[2+2] Two Architects and Two Galleries

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This paper addresses the needs of exhibition curation with the concept of a virtual gallery (which may or may not be translated into reality). Curation is often an overly linear process - as opposed to an iterative exercise, whereby collaboration between stakeholders is somewhat limited by time, distance and the opportunity for virtual communication. This suggests that the implementation of a system for sharing visual data - especially in the real-time mode that a virtual studio might offer - could facilitate a more dynamic and iterative design process, where the design team remains engaged throughout. Two (architectural) designers - from Vienna, Austria and Liverpool, UK - are collaborating to create a process for exhibition design for existing venue, involving international stakeholders in remote locations. The key outcome for this research is to create a framework for future collaborative workflow that enhances the delivery of exhibition design through improved decision-making, without the need for all of the team to have extensive software knowledge. The paper thence reflects on current experience, reporting changes in curatorial processes and suggesting areas of added value that might benefit future works.

Keywords: Communication, Collaboration, Virtual Building Exploration

INTRODUCTION

Any architectural or design project is, by nature, a series of decisions influenced by different stakeholders and circumstances such as space, content, concept, methodology, fabrication, cost and interaction. Given these variables it can be argued that improved communication and data exchange might assist in optimising these decisions in a beneficial way.

In the design of exhibitions within galleries, there are usually several stakeholders (team) from differing organisations, with often distant locations. This means that the opportunity for iterative collaboration is limited and the process tends to be linear and potentially restricted.

The main decision-making for what is included within the exhibition falls to the curator whilst the arrangement and display tends to be led by the organization running the exhibition space. Agreements are made between the team relating to artist(s), concept, costs, production and interaction. The exhibition designer tends to translate these agreements into visual constructs and ultimately working installation drawings. Whist this is a simplification of the process - curators do a lot more than mount exhibitions, Vidokle (2010) suggests that curators 'administer the experience of art' through extended (curato-
rrial) practice - the advancement in curation and the media through which art is made and exhibited, suggests that more/deeper interaction between the design and production team would be beneficial.

When considering an exhibition of the work of one (or more) artists, works under different ownerships might be brought together and then exhibited in several locations. For example, the Corbusier exhibition curated by Stanislaus von Moos et al. contained over 500 exhibits (Vitra 2009), many from the Fondation le Corbusier, but many others came from a wide range of collections. The exhibition was arranged chronologically and themed around the five key cities that influenced the artist. Many of these artifacts will not have existed before in the same time and place, and will now have returned to their permanent homes. Only a catalogue remains as a record, reflecting an exhibition that took place in 5 venues. There is therefore an opportunity to develop a richer way to prepare, record and represent exhibitions in a form that not only facilitates greater collaboration in pre-exhibition curation, but also leaves an experiential trace after the exhibition is finished.

BACKGROUND TO WORK
The first author began to work with the Tate Gallery in Liverpool in 1998 on a system of modeling interior spaces and then overlaying artifacts and images as a curatorial aid. This was a reaction to an observation that works were moved into a space, arranged and then often rearranged several times prior to final positions being agreed. As this occurred at the very end of the planning process, often near the time of exhibition opening, there was potential for decisions to be made that would not involve all key stakeholders. By modeling exhibitions in advance, we were able to understand where artifacts would fit, how they would be moved through the space, how they would be invigilated and how they would relate to other artifacts. Moreover, it became possible, using a heritage architecture approach, to consider how the gallery's own fabric might be effected by intervention. It quickly emerged that a bi-product of this approach would be a virtual gallery record of each exhibition. Through continued agile collaboration between practices, particularly using BIM model sharing, we began to develop processes that are directly transferable from architectural to exhibition teamwork. (Clark & Moorhouse 2014)

The second author, through his project to model and record the destroyed synagogues of Vienna from 1998 (Martens & Peter 2012) began to develop techniques in both modeling and representation that would lead to his virtual gallery approach to assisting curators from 2005 onwards. In particular, the requirement for highly detailed and realistic interpretations from sometimes limited data, together with a desire to produce a virtual environment that is immersive and user driven.

The authors have been collaborating and sharing techniques since 2007 and, through regular presentations to the companies whose software they use, have driven the development of features and tools that assist and enable their curatorial processes.

ENABLING AND ENHANCING CURATORIAL PROCESSES
Exhibition design brings together the notion of an 'event' - the collection and exhibition of works, within an environment - the gallery space, for an experience - that happens when the gallery is visited. The role of the curator in generating this exhibition might be described as a 'junction-maker' (Obrist 2014). Often within the conceptual phase, the curator, producer and exhibition architect are working very closely together. Content, and factors such as size, weight, location, transport, availability, fragility need to be known, shared and documented. Once these considerations are determined, and communicated between the collaborators, the relationship between concept and production can begin to emerge. The curator and producer need to therefore provide the architect/designer with good quality information about each piece of art, whether that be in 3D digital, photographic or descriptive/specified forms. The curator and architect will allocate content into spaces
and the architect will then produce detailed design that is of use to both the curator and producer enabling cost analysis and programming.

To assist this process we create a 'virtual exhibition space' via a Building Information Model (BIM). The quality of this detailed model is to be very high, capturing every single detail of the space, including dynamics such as air conditioning, electrical infrastructure, wall construction, finishes, lighting, day lighting, floor and ceiling construction, security, fire protection and emergency access. Having a BIM/FM model for the gallery is useful from the outset for assisting at conceptual stage. It actually changes the way a curator can look at, and experience both the space and their proposed interventions. Birnbaum (2008) cites Gilbert and George’s ode to art ‘...to look and look and look and then look again’ in the context of curation. By being able to model the space in full detail and then by employing the representational methods for artifacts derived from our related work we can encourage the same early-stage collaboration that we achieve in more usual architectural design. Moreover, when we are undertaking subsequent commissions we already have a ready model of the gallery space. We can also use our model as a facilities management tool, referencing previous exhibitions, findings restrictions and delapidations. By sharing these tools, we necessarily change and enhance the curatorial process, moving the linear to the iterative, in line with architecture (or heritage) design methods.

MODELING AND SHARING PROCESSES
A building information model (BIM) is created from 3-Dimensional survey data. As the gallery will hold multiple exhibitions over time, this model will provide a developable ‘back-drop’ for future interventions - storing information regarding dilapidations, accessibility, lighting, fixing potential and other curatorial notes. It might also hold an incremental archive of completed exhibitions. The BIM can consist of interior construction and dynamics or can be a more architectural model capturing the whole building. The elements that are shared can be restricted if desired. The BIM can contain multiple 'worlds' that host previous exhibitions and proposals, with curatorial and production commentary that explains possibilities, limitations and experiences.

The model can be shared from a BIM server via the Internet between the design team, creating a mechanism for virtual interaction with the curator(s) and other stakeholders. Communication could also be via a run-time building explorer export of the BIM through which the curator can hyper-link to the BIM server to forward notes and comments. In this way, the visual status of the project is accessible to all parties throughout the design phase, facilitating better interaction.

We have therefore developed a collaborative communication tool using a real-time virtual building that allows the arrangement of art within a virtual space.

We are currently using ArchiCAD 18 Bimserver, BIMx Hyper Models and cloud-based activity recording tools (such as Basecamp). From experience, we know that, once the model has been built, the other members of the design team need little training or experience to participate. The architects (authors) are able to host the model on their BIM Servers and once the other participants have downloaded the full model, information and updates are delivered by small packets of data. We are able to release sections of the model to the control of the collaborators. As the virtual art is created as objects, we are in control of creating parameters that we can lock. The curator is then free to move the artifacts around in their own time, (or via a screen share if necessary). Once the artifacts are in place, the curator can release control back to us or the producer to continue generating production information. There are occasions where, due to cost and licensing issues, curators do not have direct access to our software. In this case we can either use screen sharing, or we release run-time BIMx files that allow the curatorial team read only access to the models. This reflects our preferred working method with architectural clients where we wish to
be in full control of editing. BIMx is also the format through which we communicate completed designs.

**WORKING EXAMPLES: DESIGN**

Gallery 2010 is a collaborative gallery project in Liverpool. The curation team led by Lucy Byrne with design and facilitation by Jon Moorhouse and Constructive Thinking worked with 10 commissioned artists to produce 20 pieces of work. The virtual gallery approach allowed over 15 stakeholders to communicate during the creation of the artwork and the curation of the exhibition. Early versions of BIMx (Virtual Building Explorer) were used and curatorial tool objects were scripted in lieu of a tagged information facility. We scripted the BIM to randomise the order that the art was presented (figure 1) and this facilitated debate on the presentation format. As the theme of this exhibition was collaboration and the artists ultimately produced images using different media on the same sized canvasses. These included Nicole Renee's layered paint build up (figure 2) that required a grainy depth to our modeling, and Stephen Collett's high resolution graphic / photographic images needing a sharp and clear matt finish (figure 3). To reflect the versatility of the formatting, we also installed a facility to allow the audience to virtually rearrange the gallery.

**WORKING EXAMPLES: DELIVERY**

The elevations and plans shown in figures 4 and 5 are generated directly from the BIM. The artworks are objects that show on the plan as catalogue number and elevational references to assist the producer. These scripted objects are reusable for other artwork. As the objects are moved around within the model, the elevations and plans update.

**WORKING EXAMPLES: DETAILS**

In the above-mentioned project for ZEITkunst Niederoesterreich (contemporary art in Lower Austria), exhibiting Renate Kretschmer and Joerg Schwarzenberger, curated by Hartwig Knack and Dr. Alexandra Schantl, and designed by Herbert Peter (artuum architecture), simplified sculptural models were made using photographs. The project, modelling in ArchiCAD 17 was shared using BIMx and virtual walkthroughs for the web were created using iVisit.
Figure 4  
Elevational live working drawing

Figure 5  
'live' working plan
In this project exhibiting Gunter Damisch, curated by Dr. Alexandra Schantl, designed by Herbert Peter / Artuum Architecture, 'billboards' were used for the concept model. The second image shows the actual exhibition before opening (figure 6). Figure 7 illustrates the actual exhibition for comparison.

In this third project for the same gallery/space, exhibiting Franz Xaver Oelzant, curated by Dr. Elisabeth Voggeneder and Dr. Alexandra Schantl with design again by Herbert Peter / Artuum Architecture, iVisit was used as a tool to create a virtual gallery for the website (figure 8). Here much more accurate models were used for the sculptures. (figure 9)

**A SUMMARY OF TOOLS AND PRACTICES**

To create an exhibition space we use CAAD-software in teamwork mode, which allows the freedom of worldwide interaction.

Tablets and smartphones are supported to put focus on detailed design or concept or presentation opportunities for those who simply wish to view and interact rather than edit.

Art-libraries allow easy handling of realising the curator’s concepts and ideas

sculptures can be inserted as 'billboards' or as 3D library parts.

3D scanned / point cloud sculptures and spaces can be integrated into design process.

Virtual walk-throughs (web or device-based) can be defined or are free for the viewer to define, and are used as control and presentation tools.

Documentation and drawings are created from the virtual 3D model and used on site whether virtually (e.g. on tablets) or conventional scaled paper prints.
PRACTICAL ADVANTAGES
The clear advantage to using a BIM model that is shared between the team is that we all have access to the virtual representation of the space and the artifacts contained within. We can get a good feel for how to use the spaces, how people might flow, what an artifact looks like from a particular distance or angle, under certain lighting conditions, or even how the exhibition will flow from one artifact to the next. We can see how the artifacts will need to be transported, displayed, fixed and removed. We can also tag information to each object via the BIM and also via the BIMx viewer. Each object can contain hyperlinks. This is important because it means that, after a BIMx model has been produced, it is not inert, but 'live' as the hyperlinked connections can be edited. Through these tags and links we can access highly detailed information about both the artifacts and their originators. The hyperlinks could be used to track an artifact as it is exhibited in different places, or to enrich the exhibition by linking it to related works from the same era or school.

There are also opportunities to create proposal options. Clearly we can do this within our BIM and share directly or through IFC, but we can also create several options for parallel models within a single BIMx file. This means that an artist, for example, can be sent a virtual model depicting several options for displaying their work and can feed back their preferences.

The BIMx, as a model that is accessible on most mobile devices, can form an alternative programme or catalogue. It then becomes a resource, and a rich trace of an exhibition that may have closed or may have never been.

There are advantages in workflow as the curator, producer, architect/designer and the gallery itself do not have to be in the same place as each other, yet the interaction can be almost as if that were the case. This means that the interaction between the team at concept phase is much richer and design issues can be discussed and resolved in virtual space. The designer and curator can then extend their working time together. Given then, the level of detail and resolution that is achievable before work commences on site, time on site can be much shorter. This clearly saves costs and reduces the risk of damage to works, but also suggests that the gallery can have less 'down-time' and therefore more/longer exhibitions. The gallery, through virtual means, can also reach a much wider audience.

PRACTICAL DISADVANTAGES
The 'real space-feeling' is translated by screen and tools - simply visual impressions - gallery spaces and art interacts in real world and is of a different scale. This is one of the important points that visitors needs to feel. Creating, designing an exhibition virtually needs in-depth experience of moving between design and reality to bridge that virtual-real space feeling. Sculptures are even harder to arrange in virtual spaces, because of the inability to experience the 'weight-interaction' between a sculpture and the space or in between sculptures. This can be enhanced using high quality virtual reality headsets.

To prepare a virtual design we need at least one good photograph of the piece of art to insert into virtual gallery concept. These are not always available and pieces may be in archive. For sculptures, a series of photographs are required.

CONCLUSIONS & FURTHER WORK
We suggest that using collaborative BIM as a vehicle for curation and exhibition design enhances the communication potential between different stakeholders. As we develop means to communicate, we also develop different working methodologies through experience and opportunity. By presenting back to the software developers, we also encourage the development of new tools. Working in this way, we can find new opportunities for recording, arranging and sharing exhibitions. Whilst to date we have managed to improve automation, design, visualisation, communication and delivery - saving time, send cost whilst potentially producing a more collaborative product, we are also opening up the possibil-
ity for virtual exhibitions to become records, artefacts, means of remotely or historically viewing exhibitions; the potential for virtual-only exhibitions; a means to explain and share artwork (especially through VR headsets) and potentially a means to catalogue archives in a visual and meaningful way. We aim to collaborate more deeply within the activity of curation itself and develop tools for 'open curation' that others might use.

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