganized in presence.

inDICEs: Self-Assessment and Monitoring of Digital Transitions in the Museum
Fred Truyen (CS Digital KU Leuven) and Rasa Bočytė (Netherlands Institute for Sound & Vision)

Keywords: digital transformation, digitisation, self-assessment
Session: Planning and implementing strategies

As museums started to experiment with engagement strategies driven by digital collections, the strain and challenges facing the supporting workflows readily became apparent. Not only do digitisation processes need to be planned carefully, but also publishing online, ICT lifecycle management, understanding of copyright and marketing strategies for audiences online became new tasks for already strained museum staff. These often still loosely connected digital transitions in the museum require a comprehensive digital strategy. Hence a growing need to take a wide-angle look at the impact of digital technologies on the inner workings of the museum. It requires a rethinking of the place digital collections have in the museum's mission, business model and interaction with target communities.

The H2020 project inDICEs offers GLAMs the tools to conceive such strategies, based on comparative research data and participatory innovation models. The project is developing an Open Observatory, where GLAM professionals as well as creative industries, policy makers and researchers can find and analyse data on digital heritage accessibility and reuse, and explore case studies on novel value chains. In a tailored participatory space, institutions will find the tools to exchange expertise on the implementation of digital workflow models, policy and legal recommendations. By means of a self-assessment tool, institutions can monitor their progress and performance, while assessing risks and opportunities. The tool enables institutions to assess their strategy and plan against several aspects of digital transformation, ranging from setting up digitisation processes and metadata development to online publication, user engagement, audience development and participation.

Formulating archival description from the personal correspondences of Ananda Coomaraswamy from the IGNCA Cultural Archives

Shilpi Roy, Indira Gandhi National Centre for the Arts

Keywords: Ananda Coomaraswamy, Cultural Archives, IGNCA, ISAD (G)
Session: Planning and implementing strategies

The Cultural Archives IGNCA has an exclusive collection of seven hundred and seven (707) folders containing more than 30000 correspondences of the great art historian, Ananda Coomaraswamy in the form of letters, typescript drafts, proofs, and revised published copies of many of his articles and a few of his books. These correspondences cover a broad spectrum of his work in the fields of art history, philosophy, religion, social criticism as well. These correspondences unfold his communication with important personalities like Gurudev Rabindratath Tagore, Stella Kramrisch, Alvin Moore, Sir Alexander Cunningham, William Rothenstein and many others dating from 1890 to 1947, which stupendously reflects prolific oeuvre of his eventful life. Furthermore those are in a number of languages, i.e. English, French, Spanish, Greek, Hebrew, Latin, Chinese, Tibetan, Arabic, Russian to Hindi, Sanskrit, Pali, Prakrit, Telugu and other Indian languages. These also include drafts and revised version of his significant publications like Catalogue of the Indian Collections in the Museum of Fine Arts (1923–30) etc. This paper describes the processing of above correspondences which includes arranging, indexing and describing the content of the records following standardized codes in the data sheets and finally transferring them to computerized format. It largely follows the ISAD (G): General International Standard Archival Description guidelines developed by International Council on Archives. This initiative is aimed to facilitate scholars' opportunity for pragmatic study on prodigious work of Ananda Coomaraswamy ranged over Indian music, dance, and vedic literature and philosophy, art history, Islāmic and Far Eastern studies as well.

Bridging the gap between internal museum systems and community knowledge using the ResearchSpace knowledge system

Dominic Oldman, Diana Tanase,Cristina Giancristofaro (British Museum); Artem Kozlov (Kartography Community Interest Company)

Keywords: Semantic Web, Participation, Engagement, Linked Data, Diversity, Bias, ResearchSpace, Data, Ontology, CIDOC-CRM

Session: Planning and implementing strategies

Museums are often referred to as knowledge institutions, but much of the structured data they store about their collections is administratively oriented and lacks wider historical and contextual knowledge. Open data publishing has become an accepted function for many museums as an inexpensive way of releasing information from internal collections systems in the form of Web based, 'Collection Online' systems or APIs (application programming interface).

However, the underlying systems and data were not designed for engagement and focus on substantive documentation and vocabularies. As a result they carry long standing problems including lack of diversity and bias. This represents a challenge for data driven digital strategies seeking to address current audience concerns, and ongoing knowledge preservation for the future. While museums directly engage with external audiences accumulating important information, this is not incorporated into core museum collection systems and therefore the categories of knowledge used by museum computer systems are not expanded to address current social expectations and concerns.

This paper looks at a transformational solution using the British Museum's ResearchSpace knowledge system that provides a dynamic approach to knowledge generation and preservation and which can integrate communication with audiences with back office systems and processes. Establishing this connection provides the basis for enriching internal data systems from wider sources of knowledge, improving the quality and richness of structured data. This supports a progressive digital knowledge strategy that addresses social justice and challenges online data services that use a static monumental approach to cultural heritage data.

Sophie Walker, London Museum Documentation Network
Documenting our accessioned digital collections

Keywords: Digital objects, Collections Management System, Digital Asset Management System, Data model, Documentation, Cataloguing, Digital preservation, Digital collections management

Session: SPECTRUM session

The London Museum Documentation Network is producing a new toolkit for museum professionals on managing accessioned digital objects, which will be published in partnership with the Collections Trust. This paper will look at one aspect of managing digital collections - how to document digital objects that often challenge our concept of the museum "object".

As museums start to acquire more and more of our digital heritage, museum professionals are attempting to use our Collections Management Systems (CMS) and our Digital Asset Management systems (DAMs) to enable us to identify, track, access, preserve and interpret these collections. But does the current data model used to describe and manage physical objects work to manage the requirements of our digital collections and could this be used to document other intangible heritage?

Digital objects, such as video games, artwork and social media can be virtual, physical or part physical. Some objects change “shape” in accordance with the people or computers that interact with it. Some must be accessed or compiled using particular hardware, software or metadata. And all digital objects will need to be copied and migrated to new digital formats over time.

This paper will look at ways we can use our existing CMS and DAM systems to document digital objects to enable their long term access and preservation.

A ResearchSpace knowledge system for digital architectural representations in Cultural Heritage

Elisabetta Caterina Giovannini, DAD Politecnico di Torino

Keywords: researchspace, digital architectural representations, documentary heritage, image annotations, 3d modelling, museum collections
Session: Future of Documentation

Between 1816 and 1817, Bernardino Drovetti, former General Consul in Egypt, coordinated several experts through an expedition in Nubia, aiming to collect knowledge and souvenirs to sell in his way back to Europe. French sculptor Jean Jacques Rifaud was involved as architect of the group and he drew and recorded everything unfamiliar to European that occurred in front of him. The corpus of drawings of Rifaud, conserved at the Bibliothèque de Genève , is heterogeneous for the represented subjects and a significant part of it is on Nubian monuments. As historical documentation, drawings report a number of annotations of different nature (e.g. texts, numbers, graphical symbols), and lead to diverse possible investigations. This paper focuses on architectural and sketched drawings produced in situ, representing plans, elevations, particulars and perspective views, taking into account the architectural quotes and the different measurement units.
In the field of architectural heritage documentation and representation, architectural drawings play an important role in the critical analysis of the architectural forms. The architectural drawing and the surveying drawing can be rich in information, annotations and quotes. These data are important in the field of virtual reconstruction where the reasoning process is made not explicit. This research investigates the capacity of semantic technologies to express the interpreting process aimed at the encoding of architectural language, using CIDOC-CRM.
The novelty of this study is the use of ResearchSpace knowledge system to manage 3D digital collection with documentary heritage resources using approaches that reflects the architectural structured knowledge.

What is in the pictures vs what has been described in the museum record. 10+1 years of experience with crowdsourcing platform Ajapaik and what next?

Vahur Puik, Estonian Photographic Heritage Society

Keywords: crowdsourcing, pictorial heritage, historic photographs, geotagging, geodata, rephotography, machine learning, citizen science

Session: Future of Documentation

Historic photographs are most consulted items in museum collections as photos are very rich in information and can have many new uses as illustrative material. Digitization has made a huge leap in the accessibility of historic pictorial content but there is still a huge gap in the actual discoverability of content because of the limitations of textual descriptions that are still the main way to search for heritage content. Museum descriptions are always biased as they reflect the specificity of the museum and the reasons why specific content has been deemed valuable for the collection holding the item whereas photographs actually convey a lot of different and very multi-faceted information that has not been described in the museal record.

Estonian Photographic Heritage Society has for 10 years been running and developing crowdsourcing platform Ajapaik.ee for enriching the pictorial content with addition metadata with the help of voluntary collaborators. The platform started with 2 main tasks of geotagging and rephotography but has moved on to add different types of categorization, labelling, connecting different exemplars of the same images and even transcription of messages on the reverse sides of the postcards.

We want to share are key learnings and ideas about what can be achieved in combining crowdsourcing with machine learning in order to create so called generous interfaces for greater access and discovery of pictorial heritage.

Document networking In the family as the smallest social unit
Ali Rangchian, Soosan Amanollahi (Semnan University)

Keywords: Family Documents, Document Networking, Family Stories
Session: Future of Documentation

Each family,as the smallest social unit,has numerous identity documents, ownership documents and commemorative photographs that over time can be considered as part of the general social historical memory in the urban or rural area. At first glance, these documents may contain only personal and private information of individuals and free from any public data.
But the passage of time makes each of these documents seemingly simple and insignificant to reveal their historical function and social mission.This problem is more pronounced in extended families with wider relationships and exhibits a more complex network of information.
In the digital age, where the ability to record and duplicate paper documents is available to everyone through the simplest tools available, such as mobile phones, this opportunity has become a serious capacity for recording, classifying and duplicating documents. And this not only helps to maintain them, but also creates a vast network that, as a huge capacity of public information, can be considered as a link in this long chain.
The stories, narratives, and memories that form the basis of museums can, at the end of the chain of this vast network, welcome discoveries and explorations that can be extracted from the exploration and search of individuals in each of these networks of friendship, family, or cooperation.
In this article, we try to look at the less important public documents and their prominent role in the narration of social history and cultural geography from another view and explain and expand it by mentioning some examples.

Digital Archives as Resources for Artistic Inspiration and Production
Cheeyun Kwon. Hongik University

Keywords: digital archive, Lee Lee-nam, Korean artist, tradition, digitalisation, contemporary art
Session: Future of Documentation

With the advent of photography in the 20th century, artists found new ways to create artworks from the available photographic images. Francis Bacon, Gerhard Richter, and Andy Warhol painted or derived their paintings from photographs, while photography also influenced sculptors Constantin Brancusi, Man Ray, and Erwin Wurm (Weibel, 2013). In a similar fashion, digital images of traditional materials can provide artists with new sources of inspiration and creativity. The digitalisation of tradition, be it artworks, documents, or living traditions, can become great archival resources for new artistic production in the form of media art, film, video, or performance art.
I wish to present a case study of a Korean artist, Lee Lee-nam, whose digital translations of traditional Korean paintings and Western masterpieces have received much acclaim within the art world. His digital transformation and interpretations of traditional artworks give new meaning and life to otherwise dormant, fossilized images. His re-contextualization and reinterpretation of old images into contemporary situations revive the lore of the past into a contemporary social context, prolonging tradition's lifespan of relevance in the present. In such a way, the 'digital turn' of tradition is not only imperative in order to safeguard our heritage but also a vital means to generate new forms of artistic production for the future generation. My paper will focus on the far-reaching impact of the digitalisation of tradition in the sector of artistic production.

Knowledge accumulating and clustering in khirin
Akihiro Kameda, Sakiko Kawabe, Makoto Goto (National Museum of Japanese History)

Keywords: CIDOC CRM, Linked Data, Object Biography, Data Provenance
Session: Future of Documentation

This presentation introduces the data model of our knowledgebase system for integrating the data of object biographies of historical and cultural resources. Since 2016, the National Museum of Japanese History has been conducting a project to digitally preserve the historical and cultural resources of museums and institutes across Japan. To achieve this objective, we created an inter-institutional knowledgebase called khirin. In khirin, Linked Data functionalities enable users to browse and query relationships among resources.

At the CIDOC 2020 conference, we reported modelled examples of ethnographical objects and related activities. In the model, we used our original ontology, called Object Biography Ontology, along with CIDOC CRM, W3C PROV-O, and basic ontology such as schema.org and RDFS. This model enables us to describe ethnographical object biographies. In this presentation, we focus on two features: the cumulative feature of knowledge and the diversity of information clusters.

The former feature is that documents related to museum objects are usually an accumulation of information written by different people in different contexts. All of the information, which may be inconsistent as a whole, is important for understanding objects.

The latter feature is that one object can belong to multiple clusters. Clusters can be formed based on relationships written explicitly in the existing documentation, common keywords in the documents, or newly annotated relationships. Additionally, there are ways to represent a cluster in RDF.

With our framework based on CIDOC CRM, it becomes possible to describe and query information related to those issues.

Visualizing cultural heritage - Visual approaches to modeling and presenting multimodal data

Dr Linda Freyberg, Giacomo Nanni (University of Applied Sciences Potsdam, UCLAB)

Keywords: Cultural Heritage Data, Linked Data, RDF, CIDOC CRM, Omeka S, ontologies data mapping, vocabularies
Session: Future of Documentation

In the three-year project "Restaging Fashion - Digital contextualization of vestimentary sources" situated at the UCLAB in Potsdam new perspectives on historical dress will be elaborated. Based on semantically contextualized multimodal sources (texts, images, and historical garments) visualizations serve as an epistemic tool. Starting with a local database, which already contains about 600 objects linked to vocabularies like ICONCLASS and GND the data has been further enriched: In the Knowledge Organization System Omeka S we bring
together the digitized objects and use CIDOC CRM to shape it into Linked Data.
The diversity of cultural objects and their relations calls for a precise description and a sophisticated structure, for instance the modeling of the paintings and the depicted dresses refers to two different time spans. Also, the art historical discourse is expressed by multiple events referring to the provenance, restoration or other new findings (appellations of the artist
etc.).
Bridging information visualization and art history, the research project seeks to preserve the expressiveness of the objects and provide for interoperable data to enable scientific discourse.
Visual approaches to both, the collection, and the modeling, will be presented to enhance research findings and to facilitate data modeling.
Despite the widespread appeal of Linked Data, only a few institutions until today have accomplished to make their collection available as Linked data. We present one methodological
approach, which can be exemplary for multimodal cultural heritage collections.

Rainstones, rivers, and relationality: developing polyvocal collections documentation
Mike Jones, Australian National University

Keywords: museum documentation, Indigenous knowledge, Australian museums, polyvocal documentation, event-based documentation, relationality
Session: Future of Documentation

Exhibition spaces from the National Museum of the American Indian in Washington, D.C., to the recently-opened Western Australian Museum Boola Bardip increasingly incorporate parallel voices, diverse perspectives, and divergent knowledge systems. These are the 'polyphonic spaces' mentioned in the controversial museum definition discussed at the ICOM General Conference in Kyoto. But our historical collections documentation often fails to capture the plurality of meanings that assemble around artworks, artefacts, and specimens. Positioning ourselves as authoritative institutions dedicated to the truth, museums often risk universalising culturally and historically specific concepts, relegating other perspectives to the status of myth, misguided speculation, or simple ignorance. In this paper, the author will use a series of Indigenous artefacts and stories drawn from Australian and international institutions to demonstrate the ways in which collections contain a complex interplay of contextually-specific stories and systems of knowledge. Building on an analysis of related collections documentation, the paper will explore how the development of more polyvocal, relational, and event-based documentation structures can be used to help reveal and celebrate, rather than suppress, different perspectives on the world.

Reimagining Performance Art Histories
Erin Walter, University of Glasgow

Keywords: Performance Art. Live Art, Documentation, Documentation Techniques, Documentation Models, Liveness, Archives
Session: Future of Documentation

The landscape of performance art archives is scattered and non-uniformed. This is the result of a number of ideological influences pertaining to the idea that performance itself resists representation or documentation. Such ideas have more recently been met with different means, methods and models of how documentation should be conducted, particularly within institutional settings. This research focuses upon a curatorial approach to documentation, aiming to achieve a more comprehensive model for documentation, both accessible and working to the capacity and resources of artists and smaller organisations.

This short presentation focuses upon the research I have been conducting over the course of my PhD. Employing a practice-as-research methodology, with a poststructuralist approach, this research includes a brief survey of case studies. These case studies will highlight live performances which have been documented using a viable hybrid model of documentation. In turn, this aims to capture not only liveness, but to represent the performance process, experience, interpretation and context through a myriad of authorships and perspectives. In experimenting with techniques of documentation, from audience experience to artist interview, visual representations of movement and reinterpretation, this presentation aims to speak to the future of documentation.

Metadata politics: Europeana Data Model and the Europeanisation of Heritage Institutions
Carlotta Capurro, Utrecht University

Keywords: Metadata politics, Europeana Data Model, Digital Cultural Heritage, Digital governmentality
Session: Future of Documentation

The European Commission has increasingly mobilised cultural heritage to bolster a European identity. One of the main flagship initiatives promoted to this end is Europeana, the most extensive digital cultural project financed by the EU. At the core of the project stands europeana.eu, a portal aggregating metadata provided by national and local heritage institutions. Due to the widespread uses of cultural heritage data, it is crucial to approach them critically, reflecting on their nature and inherent politics. These are the cultural assumptions embedded in their creation, which produce wanted or unexpected consequences on the people using the data.
Central in this analysis is the Europeana Data Model (EDM). Due to its overarching nature, EDM does not deliver the granularity that cultural heritage institutions need when documenting their resources. Nonetheless, heritage institutions accept to sacrifice accuracy to have their information represented in a Europe-wide collection.
We study how this digital heritage infrastructure was designed to enact a sense of Europeanness amongst national and local institutions. Policy documents, ethnographic research and a systematic survey amongst the European heritage institutions enabled us to trace how a standardised European metadata structure plays a role in governing local and national heritage institutions. The EDM might enable heritage stakeholders to benefit from Europeana's online exposure while enacting a European mindset. Ultimately, this study of the metadata model enriches the debate on the EU's cultural heritage politics, which has not fully explored the role of the digital, and taps into debates about infrastructure and digital governmentality.

Tools for a COVID Friendly Approach to CIDOC-CRM Mapping.
Joseph Padfield and Orla Delaney (The National Gallery)

Keywords: tools, sharing, automation, collaboration, CIDOC-CRM, COVID 19
Session: Future of Documentation

This paper addresses the challenges we faced in conducting semantic mappings during the COVID-19 pandemic and presents tools and solutions for conducting such research remotely in the future. The development of semantic models is a collaborative process involving careful decision-making, particularly using complex ontologies such as the CIDOC-CRM. Rather than spending days or weeks theorising our mapping with large sheets of paper and many coloured post-it notes, we found it more practical to come up with an iterative, code-based process that would enable easy sharing and critique of small sections of our example mapping as it progressed.

A process was developed that automatically generated model diagrams based on simple text-based tab-separated triples. This allowed easy versioning and editing of models, simply by editing the text and re-running the automated formatting process. This code-based approach also allowed for further augmentations of the final models by automatically incorporating links to any external resources referenced, by URLs or PIDs, within the triples, such as WikiData and the Getty Vocabularies. The final visualisations are achieved using either Mermaid JS or D3 to provide two different interactive presentations: a dynamic web-based modelling tool for visualising on-the-fly sections of mappings and a more static solution, based in GitHub, for the presentation of more complete mappings in a user-friendly web-site environment, using its GitHub Pages and GitHub Actions features.

Our use of these tools provides a blueprint for how remote development of collections documentation can occur in the future and remain compliant with CIDOC standards.

PAGODE – Europeana China: understanding what is Chinese heritage in Europe to curate digital collections of cultural heritage

Valentina Bachi, (PHOTOCONSORTIUM) Antonella Fresa, (Promoter srl) Nataša Vampelj Suhadolnik, Maja Veselič (University of Ljubljana - Department of Asian Studies)

Keywords: Chinese cultural heritage, Digitized photography. Metadata. Linked thesauri Europeana
Session: Future of Documentation

PAGODE – Europeana China project is a Europeana Aggregation project which is selecting and digitizing, for being showcased on-line, cultural heritage items representing the connections between China and Europe.
The major technical outcome of the project in terms of curation and metadata creation for digitized cultural heritage is a semantic background: a structured scientifical knowledge and guidelines for the annotation of digital content that can be considered as related to Chinese cultural heritage, also defining specifications and technical requirements for the creation and enrichment of the associated metadata.

Once it is understood what can be considered as Chinese Cultural Heritage in Europe, with its various implications, the semantic background allowed to select cultural heritage depicted with different typologies of "objects": tangible, intangible, natural, and to determine specifications for the descriptive metadata and an extensive list of keywords, associated with AAT and Wikidata thesauri, to be used in the preparation of the digitized content for showcase on-line, and for the enrichment of the metadata.

Offering rich and effective metadata is key to help search and retrieval of the objects across digital repositories such as Europeana. For PAGODE – Europeana China, the metadata enrichment follows a hybrid approach including: addition of LOD at the source, by the content provider; citizen science and crowdsourcing enabled via engaging tools; automated enrichment applied by Artificial Intelligence. Overarching aim of the selection and curation is to ensure that the cultural heritage materials collected and presented in the project generate rich user experiences.
Website: www.photoconsortium.net/pagode

Documenting the physical object for a digital outcome
Jenny Greiner, Chester Beatty

Keywords: online collections, digitisation, access
Session: Future of Documentation

Digitisation and the resulting remote access to collections has never been more important than during the pandemic, when in-person research was impossible. At the Chester Beatty, the complete process of digitisation is a perfect amalgamation of documentation and technology. The steps move through foliating manuscripts and documenting the physical object in preparation for the photographic process. Following digitisation, the collections are reconstructed virtually, tying in with the documentation of the physical object to provide a virtual object.

Both the documentation of the physical object and the resulting digital outcome go hand in hand, each stage supporting the other. The preparatory foliation and documentation provide guidelines for the photography phase. It is then put to further use, in combination with the images, to rebuild the object on a digital platform following the structure of the physical object. Technology and the detailed documentation carried out in advance come together to provide a level of access otherwise impossible.

This presentation will look at the practical steps we take at the Chester Beatty as part of documentation in preparation for building our online collections. It will focus on the considerations, challenges and final outcomes of building a digital collection, and the combination documentation and technology which make this possible.

Consistent, Clear, Concise: Machine-Actionable Metadata Documentation

Robert Sanderson (Yale University), George Bruseker (Takin Solutions) , Emmanuelle Delmas-Glass (Yale Center for British Art)

Keywords: Documentation. Application Profiles, Validation, Standards, Linked Open Usable Data,
APIs
Session: Future of Documentation

One goal of standardization of data formats is to provide interoperability between information created by different organizations, or by the same organization in different systems or at different times. Formal specifications and logical axioms are needed for the data to be processed by a machine, but for the data to be created by humans in the first place, we need very different documentation, written concisely and clearly for the appropriate audiences. This paper presents recent efforts to precisely document data profiles from the abstract formal ontology of CIDOC-CRM, through the community profile Linked Art which customizes for the community's use cases by adding specific vocabulary recommendations, to implementation profiles developed with a specific information system such as Arches, and to the documentation needed by end users using those systems as part of their daily tasks.

The approach takes into account both the needs of users at these different levels, as well as the ability for machines to validate data and profiles alike. The data can be validated against a local profile before ingestion into a system, the local profile can be checked that it is consistent with the community profile, which can be aligned to the ontological standards. These validation schemas can also be rendered as technical documentation for software engineers building or using knowledge-management systems. Through this consistency, we can demonstrate both savings in effort and improvement in the data, across multiple implementations. This moves us toward the semantic interoperability necessary to enable inference of new knowledge.

Mapping Heritage: A Case Study of the Use of CIDOC-CRM at the National Gallery
Orla Delaney and Joseph Padfield (The National Gallery)

Keywords: CIDOC-CRM, FAIR, heritage science, PIDs, linked data, open data
Session: Future of Documentation

This paper presents an approach to mapping two distinct but related datasets to the CIDOC-CRM, undertaken at The National Gallery in 2020-21. This work was part of the EU-funded Social Sciences and Humanities Open Cloud (SSHOC) project and aims to provide an example of how heritage science data can be made more compliant with the FAIR data principles. In addition to using the CRM to define the data structure of the project outputs, a bespoke system of externally resolvable persistent identifiers (PIDs) was implemented and integrated with the CRM mapping. In this paper, we provide an overview of how this work was scoped, planned and carried out, addressing the challenges of mapping a dataset from an older, custom ontology to the CRM and presenting our Python-based workflow. We also evaluate the CRM's suitability for representing our data's highly technical concepts and specific conservation documentation in conjunction with vocabularies such as WikiData and the Getty Vocabularies, and demonstrate our use of Blazegraph and experiments with the British Museum's ResearchSpace to store and display our mapped data. This paper summarises the process of making two datasets FAIR from concept stage to final output. It also demonstrates how a dataset that is already available as linked data can be made more FAIR, an issue that will become increasingly prevalent as the linked data landscape matures.

Traditional catalogues and digital possibilities: the National Gallery's online catalogues project

Rupert Shepherd (The National Gallery), Jeremy Ottevanger (Sesamoid Consulting)

Keywords: digitisation, cataloguing, conversion pipeline, XML, XSLT, Text Encoding Initiative (TEI),
Create Once Publish Everywhere, natural language processing, named entity recognition, The National Gallery (London)
Session: Future of Documentation

The National Gallery has a long tradition of producing detailed print catalogues of its collections. Despite the emergence of online methods of publication over the last 30 years, we have continued to focus on purely printed catalogues. But the work involved to produce a single print volume is immense; the public increasingly demands digital access; and our existing model of catalogue dissemination is no longer sustainable.

The Gallery is now embarking on a major programme which will increase the depth and richness of our online collection information by an order of magnitude, with digital versions of the existing print catalogues at its heart. Based on the findings of a pilot project which ran from 2019 to 2021, this paper explains the pipeline we have set up to turn our printed catalogues into digital files which can in turn be converted into multiple formats for digital dissemination, and from which individual sections can be extracted according to need. We will also explain how the pipeline, created for the retrospective conversion of existing volumes, is being adapted so that we can start publishing a few entries at a time online before they go to print, enabling us to take advantage of research as it happens. We will also touch upon the possibilities of enriching the texts by using natural language processing techniques to automate the identification and tagging of named entities within them.

museum4punkt0 – joint project on digital tools and aplications for museums
Monika Hagedorn-Saupe, SPK

Keywords: digital transformation in museum development through partnerships, re-use
Session: A Wonderland of Digital Technology

The museum4punkt0 project networks 16 museums from several regions of Germany. Across institutional boundaries the project partners are jointly testing digital possibilities for new ways of learning, experiencing and participating in museums. New formats and digital prototypes for education, presentation, participation and communication are developed. At the same time, we look at the challenges that the use of digital technologies pose for staff, infrastructure and work processes.

Funded since 2017 with 25 million EURO by the Federal Government Commissioner for Culture and the Media in accordance with a resolution issued by the German Bundestag and Neustart Kultur museum4punkt0 creates not only a space for experiments but also a space for exchange. We exchange our findings within the network, advise each other on designing concepts of digital museum facilities and network closely on overarching issues. We also reach out to museum professionals, as we intend to make our results freely available to other cultural institutions in different formats. This includes knowledge captured in the documentation of both the development process and the deployment scenarios and guidelines, as well as reusable source codes of the prototypes created. An integral part of museum4punkt0 is not only the joint development of digital formats for museums, but also, under the aspect of sustainability, the provision for their re-use.

Our focus in 2021 is on the topic of participation, possibilities of digital storytelling and the requirements for multimedia guides, also with the use of artificial intelligence, as well as augmented reality.

Language Technology Resources for Persian in a Museum Context
Mika Nyman, Minar AI Artificial Intelligence Technologies

Keywords: Language Technology, Digital text corpora, Handwritten Text Recognition (HTR)
Session: A Wonderland of Digital Technology

The paper presents a comprehensive survey of Language Technology resources for Persian. The primary use case is the cataloging data of the Iran Art Museum. A long-term goal is the use of Handwritten Text Recognition (HTR) to create digital text corpora.

Exploring the engagement practices of museum visitors with digital heritage
Pille Runnel, Agnes Aljas (Estonian National Museum)

Keywords: visitor analyse, engagement, design of digital heritage
Session: A Wonderland of Digital Technology

The presentation discusses how the design of the digital layer of the permanent exhibition "Encounters" at the Estonian National Museum contributed to the visitor perception on the heritage. The results are based on the user analyses conducted in the exhibition to understand the engagement of the visitors with the provided content.
Five digital layers can be distinguished at the ENM's permanent exhibition, which were designed for facilitating multi-user experiences and enabling the audience to take a lead, displaying databases for browsing, sharing and comparing, but also supporting the interaction of personal and social memories. We expected that using these digital exhibits potentially result in new content and collaborative interpretations, which are influencing the metadata and museum's perception on heritage presentation.
This discussion is situated in the concept of engagement, looking at its different forms, such as emotional, intellectual and social engagement with heritage. Although research suggests that the digital layer of the museum primarily facilitates visitor's individual engagements, we look at whether and how the digital exhibits support the museum as dialogical, open and collaborative public space.

Digitized collective memories – Latvian NMKK, Finnish FINNA, Estonian MUIS: opportunities and challenges of data aggregation
Maija Spurina, Latvian Academy of Culture

Keywords: digitized cultural memory, transnational analysis, machine learning
Session: A Wonderland of Digital Technology

Digitization of museum collections promises to transgress geography and physical space by dismantling institutional and even national boundaries and opening-up a possibility to achieve a truly data-based overview of composition of national and transnational cultural memory. National mass digitization projects, at least in their intention, would allow to get an insight into “memory mountains” and “memory valleys” (Zerubavel) or dense and empty historical periods both on nation and potentially transnational level. The paper will reflect on opportunities and challenges in working towards such an overview of three publicly available national museum databases – national catalogue of museum collection of Latvia (NMKK), digitized database of museum collections of Finland (FINNA), and national database of Estonian museum collections (MUIS) – and analyze the available metadata and images, using both a conventional quantitative data analysis tools and machine learning algorythm (VGG19).

Speeding up inventory and digitisation processes
Hembo Pagi, Andres Uueni (Archaeovision)

Keywords: collection management, workflow optimisation, machine readable labels
Session: A Wonderland of Digital Technology

One can see barcodes and barcode readers every day in shops and libraries. This technological approach is used to speed up processes which otherwise would take human working time. Quite often those tasks are monotonous and tedious and intellectually not very challenging.

You do not see those solutions in museums very often though. Reason is not that there is nothing to speed up or optimise. There might be fear that it is expensive to implement, or no trust in technology etc.

An essential part of implementing a new type of workflow is analyzing the existing steps that a museum object goes through before it is put on a shelf in the museum's repository or in the exhibition. One can easily identify parts of the workflow which take too much time, have higher probability for human errors and where optimisation is needed. Some processes can be sped up by using technology (such as machine readable codes). For example when barcodes are used in annual inventories, less time spent searching for an object in a database gives collection managers more time to fully inspect the object. Adding such a tool into the workflow allows to increase the efficiency and quality of work.

Machine readable labels can be also a tool for creating linked data, putting together different documents or finding information about an object in a vast database.

Our paper shares some insights and experiences working with three Estonian museums that have implemented the machine readable labels in their everyday workflow.

Big Data Characteristics: recognizing the potential in Museum Data
Stephen Stead (Paveprime Ltd & Delving BV), Jonathan Whitson Cloud (Horniman Museum and Gardens)

Keywords: Big Data, Machine Learning, Data Management
Session: A Wonderland of Digital Technology

The paper offers an overview of the characteristics and definitions of Big Data and its processing. It includes a case study on using machine learning within museum documentation and looks to future application areas.
Big Data is frequently characterised with the 'V-Words': Volume, Velocity and Variety. However, these are not the only V-words, and their use is not always clear. Their definitions will be made clear and the implications for data management practice both in general and in museums will be explored.
The power of Big Data is in what you do with it. Key classes of techniques will be outlined together with their challenges. One class of technique is the use of machine learning to process structured and unstructured data. The trial that used such text mining techniques on narrative material from the documentation of the Horniman Museum is a useful case study and test-bed.
We will then offer some thoughts on other application areas and lessons that can be learnt about data curation and integration at both the intra- and inter-museum levels.

Algorithms study museum objects: using a machine learning model to assess the preservation of museum objects

Kurmo Konsa (Pallas University of Applied Sciences), Meri Liis Treimann (STACC (Software Technology and Applications Competence Center) , Kristiina Piirisild (The National Heritage Board)

Keywords: deterioration of museum objects, damage assessment models, machine learning model of deterioaration
Session: A Wonderland of Digital Technology

The primary task of museums is to preserve museum objects in the form of physical objects. Despite its apparent simplicity and comprehensibility, damage to man-made objects - artifacts - is a complex and complicated area. At the same time, modeling the aging of museum objects is very important for their successful preservation. Modeling of damage processes makes it possible to assess their extent (which objects have been damaged and what is the degree of damage), the speed of damage processes and thus changes in the number of damaged objects over time, and finally, the effectiveness of possible management measures.
In the presentation, we discuss the machine learning model Sälli, which predicts the preservation of museum objects. For this purpose, the machine learning model uses the data of MuIS (Estonian Museum Information System). The 73 museums that have joined MuIS have entered a total of nearly 3.7 million museum objects from the 973 museum collections to MuIS. Almost 3.7 million condition assessments have been entered into MuIS. The development of a condition prediction model based on these data requires at least pairs of consecutive condition assessments to try to determine whether one or another event or a property (nature, material, age, techniques) of a museum object or some combination of them correlates with the change in condition. The model described in the presentation tries to assess whether and how the condition and stability of objects are related to the properties and events of museum objects.

Connecting diverse humanities datasets with CIDOC-CRM
Erin Canning, LINCS (Linked Infrastructure for Networked Cultural Scholarship)

Keywords: CIDOC-CRM, ontologies, linked open data, engagement, collaboration
Session: A Wonderland of Digital Technology

The Linked Infrastructure for Networked Cultural Scholarship (LINCS) project seeks to bring together datasets created by researchers working in a wide range of humanities disciplines with institutional datasets from GLAM partners, and to convert these into an interconnected, machine-processable set of resources. To accomplish this, LINCS will convert source data to linked open data, using CIDOC-CRM to bring this highly diverse data together.

In this presentation I will introduce how LINCS has implemented CIDOC-CRM, and the workflow that we have been using with data holders. This presentation will be as much about working with the people involved as with their data: I will focus on the steps we have taken to educate and engage researchers, and how this has led to an excellent reception of a complex solution. The researchers and data holders that have had their data mapped to CIDOC-CRM have expressed excitement about the new level of detail they can bring to their data, as well as about the affordances of the structure for supporting how they conceptualize their data. I will conclude with an acknowledgement of work yet to be done on the project, which is currently one-third of the way through its timeline.

This presentation will show how existing (and evolving) standards for enabling the reuse of data can be used to link institutional data with that of researchers, as well as how the implementation of these solutions can shine new light on the data through the meanings and affordances of the chosen data structure.

Use of Artificial Intelligence and Edge-Computing in the Museum Domain

Walter Koch, Gerda Koch (AIT Angewandte Informationstechnik Forschungsgesellschaft mbH)

Keywords: Artificial Intelligence, Deep Learning, Convolutional Neural Network, Edge Computing, Internet of Things
Session: A Wonderland of Digital Technology

The integration of physical objects (“things”) which are components of a local network and connected to a cloud environment is an essential part of ‘edge-computing’. These objects are in general powered by a microprocessor and dependent of the application equipped with sensors, actuators, etc. ‘Smart Home’ for example is such a system which can be found in private households. Using this technology could lead to a ‘Smart Museum’, providing a new user experience especially in natural science and technical museums. Interacting for example with replica of Leonardo da Vinci’s inventions and developments can be an essential part of education and also provide a basis for a ‘MakerSpace’ where users are able to develop and experiment with objects in a remote environment. Adding Artificial Intelligence Features to Edge Computing could make user experiences more attractive e.g. by providing the user with a ‘Smart Camera’ which can extract and analyze specific information from a painting. One step in this direction is the research project ‘ChIA’ (Accessing and Analysing Cultural Images with New Technologies) which used Images from Europeana, the European Digital Library to identify special objects in a painting which are of interest to a visitor. Besides these examples modern technologies can be used for safeguarding precious objects, personalizing user navigation, generating Digital Twins, etc.

Why is the dog green? Using a chatbot interface to find out what museum visitors really want to know

Louise Schubotz, Oliver Gustke (Linon Medien); Aaron Ruß, Dr. Stefan Schaffer, (German Research Center for Artificial Intelligence (DFKI)

Keywords: chatbot, museum guide, conversational interfaces, visitor experience, AI, NLP
Session: A Wonderland of Digital Technology

The aim of the research project CHIM (Chatbot im Museum) is to develop an AI-based chatbot application that processes on-site visitor questions on artworks and provides adequate answers to these questions. Ideally, the answers should be extracted from existing material, specifically from annotated audio guide texts and museum databases.

In an initial step, we collected ca. 2350 questions from 255 sessions on 14 artworks using a chatbot-like website and iOS and Android app, enabling keyboard and speech input. We clustered the questions based on intents, e.g., questions about the meaning of the artwork, its style, or the technique used. Subsequently, we scanned the existing text material for whether it contained appropriate answers to these questions.

Preliminary results suggest that only a part of the questions could be answered using existing material, whereas the remainder required the creation of novel, specifically designed answers by a human author.

We suggest a combined strategy to approach this issue, including a) the manual creation of answers to the most frequent questions for a subset of the artworks, b) the annotation of questions and existing text material for the remaining artworks, c) the use of an internal confidence threshold when retrieving answers combined with a recourse to other options should an answer not be available, and d) the creation of a database containing additional information for the system to access. The final strategy will be implemented in a chatbot interface and evaluated in a field study at the end of 2021.

Franco Niccolucci, Director for Technology, 4CH project, PIN, Italy
The 4CH EU project and the SUM initiative
Session: Digital cultural heritage in a crisis

SUM – Save the Ukraine Monuments – is an initiative undertaken by the 4CH EU project with the support of the European Commission in the aftermaths of the Russian invasion of Ukraine. 4CH, acronym for Competence Centre for the Conservation of Cultural Heritage, is a project funded by the European Commission to design and set up a European Centre in charge of assisting heritage institutions in preserving and safeguarding their assets, availing of state-of-the-art digital documentation tools such as 3D modelling and knowledge management.

The project will also assist in upskilling human resources and supporting heritage institutions in their digital transformation. The SUM initiative started immediately after the war began, aiming at transferring the digital documentation of Ukrainian heritage to safe servers in the EU. The goal was to be able to restore assets damaged or destroyed by the war, for which having detailed documentation in digital format would be of paramount importance, considering that such documentation might be also damaged by military actions with irreparable consequences on Ukrainian history and cultural identity. In agreement with the Ukrainian authorities, more than 50 Terabytes of digital documentation have been copied to 4CH servers, to be returned to the legitimate owner when peace will come back again. Even if we do hope that the necessary restorations will be minimal as the damages caused by the war will not exceedingly affect Ukrainian heritage assets, experience from other disasters shows that any intervention is hampered if documentation is missing. For further details see https://www.4ch-project.eu/sum/ and https://digital-strategy.ec.europa.eu/en/news/european-competence-centre-cultural-heritage-creates-initiative-save-ukraine-monuments-sum.

Saving Ukrainian Cultural Heritage Online: An Archiving Race Against Time
Session: Digital cultural heritage in a crisis

Ukrainian digital cultural heritage has not been spared in Russia's invasion. Digitized and born-digital manifestations of Ukrainian culture are at risk – from server destruction, power outages, and non-payment. If Ukrainian cultural heritage websites fall under the control of Russian occupiers, they could have their message subverted to erase Ukraine's separate cultural identity and reframed as simply a part of Russia. Since March 1st, Saving Ukrainian Cultural Heritage Online (SUCHO), co-founded by Anna Kijas (USA), Sebastian Majstorovic (Austria), and Quinn Dombrowski (USA) has brought together over 1,300 volunteers to archive Ukrainian cultural heritage websites using a combination of tools including the Internet Archive's Wayback Machine, the open-source Webrecorder software, and custom-code scrapers. This talk will recap SUCHO's work to date, reflecting on the challenges of running an emergency web archiving project during a war. In addition, it will look towards the future of preserving digital cultural heritage and call on the cultural heritage community to do more proactive archiving, reducing the need for emergency efforts.