



## Making a Consistent with the Inconsistent

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**BM5920-R** URS Ltd (an AECOM company) is a global, multidisciplinary firm; therefore, it could not take the approach of using a single process or standard to fit all. The aim of this round table is to illustrate how URS developed a structured approach within URS in order to deliver discipline processes and standards that have helped the firm to make better decisions regarding technology approaches, to drive consistency in the disciplines, and to decide how to enable global work-share capabilities as part of the corporate strategy.

### Learning Objectives

At the end of this class, you will be able to:

- Understand how to engage with your business at the senior level to develop standards and processes.
- Understand how to create standards for various disciplines
- Understand how to implement standards and processes within your business
- Understand the potentials of a consistent approach within your business

### About the Speakers

*Allan Brown is a Technical Director with the Technology and Data Solutions (T&DS) Group as part of global and multidiscipline URS Corporation. Allan is responsible for the consistency stream of T&DS, which has a primary focus of looking at how to consolidate and streamline how URS disciplines work through company processes and relating technologies in Europe, Middle East, and India.*

*Chris graduated from Plymouth University with a Bachelor's Degree in Civil Engineering and Computer Aided Design. Since then he has worked within several infrastructure engineering teams, settling in URS for the past 5+ years. In 2009 Chris started working on Civil 3D implementation plans primarily looking at the software setup for deployment. Since the start of 2013 Chris has been working as part of the URS Technology & Data Solutions Group (T&DS), in this role Chris has been engaging with the business to introduce new technology and adapt the way work is done through refined process and standards.*

## **Introduction**

This class will be based upon the current ways of working within the EMI (Europe, Middle East and India) region of URS, and does not reflect the current state of play within AECOM. That journey will hopefully be a class for 2015!!

We have noticed a trend that standards have been aligned with core technologies without looking beyond their integration with a business at a fundamental discipline level. These standards generally have not allowed for the nuances of different disciplines, and how they carry out their day to day work which in turn can impact on their adoption and implementation.

With a multi-disciplinary business such as URS having a series of generic standards based at a technology level was not deemed to be a sustainable solution to support the core fundamental ways of working. URS viewed consistency through their technology and process, to enable global work share capabilities while aiding in the adoption of BIM across the enterprise.

Over an 18 month period URS reviewed the legacy of previous corporate acquisitions and their associated standards and began to formulate a plan to support the development and implementation of standards and process at a grass roots level up to corporate level. The aim of this hand-out is to illustrate the journey that URS under took from March 2013 through to October 2014.

## **Aims from the Roundtable**

With a roundtable, the hope is to generate discussion and debate and, we hope that with you signing up to this roundtable you will be active in the discussions and feedback some of your own experiences. As a minimum, we hope we can get the following by the end of roundtable;

- What is your current state of play?
- What are your barriers to achieving successful implementation of standards and process?
- What has your business done to implement standards and process?

## **Legacy State of Play**

Like many of our peers, URS had pockets of excellence within its business that followed stream-lined ways of working and produced excellent high quality outputs. But, it was also noted through the acquisition process that some of the approaches had fallen out of synchronization with each other. With the advent of BIM and through its related process URS saw an opportunity to “reinvigorate” how work was approached in the very core of the business.

The following was identified within URS;

- Lack of governance around technology and process – High, mid-level, grass roots.
- Lack of cross discipline awareness
- Inconsistency of output
- Inconsistency of approach to technology and use
- Lack of consistent understanding of BIM
- Some silo working

The silo working was a key challenge for URS. Due to the lack of structure or governance around the disciplines each office approached projects in different ways. As a result, disciplines could be working in entirely different ways to produce the same output, this mean the outputs varied from different regions within the business.

Due to legacy acquisitions core aspects were also out of step which provided additional challenges to drive consistency within the business;

- Network working
- Naming conventions
- File management
- Different software being used to create same outputs
- Lack of consistent software
- Common licensing

In March 2013, through URS Group Managing Director for the Europe, Middle East and India (EMI) Region the Technology & Data Solutions (T&DS) Group was created.

T&DS were tasked to address some of the key challenges within the business and to consolidate and improve the way URS worked. A significant component was to look at standards and process. In April 2013, T&DS formulated a strategy to develop and implement standards into the business.

## The End Vision

When T&DS began to plan the implementation of standards and process it recognised that a clear vision was paramount, but also accepted that any approach had to be flexible and scalable. T&DS quickly discovered that having fixed objectives would not work for a company of URS' size, but adopted more of a philosophical approach to implementation and development of standards and process.

The overall aims were to create a;

- Mature BIM enabled and educated business
- Sustainable corporate governance structure
- Naturally collaborative environment
- Self-sustaining infrastructure with mature expert networks

These flexible goals allowed T&DS to easily adapt to the ever changing landscape of the construction industry and corporate structure.

## What are T&DS?

T&DS is operations based team, reporting to the Managing Director in the EMI region of URS. The team is based around 3 core areas;

- Consultancy
- Collaboration
- Consistency

The development of the standards and processes were to be driven through the Consistency stream of T&DS.

Early in the development some key factors were identified if the implementation of standards was to be a success;

- Strong governance – from all levels of the business
- Sector Leads – Technology & Process
- Technology Steering groups
- Discipline Steering groups
- Central location for all staff to access information
- Discipline buy in and development of standards & process

## **The Journey to Business Maturity – Technology & Process**

T&DS went back to the grass roots of how URS worked, effectively creating a baseline and looking forward without being anchored by the past. This helped T&DS approach full development of corporate standards strategy uninhibited.

T&DS took a top down approach for their implementation plan, understanding that simply pushing from the grass roots would not be sufficient. It was critical to ensure that all major disciplines were involved at the early stages of development while ensuring that any development of standards and process did not hinder current working within the business.

Technology and Process boards were created to be represented by a “Sector Lead” from each major discipline to ensure that disciplines were given sight into what their other colleagues were doing at both a strategic and implementation level to help reduce any “duplication” through adoption and implementation of BIM.

## **Creating the Structure – Governance**

Behind a successful implementation of change is a network of people at different hierarchies, spreading a consistent message.

From the very top of the business a Technology and Process Board (T&P) was defined with key director members who looked after the multiple disciplines within URS. This board would have a T&DS Director sitting alongside them to help support the leadership of the business with the challenges associated with technology and process.

Below the T&P Board sits the Sector Boards (for example the power sector board), at this level T&DS support the individual sector boards to strategically work with the other sectors to provide guidance and visibility of other sectors implementation plans around technology and processes.

Under each sector board sit the steering groups; these steering groups are split into 2 facets:

- Project Management (PM)

Responsible for discipline specific ways of working at project management level, this lies beyond technology (although still critical) but looks at how to best manage projects from day to day.

- Technical Delivery (TD)

Responsible for discipline specific ways of working around technology and process, this can include aspects related to discipline technology and software.

# TECHNOLOGY & PROCESS STRATEGY (EMI)

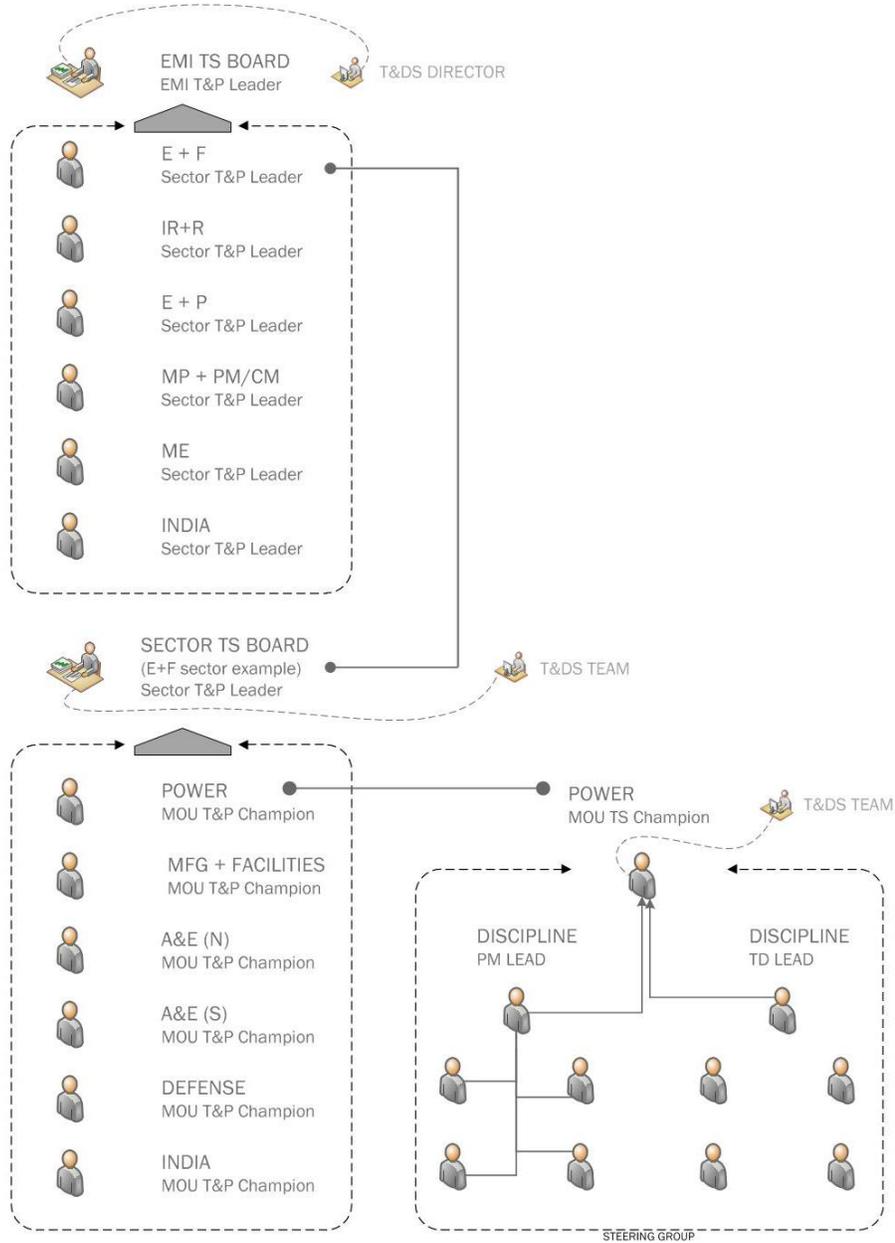
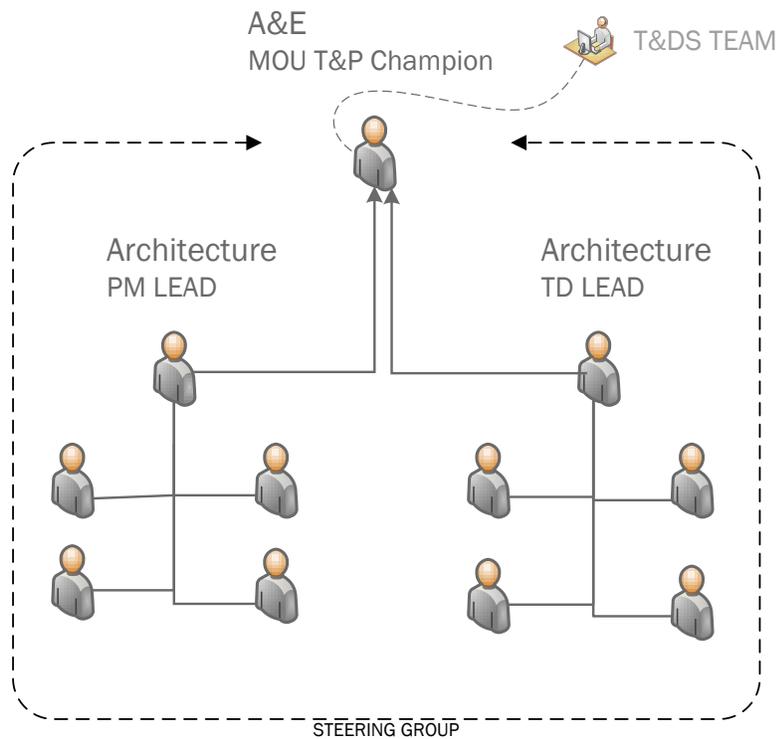


Figure 1 – URS Governance

### The Decision Making Process

The ability to make a decision is a critical component with the implementation of any process. This has to be fed across all the staff in a business to ensure buy-in is achieved. It is also important that ownership of decisions being made is driven from the top with the support from the grass roots “coal face” staff. As noted from above, working with the business, T&DS helped develop a corporate governance model to develop a decision making process.

For the benefit of this paper, we shall use an example of how the Figure 1 diagram would work.



These groups are focused on the grass roots day to day working of our disciplines (in this example, Architecture). This group is led by a Technology and Process champion from the respective sector board that sits above it. If any of this group have any challenges or issues that hinder development or adoption, this can be reported back from the steering group via T&DS to the Sector Champion, who can then affect a change within the business to remove barriers. This is pushed back down into the steering groups to remove the barrier that has been identified.

If there are issues that lie beyond the discipline and require a wider input from the business T&DS are able to push up to the sector boards, and if required, T&DS can move up into corporate board level to alleviate any blockers and push this back through the reporting structure.

## The BIM Playbook

With the governance agreed, T&DS had to look into how to make information easily available within the infrastructure that was in place (i.e. intranet, within the structure of corporate guidelines and communications) and ensure navigation was simple and effective.

During a visual strategy session hosted by Autodesk in May of 2013, the idea of creating a URS BIM Playbook was tabled. The principal behind the BIM Playbook was to help URS staff understand how to manage their BIM projects in a “follow the bouncing ball” approach to BIM implementation.

It was deemed that the URS BIM Playbook would be the conduit that staff would access these aspects;

- Educational – what is BIM, what did it mean to URS
- Technical – Support documentation to aid in the management of BIM Projects
- Standards – Portal to all standards and templates to be used by the business
- QA – Provide link into Quality Management Systems (QMS)
- Business Development – To support the BD community in response to client Pre-Quality Questionnaire around BIM related projects.
- Client facing – to illustrate business maturity in BIM

T&DS reviewed internal ways of working through the URS Project Control Procedures (PCP). Through research of where the BIM maturity laid within Europe & the UK, URS took industry recognised BIM support documentation (such as BIM Execution Plans & BIM Resource forms) and mapped the entire process back to the internal process. T&DS were able to illustrate at each decision gate of a project what should happen in a BIM project compared to the internal process. This process would later be adopted into the URS Quality Management System (QMS).



The primary objective was to create a clean interface with easily digestible elements to help both technical and non-technical staff understand what BIM is and how it might affect their project.

With the completed BIM Maturity research T&DS looked to align with the industry recognised PAS 1192-2:2013 project stages. Industry discipline groups like Royal Institute of British Architects (RIBA) have already aligned with this project. It was also felt looking

beyond the UK that other disciplines from other countries would be able to map their respective project or client stages back to the BIM Playbook in the context of an overlay driven at discipline level (**see more information in “The Standards – Infrastructure and Development” section**)

The BIM Playbook was launched via the URS internal intranet site via a T&DS desktop icon providing a quick and easy route of navigation for the end user. The BIM Playbook was presented as an HTML based

site to again, aid in navigation and to simply generate interest and bring people into the process of BIM.

Through a series of simple links to supporting documents (either educational or technical) URS were able to establish a basic approach to BIM management and illustrate the base line deliverables of BIM for URS. Educating staff of what to expect on BIM projects and help inform them how to respond accordingly.

## PRE-BRIEF

**What to expect:** At this stage, URS would expect its design teams to have a basic understanding of what BIM means to their discipline and be familiar with the basic language around BIM and around BIM deliverables. This may run from a Pre-Qualification Questionnaire (PQQ) stage through to project hand-over. Knowledge and education are deemed critical at this stage for URS' staff.



- 🔗 BIM 101
- 🔗 What is Building Information Modelling
- 🔗 BIM Maturity in URS
- 🔗 About the Discipline Process (Tier 1 - 3)
- 🔗 Overview of Collaborative BIM Environments
- 🔗 Understanding Employers Information Requirements

## BRIEF

**What to expect:** At this stage of the brief, the performance benchmarks are set by the client and any site constraints are known. The project information set can now be generated to enable Stakeholders to make informed decisions.

URS may work with project stakeholders to undertake a review of the brief with the Client team identifying project objectives, aspirations, parameters and constraints which will begin to define how the project is approached.



- 🔗 The URS BIM Project Delivery Workflow
- 🔗 About the URS BIM Project Delivery Workflow
- 🔗 Learn more about Common Data Environment (CDE)
- 🔗 Common Data Environment Set Up Form
- 🔗 About Level of Detail (LOD)
- 🔗 Understanding Construction Operations Building Information Exchange (COBie)
- 🔗 Overview of Soft Landings (SL)
- 🔗 About the BIM Execution Plan (BEP)
- 🔗 Information Model & COBie Audit Check List

### URS BIM Project Delivery Workflow

Playbook Project Stages	00	01	02	03	04	05	06	07
Based on PAS1192-2	Pre-Brief	Brief	Concept	Design	Definition	Build & Commission	Handover & Close Out	Operation
Soft Landings		STAGE 1 Inception and briefing <small>Constructive dialogue between the design, operations and client</small>	STAGE 2 Design development & review <small>How the building will work from the point of view of the occupier and individual user</small>	STAGE 3 Pre-handover <small>Comments to operational priorities and systems before occupation</small>	STAGE 4 Initial aftercare <small>Continuing engagement by the client and URS team</small>	STAGE 5 Aftercare & POE <small>Post 1, 3, 5, 10 year after care</small>		
Level of Detail (LOD)		LOD 100	LOD 200	LOD 300	LOD 350	LOD 400	LOD 500	
Produced / Delivered by URS		Data Drop 1 COBie	Data Drop 2a COBie	Data Drop 3 COBie				
URS can either be involved or leading	BEP Development and Delivery Workshops	Performance Specs delivered	Supply Chain Engagement Workshops			Supply Chain Engagement Workshops		Asset Management Plan Workshops
Engaging with client and external parties	EIR Development and Delivery		Data Drop 2b COBie	Data Drop 3 COBie			Data Drop 4 COBie	Data Drop 5 COBie †

■ Denotes project delivery where URS will be involved    
 ■ Denotes project delivery by others, outwith URS remit    
 \* May vary dependant on discipline or client need  
● Denotes project stage where URS will be involved    
 ■ SL stages in line with BIM & URS workflow    
 † Not defined within industry

## The Standards – Infrastructure and Development

When challenged with the idea of creating standards for 5000+ people across the Europe, Middle East and India we knew the standard format was not going to be sufficient. Creating a standard for each of the technology solutions would mean duplication. Also, how does a team the size of T&DS create standards for potentially 50+ pieces of technology used by multiple disciplines? We now understood the challenge and created a solution in the form of Tiered Standards and Steering Groups.

With the mandate of the EMI Group Managing Director, T&DS identified 3 key values that under-pin everything that we do;

- Day to day working, managing data – agnostic of discipline
- Core technologies
- Discipline ways of working and technology

The idea of a “Tier” approach to standards and process was born from these fundamentals

<b>TIER 1</b> <b>URS CAD/GIS STANDARD</b>	<b>TIER 2</b> <b>URS SOFTWARE SPECIFIC STANDARDS</b>	<b>TIER 3</b> <b>URS DISCIPLINE PROCESSES AND STANDARDS</b>
<p>This is the over-arching standard that is non-software specific and defines the basis for all URS’ project documentation and data.</p> <p>Technology &amp; Data Solutions (T&amp;DS) Group and Sector developed.</p>	<p>This standard defines the basic approaches of how URS are to utilise the technologies that are available to the business in a structured manner.</p> <p>Sector and Region developed with support/guidance from T&amp;DS.</p>	<p>This standard defines how disciplines are to utilise not only how to use technologies to suit their needs, but the project processes for managing their projects.</p> <p>Sector and Region developed with support/guidance from T&amp;DS.</p>
<ul style="list-style-type: none"> <li>• Font Type/Heights</li> <li>• Title blocks</li> <li>• File and Folder Naming convention</li> </ul>	<ul style="list-style-type: none"> <li>• Referencing protocols</li> <li>• Drawing setup</li> <li>• Template Files</li> </ul>	<ul style="list-style-type: none"> <li>• Discipline specific project protocols</li> <li>• Discipline specific technology Standards (Unique blocks or workflows)</li> <li>• Interoperability workflows</li> <li>• Good Practice guides</li> </ul>

This Tiered system allows T&DS to easily add additional Technology or Discipline standards. This is because the core standard resides within the Tier 1 making the technology standards very light weight.

For the document creation, is not possible for T&DS to create every standard due to time and technical knowledge. In response to this challenge the Steering Groups were created to look after a specific technology or discipline. These steering groups would create the document content with guidance and support from T&DS, these standards are owned by the Steering Groups. The technology changes or an

element isn't working they are responsible for updating the standards and passing the changes on to T&DS. This means the experts are creating and managing the standards but there is instant buy-in from the key users around the business as it is their standard. T&DS act as the gate keepers, making sure all standards pass through the team prior to release. This allows T&DS to maintain a generally consistent approach across different platforms and disciplines but also makes sure that the branding and quality of documents is maintained.

### **Embedment of Standards at Grass Roots**

With standards being developed, T&DS looked at how best to embed the standards at grass roots level. One approach was the training of staff using new technology. T&DS worked with training vendors to develop bespoke training based around the URS standards and templates. An example of this was the development of bespoke URS Navisworks training.

The experience levels of Navisworks were still immature in URS and because of this, the creation of a steering group was a challenge. Instead T&DS engaged with Autodesk Consulting to have a Navisworks standard created. As a result of the engagement a suite of documents were created which covered general standards, folder structure and file protocols and interoperability guides to explain how to export to Navisworks from different BIM authoring tools. One of the first engagements was by a URS Infrastructure team based in Basingstoke requiring help with coordination on a new town project. They had been using Navisworks but without any training or structure.

T&DS collaborated with Autodesk Consulting to create a custom training course tailored around the recently completed standards. This training was received extremely well providing the team with the technology know how and a process to manage it. Since this training was carried out we have been working with a training vendor to build a bespoke Navisworks training course based on the Autodesk Consult template. Since the creation of this course we have had in the excess of 50 delegates. To take URS from a limited number of Navisworks users to in the excess of 50 all based upon the URS processes and templates was deemed a huge success and URS continue to develop training based on this blueprint.

The unique component to this was to gain an advantage ahead of the rest of the business using a technology where URS were previously immature and drive the process and management of the data from the front, as opposed to "playing catch up" with more established technologies within URS.

## Communications

One of the key factors when working on the implementation of aspects like BIM Playbook and the standards was communication. This could be two people talking at their respective desks or working with internal corporate communications to ensure that the message is as wide spread as possible and brought directly to people.

A series of communication approaches were taken internally within URS.

### Corporate Communications

T&DS established strong ties with URS' corporate communications team to ensure that they understood the drivers behind the strategy of Playbook and Standards. With the corporate communications teams onboard T&DS are easily able to produce communications into the wider business as far reaching as possible and most importantly, as transparent as possible.

### With Sector Leads

As noted in the **Creating the Structure – Governance** section, working with the Sector Leads was important to ensure they could report back into their respective business units with the changes and developments that were going on elsewhere within the business.

### With Discipline Boards

Internally, discipline board meetings are conducted at set intervals, during these meetings presentations are carried out to communicate what is happening in the business and to what level development has been made.

### Internal Communication Platform

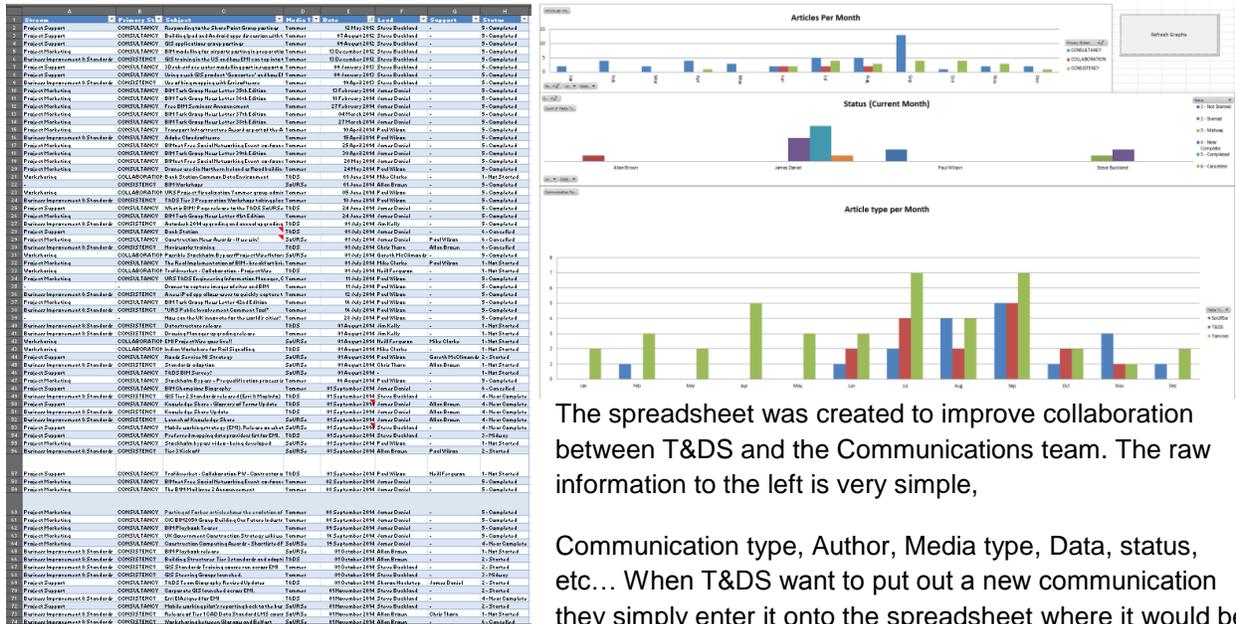


URS utilise the Yammer platform to connect URS staff globally. This platform hosted our technology and discipline Steering Groups for the development of our standards and processes. URS over the past 18 months have built up communities and Steering Groups in the major key disciplines. These range from Architectural, Structure, MEP, Civils (and related sub-disciplines) and continue to grow as the Tier system grows. Each of the steering groups is responsible for the development of the technology and discipline standards all managed by T&DS to ensure consistency is met.

The focus on the importance of communications in any business cannot be overestimated. If people do not understand what is happening or what your development plan is, getting buy in will continue to be a challenge. Being transparent and inclusive helped URS evolve their approach to standard development and implementation.

## Managing Communications

Understanding how critical the communications are with supporting the development and implementation of standards and process in a business, T&DS also managed how they internally communicated as a team and how they engaged with corporate communications. This was done through a simple communications spreadsheet that was reviewed bi-monthly to chase up where communications lay within the team. Internally T&DS would communicate with the business through all the avenues that was available and in line with corporate communication mandates. These include internal intranet site, Yammer (as noted above), T&DS home page. The management of these communications and understanding where the team were on their level of engagement with the business helped generate transparency and consistent communication with the business that would have lacked without simple management around communication.



The spreadsheet was created to improve collaboration between T&DS and the Communications team. The raw information to the left is very simple, Communication type, Author, Media type, Data, status, etc... When T&DS want to put out a new communication they simply enter it onto the spreadsheet where it would be

picked up in the bi-monthly review. The communications team can filter the sheet to find the exact information they need see who to contact about it. In true BIM style this raw data is processed into the more useful format shown on the right.

Communicating to staff is always a difficult balance; on one hand if you don't communicate enough, staff won't feel part of the process and won't buy-in to the plan, where as if you communicate too often, it will be viewed as spam. Using the spreadsheet T&DS are able actively and easily manage communications to make sure they are well spaced, informative and on the right media.

Media is the final important key; each story has an appropriate media to make sure the right information gets to the right people. T&DS created a philosophy around the different media types to ensure the correct people were reached with the right type of language:

- Yammer – The equivalent to a conversation in a social environment, telling an interesting story to a group of interested people. [Public/external articles up and coming events, etc...]

- Internal Intranet – More formal, the type of announcement you would expect to receive in a staff meeting. [Release of standards, awards, etc...]
- T&DS Homepage – This is akin to a staff notice board where the information is formal and needs to be accessible for a length of time. [T&DS Group Staff Bio's and contact details, links to useful pages like the Standards and Playbook]

### Branding

With the coming together of businesses through acquisitions, and with the aspirations that T&DS had with standards and process it was important to ensure that a clear “brand” was created to ensure that documents were;

- Easily identifiable
- Within context of corporate guidelines, but unique
- Consistent

By creating a brand with a unique look within URS guidelines staff over the course of 18 months began to understand where they were to come to look for all standards and processes for their discipline and technology. Staff were able to very quickly see if a document had been produced and approved at corporate level, or if the document that they were looking at had been produced in an unapproved manner. With the advent of Playbook and the Tier standard structure, it became easier to track the approved corporate standards and to ensure they were consistent across all disciplines.

The approach to branding should not be underestimated in establishing corporate governance for standards and processes. A unique “brand” helps promote the message that you are trying to convey to the wider business while establish a centre point for people to ask and be involved with any development.

### Conclusions

What was undertaken within URS was a level of change management around technology and process. It may be the cliché, but without top down support any implementation of standards and process will not succeed. But, it is crucial that the development and implementation of these are done looking beyond the actual content of the standard. Being mindful of where the standard or process is going, or who is actually going to use these will fundamentally shape the way that you development and implement anything that is developed.

URS learned a significant amount from going through this process, but if there is one thing that would be strongly recommended, it is take people on the journey on the development. Listen to what the end disciplines actually do in their day to day and mold everything you do around that. Once the basics are in place and adopted you can look toward maturing process and innovation all based upon a strong foundation of core principles.

Going forward, URS are going into a new frontier with our new AECOM colleagues, but as mentioned, that's a different class!