

City Verve Internet of Things Demonstrator: City Verve Commissions: Manchester's Plinth

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This paper discusses the development and progress within the multi-partner £10M CityVerve Internet of Things (IoT) demonstrator project currently underway in Manchester, UK, focussing on innovative public realm installations that marry together design, virtual technology, contemporary art and heritage. CityVerve IoT city demonstrator is based around the large-scale deployment of IoT technologies creating a 'Healthy City Region', building on the ground-breaking work achieved through the Devolution Manchester agreement between the Greater Manchester Combined Authority and HM Government.

A range of use cases have been identified with partners across four key themes: health and social care; energy and environment; transport; culture, public realm and community. The project will pioneer the deployment of a range of existing and newly developed IoT technologies across these use cases in an integrated way to derive place based impacts and benefits. This approach will demonstrate and evidence benefits to citizens through environmental improvements, economic opportunities, and the more efficient and effective delivery of services. The demonstrator will provide the ability to create new services and operating models through the interoperability between these four themes, establishing an IoT Centre of Excellence for the UK.

City Verve. Internet of Things. Urban. Public realm. Culture. Art. Heritage. Design. Curation.

1. INTRODUCTION

1.1 Background

IoT is creating real-time data streams, which are increasingly becoming integral in the fabric of modern cities. Such urban environments are where the complexities of technology, business and society meet in their most condensed and voluminous forms, shaping also the rest of society. We aim to connect to the forefront of human-centric societal development shaped by real-time connected technologies, markets and policy in the 21st century. Projects embrace IoT in unique, engaging ways, impacting on cultural aspects of 'Smart Cities'. Culture, Public Realm and the Community: CityVerve Commissions: Manchester's Plinth.

Manchester's Oxford Road Corridor is a one mile strip connecting two major universities, galleries,

museums and teaching hospital, theatres, cafes, bars and shops to the city centre. This task, led by Manchester School of Architecture / Manchester Metropolitan University, opens university activities to citizens. Spatio-digital projects aim to transform the understanding of IoT by addressing society in relevant and culturally engaging ways to the public. This engages citizens in the choices made about the city and encourages innovative interaction with the public realm. This is innovative as there are very few projects globally that communicate IoT or city planning effectively to citizens.

CityVerve Commissions aims to build galleries without walls, using art, heritage and history and varied international research as the vehicles to open public access to and engagement with the urban infrastructure and landscape of MMU campus. The project proposes unique, original and engaging site-specific platforms connecting culture and SMART technologies with the city's citizens.

Augmented and virtual reality, when combined with the use of connected sensors around our urban environments, enables us to think about collections and storytelling in entirely new ways.

Working across research within the school we have tested and developed a series of proposals. 'The Manchester Plinth' would enable the public of Manchester to directly engage with key works in our collections department with is unique, regionally, nationally and internationally. Works will be chosen and curated by leading MMU Alumni over a 12-month period and be showcased in a public 'virtual' arena, in using cutting edge technology we aim to lead the way in which collections can be showcased, engaged with and visible to a wider public, whilst taking these precious artefacts and objects into the public sphere and away from a 'Museum' where they are currently held under specific regulations.

In utilising the digital technologies available we can ensure both MMU campus will be a new 'cultural' destination and the first of its kind in the UK to fully transform IoT technologies in a new 'Cultural' language.

1.2 Overview

CityVerve is a ground breaking project is designed to show the applications of IoT based approaches and solutions to the questions posed by the SMART City. Running over 24 months from summer 2016 CityVerve involves 21 partners, led by Manchester City Council and CISCO working on a wide variety of themes and use cases that are designed to test and develop the capacity of IoT to operate in the city. Manchester Metropolitan University is working in the themes of Culture, Transport and Energy. The project described here sits in the Culture theme, with a specific aim of engaging IoT with citizens in new and 'fun' ways that connect to the enrichment of the public realm.

"Approaches to Smart City have often put services and systems first, and the end user/citizen second or, indeed, nowhere. CityVerve will put people at the heart of its activity." (<http://www.cityverve.org.uk>).

2. SPATIO-DIGITAL TECHNOLOGY

The Oxford Road Corridor is a 1 mile long urban strip connecting two major universities, galleries, museums and teaching hospital, theatres, cafes, bars and shops to Manchester city centre. This task, sitting within the Culture theme, led by Manchester School of Architecture (MSA), aims to develop innovative ways to open university activities to the city. Spatio-digital projects are designed to transform the understanding and

relevance of IoT to the public. This engages citizens in the choices they make about the city and encourages innovative interaction with the public realm. This is innovative as there are very few projects globally that communicate IoT or city planning effectively to citizens.

The shift to new technologies impacts on how we envision ourselves and our collective cultural legacy. This project explores the impact of this on our way of viewing and engaging with collections, IoT technologies and place. It deliberately sets up a mediation between the real and the digital or virtual as a type of emergent space in our cities, a space that is currently underinvested as a cultural asset. Art, architecture and design has influenced the rapid development of new technologies to enable new art forms to swiftly arise, expanding the field through net art, digital installation and works using virtual reality, we are seeking to embed these possibilities as a meaningful part of the urban scene.

Developed from research proposals within MSA innovative designed platforms that engage real and digital would enable the direct public engagement with key works in MMU Special Collections which is a unique and regionally, nationally and internationally notable, body of culturally valuable artefacts. Works will be curated and showcased in a public 'virtual' arena, using technology to lead the way in which collections can be showcased, engaged with and visible to a wider audience. The platform is intended to become a new elemental type in the urban landscape.

3. NEW URBAN CURATION STRATEGIES

The project responds to timely developments. While two decades of the world-wide web have enabled dissemination to a wider community and also extended diversity and awareness, in-person gallery attendance has decreased. Cultural possibilities have often been overlooked when new technologies are introduced, specifically how technology can impact art works and installations in the public realm. The key theme that we are presenting embraces the 'Culture' theme of the CityVerve and the cultural aspect of Smart Cities.

We propose a series of CityVerve Commissions as the vehicles to open public access to and engagement with the university's urban and academic space, infrastructure and landscape. The project proposes unique, original and engaging site-specific platforms connecting culture and SMART technologies with Manchester's citizens. Augmented and virtual reality, when combined with the use of connected sensors around our urban environments, enables us to think about collections

and storytelling in entirely new ways, that aims to build galleries without walls, using art, heritage, history and varied international research.

3.1 A Plinth for Manchester

Working collaboratively with students, academics, digital developers and the collections team we are working to see the future possibilities, adapting new technologies to produce a significant new cultural platform that extends the possibilities of showcasing precious objects outside of a museum environment, or possibly radically redefining what a 'museum' or 'gallery' might mean. Underpinning this are two crucial and linked questions:

- 'How can Manchester connect with our Universities?'
- 'How can our Universities connect with Manchester?'

3.2 Curating the Public Realm

Manchester Metropolitan University estate has some of the most central sites on the Oxford Rd Corridor. Situated directly behind the bus corridor and just a few minutes from Oxford Rd Railway Station. The aims of our research were to create a public engagement platform that was accessible to all, led and shaped by the student body and was visible on the corridor, working with University Estate teams to identify sites would be suitable for City Verve engagement. Initially, three sites were identified, which were set as a student brief for exploration: Developed from research proposals within MSA 'The Manchester Plinth' will enable the direct public interaction with IoT based media and content. Manchester's Plinth engages with the potential to bring high value cultural objects out into a virtual public arena, which would both maximise the impact University (and other) collections and enrich the wider engagement. Works will be curated and showcased to citizens, using technology to lead the way in which collections can be displayed, engaged with and visible to a wider public, whilst taking precious artefacts and objects into the public sphere and away from a 'Museum'. Utilising digital technologies will transform MMU campus into a new 'cultural' destination, the first of its kind in the UK to fully engage IoT technologies and adopt a new smarter 'Cultural' language.

4. DESIGN: A COLLECTIVE ACTIVITY

The Manchester Plinth originated from an initial design event in September 2016. The Manchester School of Architecture launched an 'All School Project' in which 800 students and senior academic staff were asked to conceptualise, workshop, design and represent proposed near (3-year) and

long (30-year) term future visions for the Oxford Road Corridor. This innovative one week long academic task connected 750 participants all levels of the School including new students, experienced undergraduates, postgraduates and tutors to develop 49 visionary, fun, and exploratory proposals as the trigger for an in depth CityVerve project design.

In October 2016, Tom Jefferies and curator Jane Anderson led a 10-week workshop to analyse and develop the outcomes of the All School Project, working with 18 first year Masters of Architecture students in a research by design development workshop. This aimed to distil the large body of propositional material from the All School Project into a small number of discreet and realisable project proposals. The work was staged into a number of sub tasks, each lasting around 1 week:

- (i) Themes and proposal identification from an evenly distributed sample of All School Project proposals
- (ii) Theme refinement and initial proposal development
- (iii) Theme and proposal initial iteration
- (iv) Scheme outlines shortlisting
- (v) Scheme development – Scope
- (vi) Scheme development – Users
- (vii) Scheme development – Form
- (viii) Scheme development – Material
- (ix) Scheme development – Detail
- (x) Final scheme presentation

Through the workshops potential curatable sites, locations and IoT/citizen engagement project forms were identified that reflected the ambition of Manchester's City Verve project as revolutionary in its outcomes were researched in depth. These included interactive street poetry, projected and screen based media concepts, participative recycling and green transport proposals, all exploring the adoption of Internet of Things technologies within the cultural space of the city.

A critical aspect of placing work within the context of the city is to understand the potential and limits of various places. Through working in one of three archetypal conditions, the semi enclosed urban room under the Mancunian Way, the public urban field of All Saints Park and the vertical urban surface Mabel Tylecote (Figure 1), scheme proposals could offer significant diversity within a single site, the MMU All Saint's Campus. All designs considered digital and user based systems and proposed activities that could inform use of site and how these are physically and conceptually framed by the various site conditions.



Figure 1: Mable Tylecote Building: Smart hoardings proposal. Workshop R+D MSA December 2016

As The Manchester Plinth progressed within these workshops, we recognised a need to establish a wider cultural framework for the city outside of a gallery institution, we realised the wider research and frameworks as an educational institution in the heart of the city and the assets and collaborators we could approach to work with to define new ways of showcasing museum collections in the public sphere, which will new ways of looking at museum collections and IoT technologies to aim to be at the forefront of enabling the untapped potential between smart technologies, heritage and audience engagement Language' became the forefront of this development where we employed the term 'spatio-digital projects'.

Taking national cultural public realm projects into account, for example The Fourth Plinth in Trafalgar Square, London, UK, that for the past decade has successfully been curated to showcase site-specific art projects that are housed in situ over a period of time has played a key role in engaging global audiences to cutting edge contemporary art and cultural debate.

Working across research within the school we have tested and developed a series of proposals. 'The Manchester Plinth' (Figure 2) would enable the public of Manchester to directly engage with key works in our collections department with is unique, regionally, nationally and internationally. Works will be chosen and curated by leading MMU Alumni over a 12- month period and be showcased in a public 'virtual' arena, in using cutting edge technology we aim to lead the way in which collections can be showcased, engaged with and visible to a wider public, whilst taking these precious artefacts and objects into the public sphere and away from a 'Museum' where they are currently held under specific regulations.

In utilising the digital technologies available we can ensure both MMU campus will be a new 'cultural' destination and the first of its kind in the UK to fully

transform IoT technologies in a new 'Cultural' language.



Figure 2: Test and Development, The Manchester Plinth concept December 2016

5. INSPIRED BY DESIGN: THE ARTS AND CRAFTS COLLECTION OF MANCHESTER METROPOLITAN UNIVERSITY

The MMU collections are central to the artistic culture and teaching of the faculty and have been since its foundation as the Manchester School of Art in 1853. Collections housed at the Museum include:

- Artists' Books: a great range of creative experimentations with the book form
- 20th century international poster collections
- The Manchester School of Art Collection including fine and decorative art and the work of past and present students and staff
- The Schmoller Collection of Decorated Papers
- Children's Book Collection: featuring 19th and 20th century children's book illustration
- Book collections exploring aspects of the book as an artefact
- Archive collections including artists' working drawings and correspondence
- Manchester Society of Architects Library
- Victorian ephemera featuring 19th century albums and scrapbooks
- Mary Butcher collection of Baxter prints

MMU Special Collections holds the largest collection of objects from the Arts and Crafts Movement outside of London, with limited resources and museum standard regulations how can we showcase these to a wider public,

increasing our engagement, reputation and promoting the Special Collections of MMU to a wider public (Figure 3).

In 1994 there was a major exhibition at Manchester Art gallery and the Holden gallery which displayed the Arts and Crafts collection held by the University, 23 years later we aim to adapt the Arts and Crafts collection, which is significant both nationally and Internationally, extending the research, scope and reach of how we are engaging with collections via digital technology animation and display.

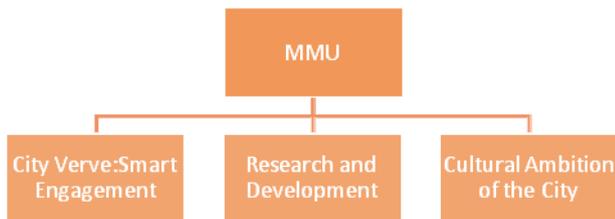


Figure 3: Framework of approach

5.1 Campus as Curated Space; Precursor Projects

In 2014 in collaboration with the National Football museum, Manchester, The Arts Council of England, Tom Jefferies and Jane Anderson began to identify the need for a new 'creative campus' on MMU and the importance of exhibiting and curating heritage collections in new ways. Shaun Hur was commissioned to work exclusively with Manchester School of Architecture and the National Football Museums Collection department. The artist Shan Hur's site-specific installation, A New Column for Manchester (Figure 4), is showing underneath Chatham hexagonal walk bridge, Manchester Metropolitan University. The intervention championed new ways of accessing the collection of a museum and has since engaged audiences of hundreds of thousands into the museum collections in the public realm. Further the installation has been recaptured in a Pokémon Go environment, where new audiences have interacted with the installation directly using smart technologies. We have recognised the scope of this project as a platform to what can be realised and how we can actively animate university campus grounds to engage users and citizens to 'Culture' and engagement within the platform of the City Verve framework.



Figure 4: Column for Manchester (detail) Shan Hur (curated Jane Anderson, Tom Jefferies) 2014.

6. ANIMATION, PARTICIPATION AND ADOPTION

The Manchester Plinth provides an opportunity for these hidden collections to become visible to an entirely new audience in a new way, creating new precedents for the city and for museum and heritage organisations.

All Saints Park on the University campus has been allocated as a site for the production and development of The Manchester Plinth, following on from the earlier All School projects and workshops with the MSA MA students a small research group has designed a plinth that will house the collections in augmented reality (Figure 5). 'The concept behind the plinth derives from the reinterpretation of a traditional exhibition plinth. Given the nature of the exhibits in the virtual gallery, the intrinsic principles of monolithic mass and solidity are no longer necessary attributes to the plinth when displaying non-objects. The intention is that the pixelated plinth becomes an art piece in itself, symbolising the intertwining of the physical and digital environment within modern society.

The existence of the object exclusively within the digital realm alters the perception of the plinth within the physical. Traditional plinths are entirely subservient to the object that they display, with the intention to be that they offer little more than a backdrop to that object. However, when the object is not present, the plinth must be able to attract and engage with users as an element in itself. This encourages a form that is bold, exciting and playful, whilst also being informative of its wider purpose. The first point of transforming the traditional plinth was to break up the solid mass into transparent sections or pixels. The second stage deals with the unusual nature of the exhibits, removing the horizontal display surface through fragmented elevation of the pixelated sections. The resulting lightweight and transparent plinth appears as if

elevated from the ground, further emphasising its removal from traditional principles.

The suggested location of the plinth would be within the footprint of the demolished All Saints Church, along the visual axis from the Oxford Road entrance to the park. To have a strong visual presence from this key sightline, the plinth should measure a minimum of 1100mm high.

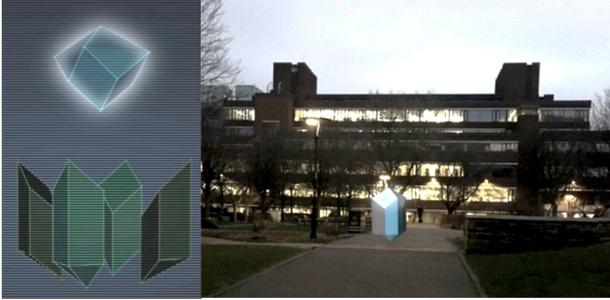


Figure 5: Test and Development, The Manchester Plinth final 'Dimetric' designs: March 2016

6.1 Activating Artefacts

The Manchester Plinth will activate and animate user experience and collection development, the plinth project is an advanced art, architecture and design research platform within the broader framework of digital culture and Smart City development across the globe.

This combination of public space and public digital space creates a third plane in which art can be metaphorically hung.

Augmented reality is currently being recognised as a tool for engagement and participation in the arts and museum collections, among the forerunners are the Stedelijk Museum in Amsterdam which used AR to install artworks in a local park (ARTours), and the San Francisco Exploratorium which turned an evening event into a surreal AR playground (Get Surreal).

Often used as a tool to deliver additional value to museum visitors and sometimes not well understood, we aim to push the boundaries in AR, pushing the creative form in 'spatio-digital' terms, while creating new experiences and new forms of visual experimentation with artefacts and precious museum collections.

Our research adapts a multifaceted approach which brings together new collaborations across the University including:

- Student and academic research and engagement.
- Research in digital engagement and animation technology.

- Curating the museum collections in the public Realm.
- Identifying the scope of City verve, Smart Cities and Culture.

Innovation and collaboration: as part of the CityVerve project a 'hackathon' was developed over a three-day period. The event will have gathered passionate developers, digital artists, MMU students IoT experts, museum curators and business savvy professionals to bring about the pro-social and creative potential to develop spatio-digital solutions to the next phase of the Manchester Plinth. In the first instance four items from MMU special collections have been identified as objects for the plinth and AR application these include:

- Goblet and vase made by L.C. Tiffany, 1903
- Golden Lily wallpaper designed by J.H. Dearle for Morris and Co
- Vase made by Cantagalli, 1896
- Casket made by Mary Houston 1902

Creative Multimedia students have undertaken some initial tests with these objects to explore how they could be animated or used as digital objects to engage visitors to the plinth. Haroon has explored scanning images using a smartphone application and how these could be manipulated by the user. Mariton has devised a game where users can catch balls representing traffic data in Goblet and vase.

Digital storytelling and using smart technologies can both test and record data and sensor development, user experience and analytics whilst being playful and visual in the public sphere. Collections can be re-interpreted imaginatively, whilst also being strategic in recording the power of IoT technologies to revolutionise and improve city services and user services.

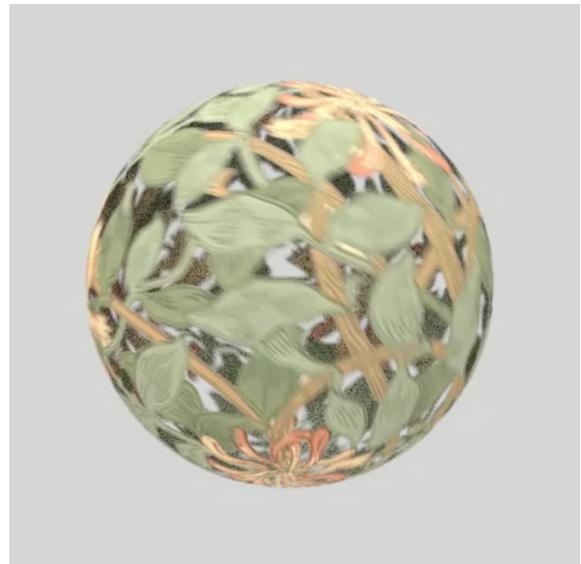


Figure 6: The 'Morris Ball' Concept, March 2016

The 'Morris Ball' (Figure 6) takes and manipulates William Morris designed Golden Lily wallpaper as an example of innovative engagement with an archival artefact. Designed by MMU student Ed Florence this transposes a flat wallpaper design into a three-dimensional interactive ball. The 'Morris Ball' takes the design of the wallpaper, transformed and animated into a three-dimensional sphere. The 'Morris ball' will be a live experience in an augmented virtual world, playfully pulsating and performing on the Manchester plinth, whilst users can be directed and inspired to engage with the work, each part of the design will be recording and expanding user interactivity, health and wellbeing. This project uses digital and IoT based techniques to transpose and visualise how culture can become a core element of a 'Smart' city. The creative concept and re-interpretation of an important textile from the arts and crafts movement and MMU special collections in this capacity poses a question and response to current research into art, culture, heritage and digital technologies.

6.2 Project Objectives

Manchester is famed as being a revolutionary city – the aims of the Manchester Plinth are to revolutionise culture, heritage, arts and engagement in the public realm. Whilst taking precious artefacts and objects into the public sphere and away from a 'Museum'. Utilising digital technologies will transform MMU campus into a new 'cultural' destination.

During a twelve-month period, we aim to:

- Support and collaborate with local artists and arts organisations to create ambitious new works in the public realm that responds to MMU special collections as well as commission new work by artists working internationally;
- Work with artists, researchers and students whose practices contribute to an essential and critical contemporary art discourse in the public realm and digital technologies;

- Develop artistic discourse between local and international artists and audiences through talks, events, exhibitions and visits;
- Extend the Manchester Plinth experience across the city and communities by showcasing the collections work in non-traditional spaces that are relevant to site and location.

The Manchester Plinth, the first of its kind in the UK aims to fully engage IoT technologies in a new 'Cultural' language and what urban space means to us in a post-internet SMART City.

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