Twinmotion 2015
Immersive real-time 3D visualisation

Planning for BIM Level 2
Are you ready for April 2016?

Predicting the future of design
Predictive Background Processing in
Graphisoft ArchiCAD 19

Enter the 5th Dimension
Bidcon BIM from Asta provides 5D CAD
Without BIM, your projects could be in trouble. And so could your business.

VIEWPOINT CAN HELP.
The UK government has mandated that all public sector contracts to utilise BIM by 2016 - so if you're considering BIM, now is the time. 4Projects® by Viewpoint with 4BIM is a collaborative software solution for building, infrastructure and energy. 4BIM makes it easy for clients, contractors, consultants and their full supply chain to manage and control their collaborative BIM requirements without expensive IT infrastructure or licenses - saving time and money.

See this and all our construction software solutions at www.4projects.com
FAIL TO PLAN: PLAN TO FAIL 28
Ben Wallbank, BIM Strategy Manager at 4Projects by Viewpoint, highlights the importance of adequate planning for April 2016.

BLADE STUNNER 18
SimpsonHaugh and Partners uses Generative Design to shape their One Blackfriars Tower concept, letting daylight into neighboring properties via a blade-thin, 50-storey skyscraper.

A VECTORWORKS TAKEAWAY 24
All the best parties end with a goody bag and the 2015 Vectorworks Design Summit was no different, sending attendees home with a bundle of exciting developments to look forward to.

PREDICTING THE FUTURE OF DESIGN 10
Due for release in June, ArchiCAD 19 is taking a giant leap forward in BIM performance through its use of Predictive Background Processing.
Jack of all trades

by David Chadwick

What a great time to be an architect. 3D modelling tools have reached such a high degree of sophistication that any conceivable structure can be created, rendered and located in some exotic location, and appear indistinguishable from a real building. It can then be analysed, sectioned, layered and used to produce a wealth of fascinating reports from the geometrical data, and the information stored with each additional component.

In fact there’s not much that you can’t do now when it comes to laying out the actual shape, size and components of a building, and a lot of the most recent developments and innovations have centred around improving the actual means of doing so, namely the user interface. Except that now we have some really interesting stuff being added to the latest releases of two of our most popular architectural applications that are not so hot for the computer’s cores for proper parallel processing, but which is great for static processes such as rendering and simulation, as the compute intensive processes involved can be chopped up and fed into each of a computer’s cores for proper parallel processing, which is not so hot for the dynamic elements of model design - namely the drawing and editing process itself.

In the first instance, Graphisoft has broken free of the constraints of multi-core processing, which is great for static processes such as rendering and simulation, and the computer intensive processes involved can be chopped up and fed into each of a computer’s cores for proper parallel processing, which is not so hot for the dynamic elements of model design - namely the drawing and editing process itself.

Using algorithms that they have developed and are now patenting, Graphisoft has introduced predictive background processing in ArchiCAD 19 (see the article on page 10). Predictive background processing updates background views of a model using one or other of a computer’s ‘idling’ cores. This means that when they are selected by the user by opening the appropriate tab, the up to date model is immediately available. This represents a massive leap in BIM performance.

That’ll work for us!

Building performance is another tool being handed to the architect. It’s not enough these days to just create a concept and then develop it through to a buildable 3D model - architects now have to calculate energy usage or building performance right from the beginning of a project. An architect doesn’t need to have the skills of a professional environmental engineer though, as the modules available with both ArchiCAD and Vectorworks are simple to use and sophisticated enough to provide an architect with a projected BREEAM rating.

All of these new developments will provide architects with the tools to work faster, design better, create more complex structures, deal with environmental concerns and communicate better with each other.

That’ll work for us!
IMAGINE DESIGNING
AN 77,000 m² HOSPITAL THAT NEEDS TO BE BUILT IN 30 MONTHS

Meeting the demands of complex projects requires everyone to be on the same page. Learn how Bluebeam® Revu®’s PDF-based collaboration solutions enabled Mortenson and their partners on the Saint Joseph Hospital project to coordinate design changes in seconds – not days.

Imagine the possibilities
bluebeam.com/learnhow

© Copyright 2015 Bluebeam Software, Inc.
A TRIO OF ASTA DEVELOPMENTS

Asta Development has officially released the second version of Asta Powerproject BIM and is rolling the product out via its global reseller network for the first time. Asta has also launched the estimation tool Bidcon BIM into the UK (see the article on page 26 of this issue) and is adding to the capability of Site Progress Mobile with the addition of a web application to allow browser access.

Asta Powerproject BIM was the first product to combine 3D planning and scheduling in a single, affordable 4D application. Version 2 builds on its core capability to create and play 3D visualisations along a timeline by allowing users to:
- Separate 3D objects in IFC models into a number of smaller 3D elements - in order to associate separate elements with tasks in a timeline to reflect the realities of construction
- Split multiple times in 3 axes
- Merge IFC elements into single objects to associate them as a whole with a project task.

ARCHICAD MAKES RHINO CONNECTION

Graphisoft has announced a Rhino connection for ArchiCAD. The connection enables ArchiCAD users on Mac and Windows platforms to import Rhino models into ArchiCAD as GDL objects.

The Rhino-ArchiCAD link converts a Rhino model into ArchiCAD geometry. The container of the Rhino-based model is GDL, which is ArchiCAD’s generic object format. For larger and complex models, Graphisoft has introduced the option to convert a Rhino model into a set of smaller GDL objects. This process enables the user to retain separate logical parts within the same model while providing a functionality to monitor and easily update the imported Rhino models in ArchiCAD. The LCF option is also advised to enable ArchiCAD’s performance optimisation algorithm to work seamlessly on an imported large Rhino model.

www.graphisoft.com

NEW KNOWLEDGE TRANSFER PARTNERSHIP

A North-East architects firm is attracting international clients thanks to a joint research project with Teesside University into cutting edge BIM technology. Ryder Architecture in Newcastle is working with the University on a Knowledge Transfer Partnership (KTP) to investigate different ways in which BIM can be implemented into facilities management.

This is the third KTP that Ryder has undertaken with Teesside University and the research into BIM has helped position it as a leading practitioner of BIM methodologies and helped attract clients in Australia and the Far East.

The latest KTP is looking at ways in which this knowledge can be adapted to provide data and information which can be used to manage the building after its construction is completed and how this knowledge can be fed back to architects and engineers so they can design better buildings.

KTPs typically last for two years and are a collaboration between a University and a company. They are part-funded by Innovate UK to help businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills.

Ryder’s previous collaboration with Teesside University has already led the company to form a new business, BIM Academy, an R&D, education and consultancy organisation to support other firms which want to implement BIM methodology in their work.

The success of the KTP projects helped Ryder win a prestigious international consultancy on BIM for facility management at the Sydney Opera House following a global tender call. Ryder is also working on BIM projects at the M+ Museum of Art being constructed in West Kowloon, Hong Kong.

The company has also formed a partnering agreement with Ecodomus, a US IT firm which specialises in BIM for facilities management to help push the technology in UK and the Far East. Peter Barker, Director at Ryder Architecture and Managing Director of BIM Academy, said: “From Ryder’s perspective, the KTP has really helped to broaden our services, not just in terms of designing the client’s building but also having the potential to deliver reliable information about the building for the operational stage.”

www.innovateuk.org
By January 2016, everyone working in the UK construction sector needs to understand the potential of Building Information Modelling (BIM) and how they can use it to produce better quality buildings and landscapes more efficiently. For 25+ years, Nemetschek Vectorworks Inc has been a global leader in design technologies providing elegant architectural, landscape and lighting design software that offers Building Information Modelling capabilities in a flexible, hybrid-design environment. Act now and contact us to make sure you are ready for BIM.

**THE CLOCK IS TICKING… ARE YOU READY FOR BIM?**

**Vectorworks Architect - Supporting Building Information Modelling workflows from concept through completion**

By January 2016, everyone working in the UK construction sector needs to understand the potential of Building Information Modelling (BIM) and how they can use it to produce better quality buildings and landscapes more efficiently. For 25+ years, Nemetschek Vectorworks Inc has been a global leader in design technologies providing elegant architectural, landscape and lighting design software that offers Building Information Modelling capabilities in a flexible, hybrid-design environment. Act now and contact us to make sure you are ready for BIM.

**Book a BIM Workshop**

3ddesign@unlimited.com

**For more information on Vectorworks:**
visit [www.bimvectorworks.com](http://www.bimvectorworks.com) or call 020 8358 6668

**Associations we work with include the following:**
BIM PRODUCT DATA TEMPLATES FROM ICON

The Industrial & Commercial Energy Association (ICOM) has announced the completion of BIM Product Data Templates (PDTs) for five categories of commercial and industrial heating equipment. The PDTs have just ended their public consultation period and the comments will be reviewed by CIBSE before they are approved as the industry standard. These are amongst the first product groups within the building services sector to be distributed for public consultation by CIBSE.

The product categories are air heaters, burners, gas & oil boilers, gas boosters and direct-fired storage water heaters. This means that engineers specifying these products are able to work with generic PDTs that are manufacturer-neutral. These PDTs are standardised product group questionnaires, which manufacturers will then complete with their product information. The completed PDTs will then become Product Data Sheets (PDSs) containing digitalised information unique to each manufacturer’s product.

ICOM Director Ross Anderson commented: “ICOM members have come together to share their knowledge and create industry-wide templates that will prove to be of significant benefit to the building services industry as a whole.”

www.icomenergyassociation.org.uk

BIM MODULE VERSION 1.1 RELEASED

Business Collaborator has released version 1.1 of their BIM Module. The BIM Viewer and Server now enable the entire project team to federate together models from different disciplines and run Clash Detection to find problems in those models.

Models are uploaded to Business Collaborator (Common Data Environment/Project Extranet/Document Management System) and imported/optimised into a Semantic Database. From there, any member of the project team can select two or more models and view them at the same time. All of the capabilities when viewing a single model is transferred across when viewing many models together. Users can navigate, filter by IFC Category, turn individual models transparent and search for objects across the federated model.

Stephen Crompton, CTO of Business Collaborator Ltd, said: “The team have worked incredibly hard to deliver this next phase in our BIM journey. Model Federation and Clash Detection were unanimously identified by our customers as the most needed additions to our BIM module and I am delighted to be able to announce the availability of this functionality, fully integrated with our leading CDE and Project Extranet platform. I have no doubt our customers will be just as delighted with the result as we are and can’t wait to get this into their hands.”

www.groupbc.com

GREATER POINT CLOUD INTEGRATION

Arbometria has significantly enhanced its Pointfuse automated point cloud processing software with simplified integration for CAD software. The new release of Pointfuse Pro also automatically textures the generated 3D models by using RGB, Intensity or statistical derived values.

Using the original RGB values from the point cloud the software can now automatically add real world context to the generated models.

Other new functionality allows users to quickly and accurately generate 3D models and then easily produce 2D plans, elevations or sections for use in project documentation. The software also includes the ability to create scaled ortho images from the point cloud data that can be used to draw measure or take dimensions from.

“The latest version of Pointfuse makes it even faster and easier to visualise large point cloud as textured vector models,” commented Mark Senior, Pointfuse Development Manager. “but, more importantly we have simplified the workflow allowing users to create 3D models, 2D line work and scaled ortho images automatically, quickly and easily. These are then fully compatible with CAD software and modelling packages. The models can also be made to look photorealistic with automatic and accurate texturing.”

An evaluation version of the software will be available as a free download from June at the website below.

www.pointfuse.com

EXERTIS ACQUIRES COMPUTERS UNLIMITED

Exertis, distributors of IT, communication & home entertainment products, has acquired Computers Unlimited, the distributors of Vectorworks in the UK. Computers Unlimited supplies a wide range of third party branded software, IT hardware and consumer electronics products to over 2,000 partners throughout the UK and Continental Europe. The business employs 200 people and operates from offices in London, Paris and Barcelona. Exertis is one of Europe’s largest and fastest growing technology distribution and specialist service providers.

Niall Ennis, Group MD of Exertis said: “We are excited at the prospect of extending the reach of Computers Unlimited to the multiple retail channels that Exertis supports both in the UK and in France. This acquisition also extends the Exertis footprint into the Spanish retail sector, where Computers Unlimited has a growing presence.”

www.unlimited.com
Trade in your old 3D printer and get up to £1000 off a new Stratasys Idea Series professional 3D desktop printer

There’s never been a better time to buy a professional desktop 3D printer from Stratasys

With the new Stratasys Trade In, Trade Up programme you can get up to £1000 off the professional Idea Series 3D desktop printers. All you have to do is trade in your old 3D printer, and as long as it’s in full working order you can get:

- £400 off a Stratasys Idea Series Mojo
- £800 off a Stratasys Idea Series uPrint SE
- £1000 off a Stratasys Idea Series uPrint SE Plus

You can trade in any 3D printer models including: Z Corps, 3D Systems (Cube), AutoDesk 3D, Leapfrog, Ultimaker, HP Designjet 3D, AirWolf, BeeCreative, TierTime (Up!Print), Cel Robox and more.

It all means that these superb Stratasys 3D desktop printers are now an even better buy than before!

Want to know more? Then call the ArtSystems Design Team now on: 0115 938 0399
email: marketing@artsystems.co.uk   www.artsystems.co.uk
It's a measure of the quality and usefulness of a software solution that it is capable of being upgraded to take advantage of the latest technology developments, offering performance enhancements undreamed of when the software was originally being mapped out. Graphisoft's ArchiCAD is in that happy position, and the latest release of the software, ArchiCAD 19, offers users a quantum leap in the speed with which fully prepared model views are loaded, dramatically improving the editing, modelling and viewing experience.

Predictive Background Processing is just one of the highlights of ArchiCAD 19. Besides a number of working environment and productivity enhancements, the software now includes Point-Cloud support - the 3D scan results becoming increasingly popular for mapping legacy structures prior to refurbs and other developments - and an Interactive 3D Surface Painter, for drag and drop editing of building model surfaces.

Leading the way in Open BIM, the software also includes the ability to import correct IFC models with perfect geometry and minimal attributes.

BACKGROUND PROCESSING
If you are going to buy a computer these days - anything from a workstation to a fairly basic laptop - then you'll want at least a 64-bit multi-processor with a minimum of 4Gb of RAM and 500Gb HD as a minimum spec. Current architectural CAD applications, however, were developed before the days of multiple core technology, which means that, whilst parallel processing may be a possibility for some purposes, the software doesn't know how to fully take advantage of it. In a 4 core machine, then, most of the time 3 of those processors might be kicking their heels while the remaining core takes the strain.

Whilst processes like rendering and simulation, which used to be handled separately when computers were somewhat slower, can easily be subdivided into separate chunks and run through a number of cores in parallel processing mode, elsewhere the strain is more evident - such as in the editing of a 3D model.

Creating and modifying geometry, and the frequent switching of model views that it entails, incurs substantial amounts of recalculation. When a user switches from one view to the next, that is when the computations start. In order to address this Graphisoft has now developed an algorithm that 'second-guesses' the user switching between views, anticipating what the user is going to do next, and taking advantage of spare core processing capability to update the model in the background. This means that when alternate views are accessed they are immediately available and up to date.

Graphisoft has also introduced a true full-screen mode that provides a more 'natural' viewing environment. Wanting to cut down on clutter and give users maximum space for developing designs, they have...
Faster than ever

A QUANTUM LEAP IN BIM PERFORMANCE

ARCHICAD 19 is now faster than ever! No more waiting for views to load. GRAPHISOFT has extended its robust 64-bit and multi-processing technologies with background processing – an industry first for BIM. ARCHICAD now offers Point-Cloud support to integrate faster, error-free 3D building surveys. ARCHICAD 19 is the undisputed speed leader in the BIM business.

For further information on ARCHICAD 19 contact GRAPHISOFT at www.graphisoft.com or call 01895 876222
maximised the working area on screen, and populated it with floating palettes - Toolboxes - that can be opened and moved about at will, so that only relevant Toolboxes need remain open at any time, tucked away in the most convenient location on screen.

PERMANENT GUIDELINES.
A couple of handy drawing tools have also been added. Permanent guidelines can now be created in any plane (previously it was only possible to create temporary 2D guidelines), and can be toggled on or off, snapped to geometry and, once set up, shown in different views. There is also support for drawing tangents to circles - not so easy to achieve if absolute accuracy is required - which shows a 90 degree angle once tangency has been achieved.

Related to this is the ability to display the relationship of objects to each other within a drawing - the sort of thing you would have dragged the protractor out for in the past! Splines can also be drawn with regular subdivisions, created by specifying measurements or number of subdivisions along a given length for more accurate drafting.

POINT-CLOUDS
As mentioned earlier ArchiCAD 19 also introduces support for Point-Clouds, enabling users to import and navigate through the massive amounts of data associated with 3D scanning. This is made possible with the software’s fully optimised OpenGL engine for smoother and faster 3D navigation and walkthroughs. Version 19 supports colour input, snapping to individual points, sectioning and slicing of Point-Clouds - through the line of a façade, or to create a horizontal slice. Imported Point-Clouds can be used as reference models or starting points for standard 3D model creation. Point tools are also used for as-built surveys which, when compared with the original building model, show the differences between the intended and actual construction, highlighted in red.

ArchiCAD provides a substantial library of textures and surface effects for rendering 3D models, traditionally accessed and set up through dialogue boxes for each material before they could be applied. ArchiCAD 19 makes the whole process interactive, enabling users to drag and drop surface materials from a floating palette, called the Surface Editor. With a few more clicks surfaces for a whole building can be selected and updated. Two further surface tools are included. Syringe produces a list of elements and materials used in the model, whilst Surface Lists handle the scheduling of exposed surface areas, and defining the differences between exposed and covered areas.

DIMENSIONS AND LABELS
Hardly a trivial matter, things like labels and dimensioning tools can be aggravating if they are difficult to read or implement. ArchiCAD 19 addresses both of these with innovative solutions. Text scaling enables dimensions to remain legible whatever the scale of the drawing, and pointers for dimension texts can be positioned and sized to enable users to show the dimension of objects that are close to each other.

It’s the label tool that impresses most, having been redesigned completely. Now you can attach more than one label to an object, each of which shows different information, automatically generated from the elements parameters, and which can be displayed together on designated layers. It’s common sense really - an object that is displayed on the floorplan may need to impart different information to that on an MEP layer.

The solution’s Collision Detection capabilities in the MEP Modeller Environment have also been improved in the new release.

OPEN BIM
Graphisoft is a leader in BIM implementation. This is taken further with the ability to import IFC models that will look as they did in the original application in which they were created, in the most complete implementation of the standard. Although IFC was meant to be the most efficient file sharing collaboration format it is well known that some applications, because of their model structures, have difficulty in full compliance. IFC files for architectural models will also contain different information to those from Structural Steel engineers. Graphisoft, however, filters out technology specific information. It also handles IFC creation automatically, eliminating much of the mundane tasks involved.

Graphisoft is also working on IFC4, the next generation of IFC that will handle more advanced geometry, including NURBS, and web links embedded in model information. www.graphisoft.com/archicad
excitech

BIM ROADSHOW

A journey demonstrating how today’s technology and processes can make a real difference in a project lifecycle. From inception, through design and construction, to meeting the owner’s ongoing space and asset management requirements, we will use real data to make the journey a reality.

FIND OUT MORE AND REGISTER:
www.excitech.co.uk/br2015cu

LOCATION - VENUE - DATE

Bristol - Bristol Zoo Gardens, The Clifton Pavilion (BS8 3HH) - Thursday, 2nd July 2015

Edinburgh - Royal College of Surgeons (EH8 9DW) - Tuesday, 7th July 2015

Manchester - The Studio (M1 1FN) - Wednesday, 8th July 2015

Birmingham - The ICC (B1 2EA) - Thursday, 9th July 2015

London - Central Hall Westminster (SW1H 9NH) - Thursday, 16th July 2015
Even though I am a sole user, I think I count as a ‘power emailer’ with an understanding of the problem Mail Manager from Oasys seeks to solve for businesses. I have upwards of 35,000 emails distributed between a dozen separate folders, and when I want to search for something I have to be quite specific, otherwise pages of results pop up.

There is no connection between my emails and the information they relate to either. Companies send press releases, technical information and images, which I duly file away in the appropriate folder, but there is absolutely no record of where it was sent or why. I barely understand the logic behind my own filing system as it has evolved over the last couple of decades, but there is no way anyone else coming upon it would find anything useful in it.

By and large, then, the sort of things that I can’t do on my system are precisely those that are vital to any large organisation, and which Mail Manager addresses perfectly. To retain the link between emails and the projects they are associated with, both emails and the project documentation are stored within the same folder. That makes searches that much easier, although Mail Manager has a sophisticated set of filters specifically designed to optimise the search process.

My shortcomings with regard to filing emails and ensuring that others know where I have put them are also addressed, as Mail Manager prompts with a suitable storage location when emails are opened, and both incoming and outgoing emails are filed within common locations in the cloud server, so there’s no danger that I could go walkabout - or get fired! - without the organisation being able to access everything I’d been working on.

As for remembering where I put things a couple of years down the line, well Mail Manager includes an audit trail that knows when I sent what, and to whom, what their response was and, more to the point, what documentation accompanied our digital correspondence. Talking of which, Mail Manager can also depict email traffic graphically, enabling managers to see at a glance who has been talking to whom, who is working in isolation without communicating with anybody, and where most traffic has been routed within any project. Besides creating a secure storage system for emails, Mail Manager also has an effective solution for archiving old emails in an organised manner.

SO WHAT’S NEW?

Having been developed to serve the AEC industry, it soon became apparent that the problems of effectively managing email systems aren’t just limited to construction, but are applicable wherever communication by email has become the norm. Mail Manager is therefore directed at all large organisations and can work as a plug-in to the widely used Microsoft Outlook users, enabling them to manage their interpersonal communications in a more secure and efficient way. It contains a number of tools that allow users to file emails and documents more quickly, run faster searches with advanced filtering, and share folders more easily.

Mail Manager not only slashes the time wasted on managing an organisation’s emails but also effectively formalises it, providing a framework that individual users find easy to learn and work with (it’s estimated that a couple of hours are quite sufficient for users to come to grips with Mail Manager and to start using it productively).

So, how has the latest version, Mail Manager 6.1, managed to enhance its productivity further? For a start, there’s a fresh user interface, faster filing with more filtering options, a refined dialogue for even quicker searches, easier folder sharing and brand new support for Bentley ProjectWise.

FILE, SEARCH AND COLLECTIONS

File, Search and Collections are three fundamentals of Mail Manager.
EMAIL OVERLOAD?

With billion of emails sent and received each day, it's easy to see why email overload is seen as an unavoidable feature of today's business world.

Save time and effort each day

Shared email locations - for improved communication and efficiency

File, share and retrieve emails in seconds

Supports mobile and tablets

Comprehensive email search with advanced functionality

Download a free 30-day trial from the Oasys website, and see how Mail Manager can save you time and effort each and every day.

+44 (0) 191 238 7559  oasys@arup.com  oasys-software.com
Collections are filing locations for groups of connected people - architects, engineers, project members, etc. - or personal selections such as BIM and Marketing. File and Search provide users with a number of ways of receiving, redistributing, storing and retrieving emails and associated documents, applying a bit of intelligence by learning favoured destinations and recipients to speed up the process. The more you use the software, the more intelligent it becomes.

In the latest version of the software filing tools are enhanced by adding a ‘file on send’ handler, to the list of filing options, automatically storing emails after they have been sent in predesignated folders. Alternatively, users can click on the file icon within Outlook once an email has been opened, select a project and click to file - or click to file without opening the email. By sending a file to a common collection it can be accessed by authorised users within a project or group.

An organisation might have many hundreds of thousands of emails floating around, though, and with 200 recipients working on the same project, sending emails with large attachments tends to waste valuable space on the system. To overcome this, emails can be sent that merely contain a link to the location of the file itself.

With Bentley's ProjectWise becoming the de facto Project Management application of choice in many major projects, it is natural that one of the filing options also allows users to file to ProjectWise.

SEARCHING
There are numerous ways to file an email, and numerous ways to find them. Users can search on date, time and subject in the appropriate project folders and selecting date ranges, authors and so on.

With rather less information to go on a dialogue box is available to search the whole database, with each additional search criterion dropping off those that don't match, until only the file you want remains. If unsuccessful, users can search for near misses - to pick up spelling mistakes for example - and can grade results by their 'strength'. And you don't even have to be online to do this, as Mail Manager retains the search capability offline.

MOBILE APPLICATIONS
Mail Manager is available across all mobile, tablet and laptop operating systems, extending its use outside the office. It almost acts as a remote control for the office system, providing the same capability of filing and searching emails. The list of available folders is 'intelligently' selected for ease of use, and emails dragged and dropped into whichever is appropriate.

Besides managing the routine process of sending and receiving emails, Mail Manager includes a couple of very useful tools; one for grabbing information from the screen and distributing it to others, and another for analysing the social patterns of email transmissions within an organisation.

SNAP AND SEND
Rather like the ‘Printscreen’ feature for taking snapshots of the display and printing it out, Snap and Send enables users to select items on the screen - some text, images, spreadsheet details - and to mark them up, add some explanatory text, and then to send them within an email to their list of contacts.

SOCIAL NETWORKS
Briefly mentioned above, a graphic display is available that shows the map of email transmissions over a given period of time, enabling managers to see who is sending and receiving most traffic. This can be narrowed down to a single date or time period to isolate specific activity on a project.

Once the sequence of emails can be ascertained, the results can be used to search and retrieve the relevant emails themselves. It might show, for instance, that the Project Manager has been directing most of his emails to the finance department, which would indicate a problem with invoicing or cash flow - or alternatively show emails being sent and decisions being made in isolation to the rest of the project team.

It’s clear that Mail Manager has evolved far beyond merely handling the ins and outs of emails to become a highly useful project ‘management’ tool in its own right.

www.oasys.com
Thousands of free BIM objects from almost 300 manufacturers across Europe. Over 60,000 architects and designers are using these intelligent and configurable objects, with automatic alerts when objects change.

With clever BIMobject® APPs, the objects are available directly from within market leading BIM solutions including Revit, ArchiCAD, Autocad and SketchUp Pro. Other formats are also supported.

Make sure you’re not missing out by going to www.bimobject.com or, to find out more, enter BIMobject into search on YouTube.

BIMobject UK Ltd
Tom Newman – +44 (0)7427 162 204 – tom.newman@bimobject.com
London’s leading property developer, St. George PLC, retained SimpsonHaugh and Partners to fulfil a vision for mixed-use development at the junction of Blackfriars Road and Stamford Street, situated at the head of Blackfriars Bridge in the central London borough of Southwark. The award-winning practice designed the GBP 250 million signature skyscraper One Blackfriars using GenerativeComponents, Bentley’s parametric modeling software, to set out the curved geometry of the building form and define the relationships between internal and external façades. The 170-metre tower joins a sequence of landmarks along the Southbank of the River Thames, where its minimal footprint and slender profile allow it to rise skyward without overshadowing its neighbours.

One Blackfriars presents 74,925 square metres of prime space for a 152 room boutique hotel and 274 luxury apartments, as well as retail shops, restaurants and bars, a health and fitness centre, community viewing lounge and underground parking. The site also makes space for a landscaped public piazza. Targeting ambitious performance standards for sustainability and energy, the tower was designed to Code for Sustainable Homes (CfSH) Level 4 whilst the hotel was designed to Building Research Establishment Environmental Assessment Methodology (BREEAM) Rating Very Good.

**Being a Good Neighbour**

In an age of austerity and popular criticism of the contemporary tower form, the introduction of another sculptural skyscraper to the Central London skyline could have been controversial. One Blackfriars achieved the balance between form and function to earn its place on the cityscape, but not without a struggle. Conceived in 2004 as a hotel-led tower, the concept for One Blackfriars eventually earned community approval and planning permission, having been tested during a public inquiry in 2008 where they were responsive to public feedback.

To stand the test of time, the tower design needed to address form, scale and proportion as well as deal with the recurrence of element repetition, and provide a contextual response to the particular place. The No. 1 challenge was to establish a base at the bottom of the tower on the site without obstructing the daylight of neighbouring properties. At the same time, SimpsonHaugh had a responsibility to fulfil numerous functional pragmatics of the original program. Finally, the building had to be beautiful from every aspect.

The final tower design marks the southern bridgehead of Blackfriars Bridge and is a gateway to Southwark. SimpsonHaugh conceived a thin form with ‘shoulder blades’ on the east and west elevations that reduce its apparent width. To develop the design for this flaring shape, SimpsonHaugh developed a set of innovative tools based on existing applications such as GenerativeComponents, Bentley Architecture, and other software that integrated with the core Bentley applications. The aim was to use the technology to deliver the scheme with fewer people, in less time, and with fewer errors due to reworking or inaccurate coordination.

**Building Within a Building**

SimpsonHaugh benchmarked its existing processes, team structures and uses of technology against best practices in architecture, engineering and other industries. For example, the design and manufacture of boat building and luxury yachts inspired the development of the building canopy. Bentley applications provided a solid platform for parametric modeling and building information modeling (BIM). SimpsonHaugh customised and enhanced the available scripts and tools to push the boundaries of what could be achieved.

The design created a double-skin façade, where the outer leaf is a substantially transparent glass surface that traces the curved geometry of the envelope. The solid elements of the more orthogonal inner leaf are coloured to overlay the interior volumes with a subtle variation of rendering that lightens as the building extends skyward. The building-within-a-building concept resulted in an outer skin comprising 5,496 panels - each one different from the other - including flat, single and double curved. The inner skin provided thermal lining and opacity. The building breathes through the skin, so ventilation and solar gain had to be quantified and accommodated.

SimpsonHaugh quickly realised that the parametric model could be used to provide more than the initial building form. Development of the model allowed the...
team to explore the relationship between the inner and outer glazing systems, internal spaces, structural column positions, and other systems. For example, SimpsonHaugh used the model to investigate and rationalise the geometry and manufacture of the outer façade, the colouring of the glazing schemes, and the size of the shadow gaps between façade panels.

From the base geometry, SimpsonHaugh developed five modules for the external and internal façades, structure, residential areas and the 3D surface model. External components included the tower cap, mechanical ventilation, purge ventilation, panel type drawings, setting out drawings, unwrapped elevations and schedules. Internal components comprised unwrapped elevations; panel type, setting out, scraping and rain screen drawings; panel wall division and set out colours. The structure involved slab set out drawings, column set out, clash detection, slab openings and an analysis model. Residential areas required matrix drawings, apartment types and views, area labels and accommodation schedules.

MODEL EXCHANGE
Panel types, analysis model and façade zones were entered into the 3D surface model. The analysis model of the structure - comprising points, lines, and meshes - was imported directly into analysis software used by the project's structural engineers, WSP Building Services. The results were then fed back into the parametric model, which ensured consistency and accelerated the collaborative process.

The parametric model was also imported into the building information model in Bentley Architecture, allowing the team to generate detailed schedules and general arrangement drawings. In addition, the parametric model was used to draw, annotate and dimension the elements related to the façades and the setting out of the structural slabs and frame. The team used MicroStation to develop details and assembly drawings based on dynamic views extracted from the model.

The 3D model of the external façade contained crucial information on the façade zones, panel geometry, curvature, warp, inclination, skew, stack joint group, stack joint deviation, glass wastage and pinstripes. This information was then made available to contractors as editable files, which helped to explain the complexity of the design. One particularly challenging aspect of the tower design was the tower cap, where façade mullions lie on a plane defined by the façade joints. The transom planes were set on a best-fit geometry segment by segment, so that they are nearly perpendicular to the glass surface.

PRODUCTIVITY GAINS
By integrating a parametric workflow within traditional BIM and 2D processes, SimpsonHaugh was able to investigate and resolve a number of unique design issues and respond quickly to client requests and requirements. Bentley’s parametric tools significantly increased project team efficiency and productivity, while ensuring project delivery exceeded client expectations.

Many innovative design options explored within the virtual environment would never have been considered, much less developed for buildability. Complicated tasks that might have been insurmountable in the past were not only completed but delivered within very short timeframes - e.g., two days instead of weeks to produce visuals for viewing angles from each and every apartment.

FAÇADE DELIVERY
Bentley’s GenerativeComponents allowed the project team, led by Matt Schmidt and Ralph Lindemann, SimpsonHaugh’s computational designers to deliver a complex façade system that might not have been possible otherwise, fine tuning the façade to reduce the number of panels and minimise the number of double-curved panels with a direct impact on cost savings. Though some were sceptical that One Blackfriars would be built, the groundbreaking ceremony in October 2013 marked the start of construction, which is expected to be completed by 2017. With a mix of residential, commercial, and retail properties, One Blackfriars represents a significant investment by the developer. The 50-storey tower is now being marketed worldwide.

www.bentley.com
ZWCADE is ZWSOFT’s 2D and 3D drafting software, and with a user base of over 320,000 satisfied users across 80 countries, ZWCADE is gaining momentum as the .dwg-compatible, affordable alternative to other mainstream CAD tools. In addition to ZWCADE, Standard and Professional, the ZWCADE family of products includes ZWCADE Architecture and ZWCADE Mechanical - a solution for all users across the AEC and MCAD industries in other words.

As one would expect ZWCADE has a comprehensive set of common 2D and 3D drafting functions to manage, so this article will highlight some of the innovative features in ZWCADE + that differentiate it from similar CAD tools.

Often it’s easier to express design intent, request design changes or capture design review comments as audio rather than text. ZWCADE +’s SmartVoice allows users to do exactly that by enabling users to annotate their drawings with voice notes, the SmartVoice Manager providing options to manage the voice objects. Other features such as SmartMouse, SmartSelect and File Compare further differentiate ZWCADE + from its competition. SmartMouse allows the user to execute defined commands by moving the mouse on a certain path, for example pressing the right mouse button and moving vertically upwards invokes the ‘new’ command. The set of predefined mouse gestures can be augmented with user defined gestures to invoke other favourite or often used commands. SmartSelect presents the user with a dialogue box which presents lists of all the objects in the drawing and allows easy selection of the objects through a series of filters. File compare enables users to spot any differences between two similar drawings by highlighting them in different colours. Variations between blocks, attributes and text can be easily found, and the comparison settings such as colour and filters can be customised.

The Online module for file synchronisation in ZWCADE + allows users to save drawings and customisation settings to third party cloud services like Dropbox, Google Drive and others. Configuring the Online Module is straightforward and, coupled with ZWSOFT’s mobile CAD solution CAD Pockets, drawings can be accessed at anytime from anywhere. ZWCADE + offer many functions for drafting and detailing - however sometimes the standard commands and features in CAD tools are not sufficient and further customisation is necessary. There are a number of APIs available in ZWCADE + including LISP, VBA, .Net and ZRX. The ZRX, ARX and .NET are code-level compatible and Lisp routines can now run directly on ZWCADE + with only a few modifications. These APIs also enable developers to very quickly port applications written for other CAD tools to ZWCADE +.

In addition to the regular ZWCADE + products, ZWCADE + Standard and Professional, there are two application-specific ZWCADE + products available, ZWCADE Architecture and ZWCADE Mechanical.

ZWCADE Architecture includes all the functionality of ZWCADE +, plus content libraries and tools designed specifically for architectural drawings, which enhance the workflow, automate tedious drafting tasks, reduce errors and increase efficiency. ZWCADE + Architecture allows users to generate walls, add doors and windows, and create roofs. From the completed 2D plan, elevations and sections can be generated accordingly. The components you draw in 2D, but after switching views they can be viewed in 3D, and the 3D model can then be exported as a .dae file or .stl file.

ZWCADE Mechanical is also built on ZWCADE + and supports ISO, ANSI, DIN, JIS, and GB drafting environments. ZWCADE Mechanical has a number of additional features specific to mechanical design. For example, Power Dimension makes dimensioning easier with abbreviated dialog boxes that control and expand the variables relevant to manufacturing, as well as integrate tolerance and fit list information. There is a comprehensive part library containing screws, nuts, washers, pins, rivets, springs and bearings, and parametric models of shafts and gears are also available.

One feature of ZWCADE + that remains constant is its licensing mechanisms. ZWCADE + products are licensed either as a single user or a network license, giving flexibility in how users access the software. Licenses are perpetual and there are no ongoing subscription fees. Users are not obliged to update their licenses as new releases of ZWCADE + become available.

ZWSoft continue to develop ZWCADE +, and current projects include cross-platform support, more optimisations in performance and additional features to further improve the ZWCADE + user experience.

In the UK ZWCADE + products are available from ZWSOFT's Valued Added Reseller EDA Systems. For more than five years EDA Systems has provided sales and technical support for ZWCADE +, as well as developing add-on applications for users, including lighting design, drain surveying and arboriculturists. EDA Systems’ ZWCADE + user base currently comprises over 150 companies, ranging from multinational corporations with many licenses through to small companies with one or two licenses.

www.edasystems.co.uk/  
Email: info@edasystems.co.uk
September will see the fourth annual CAD User BIM Supplement, for more details and to be involved contact:

Josh Boulton on 01689 616 000
or email
josh.boulton@btc.co.uk
Online Bookings

The Challenge for AECOM was to deliver a high quality hotel refit on time. CONJECT provided the answer, replacing handwritten defect management with an online system

With choosing and booking into a hotel now being carried out entirely online, it is interesting that global construction companies often still have paper-based defect management systems in place when tasked with the refurbishment of such properties, like the Novotel in Dubai. The digitisation of the industry may have come on apace, but there are still areas where entrenched practices remain in force - although they can be addressed with the appropriate tools. Defect Management is one such area. Introducing a mobile solution, like conjectMI, has proven to save both time and reduce manual processing errors, leading to a refurbishment project being finished well within time and on budget.

AECOM are an international provider of construction, engineering and technical services across a broad range of sectors. With over 60 years' experience operating in the Middle East, AECOM were selected to manage the total refurbishment of the 13 floor, 4 star Novotel hotel, part of the famous Dubai World Trade Centre (DWTC).

THE CHALLENGE

Being a refit of a high-end hotel, delivering high quality standards, including the rapid identification and rectification of defects, was a priority. Compounding the challenge of effectively managing defects, the work was carried out in multiple stages whilst the hotel remained open. In addition to the normal costs associated with poor defect resolution, delays in resolving defects would have knock-on effects on other stages of the project and could impede the day to day running of the hotel.

AECOM's defect management method had been manual inspections recorded on paper-based spreadsheets and forms which were used to track the process from identification to resolution. AECOM Senior Project Manager, Amer Abuzeineh stated that with the existing method, the average turnaround time from identifying to closing a defect was 5 days. With three different companies logging defects over a 200,000 square foot site, accurate recording of defects was vital and the existing paper based system carried the risk of clerical error and the process of sharing defect information by email was administratively burdensome.

Amer wanted a more efficient way of delivering quality control, turnaround times, and better reporting than was possible using the existing paper-based system. Management tasks like the tracking of defect statuses, meeting project timescales and ensuring that high quality levels were being delivered, were all made difficult due to the lack of timely reporting.

AECOM were not using specialised software to assist with their defects management processes, so Amer along with DWTC (the client) decided to deploy an inspections and defects software solution to test the impact on efficiency and quality. Based on the selection criteria of ease of use, reliability and monitoring/reporting functionality, conjectMI mobile inspections and defects software was chosen as the preferred solution.
MOBILE DEFECT MANAGEMENT

Before the solution was deployed, CONJECT consultants spent time with AECOM assessing their processes and consulting on both configuration changes to the software and changes to inspections and defects processes, to ensure the two were closely aligned. Amer commented, "The fact that CONJECT were able to easily configure their solution to match the nature and requirements of the project removed barriers to adoption of the new system. All users were able to use the system after the first training session with no issues."

Users logged in using tablets that had been loaded with the relevant floorplans. Locations, images and descriptions of defects (including the relevant trade) were marked up using the tablet. The data was then synchronised with the master version of the floorplan, either on the move or when returning to the site office, depending on Wi-Fi availability.

EARLY COMPLETION

In the three month duration of the inspections and snagging phase of the project, the team recorded 6,654 defects across a project area of over 200,000 square feet. The defects inspection, resolution and quality assurance project represented a significant commitment of project time and cost. Fast snagging identification and resolution ensured that defects were quickly and accurately snagged using conjectMI, and the information was automatically shared with the relevant parties so they could undertake rectification works.

Amer commented, "Under the previous system it took between three and five days to resolve a defect but using conjectMI the resolution time was reduced to two days." Considering the number of defects the system recorded this represented a significant time saving for the project team. It was also of benefit to the supply chain as they quickly got the information they needed on exactly where and what the defect was, improving performance against internal quality and compliance targets.

REAL-TIME REPORTS

As well as significantly speeding up the process for identification and notification of defects, the entering of all snags onto the conjectMI platform allowed real time reporting of the status of each defect. These reports could be easily exported and sent to other members of the project team. This meant intelligence, such as the number of defects per area or per trade as well as overall progress updates on the work, could be quickly shared with suppliers and stakeholders who were not users of the system. This level of oversight ensured that the project was both delivered on time and with high levels of quality.

PROJECT SUCCESS

On reviewing the benefits conjectMI provided Amer considered its use on the project a success, stating "The system will be recommended to be used to my colleagues within AECOM and to future Clients."

ABOUT CONJECTMI

ConjectMI is a web-based, mobile enabled, collaborative defects management tool for construction projects. It handles the capture, organisation, distribution and tracking of all project defects among project participants throughout the project lifecycle. ConjectMI also helps to eliminate defects efficiently to ensure on-time quality-assured project delivery and cost control.

Supplementary modules include:

- **Zone cutting** - Easy-to-use zone cutting software. It views, defines and cuts all sizes of DWG files into zones, reducing zone creation time and significantly improving zone management - all without the requirement for AutoCAD knowledge.

- **Handover management** - Streamlines and optimises the built asset delivery process. It ensures the capture, organisation, tracking, distribution and repair of handover defects. It helps to resolve defects efficiently to ensure on-time, quality-assured project delivery and cost control.

www.conject.com/uk
Like all good software companies, Vectorworks has a large and active feedback group that sends in suggestions for the future direction of the software. Every year about a hundred or so good new ideas are put forward, with quite a few of them making it into subsequent releases. The suggestions put forward are not necessarily unique or singularly inventive, but are rather tools that users would like to have access to within their favourite application.

As a taster, at the end of the Philadelphia Vectorworks Design Summit, Dr. Biplab Sarkar outlined some of the suggestions that have been accepted and developed - and which are now ready to be released to the Vectorworks community of users.

**VISUAL SCRIPTING**

The first of these is Visual Scripting, to be made available as a separate module with the rather interesting name of Marionette. This is a brand new rapid computational system that can be used to explore design variations. In appearance it looks like a hand drawn flow chart - and that's exactly how you lay it out, linking nodes together, each of which has an algorithm or logic statement associated with it. If you are building a multi-storey building, for instance, one of the nodes would relate to the height of each storey, which can be changed on the fly to try out design variations. These are the building blocks of the process.

Nodes are assembled within a separate toolbox, and can be dragged and dropped to create the flow chart. It can all get quite complex though, as architects can use logic to introduce an element of randomness to the flow chart, or path extensions can be modified on the fly to create individual shapes that would be difficult to design otherwise. Visual Scripting, therefore, extends the boundaries of an architect’s creativity. So, to help simplify what could develop into a complex maze of workflows and interactions, sequences of nodes that cover complete operations can be condensed into a single node on the flow chart.

The network of nodes is then converted into a geometrical model, using Vectorworks Python API or Vectorscript - Pascal like programming languages that define path-based parametric objects, coordinates and actions. Objects created (rectangles, parallel lines, etc.) along the underlying path can be subsequently edited in Vectorworks using Reshape and other editing tools. It might take some experimentation to get the most out of, but Visual Scripting is a very interesting addition to the Vectorworks stable.

**ENERGY ANALYSIS**

Building performance has been notably lacking from previous versions of Vectorworks, which has always aimed to provide a complete solution for architects; from terrain development right through to rendering, landscaping and visualisation. No development can be undertaken these days, though, without incorporating energy use calculations into the design - and in order to be effective they have to be available as early as possible in the design process.

Hence the introduction of Energy Analysis as another module, essential for anyone aiming for net zero building design. Users can work on lowering the carbon footprints of buildings with Energos, which uses Passivhaus calculations and methods to provide a building's energy performance figures. Energos is a BREEAM and MINERGIE ASHRAE compliant feature, providing a simple tool for calculating energy use in a building.

The module covers all components, materials and elements within a structure including doors, windows, ventilation and heating systems. The analysis looks at the overall design using typical spaces within the structure to produce performance figures, and architects can play around with different layouts, materials, heating system performance ratings and so on.
achieve an optimum solution. At the end of the analysis the software comes up with the building’s environmental classification.

The architect as environmental engineer? Not quite, as Energos doesn’t include the necessary CFD and other tools that enable a detailed environmental study of a structure to be made, but instead uses the data already available within the model to perform a satisfactory survey and confirm that the right steps have been taken to maximise a building’s environmental credentials.

PROJECT SHARING
Vectorworks allows users to set up a multi-user environment collaboration, which works on a layer basis. Users can extract and work on different layers, allowing a number of users to edit parts of a building model simultaneously. When editing is completed and returned to the model the whole model is updated.

The first time a model file is opened permissions and constraints are configured to allow a number of users to work together on the same model. Each member of the team is able to check out the layer that contains the parts that he or she needs to work on. Once editing has been completed, the revisions are shared with all team members and the layers reinstated with the building model.

New layers can be issued at any time, and throughout the process team members can collaborate with each other in real-time, using split screens and video to enhance communication. All team members have to return their layers at the end of the editing session, so that modifications or alterations can be reviewed and implemented. The whole process is audited throughout, so that shortfalls in editing are highlighted and can be returned for further work before the process is finally signed off.

POINT TOOLS SUPPORT
3D scanning is rapidly gaining in popularity with projects involving refurbishment of existing properties, or because architects need to use existing structures as reference points before designing can start. As a result software developers are gearing up to handle the extremely large files that arise from the extensive 3D point cloud data. Vectorworks users can now take advantage of such data too with the aptly named Vectorworks Point Cloud Support function.

A degree of object recognition is included, so that various configurations within the point cloud can be recognised as objects and transformed to become geometric elements. Point Cloud Support includes a number of tools for slicing through, changing colours or flattening point clouds as an aid to recognising features, and preparing them so that they can be used as a basis for further development.

SUB-DIVISION SURFACES
Sub-division surfaces provide a different way of modelling surfaces. It provides a tool for creating irregular, nonlinear shapes, using existing shapes as starting points. To design a chair, for instance, you can start with a cube (an unlikely starting point for such an object, I admit) and then start to stretch the shape, having divided the surface of the cube into segments, each of which contain sets of anchor points for bending it, pulling out arms, slicing off ends. In fact you can totally manipulate the shape, rather like playing with plasticine, to create a free-form model of the chair. Another tool for releasing the creative juices of the architect or interior designer then.

ON THE HORIZON
This was a great group of features to end any conference on, introducing new modules that will be great fun to use and increasing the range of things that you can do with Vectorworks. The final taster was the likelihood of introducing browser-based CAD at some point in 2016. Using Vectorworks app streaming users can have all of their designs on a browser, and because it’s cloud-based the designs can become shared entities, allowing users with different devices to work on a shared project.

There are obviously a number of issues to address with browser-based CAD - otherwise it would already be widely available in the same way that Google’s own apps are - and I am certainly looking forward to investigating the implications before Vectorworks launch their own app.

www.unlimited.co.uk
The 5th dimension of 3D modelling

Asta Development brings Bidcon BIM to the UK, adding cost estimation to its popular Asta Powerproject project management application.

3D modelling has now progressed through the 4th dimension, time, and into the fifth Dimension, namely cost. The breakthrough has been made by Asta, well known for its project management software, Asta Powerproject, by introducing a new estimating package, Bidcon BIM, that has links with Asta Powerproject. Bidcon BIM enables costs to be associated with a building project from an early stage - and if you have the necessary basic information at hand, at the planning and budgeting stages of the process. This allows managers to extract information from IFC models of the project and associated sources, in order to build up a database of costs which will form the basis of detailed financial reports.

With accurate cost information available throughout the life of a project, managers are forewarned about budgetary overruns, can make critical decisions with an understanding of the financial implications, and are able to investigate alternative solutions to keep projects on track and in budget.

A powerful and comprehensive costing program, Bidcon has been available in Scandinavia for many years. The market leading tool was developed within the Eleco Group, of which Asta is a part. It is based on an SQL database and uses dynamic templates and reports to identify the most cost-effective solutions, enabling project managers to revise estimates to suit changing conditions.

As the project develops, quantities and associated costs are shared with Asta Powerproject through take-offs from an IFC model, helping to enable a Common Data Environment. Budget plans can be set up even earlier though, and linked to the IFC model when it becomes available. It's a dynamic process throughout, as resources can be built up and new costs established as the project progresses, all of which increases the accuracy of the periodic reports.

The cost estimates are built up from material costs using SQL-based reference libraries, such as Spon's Price Books, or from quantities automatically imported via the ELECO BIMCloud portal, and from other BOMs as Excel or text files in virtually any format, probably compiled from price requests sent out to suppliers, together with manually added elements such as labour, plant and other resources. Where there is duplication of prices for materials from more than one supplier, Bidcon automatically selects the lowest - which can be overridden, however, if one supplier is preferred over another.

The software provides a suite of ready-made templates for reports, but to enable users to produce reports that suit their own particular requirements, they have the freedom to set up their own resources, or to create their own templates to base their estimates on. Cost estimates, generated within fully detailed customisable reports, can either be viewed in their entirety or by using filters to drill down to resource groups, construction phases and other areas. This highlights the fact that on some of the largest projects, the massive amount of cost information available could, if unchecked, swamp the capabilities of those tasked with handling it.

It is suggested therefore that, when transferring quantities from the largest projects, it is best done piecemeal, working on one part of the project at a time. This is where the real benefit of Bidcon becomes apparent, as the software retains a link between the IFC model and the estimate. Each item entered is kept track of, allowing users to stop working on the model and to return to it at a later stage, with no delays and no items lost.

The IFC link also enables users to keep abreast of model updates, hence the addition of BIM to the application title, and to upload revisions through Eleco BIMCloud, and to verify elements by visually navigating their way through and around the model.

Once a cost schedule has been...
compiled it can be imported by Asta Powerproject, or alternatively by other applications that can read industry standard IFC formats.

BUILT-IN NRM LIBRARY
The Framework of the New Rules of Measurement, provided as a built-in library, guides users through the Order of Cost Estimating. If that doesn't quite meet their needs, though, they can add their own frameworks of codes, and configure the system so that they can be selected by Bidcon in a manual build-up or automated import.

COMPLEX RESOURCES
Quite often, single costs will need to cover a combination of resources, such as materials, plant and labour used for a particular job, and Bidcon allows these to be combined and set up as complex resources. Similarly parametric assemblies (design elements) can be used for construction elements - a partition wall or trench - which have a variable cost, determined by their dimensions multiplied by cost per unit of measurement. Quite a useful feature, as detailed parametric assemblies can even be used to cover different types of rooms, buildings or, even, railway embankments, with a common structure, but variable contents.

SUPPLIER AND SUBCONTRACTOR TENDERS
Large databases of material and component costs come with a correspondingly large network of suppliers. Sending out requests to tender to them, and then setting out to compare the returns of each with its competitors, is a pretty daunting task. Imported into Bidcon, though, in one of the many formats available, allows them to be compared side-by-side and for Bidcon to select the lowest price by default. Or, as we saw earlier, that selection can be overridden in favour of a preferred supplier.

This points to a very flexible solution that can automatically select the most favourable costs based on cost price alone, and which then allows the user to analyse the results, substituting alternative prices to meet specific needs. This could take the form of identifying a price that needs to be achieved to meet a tender sum, or to experiment with what the bid price would be, based on a variety of manual or global adjustments, and then producing reports on a number of outcomes for management discussions.

Reports are entirely customisable, and can be set up to cover high level summaries or in-depth analysis. They can also be configured to cover the most relevant information, whether it's on the NRM code, materials, locations or other user-definable criteria. This allows users to very quickly and easily provide summaries for different perspectives. Helpfully, reports can be generated as previews or sent to a printer, as well as being saved as useful file types such as Excel.

Bidcon BIM is another element ticked off on the BIM checklist. Taking full advantage of the cost data associated with a Building Information Model enables clients to factor in Capex, as well as Opex, on a project at an early stage in the development process. This is essential for overall budgetary control when costs and time schedules are critical for a project's success.

www.astadev.co.uk
Fail to plan, plan to fail

Ben Wallbank, BIM Strategy Manager at 4Projects by Viewpoint, highlights the importance of adequate planning for April 2016

The digitalisation of the construction industry is upon us. UK Cabinet Office returns indicate that by September 2014 total contract values of £9.4 billion (excluding MOJ, EFA, DoH and HS2 returns) were in the marketplace with Level 2 BIM Deliverables. At a BIM Technologies Alliance briefing on 15th May 2015 the software providers were informed that that figure is now at about £20 billion, halfway to the April 2016 target.

In addition to these public sector projects, many private sector clients are starting to understand the advantages of offering asset data sets to allow potential purchasers and tenants to drill into the 80% of the cost of an asset that lies beyond construction. Across the industry one hears reports of BIM deliverables in Requests for Proposal from the private sector client, although often poorly defined.

Many of these projects are large and as such have long gestation periods, but our industry should be under no doubt that a tidal wave of work, where teams are contracted to deliver to Level 2 BIM, is about to hit the construction coal face.

Much of the industry has been preparing for this; however, there is a substantial section that is not yet ready to deliver. Large projects have extensive supply chains and BIM can only succeed if all parties understand what they are supposed to do and when, and are able to collaborate to achieve the contracted objectives. Even the well prepared tier one contractor will, therefore, face substantial challenges in coordinating and defining what is required from the design and construction team.

We now have a framework of standards, guidance notes and supporting documentation which, if followed, will assist the industry in BIM adoption. The five parts are BS/PAS 1192, (standards and processes), the CIC BIM Suite of documents (commercial and legal), Government Soft Landings and the emerging Digital Plan of Work (level of information and detail required) and Uniclass 2015 (classification). Together they define what Level 2 BIM is, namely:-

- A federated BIM (coordinated and clash detected)
- 2D contract documentation derived from the federated model
- Sharable structured asset information (COBie)
- Use of a Common Data Environment (CDE)

Viewpoint’s objective is to provide the industry with the tools necessary to deliver BIM projects through collaboration in their Common Data Environment (CDE).

4Projects was founded 15 years ago and quickly established a reputation as a cloud based collaborative Electronic Document Management System. The company was acquired by Viewpoint, a construction software specialist with its headquarters in Portland Oregon, just over two years ago. Viewpoint 4Projects is Viewpoint’s offering to the Common Data Environment. A CDE still needs to be able to deal with documents and drawings; at Level 2.

With the challenges facing asset owners and design and construction teams with Level 2 BIM delivery they need far more from their chosen CDE than just a record of who has done what and when. At the early stages of a project a CDE should be able to assist with defining who will be required to do what and when. It should then monitor progress and validate submitted data, and be able to report back to all contributors on their progress with
additional requests and tasks as necessary. Viewpoint’s 4BIM allows users to federate models using their web browser through any computer or mobile device. No additional software is required. Teams with varying BIM originating software or none are able to collaborate. An add-on has also been produced for Revit users to allow direct connection to Viewpoint 4Projects from within their software. Add-on’s for other software are in development.

The model can be viewed, in both solo and shared sessions, marked up and tasks allocated. Data and documents can be attached to elements of the federated model and this data resides within the CDE database, keeping model sizes down.

COBie data can be viewed and the selection of a line of COBie data is graphically shown in the model or data tree (or vice versa). COBie data can be imported and COBie from all contributors can be allocated to different parties at each work stage. The architect perhaps allocated modelling the spaces at Stage 1 through to Warranty Information being allocated to a supplier at Stage 6. Each contributor’s progress towards COBie completeness can be monitored and reported by work stage, with a RAG (red, amber, green) reporting tool.

The Autumn software release will strengthen Viewpoint’s offering further with the integration of BCF file exchange, model version control, an Employers Information Requirement (EIR) tool and BIM Execution Plan (BEP) tool (both replete with helpful notes for the compiler). In addition, Viewpoint are currently beta testing a new non-sequel database for the Ministry of Justice that will enable searches to be carried out across multiple COBie assets, and this too should be released in the Autumn.

Viewpoint continues to grow and five months ago they acquired Priority1 (now Viewpoint Field View), which will be integrated into their CDE in the coming months. Viewpoint is already working on the field capture of COBie data (enabling supply chain members to capture COBie without even knowing they are doing so).

In fact the first COBie efficiency enhancement for Viewpoint Field View has just been made in recent weeks. There is now the ability to import COBie spaces into Viewpoint Field View, avoiding the need to manually populate spaces on drawings. With the addition of mobile data entry to the CDE from the field, Viewpoint 4Projects CDE should continue as a market leader.

To be successful at Level 2 BIM delivery a little time must be invested in planning, setting out the roles and responsibilities of all contributors to the BIM. Only by doing so can progress against targets be monitored, validated and, of course, recorded. If delivery teams avoid these tasks (implicit in the UK Standards) BIM adoption will surely fail. With the addition of the Information Planner to their CDE along with monitoring and recording tools, Viewpoint are ensuring that their customers have the best chance to succeed at delivering Level 2 BIM.

www.4projects.com

Naming Convention Tool: Has a BS 1192 default but can be configured to any bespoke convention.

COBie deliverables can be defined for each contributor on each tab/workbook.

SOFTWARE review
Brazilians are noted for their passion for football, so when a national stadium had to undergo a major renovation, it was not only the wind that had to be factored in to the safety analysis but the structure itself, and the activities of the ebullient, cheering crowds. Because time constraints on the project meant that a wind tunnel solution was unrealistic, ANSYS multiphysics tools were used instead, allowing CFD tools for wind testing to be used together with ANSYS Mechanical structural analysis for gravitational testing of the spectators’ actions, under the umbrella of Ansys Workbench environment.

Estádio Nacional Mané Garrincha, a 70,000-seat football stadium in Brasília, Brazil, was rebuilt in 2013 and hosted seven games of the 2014 FIFA World Cup Brazil, including a quarter-final. Validating the design of a stadium of this size for wind loads normally requires wind tunnel testing, which is time consuming and costly, and runs the risk of scaling errors - a scale model that fits in a wind tunnel does not exhibit the same precise behaviour as an extremely large building. With assistance from the CFD simulation specialists at ESSS, the ANSYS channel partner in Latin America, the engineering consultant for the project used ANSYS multiphysics capabilities to verify the safety of the stadium.

The ESSS team used CFD tools to predict airflow around the stadium and pressure on the stadium cover. Then a structural analysis was performed to study the combined effects of wind, stadium infrastructure and the cheering crowd. The study recommended several changes, such as increasing the number of cables and cable tension. This is believed to be the first time that CFD analysis has been used to replace wind tunnel testing in the design of a major stadium in Brazil. The analysis was completed in only two weeks. Simulation reduced costs by one-third and took one-tenth the time of wind tunnel testing.

MAJOR RENOVATION PROJECT

The stadium was originally built in 1974 and named after the famous Brazilian soccer player Mané Garrincha. Estádio Nacional was almost completely demolished through a controlled implosion in 2011 to make way for the current stadium, which includes a new façade, metal roof and stands - as well as a lowered pitch (playing field) that enables unobstructed views from every seat. The reconstruction involved dismantling the lower tier of seats and incorporating the upper tier into a new rectangular bowl. The size of the playing field was reduced to make the stadium into a single-use facility for football.

The renovation cost approximately $500 million (U.S.). NOVACAP, a Brazilian state company involved in construction in Brasília, contacted ESSS to validate the safety of the stadium design from a wind-loading perspective. Traditionally, this is done by building a scale model and testing it in a wind tunnel while measuring loads on the...
model. More recently, projects have been completed by using CFD to predict the loads on the structure, then using a wind tunnel to validate CFD simulation. However, stadium CFD simulation has progressed to the point that wind tunnel validation is no longer mandatory, saving substantial time and money. In any case, the validation had to be done in only 15 days, far less time than is required to build a scale model and perform wind tunnel testing.

CFD SIMULATION
NOVACAP provided an architectural model of the design. The stadium was designed as two independent structures. The roof is supported by columns and is independent of the stadium itself, which consists of seating, stairs and ramps. The roof is 309 meters in diameter, the largest circular roof in the world. To provide a suitably large envelope in which to carry out accurate wind simulations, the CFD design space was made 6 km in both horizontal and vertical directions, which is about 20 times the size of the stadium.

The model of the stadium used quadrilateral, tetrahedral and pyramidal elements which, together in the completed model, amounted to 20 million computational cells with 120 million degrees of freedom. The team iterated to remove details of the geometry that did not impact the flow, hence speeding up simulation without any loss in accuracy. Wind speeds were taken from the Brazilian building code, which specifies a velocity of 35 meters per second.

The team applied wind from two orthogonal directions as a boundary condition at the edge of the solution domain and employed the k-epsilon turbulence model. ANSYS CFD simulation took about four hours to complete on a high performance computing cluster with 12 nodes, 24 processors and 96 gigabytes of RAM. The results of the analysis provided the pressures, both positive and negative, exerted by the wind on the structure's various elements.

STRUCTURAL ANALYSIS
The structural engineers converted the design into a finite element model with 100,000 beam and shell elements for structural analysis. The pressures predicted by the CFD model were transferred to ANSYS Mechanical using the ANSYS Workbench environment. The gravitational loads provided by spectators in the stands, lights and audiovisual systems were also incorporated into the model.

The stadium model was used to calculate the structure's natural mode shapes and frequencies of vibration. Modal analysis was performed on the pre-stressed structure. The lowest frequency mode was a rotating mode at below 0.5 Hz. This mode was a problem because the original design did not have a lot of stiffness in the rotating direction. The lowest bending mode was at 0.8 Hz, which was acceptable. Hand calculations were used to determine the amplification factor of the structure.

The CFD model allowed evaluation of a number of different design changes to address the rotating mode problem. Simulation showed that by adding additional cables and increasing tensile force on some of the existing cables, the rotational stiffness of the structure increased and the frequency of the rotating mode was raised to above 0.8 Hz. The architectural design incorporated these changes, and the structure was completed in 2013.

The stadium was used for the first time for the opening match of the Confederations Cup, in which Brazil defeated Japan. The stadium hosted seven matches of the 2014 FIFA World Cup Brazil; it will host some football games in the 2016 Summer Olympics to be held in Rio de Janeiro. The work was performed under the auspices of Maruska Holanda (NOVACAP) and Pedro Almeida.
Your guide to AUTODESK training courses

**TRAINING COURSES OFFERED KEY:**

- AUTOCAD AND LT:
- AUTOCAD P&ID TRAINING:
- AEC/BUILDING SOLUTIONS:
- 3D MODELLING & ANIMATION:
- AUTOCAD ARCHITECTURE:
- FM DESKTOP:
- GIS/MAPPING:
- REVIT:
- VAULT FUNDAMENTALS:
- AUTODESK VAULT FOR INVENTOR USERS

**VISUALISATION:**

- AUTODESK CIVIL:
- INVENTOR SERIES/MECHANICAL
- NAVISWORKS TRAINING
- PRODUCT UPDATE COURSES
- INVENTOR PUBLISHER:
- GOOGLE SKETCHUP
- CHARACTER ANIMATION:
- AUTODESK SIMULATION:
- FACTORY DESIGN SUITE:
- AUTOCAD ELECTRICAL

For further information about authorised CAD training or to advertise on these pages please contact:

Josh Boulton on 01689 616 000 or email: josh.boulton@btc.co.uk
Twinmotion is distributed and supported by Abvent, developers of Artlantis:
www.abvent.com

Got the World Twinmotion

Create visualisations and 3D immersion in real-time with Twinmotion 2015

It’s getting easier and easier to add lifelike effects to 3D models - as evidenced by the forthcoming release of the latest version of Twinmotion, developed after close association between the software developer and over 100 international architecture firms. Written for Windows OS and aimed at architects, urban planners and landscape designers, it changes the way designers interact with their models, and is compatible with every 3D modelling software solution currently available. Twinmotion 2015 is an ‘out-of-the-box’ solution that allows users to rapidly create high quality images and animations, and to compile and share 360 degree View panoramas with clients. The latest version includes hundreds of new materials, better dynamic reflections, real-life architectural colours and realistic skies, background images and even perspective correction. The days of sending out images to rendering farms for visualisations are just a hazy memory. Now, within a few seconds, projects can be incorporated into dynamic landscapes, allowing users to experiment and share designs and export images and videos in high quality - even, if you are so equipped, outputting stunning 3D videos.

TWINMOTION - THE GAME
Videogaming is second nature to today’s tech savvy software users, and Twinmotion takes advantage of that familiarity. Everything is easy and instantaneous in whatever 3D environment you choose, Twinmotion allowing users to interactively explore and share the atmosphere and spaces of their creations. Everything can be controlled in real-time, from the effects of wind, rain or clouds to the simple modelling of sites and 3D surfaces, adding trees and plants, or even the flow of vehicles or characters within the environment. Twinmotion even goes beyond the levels of interactivity that you would typically conceive of. You can sculpt a surface, change materials, modify sunshine by date and geographic coordinates, add a character or a crowd, or integrate a car or several lanes of vehicles on a road and draw their route. Alternatively you could add waves to the ocean, create a town square or a forest, modify the foliage of one tree or many, transform raindrops into snowflakes - and then view your project from all angles while walking, driving or even flying. You control the 3D environment in the same way that you might manipulate an ‘open world’ game environment, choosing how to move and the speed and mode of walking, driving or flying. The interface with chronological tabs continuously guides you through your immersive walkthrough, and the logic behind Twinmotion allows you to progress step-by-step in the construction of the scene. From perspective to orthographic views, you can observe your project from any angle, and for more precision access the Object manager and its advanced features to customise your workspace.

IMPORTING THE MODEL
Twinmotion imports many model types directly (FBX, DWG, DAE, SKP, C4D, LI3) and you can merge multiple Twinmotion projects in a single scene. You can also import images and videos to enhance your scenes. The scenes environment can be set up using a ‘slider’ system, with each choice visible in a preview window. Surfaces can be ‘flooded’ to enhance ocean colour, reflections and even the size and type of waves. A wide choice of materials are available, which can be adapted to day or night time, and are amenable to adjustments of their UV scale, opacity and halo effects, and illumination or brightness - with ‘ bump mapping’ applying relief effects for added realism. Illuminating the scene is easy, with a wide range of customisable light sources. IES users can also import their IES files.

POPULATING THE LANDSCAPE
Projects can be set in any desired - or imagined - location, as you can choose your terrain, trim the surface using push / pull to create hills and valleys, and ‘paint’ textures of rocks, sand or earth to enhance your landscapes. And then you can use the ‘brush’ tool to create a forest, choosing and adjusting tree species, sizes and densities. Vegetation is animated, 3D trees and blades of grass reacting to the wind and adapting to the seasons.
Various rocks and 3D models of green walls are also available. People and cars can also be added, defining their paths with Bezier curves with just a few clicks. Different types of animated characters - professional, casual, mixed - are also available, and you can adjust the number of traffic lanes, density and speed of cars.

LIGHTS, CAMERA - ACTION
Camera settings allow focal, vignetting and possibly lens deviations using the intuitive camera editor. You can also transform scenes using a filter (‘white model’, ‘Black & White’ or ‘Sketch’ etc.), customise them with the many options detailed above and then export the results in your optimal resolution. Video formats are MP4 and WMV (H.264) in stereo 3D video; images are PNG format.
Twinmotion is distributed and supported by Abvent, developers of Artlantis: www.abvent.com
DATE FOR YOUR DIARY
19th November 2015

www.constructioncomputingawards.co.uk

For more information please contact
Josh Boulton on: 01689 616 000
or email: josh.boulton@btc.co.uk
A truly Integrated Contract Financial and Operational Solution

RedSky IT’s Summit system is the only truly integrated, construction specific, enterprise solution for the UK and Middle East markets. Summit covers the complete process within a single product:

- Estimating & Tender Management
- Budgeting
- Planning
- Requisitions
- Procurement
- Plant Management
- Valuations
- CVR
- Job Costing Financials
- Payroll & HR
- Subcontractor Database & Management
- Housebuilding
- Service Management
- Mobile Solutions
- Document Management
- Dashboards
- Email Archiving
- Forms Control
- Workflow
- Approvals
- Alerting

Scalability
Whether you are a small growing subcontractor or a top 100 construction business, there is a Summit solution to suit you, and as you grow you can simply add modules and licenses as required.

IT Choice
Summit gives you freedom of choice to choose the appropriate technology for your business: Hosted or on premise Microsoft SQL/Oracle Database; Windows or Linux; Scalable thin client windows or web interface.

Pedigree
Over 1000 clients from your industry have chosen RedSky IT. These secure partnerships drive an unrivaled depth of functionality into our solutions.

Customer Driven Solutions
As authors of our solutions and not resellers of a 3rd party product, RedSky IT and our customers make the critical decisions regarding product direction and development.