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WELCOME

Well what a year and it's all down to you and the support we are receiving for TDW!

We ended a fantastic 2017 with our best-ever conference - **TDW-Live#7** which has had overwhelming positive feedback. The introduction of the second supportability stream was a tremendous hit and will certainly be bigger and better for **TDW-Live#8**. My team is currently working frantically to edit the recordings of the presentations and making them available on TD-iQ - delegates and TD-iQ subscribers will be able to watch the presentations back at their leisure! I won't dwell on TDW-Live in my introduction as there is a full review and some photo's inside the magazine.

2017 was a year of tremendous growth for TDW - I started the year by telling my team we are building a community, a community of technical information specialists - that's our focus and this has paid us back in droves!

In 2017 I did notice a number of changing market dynamics, most of which I will talk about in some blogs and vlogs as these will be great content to share on our social channels. But to summarise I am seeing some attitude changes, these range from those questioning if innovative deployment methods (like AR and VR) will fit into their product deployments, to those looking to outsource their entire information production needs and allow specialist companies handle support information production.

As ever specifications and standards consumed a large amount of our time at TDW. Those who were questioning the how ,why and if, to those just needing to identify the tools to get on and just do it! We also released a number of new courses and tutorials via TD-iQ and have many more planned for 2018. I am also very keen to change the way that learning content is delivered. My focus for 2018 is to deliver material that is more engaging and less slides driven. There will of course be a need for slides for the more academic type topics, but they do not need to be dull, we will up our game at TDW on how this material is created and deployed - watch this space!

During 2017 we supported many organisations identify new technical publication service providers, specialist software support and interestingly the question of ASD S3000L came up multiple times. I believe that S3000L will gradually become a requirement for many projects in the future, again I will do some tutorials around these new standards and specifications during 2018 - so subscribe to all our feeds if you have not done so yet.

As ever the work we do at TDW is both enjoyable and tremendously satisfying but is only made possible by those that support the work we do.

From all of the vendors who are members of TDW, sponsor our events and support the production of this magazine. Without the support of these specialist vendors, our work



would be much harder to do, so a huge and personal thank you from me to all of you.

You will have noticed over the last few issues of this magazine, we have had regular specialist and expert contributors for articles. Again, this makes life so much easier for me and my team as well as making the magazine a much more interesting read for you. Thank you to all of you, I hope you will continue to support the magazine with your fantastic articles.

It would not be an end of year thank you message if I did not mention my team behind me, Claire, Lewis, Jamie and Marjan have all worked feverishly behind the scenes putting up with my 'ideas' and keeping up with my thought processes - the silent voices behind the curtains at TDW really enable me to be creative and deliver my voice to the community. I hope that 2018 will continue as 2017 ended, hard but very enjoyable work for all of us!

So what about 2018? Well at the end of 2016 I said we were stepping up a gear, this year is no different. 2017 we produced weekly blogs and fortnightly YouTube videos, squeezing in TD-iQ tutorials in between all of these - 2018 will see this stepped up even further. I have plenty of ideas for content, but also new ideas on subjects and focus points - so I will again be asking my team to join me on the journey in stepping up what we do and most importantly how we do it! Keep your eyes peeled, TDW will be making lots of noise in 2018.

2018 will start with a new event for us - **Innovation in Information** - we are running the first tester event at the BAWA Centre in Filton on the 18th January. The deliberate emphasis and focus is on playing with technology and speaking to the information specialists who know how it works as well as how it can benefit your projects. For those who can't make it we will be broadcasting to TD-iQ - not the same as being there and playing with the gear, but will give you an idea of what is available.

This just leaves me to say a whopping thank you to everyone who is liking what we do and how we do it! The genuine feedback we have had has been exceptional and from the bottom of my boots! Thank you and here is to 2018!



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COMPANY INFORMATION

Technical documentation world is a Limited company registered in the United Kingdom REG: 07304547. VAT Reg: GB 984842665

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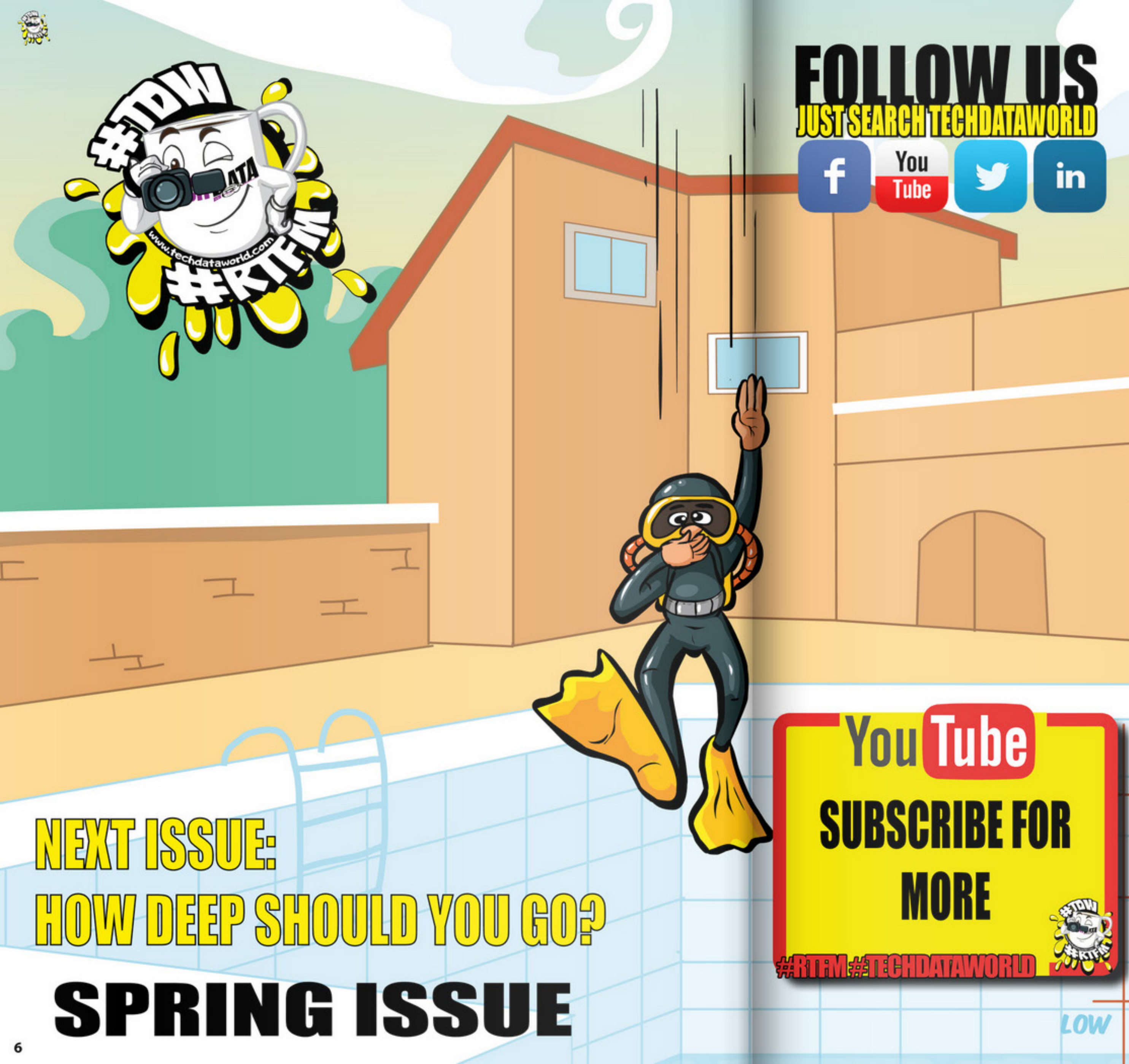
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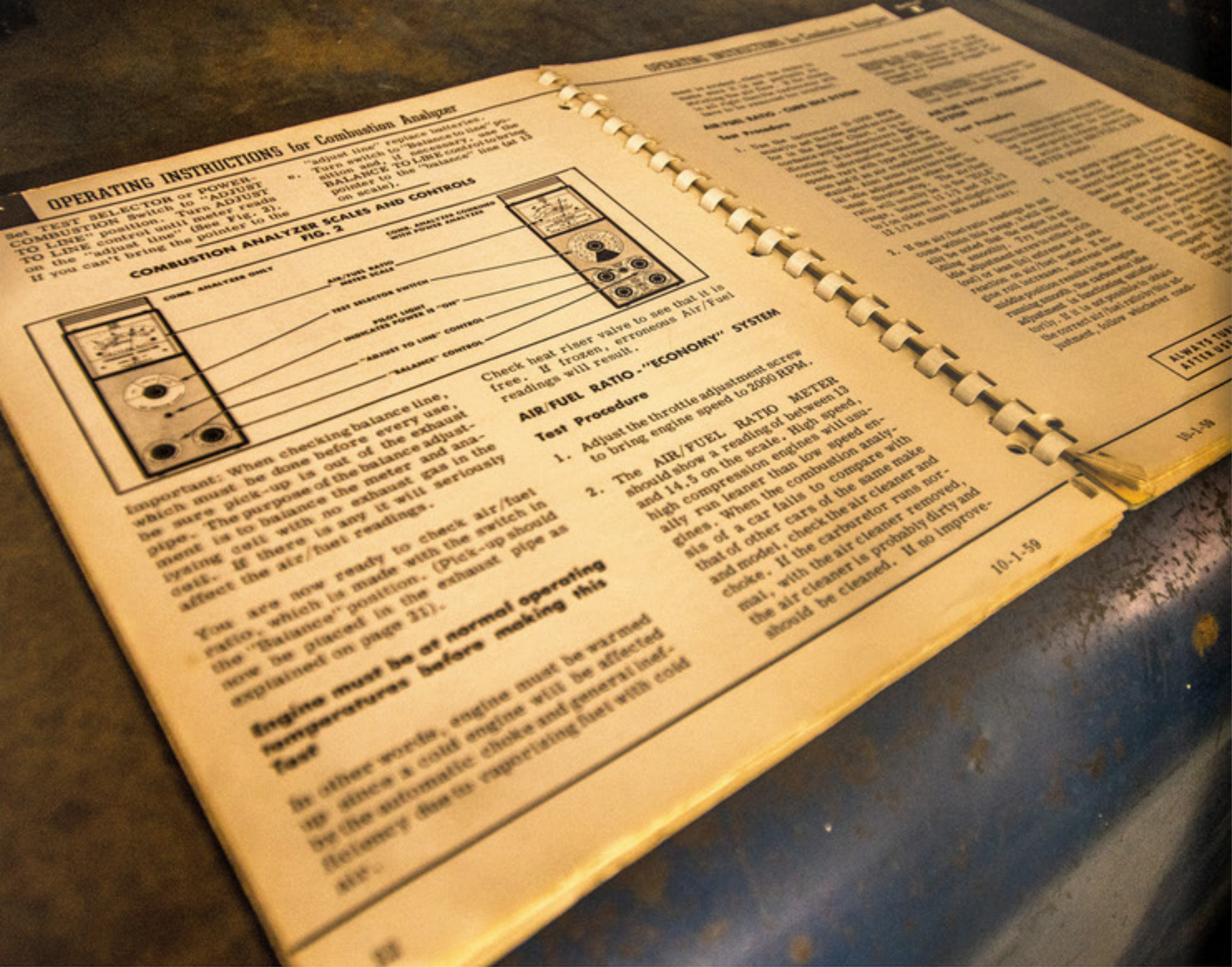
We may from time to time change the advertised content of a magazine to accommodate late submissions.



NEXT ISSUE: HOW DEEP SHOULD YOU GO?

SPRING ISSUE

LOW



PART 2: STATE OF TECHNICAL DOCUMENTATION NOW

JOUNI OJALA

CURRENT STATE OF TECHNICAL DOCUMENTATION

As an industry, technical documentation is in a state of flux, moving towards digitalization. The benefits and need for electronic publications and platforms is well understood in the technical documentation industry, just as the industry has identified the need and benefits

of industrial networks and networking devices. Changing from traditional publishing to digitalization is not effortless, the history and legacy content weighing heavily on the scale for the traditional publication side, which is due to the fact that in order to make traditional documentation more efficient to produce, it requires the reuse of existing material. The business model for traditional technical documentation

services is based on the need to update old information, where the documentation delivery or customization is done by making minimal changes to existing material, which means that the content needs metadata and content management systems to manage the reuse of the material. The issue with elaborate content management systems is that they limit the flexibility of the process and work methods, and these

specialized systems require a certain know-how especially if changes need to be made to the content.

The technical documentation business thus far has been mostly about creating service products that are easily quantifiable and creating unique information products as efficient as possible. Product information has been built top-down and the content has been refined where more detail is needed, meaning that the most complex concepts that need the most instructions are done last. Information has a semantic structure and is marked by metadata in the production and planning phases, but the resulting products have been refined to suit one use-case or purpose. Electronic and digital documents differ from the traditional media, by retaining the semantic structure and flexibility all throughout their life-cycle. This allows the information products to be built bottom-up, which is a lot more agile and allows more iteration and content creation for the most important concepts first. Retaining a semantic structure all the way to the end-user documentation also allows for lean processes and results in documentation that is based on true customer and end user needs.

INFORMATION MATURITY

The shift to digital publications sets new kinds of requirements for information maturity. The simplest production methods do not require any mark-up or metadata for the information. A simple text editor is a good enough tool for the job, but when anything more advanced

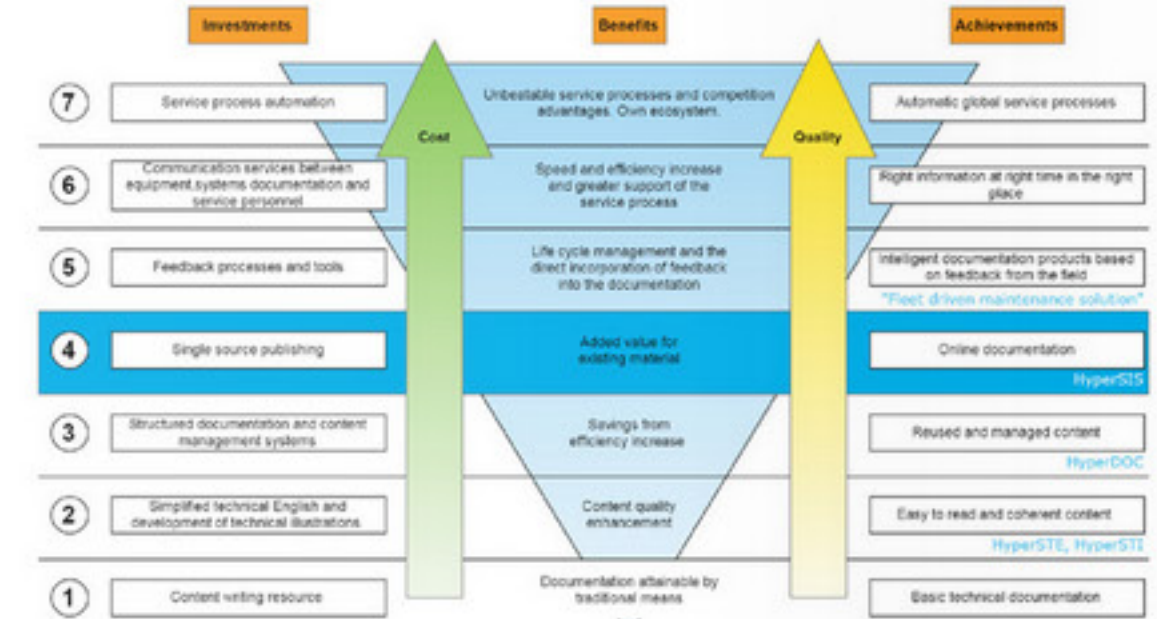


FIGURE 1 INFORMATION AND SYSTEM MATURITY MODEL (ETTEPLAN, 2015)

is needed than a simple Word document, metadata and information mark-up comes into play. Basically, this means that the information needs to be marked up on the paragraph level and documents and document components need to have metadata.

"METADATA IS DATA THAT DESCRIBES OTHER DATA. META IS A PREFIX THAT IN MOST INFORMATION TECHNOLOGY USAGES MEANS "AN UNDERLYING DEFINITION OR DESCRIPTION."



PART 3: FUTURE PROOFING TECHNICAL DOCUMENTATION



By maturing information considerable benefits and quality increases are achievable. The effect of maturity of information on technical documentation and field service processes is described in figure 1 below. Typical modern technical documentation is on level four, where simplified language, clear illustrations, and content management systems are used to make concise, digital and single source technical documentation.

Quite often the technical documentation maturity in companies is still on level one, which in many cases can be sufficient. Especially in project deliverables, where reuse of content doesn't create any real benefits. This of course doesn't mean that level two and three wouldn't bring benefits. Controlled language and more advanced illustrations bring cost savings in localization and considerable increases in usability of the documentation. Content or document management systems also bring obvious benefits and data security to any company. Level four results in more tangible benefits, as products

are changed iteratively and have options and variations that may need to be considered in the documentation. More massive production often also means international customers, which requires internationalization and localization of the content that will require more language versions and therefore more documentation. This requires more careful management, in order to keep the quality good across the board and the documentation process efficient.

But moving onward from maturity level four requires a new way of working. As already discussed before, the documentation can be built bottom-up, if sufficient technology is available. Level five is all about building the platform to facilitate a more precise control of information and the cross connection between processes, organizations and information.

PARTIES RESPONSIBLE FOR DOCUMENTATION

Often the product design and development organization is responsible for the technical documentation. This means

that technical documentation is seen as a part of the product delivery, and the responsible organization doesn't really care about the documentation after the product leaves the factory, which brings us to part 1 of this article. Warranty is void when the tail-lights disappear from sight, which obviously is not a good attitude with products that have a long life-cycle. Another issue that is related to organizational division is that the technical documentation organization is separated from the design organization and can't affect or get all the information that is available from the design organization.

When the customer receives the product the responsibility for its care is moved to the service and support organization, which is often incapable of affecting the quality and content of documentation as they are separate organizations within their company. This also means that the documentation may not support the work of the service and support organization and they therefore need to create their own documentation, which also affects the quality of the after-market documentation, as it's often not made by professional technical writers. Figure 2 describes the gap in information between organizations. The design and documentation converse between each other, but the organization responsible for the rest of the product life-cycle services is separated from the information providers.

The gulf of information that exists at the delivery separates the design and service organizations, but this can

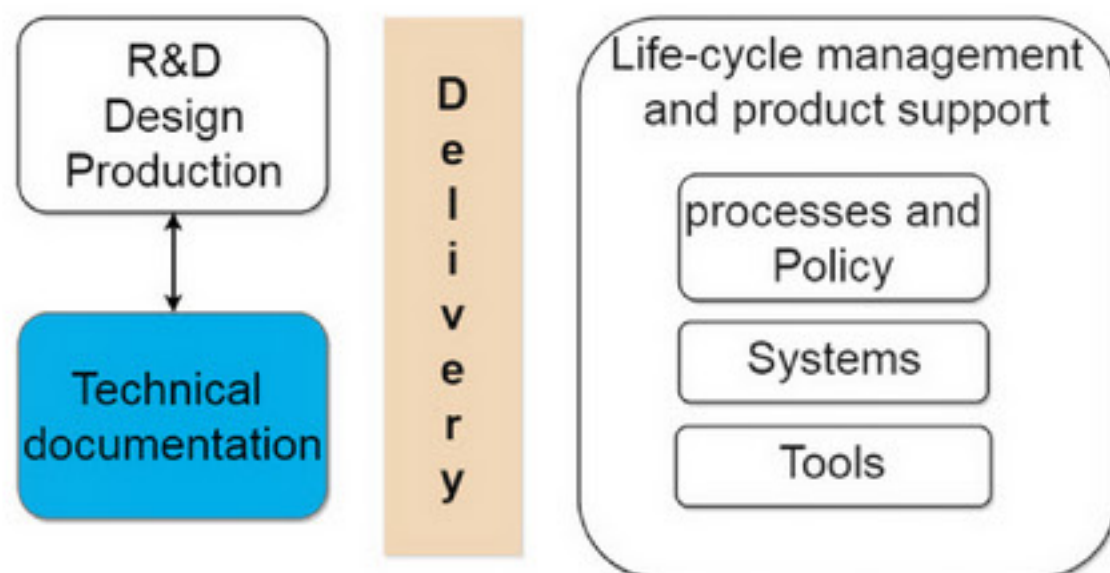


FIGURE 2 THE GULF OF INFORMATION BETWEEN ORGANIZATIONS



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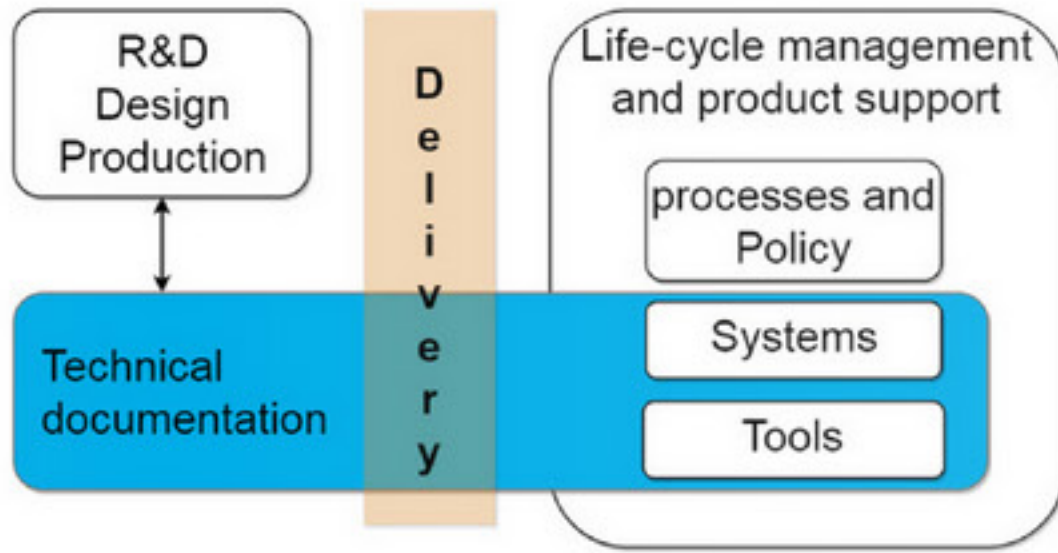


FIGURE 3 TECHNICAL DOCUMENTATION ORGANIZATION AND SYSTEMS CAN BRIDGE THE GULF OF INFORMATION BETWEEN ORGANIZATIONS

be bridged by the technical documentation organization by giving them access to the after-market service tools and systems, as illustrated in figure 3. The after-market organization can still decide on their policies, systems and tools, but they need to provide information to the technical documentation organization, who in turn can integrate the lifecycle data from the field into their decision making process and documentation policies. This has additional benefits as the technical documentation organization can communicate the information to the design and development organization

and support them with information from the field. This also means that new kinds of communication channels and an ecosystem is created as everyone will start using the same tools and language, which in turn further helps the communication between different organizations. This kind of change in policy and thinking is crucial when organizations want to take the leap in the information maturity model to level five.

Creating this kind of collaboration is not easy and needs an open attitude, as walls between organizations

are made transparent and often the way of working in each organization needs to be brought closer to one another, as information becomes shared and changes in the source start affecting the end publications. But it should be noted that this also gives end users a direct feedback channel to the designers.

This kind of change has not been feasible before or even possible, but the quickly developing industrial networks and connected products make this possible. Cross organizational information systems and connected devices need better marked information and a lot more integrations, but this allows for automation of business processes as described in the upper levels of the information maturity model.

CHALLENGES

Often the first challenge is that the documentation has not been refined to maturity level three or four, but this is easy to overcome if there is an interest in the development of technical documentation. The content conversion and structuring by itself is simple, but if there is a lot of material to convert it will take time.

The more challenging parts are the integrations, defining a broad enough information model and of course the needed change in the organizational culture, as the thinking needs to change from a top-down design centred model into a bottom-up service centred model. The integration of systems and building a

service-friendly information model requires a broad perspective and understanding of how to combine several information sources and types into new semantic sets of connected information.

Technical documentation also needs to function in a more service-centred manner and provide information to service needs. Information needed during the product life-cycle is a lot more fragmented than the top-down architecture in the design and product oriented model. The information that service organizations use is often based on definite needs and more focused on providing a service. The content requirements can be very narrow and detailed and there is a big difference in the users, cases and environments when comparing to product instruction manuals.

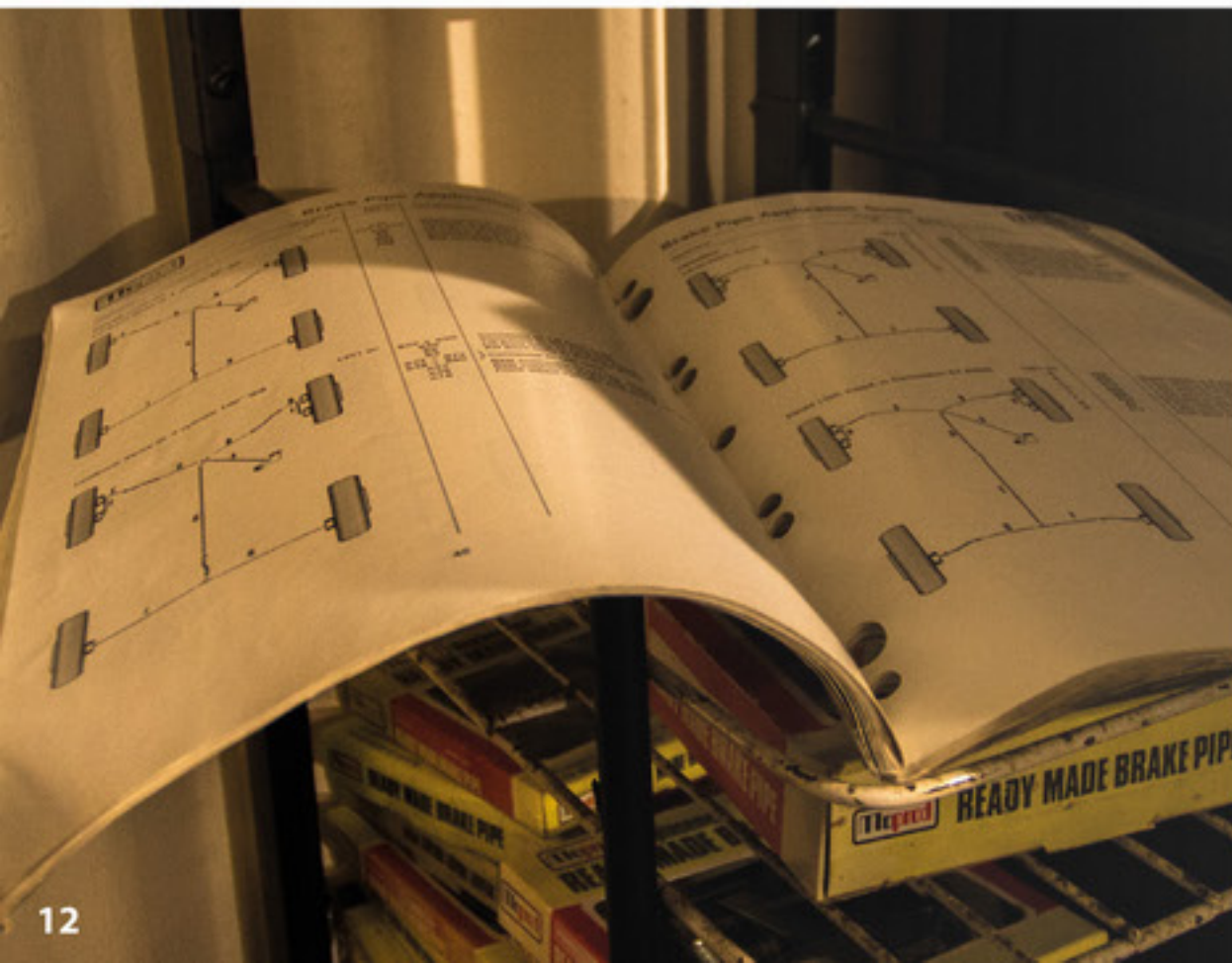
Electronic publications address the fragmented information needs of the service organization, since the level of detail and the display method can be tailored for each case. Electronic publications also give timely access to the right information, which lowers the cognitive load as already familiar information can be filtered out. Information can be made available where needed and the work flow can be controlled by systems. By supporting the service organization directly, the technical documentation organization can also get in-depth information from the field, which they might not hear at all otherwise. This information then also serves as an excellent base for other

types of documentation, like training material, assembly or operational information.

PROBLEMS AND POSSIBILITIES

Future potential benefits of technical documentation are based on automated business processes, where the information is made semantic and is connected. The automation of the publication and distribution of technical documentation requires better control and management of product information from the start all the way to end of the life-cycle. At the same time, technical documentation stops being a static product as it changes during the product life-cycle. The possibilities of automation also grow along with the developing information networks and new system integrations, but automation also sets new requirements for data.

Extensive integrations require a functional and robust information model that can handle the change requirements during a product's life-cycle. This new information model also means that using old data can be challenging, as it uses different standards or is missing metadata, which then often needs to be created manually. This means that information models need to be well thought through and implemented as early as possible, to avoid manual rework of old information, but if you create a solid information model it will last and take you all the way up to the top level of the information maturity model.





TDWLIVE

Three days in November under dark and dreary clouds saw TDW host the 7th TDW-Live event, the annual event that has now become the go to event for those focused on delivering support information on complex projects in aerospace and defence.

both industry technical information professionals as well as those representing various projects within the UK Ministry of Defence.

This years event attracted almost 150 delegates over the three days and with a fantastic mix of

Again split over three days with each day boasting some exceptional presentations from leading experts in their field.

The introduction of a specific and specialist



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supportability track proved popular and attracted many new delegates to the event this year.

Day 1 (traditionally known as the workshop day) was opened by Peter Stuttard of Aspire - who introduced the principles of ILS Processes, the why and how of the wider ILS topics. As ever an enthusiastic and passionate presentation on ILS and where Peter believes ILS is failing and must be improved.

Following the opening session Michael Ingledew of TDW decided to challenge the role of technical publications on a real project. The challenge Michael set himself was to look at how technical publications and the costs has directly impacted on through life maintenance costs of a real-life platform.

Taking a look at the British Military Lynx platform, which is currently being retired, Michael gathered metrics and assumptions to show how good, bad and indifferent attitudes to technical publications has a material affect on maintenance hours over 40+ years of in-service equipments.

To demystify the art of augmented reality was the session that Wendy Farrell from Lionbridge presented. The genesis of this presentation came as a direct result of the study (with TDW and Lionbridge) into augmented reality in aerospace and defence where a key finding was the confusion of how and where augmented reality could sit



within a project or organisation.

The sessions on day one closed with a series of one-on-one meetings with delegates to discuss their technical publication problems as well as those who were brave enough to try the vendors capabilities in the room.

Day 2 (now known as the practitioners day) attracts many technical information specialists who need to keep abreast of developments in information production and deployment.

Opening the day was James Whitehouse from Meggitt who is responsible for technical publications production and deployment within the wider corporation. James presented on the challenges facing Meggitt around consolidation and the path they chose in selecting new tool and service providers.

The sessions then broke into two main tracks - a supportability track was hosted by Aspire consulting where topics looking at everything from costing the complex through to data analytics were presented. The addition of this new track was exceptionally well received by the delegates and

Magnus Nordling from Flatiorns-Jouve showed how a change in focus can deliver stronger and better returns!



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many suggestions for new topics were made by those attending,

Track One - the technical publications track, kicked off with a **Use Case for Augmented Reality** in aerospace and defence technical publications - looking at three possible use cases around augmented reality with examples of the 'how' of use! During the presentation Michael Ingledew listed some of the key findings of the study into aerospace and defence attitude toward augmented reality, which lead nicely in to the updates in augmented reality from Wendy Farrell of Lionbridge. Lionbridge has supported the TDWLIVE event for the last four years and each year Wendy has given an excellent update on trends and technology in this innovative field.

Moving on to Flatirons-Jouve and how they believe that a slight change in focus from production to delivery of information can deliver far more returns than focusing on just production gains. Magnus Nordling demonstrated how Flatirons-Jouve is pushing forward traditional IETP solutions and incorporating information into lens technology and user assistance.

How to use ILS data in technical publications has always been a struggle for many projects so up stepped Andreas Pinter from HiCo and showed how the HiCo ILS suite has answered this very challenge.

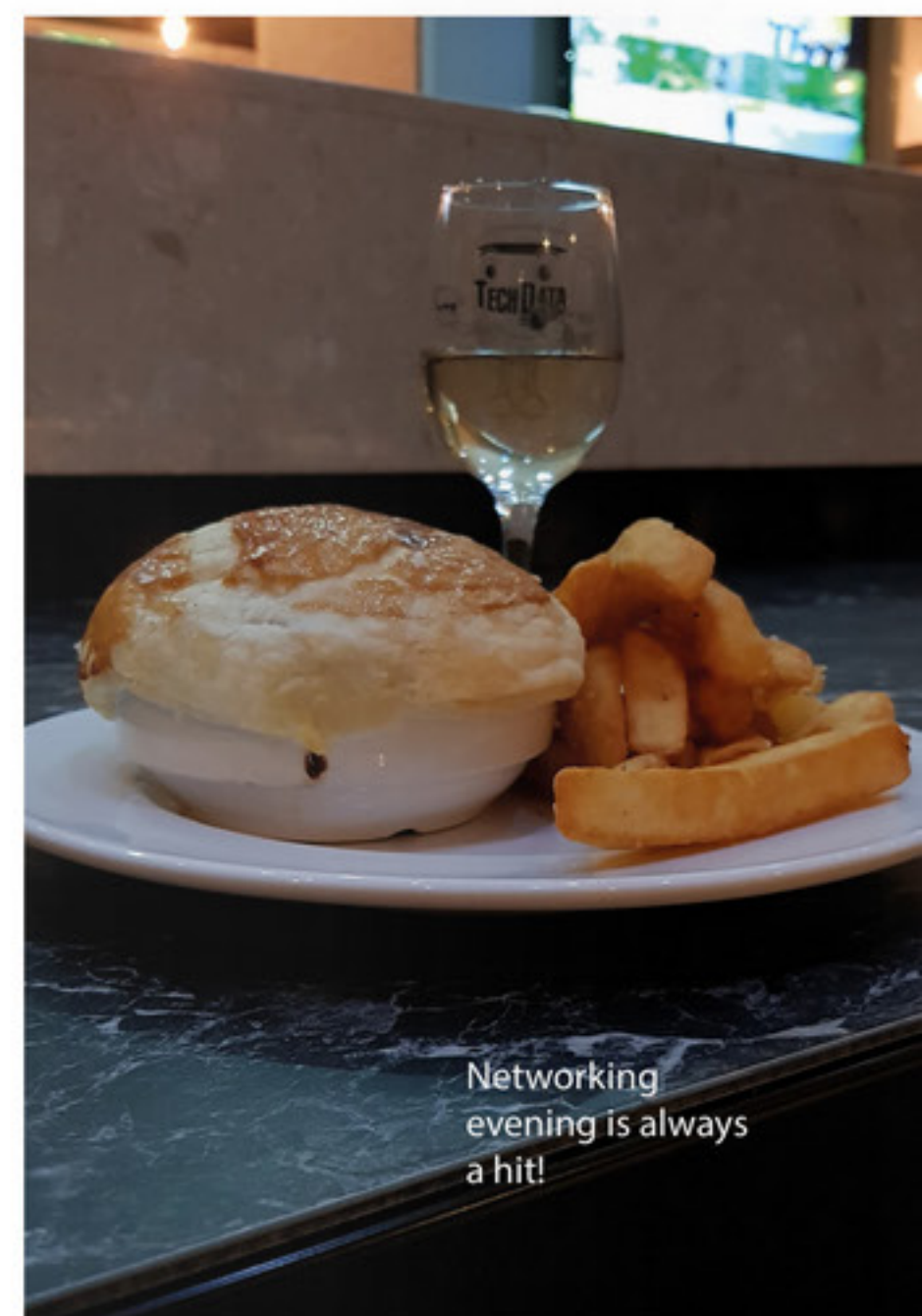
Simplified Technical English and how it relates to augmented reality based textual instruction was presented by Berry Braster of Etteplan, demonstrating how clear written instruction can be used within a modern augmented world.

For those interested in the highly complex issue of successfully and efficiently creating and managing parts catalogues - David Ball of WebX Systems showed the solution! Creating parts information in an intuitive and efficient way using the WebX Systems Ultra tools saving many man-hours!

Michael Davis from SDL gave an excellent presentation on an issue that many projects and organisations face - the mixing and management of multiple versions of specifications like S1000D. Michael talked about how the US Navy solved this problem with the support of SDL experts.



David Ball



Networking evening is always a hit!



New to the event this year were Capgemini who not only showed some excellent capability with their augmented reality implementations but also their approach to Service Excellence through digital transformation.

The last presentation the day fell to BAE Systems and Paul Stevens. Paul presented on how BAE Systems had approached the challenge of publishing export controlled data in an affordable way using Adobe's FrameMaker capability and existing know-how they had in-house.

The evening of Day Two is where delegates and vendors come together and enjoy what has now become the established Pie 'n' Pint networking evening. After a long day of learning, understanding and idea sharing, further discussion is had in the bar area over a traditional British pie and a pint where delegates get to take home their keep-sake beer or wine glass.

Day three is now the day that focuses purely on the UK defence sector and the needs of the defence community around technical publication contracting and production.

Topics covered included updates on policy advice and guidance as well as updates from Tech Defence Information (formally UKCeB), Boeing Defence.



DID YOU MISS TDW-LIVE AND WANT TO WATCH THE RECORDINGS? CONTACT US AT TDW FOR MORE INFORMATION

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IT'S NOT WHAT YOU DO, BUT THE WAY THAT YOU DO IT.....

SUPPORT ENGINEERING A PROCESS APPROACH

of what the "Ideal State" would look like, and where we are starting from, the system "Baseline", both in this diagram represented by the Total System.

Once you adopt this mind set then the importance of understanding the start and end points, and I hope the concept of the Total System, become clear.

To illustrate, we need to understand that the solution that should be delivered by a Technical Documentation programme is not a set of Technical Publications. What we need to deliver to the Front Line Commands [FLCs] is a system, a system that ensures that the right technical information is delivered to the users, when and where they need it. 'Right' in this context means the right content, in the right format on the right media (Tablet, PC, Paper?). Moreover, this system must be flexible, it has to work in a variety of circumstances, for training, on combat operations, in desert and Arctic conditions. Such a system must be agile, it may be in in-service for five, ten or twenty years, it must therefore be able to capitalise on emerging new technologies, it has to be able to react to changing operational environments, changes to military organisations, changes to the military infrastructure (communications, IT etc) etc. The system must of course be primed with an initial, high calibre, set of Technical Publications.

Inevitably, such an understanding of the "PRODUCT" of a Support Engineering programme leads to the understanding that the Support Engineering "PROCESS" is not only complex, but critical to success.

Now the fact that process is critical to success when developing a new system is hardly a new concept, the idea has been discussed since time immemorial.

Most readers will be familiar with the Henry Ford story, about how he transformed manufacturing processes, and improved the quality and lowered the price of early motor cars. Similarly, the Japanese led a quality revolution that has now swept around the world, the essence of the approach is that you cannot inspect in quality, you must modify the process so that quality defects are eliminated.

Originally applied to manufacturing, many of the concepts (Lean, Value Stream Analysis [VSA], Taguchi Techniques, Total Productive

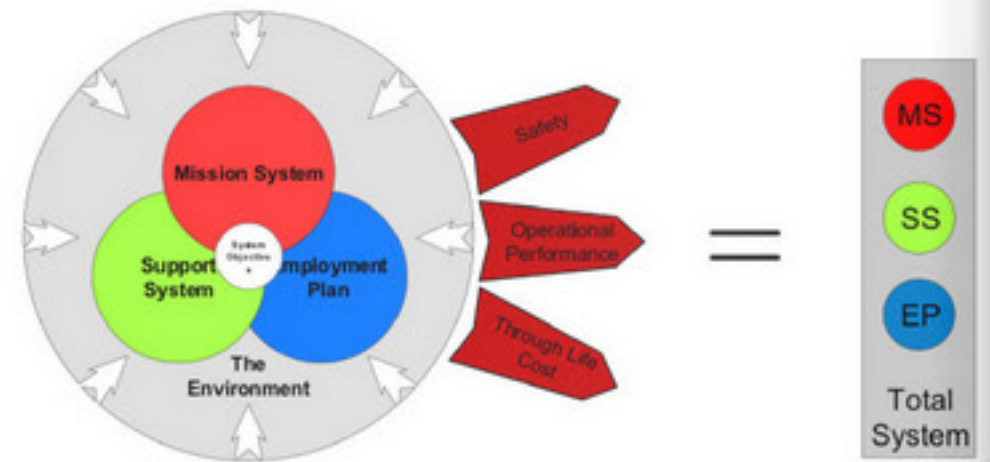
In recent years, particularly in the Defence sector, there has been a reaction against "PROCESS" and a focus on "OUTPUT", as in "output based contracting". The prime example in the world of Support Engineering has been in the number of "Contracting for Availability" and "Integrated Operating and Support" [IOS] contracts that have been let in the last decade or so.

This article argues that this is the wrong approach.

The title of this piece is "It's not what you do, but the way that you do it..."; now this is not quite true. When we are implementing a process, a complex process that is intended to deliver a complex capability such as a defence system and its support; then it is absolutely critical that we have an unambiguous goal in mind.

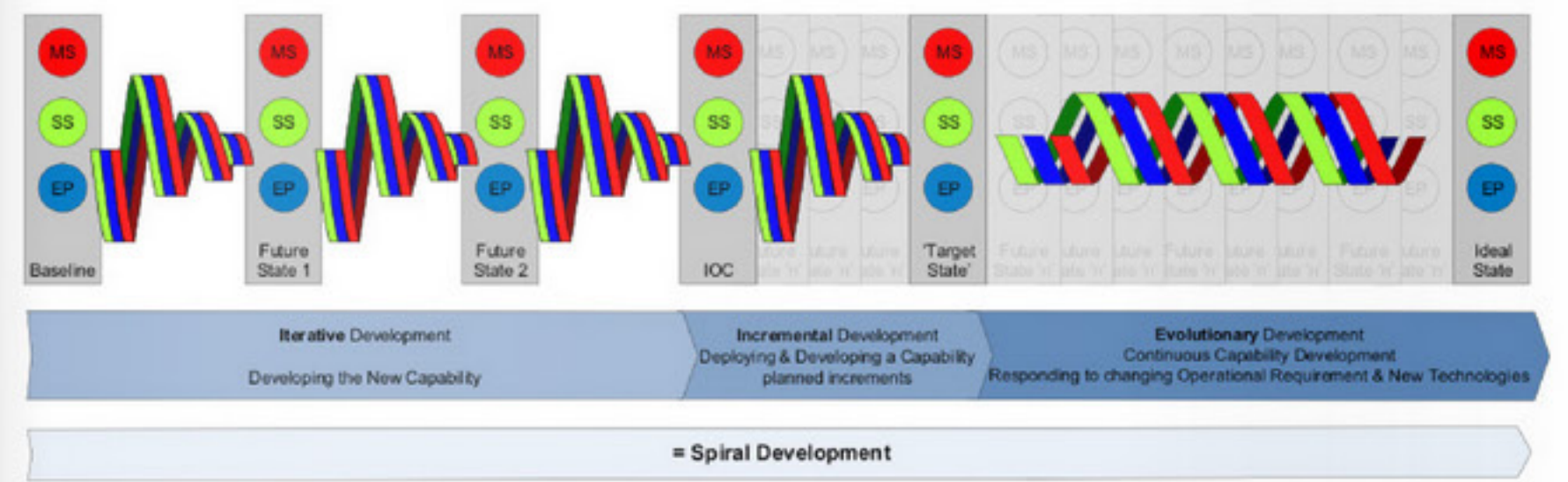
In the Defence context, the goal can be represented by the "Total System". The reasoning behind the concept of the Total System has been addressed in other articles and blogs etc, so suffice to say here that an

optimal Support Solution, (which includes amongst many other elements, an In-service Technical Publications solution), is comprised of the support aspects of the Mission System and the Employment Plan, and the Support System.



It is also vital that we have a profound understanding of where we are starting from; only then can we design and implement a truly effective process for getting from one, to the other.

In the context of the diagram above therefore we need to have a profound understanding





Maintenance [TPM], SC21, etc, etc) have been adapted and applied outside the manufacturing sector, to service industries such as hospitals, social services, etc .

QUALITY IS ACHIEVED BY IMPLEMENTING OPTIMAL PROCESSES.

In the field of Support Engineering however, process is significant for other reasons. It is simply not possible to judge the "Goodness" of many Support Engineering products, by inspecting them. Consider the typical technical publication or a set of training materials, how easy is it to judge if they are 'good', that they complement each other and the mission system design, that they take cognisance of the operational environment and the capabilities and aspirations of the end user? These facts cannot be ascertained without embarking on a very intensive, time consuming and expensive 'inspection' or 'testing' process?

Similarly, consider a piece of hardware, you cannot determine how reliable it is without conducting extensive, time consuming and very expensive testing.

In these circumstances, it is better to provide "assurance" that the "products" are of a high standard because they have been developed by the application of optimal processes. (If the process was the best possible, the results will be the best achievable).

This means of course that those processes must be designed not only to deliver an optimal product but so as to deliver appropriate evidence, suitable to support the governance process. A collection of such evidence, collectively, forming a "Support Case".

There is little doubt that the Support Engineering processes that are applied to day are flawed, the costs of some products and services are extraordinary, and the quality of many products and services is highly questionable. The evidence is readily available to anyone who follows the Defence sector in the press (worldwide, this is not just a UK problem) or to anyone who takes the time to

walk around an operational unit and to talk to the maintainers and suppliers, or to discuss support issues with the FLC Headquarters.

This gives us another reason for requiring the application of robust processes, and for having detailed visibility of those processes. That is, when the FLCs are funding a support product or a support service they need to understand; i) what they are paying, and ii) precisely what they are paying for.

This visibility needs to be at a level of granularity that allows the customer to question and to justify those costs.

Many years ago, the MoD, following the lead of the US DoD, instigated the principle of price marking, i.e. putting the price on the labels of all spares and consumables so that the users could question the cost when it seemed unreasonable. (There was a story of hammers being sold to the DOD at \$1,000 a piece which was supposed to have triggered this initiative – given that this was occurring in the mid to late '70s this was an outrageous abuse of trust).

The question today is more complex; how much are the FLCs paying for technical documentation today, for spares and spares management services, for repairs, for Support and Test Equipment, etc and is this acceptable? These costs are determined, to a large extent, by understanding the process by which such products are produced and acquired.

The next question we need to ask, is "what can we do about it", we need understand what the causes of poor performance are. Significant amounts of time and money have been expended preparing extensive Support Engineering standards and supporting publications over the last two or three decades. Some such standards get more detailed and more prescriptive with each iteration, but the situation seems (in the authors opinion) to be getting worse, not better, possibly (again in the authors opinion) because there is an increasing level of reluctance to implement such standards accompanied by, (generally – there are exceptions), a limited, narrow, understanding of what Support Engineering is, and what its true potential is.



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There is also a cogent argument, (to be addressed in a future article) that extant commercial practice constrains innovation (and sometimes simple common sense), and iterative, systems engineering, development processes in particular; all of which are essential ingredients of a successful Support Engineering programme.

So, my argument would seem to be that we need organisations to apply rigorous, optimal processes, but we shouldn't enforce detailed standards because that won't work!

SO WHAT IS THE ANSWER?

There are two 'Specifications' published by the SAE, that provide the right blue print I believe; they address Reliability Centred Maintenance [RCM], a complex process in its own right that aims to deliver optimal maintenance schedules. The first of these documents, JA 1011, defines the fundamental principles of RCM. JA 1011 was written because a lot of organisations are implementing processes that they are claiming to be RCM, but which do not conform to the fundamental principles that make RCM, RCM. If a programme does not conform to the principles outlined in JA 1011 it cannot claim to be an RCM programme. Note that these principles are based on sound engineering arguments, it is not the 'opinion' of the SAE. The second specification, JA 1012, merely expands on the first, providing explanations and examples etc.

This approach, the expounding of principles, supported by an explanatory text or texts, seems to me to be the key, this is how we should address the shortcomings in Support Engineering, how we could ensure that effective process is applied. That those Support Engineering principles should incorporate Systems thinking and Systems Engineering principles, that they should require a coherent Support Engineering PROCESS that leads to a coherent Support PRODUCT (the Total System), that they require IT systems that facilitate that coherent process (and not vice versa) and enable the definition of the PRODUCT is axiomatic.

We need to move from a philosophy of "apply these standards" to "apply these best practices".

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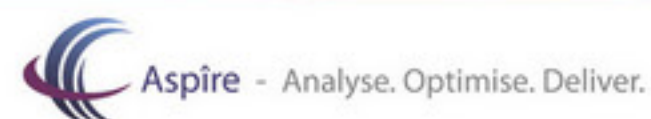
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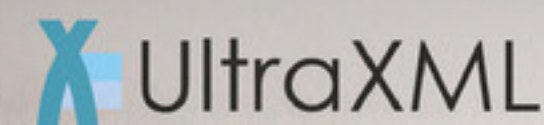
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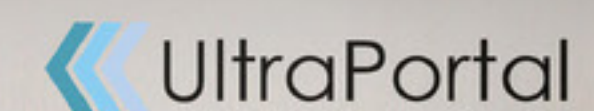
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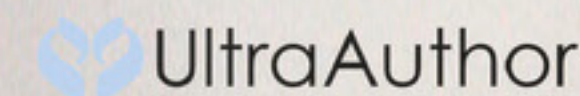
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IS INNOVATION ENABLING PROCESS BYPASS?

(Is TECHNOLOGY INNOVATION ENOUGH?)
MICHAEL INGLEDEW

Recently I was chatting to some old military chums and we were swinging the lantern and lamenting days gone by, how things were SO much better when we were [engineers] young! How the [maintenance] generation of today would never have survived for a single second in the maintenance environment in which we cut our teeth! The old adage of 'starting to sound like my dad' was never truer!

Our conversation mainly revolved around maintenance practices and how he was surprised at the lack of enforced process around a specific topic (more later, but stick with me!).

Anyone who has sat and shared a beer with me knows that I am that one person who likes to turn the conversation around to technical documentation - it's in my DNA, I just can't help it. I am lucky enough to have many friends who either are users of information or have to acquire information for platforms. So it has become almost a little inside joke that 'Ingledeew will start talking tech docs in a minute'.

But when I started to dig deeper, it really did get my tech pubs thought juices flowing, it may have been the beer but I had almost a eureka moment. I just said it - 'so we are missing a major point here!'

Our desire to have innovative ways of deploying information has indeed changed the way we need to approach key process issues.

This was further emphasised for me when I attended an event in the UK back in October.

I was listening in to the presentations whilst checking and responding to my emails and a number of times presenters discussed innovation, a subject key to my heart and one that immediately made my ears focus and tune in to what was being said.

“INNOVATION IS MUCH MORE THAN TECHNOLOGY INNOVATION” - “WE NEED TO THINK ABOUT PROCESS INNOVATION”

I stopped and thought about this for a moment, recalling my conversation with my old chum and the wider conversation we had recently had!

The presentation went on to discuss how process innovation delivers real returns and started to point at industry examples, Amazon, Argos (UK based retailer) were two that resonated with me. The processes that these retailers have had to implement to maximise their infrastructure investment has been huge. From ordering on your phone to collection in store (Argos) within a few hours requires tremendously streamlined processes - these retailers do not wish to stock millions of items listed in their catalogues, but be able to move them around efficiently when requested by a customer and have it available in store within an allotted time almost like it



was always there and the customer is none the wiser of the processes that were triggered in the background.

This is when my connecting of the dots started - process bypass is an issue, technology has meant we have inadvertently enabled our users to do things that we were not expecting them to do.

Let me take you back in time, a time in the distant past when fly-by-wire was nothing but a pipe dream and everything on the helicopters was physically connected, locked and wired.

When working on these aircraft there is a strict process, a process called Tool Control - anything that happens to an aircraft from a maintenance perspective means that the aircraft is placed within this process.

From a high level process perspective, this means the aircraft is locked for work - entries in the log prevent the aircraft from being used inadvertently whilst there may be Foreign Objects (tools) in critical areas that would cause damage, harm or death if flown.

This got me thinking back to the good old days! Were we really any different? Did we look for new and innovative ways of doing things? The answer quickly was, of course we did.

The example I used during my TDW-Live presentation resonated with many in the audience.

The Gerber - an all in one multi-tool that sits nicely in a pouch on an engineers belt. This was the innovation of the day, pliers, snips, screwdrivers all in one tightly compacted device ready for use at any time! This enable us to quickly tidy up locking wire, re-seat loose lock-pins and so on during daily (flight) inspections, saving tremendous amounts of time and (log book) energy - a simple whip out of the Gerber, tighten the wire, no one was the wiser and the aircraft was ready for flight.

One problem - this was totally illegal, this was not the process, the process is there for a reason - to prevent FOD (Foreign Object Damage) and as I said, leading to accident or worse - this is why the process exists!

Yet as young engineers we had found a way to

bypass process and do what we thought was right - have the aircraft ready for work without interruption.

These Gerber tools were eventually banned and anyone who was caught using one was quickly knuckle-rapped and reminded of why the tool control process exists, FOD is serious.

Anyone who works in a workshop will see that there are FOD posters everywhere reminding you what to look out for and why it's important to clean up and remove FOD when found.

So after recalling this time of years gone by, I started to align what we did back then to how our engineers are equipped today.

Today we strive to adopt [technology] innovation, we try to deploy our information in ways that our users can access and use quickly and efficiently. The problem is that this introduces modern FOD issues (see poster to the right). The hardware we use introduces components that easily fall-off or fracture when not correctly handled. Items like keys from a keyboard, stylus pens, AR lenses and so on are all possible FOD candidates.

But what do we all have in our pockets that we never had when I was a young engineer? Mobile phones - the modern Gerber!

WHY HAS THE MOBILE PHONE BECOME THE MODERN GERBER?

It's not the way we deploy the information, it's the devices the information is on. They all have cameras and light sources (torches)! The desire to remain completely connected



(Facebook, Twitter, Instagram) and so on means we are never more than a few feet from our connected world.

How have these devices enabled process by pass?

Well lets look at a couple of real world examples -

ACCESS TO TECHNICAL PUBLICATIONS - some IETP's or workstations (by design) prevent the user from printing technical manuals - but a camera on a mobile device means that the users can take a photo of the workstation screen and take it

to the aircraft with them, this enabling process bypass - we now have uncontrolled copies of our information on unauthorised devices

LIGHT SOURCE - a vital tool in the box is a torch, often we just can't see enough detail on visual inspections to make a judgement, so we require a light source. Ordinarily this would mean tool control and the process I have previously outlined - slowing everything down, creating frustration. But alas no more! Almost all smart and mobile devices today have the very torches we need! A simple swipe down on the devices screen opens a world

of [uncontrolled] and time saving utilities that enables a user to bypass process.

ABOUT THIS?

was simple, they were banned, users who were caught using them were pulled over the carpet (a term used for putting in front of the boss!) and reminded, usually financially, that the action of using an illegal tool was not to be tolerated.

The affect of banning these tools obviously enforced process by fear but had an overall impact on aircraft downtime and availability - (this is a subject of another article I have written planned for publishing shortly and extracts key points from my presentation at TDW-Live#7).

Now realistically banning the use of mobile devices, tablets, laptops and so on would be counter intuitive - especially as we strive for mobile device adoption via our thirst to adopt deployment innovations.

As the way we continue to deliver innovative information that is only going to get more device dependent (Augmented and Mixed Reality are two examples) - we need to improve and amend our out-dated processes to enable our end users to maximise these new tools and capability available to them. Banning the Gerber is a draconian approach to a process problem that, with a little more thought, could have delivered real business and maintenance benefits.

THE ANSWER?

In this example the tool control process was being bypassed - a key and vital maintenance process designed to prevent damage, harm, death! The process needs to be inclusive of modern capability, if this means there are slots or tallies in toolboxes for mobile devices, then this could easily be achieved. If a user must register his or her mobile device in the maintenance office, then so be it and it now becomes a controlled tool checked at the end of the tool control process. With a little imagination the answer is not difficult!



"The task you would like me to fulfil is so difficult that I do not dare to refuse."

Ernest Starling

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ALL ABOUT BUSINESS RULES – HOW TO CREATE A BUSINESS RULES EXCHANGE (BREX)

PART - FOUR

DR MIKE DAY

BACKGROUND

In the previous articles, we have seen what the purpose of the BREX is. We have discussed how it can be used to (a) exchange business rules between partner companies, suppliers and customers, and (b) to automatically check that your S1000D data conforms to the specification (and through the layering) to your project business rules.

We also saw how the BREX fits into the automated checking process as shown in the diagram in Figure 1. We also discussed that you will probably want to extend the capabilities of the BREX to enable cross-system business rules checks and to provide better reporting and technical content checks. In this article, we will assume the BREX is being used in the quality assurance process as shown in Figure 1 and we will give basic instructions that will help you create your own BREX.

Information flow during the use of the project business rules

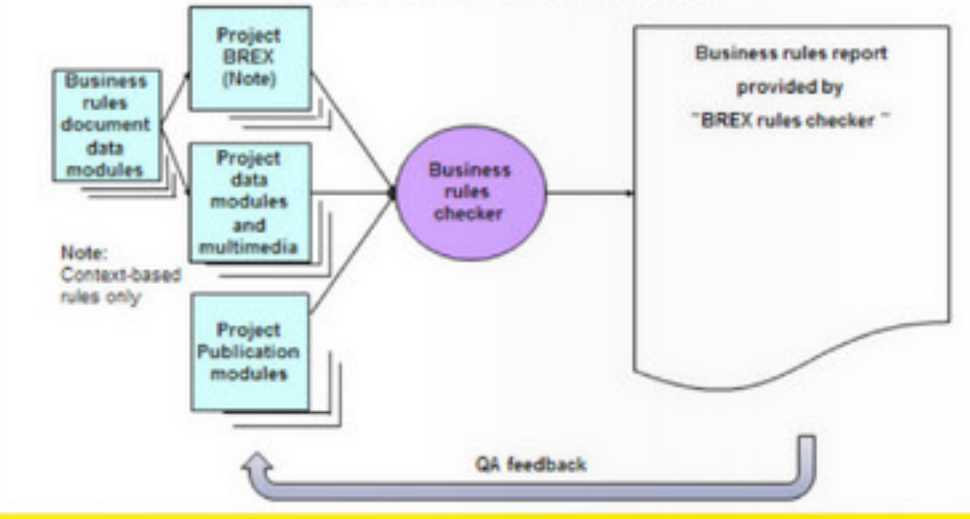


FIGURE 1 - THE ROLE OF THE BREX IN THE QUALITY CHECK PROCESS

WHAT SKILLS DO YOU NEED?

To create a BREX, you need to be armed with a knowledge of S1000D, XML, and in particular XPATH - a W3C XML standard that allows you to address groups or individual nodes in an XML

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document such as a data module, publication module or a data module list (for example).

Using a BREX in Older Projects

Business rules existed in S1000D long before the BREX was defined. Sometimes people think that they cannot use a BREX if they have SGML data, this is not true – You can convert SGML into XML on the fly for checking – which is fairly trivial and by doing this you can use a BREX for older S1000D data. Recall though that each data module contains a reference to the BREX that it conforms to and you don't have that with older versions of S1000D.

Configuration Control with the BREX Reference and Layers

While we're on the subject of the BREX reference – to me, it makes absolute sense to include the issue number of the BREX data module so that you know the issue number of the data module that the data module was written to when it was received into your CSDB. This is an indication that the data module may need updating should the business rules change and the BREX is up issued (which they do regularly especially for a young project).

The BREX reference in the S1000D default BREX points to itself and this indicates that it is at the top layer. The Standard Numbering System of the default BREX matches the chapter (4.10.3.1) where S1000D details the BREX. Project BREX that will reference the layer above until ultimately there will be a reference to an S1000D BREX.

The Structure of a BREX

The BREX is a data module and just like your procedural, descriptive and fault data modules it has an identification and status section that contains all the usual information like the data module code (BREX is identified by information code 022), issue number, issue date and so on. It uses the BREX Schema and its content section contains three sections – the SNS rules, the context rules, and the non-context rules.

The Issue 4.2 default BREX and new features

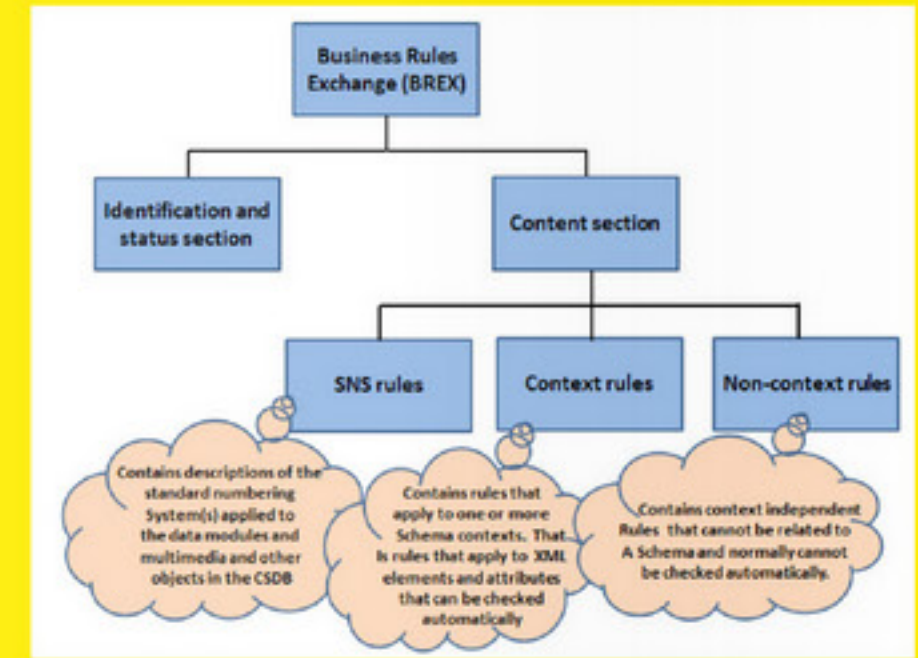


FIGURE 2 - THE STRUCTURE OF A BREX DATA MODULE (COMMON INFORMATION OMITTED)

At the top of the Issue 4.2 BREX you will see all the

changes that have been applied to the BREX over and above the one in Issue 4.1 in the reason for update section. These statements are very useful when you need to see the new features added for 4.2. In these additions are two very important new features. First, there is now the ability to add a unique identifier to the rules and the ability to reference other rules in the same or other BREX – a path that can lead right up to the business rules decision points in the specification. Second, there is now the ability to reference the business rule priority and the severity that we saw in our earlier articles – these are both project configurable attributes.

The BREX Blocks

Now let's look inside the BREX at its XML structure for the three blocks in Figure 2. Although there is the ability to add common information to the BREX like you can in other S1000D schemas, the meat of the BREX is in the sections SNS rules, the context rules and the non-context rules which must be entered in that order. The SNS rules define the Standard Numbering Systems that you are allowed to use for your project. The Context rules are the rules that can be checked automatically using XPATH and the non-context rules are the ones that cannot be checked automatically.

Context Rules

Let's start with the context rules. These are defined by the mark-up element <contextRules>

which in turn contain zero or more structure object rules <structureObjectRule> held within a group identified by the mark-up element <structureObjectRuleGroup>. Each group allows you to collect rules together for example for things that are common – the S1000D default BREX uses this to collect rules together for each schema type (dml, comment etc). It's probably good advice to follow these groupings for your project BREX, that is code your rules in the same order that the default BREX does – and you will get better traceability through the layers.

STRUCTURE OBJECT RULES

So what does a Structure Object Rule look like? We can see an example from the default BREX in Figure 3. Let's look in detail at this example. Notice that the default BREX in the @reasonForUpdateRefids attribute provides a reference to the Change Proposal Form (CPF) that introduced the change – if you have access to the S1000D Specring site you will be able to read about why this changed and there will also be a white paper giving more details.



FIGURE 3 - A STRUCTURE OBJECT RULE FROM THE DEFAULT BREX

Note that the common information section of the BREX also gives descriptive details of the changes made to the BREX at this version. On the 4.2 download there is an HTML version of the BREX and when you open that, you can click and follow this link to see this information.

BUSINESS RULES DECISION IDENTIFIERS

There is a new element in Issue 4.2 called <brDecisionRef>. When you look at Figure 3, you will notice that the attribute brDecisionIdentifier does not quote any S1000D business rules decision point numbers – if you think about this, the reason is that the default BREX rules are not based on decisions – they are things you must do. In a project BREX of course you will use this attribute to record the BRDP number from which you made the decision. This valuable new element will also provide you with a link from your project BREX back to the business rules document data module (BRDOC) where more

information will be provided. Next look at the <objectPath> element. This is the important one as it contains the XPATH statement that will be executed by your automated BREX rules checker. But first notice the attribute @allowedObjectFlag – this can take the value “0”, “1”, or “2”. “0” means not allowed – so if the statement given in the XPATH evaluates to “True” then what is found is not allowed. “1” means that it is allowed (must be followed or mandated) and “2” means that object is allowed but is optional ie it means “may be followed” and the project must decide when it is to be used or not at the next lower level of the BREX. If a higher level BREX has a value “2” and the next level project BREX turns it into a “0” then it is not allowed at any lower level. Equally a “2” becoming a “1” means it must be used. We need a gentle introduction to XPATH here. Good XPATH skills cannot be avoided if you want to write a powerful BREX and the reader should at least study the information on W3C Schools. Another good bit of advice is to try to understand what is written in the S1000D default BREX and learn what the XPATH statements are doing – you will be able to reuse these to specify further similar rules.

Let's start simple. For XPATH think of the XML data as being hierarchical, for example the <dmodule> element has children <identAndStatusSection> and <content> and <identAndStatusSection> contains <dmAddress> and <dmStatus> - although it can do more, start by thinking about XPATH as a way of addressing and counting elements or detecting that they are there or not. It can also detect values that elements and attributes have and can get quite complex.

Figure 4 - A simple rule expressed in XPATH

A project may decide not to use the optional element <techStandard>. In the example in Figure 4, the attribute objectAllowedFlag is set to “0” meaning “not allowed” and the XPATH statement “//techStandard” will evaluate to “True” if you find a <techStandard> element anywhere in the data module from the root element downwards. In this example, in the report, the message “Do not use the element <techStandard> for Tank data modules” will appear against the data modules in a set that contain the element. If the project had decided that the <techStandard> although optional in the Schema is mandated for the project, the rule would be exactly the same except

the attribute @allowedObjectFlag would be set to “1”.

It could be that the project wanted to use <techStandard> only in procedural data modules – and it could set @allowedObjectFlag to the value “2”; however, it would be more powerful if we actually checked that when the element is found, it is actually in a procedural data module. How then would we do that? One way is to use two <structureObjectRules> (as shown in Figure 5) one to say that it must be used in procedural data modules and another to say that it must not be used in non-procedural data modules.

In this example rule 12345 says if you find a <techStandard> element and a <procedure> element (which can only be found in a procedural schema) then return “True”. As the attribute @allowedObjectFlag is set to “1”, this means if you don't find a <techStandard> element in the procedural data module, display the error message given in the <objectUse> element. The second rule detects the use of the element in a non-procedural data module (by adding the operator “not”) and therefore if it is found and the data module is not procedural, then the error message is displayed.



FIGURE 5 - EXAMPLE: CHECKING THAT <TECHSTANDARD> IS ONLY USED IN PROCEDURAL DATA MODULES

In <objectUse> you can use the element <refs> to refer to a BRDOC data module and a referred fragment (eg a specific paragraph) and this could be a reference to your author's style guide, or your BR Index and one can see that it is possible for an automated business rules checker to then provide a hyperlink from the error message in its report through to where you can find much more information about the business rule. It could even refer to a non-S1000D document (eg Project Security rules etc).

BUSINESS RULES SEVERITY

Let's return to business rule severity. Firstly there shouldn't be any excuse for breaking business rules

provided the authoring environment is correctly set up. But it happens! When I receive data modules from a partner or supplier, do I really care if a <techStandard> element has been used in a descriptive data module? Well, maybe, but should I stop the data module being loaded to the CSDB? Probably not as it's one of those problems we could fix on the next issue. The CSDB system could present the list of BREX errors to the author when he or she checks out the data module next time.

Recall that severity means the effect of breaking the rule and that a value of “1” is quite severe (something that affects for example the technical content) and a value of “3” could be a minor issue. Therefore as the project has deemed the rule is a “fix next issue”, we can add a severity level of “3” as seen above with the value “brsl03” being set. Just to complete the picture on severity you will notice that the attribute is optional if it is not present then the rule inherits the default severity level. This is set by the attribute @defaultBrSeverityLevel on the <brex> element.

Checking that values are in a list of allowed values There are two ways that you can check that the value of an element or attribute is in a list of allowed values. First, just use XPATH. In the example in Figure 6 we are checking that the responsible partner company contains the NCAGE value of one of the four partners, and we are using XPATH to do this (in this example != means not equal to).



FIGURE 6 - EXAMPLE OF A RULE FOR RESPONSIBLE PARTNER COMPANY USING JUST XPATH

The second way is to use object value as shown in Figure 7. Here the allowed values are in a list of <objectValue> elements. What's the best method? One could argue that the earlier example is easier to translate into an XSL rule for a BREX checker to use. But it is also possible to transform the object values into XSL too.



Figure 7 - Example of a rule for responsible partner company using object values



VALUE TAILORING

The attribute @valueTailoring can take one of three values. The value "restrictable" this means that in a lower level project BREX, the sub-project may further restrict these values – for example, one company's BREX would restrict this to just their NCAGE code.

The value "lexical" which means that the text string between the tag start and end can be modified but not the value and the value "closed" means that no restriction of change can be done in the lower level BREX.

SPECIFYING RANGES OF VALUES

Next let's have a look at what else we can do with the attribute @valueAllowed. It can be used to specify a single value as we have seen above, it can also be used to specify a range of values or a pattern too.

In the example below we can see that the project has taken the default S1000D BREX rule for attribute @accessPointTypeValue which restricts the project to the values accpn151 thru accpn199,. You will see a start value and an end value in the range separated by the tilde ~ character. Converting this notation into XSL (for example) could represent a challenge.

```
<structureObjectRule reasonForUpdateRefds="CPF2015-005N1 CPF2014-009QBRTT.E" changeType="modify" changeMats="1">
  <DecisionRef toDecisionIdentifier="BREX-S1-00181" reasonForUpdateRefds="CPF2014-009QBRTT.E" changeType="add">
    <objectPath allowedObjectFlag="Z" @accessPointTypeValue</objectPath>
    <objectUse>Attribute accessPointTypeValue - Access point type (Chap 3.9.6.1, Table 2)</objectUse>
    <objectValue valueForm="single" valueAllowed="accpn01" valueTailoring="lexical">Access is a door</objectValue>
    <objectValue valueForm="single" valueAllowed="accpn02" valueTailoring="lexical">Access is a panel</objectValue>
    <objectValue valueForm="single" valueAllowed="accpn03" valueTailoring="lexical">Access is an electrical panel</objectValue>
    <objectValue valueForm="single" valueAllowed="accpn04" valueTailoring="lexical">Access is a hatch</objectValue>
    <objectValue valueForm="single" valueAllowed="accpn05" valueTailoring="lexical">Access is a fllet</objectValue>
    <!-- Values within range accpn01-accpn99 can be allocated and defined by projects or organizations -->
    <objectValue valueForm="range" valueAllowed="accpn01-accpn99" valueTailoring="restrictable"/>
  </DecisionRef>
</structureObjectRule>
```

FIGURE 8 - USING A RANGE OF VALUES

There is potentially a third way of checking that a value is in a list by storing the allowed values in a separate XML file and using the XSL function 'document', but this is not XPATH and may not work in your implementation. I'm not sure, but there could be equivalent XPATH functions. Using this method, you can for example, check that a part number is valid if you have a separate XML file containing all valid part numbers (extracted from your PLM BOM).

PATTERNS

As an example of the use of pattern is where a

project has part numbers that are say 10 characters long and start with the letters "JJ". In practice in a proper business rules checker we wouldn't check part numbers like this of course as we would likely look them up in a list of valid part numbers as we have just discussed. But let's go with this one to show how it works.

```
<structureObjectRule toSeverityLevel="3rdGT">
  <DecisionRef toDecisionIdentifier="TANK BR 1234T">
    <objectPath>
      <objectRef>
        <idCode modelIdentifier="TANK" systemOfCode="A" systemCode="00" subsystemCode="E" subSubsystemCode="0" assyCode="00">
          <disassyCode="00" disassyCodeVariant="A" infCode="004" infCodeVariant="A" itemLocationCode="D"></disCode>
          <asswble infCode="00" asswbleNumber="001"></asswble></idCode>
          <techName="TANK" techName="</techName> Business rules index</techName>
          </idCode></idRefAddressItems>
        </objectRef>
      </objectPath>
    </DecisionRef>
    <objectPath allowedObjectFlag="Z" @partNumber="JJ[0-9]{9}">TANK part numbers in the element </partNumber>, must start with the value "JJ" followed by 9 uppercase alphanumeric characters. </obj>
    </objectPath>
    <idCode modelIdentifier="TANK" systemOfCode="A" systemCode="00" subsystemCode="E" subSubsystemCode="0" assyCode="00">
      <disassyCode="00" disassyCodeVariant="A" infCode="004" infCodeVariant="A" itemLocationCode="D"></disCode>
      <asswble infCode="00" asswbleNumber="001"></asswble></idCode>
      <techName="TANK" techName="</techName> Business rules index</techName>
      </idCode></idRefAddressItems>
    </idCode>
    </obj></objUse>
    <objectValue valueForm="pattern" valueAllowed="JJ[A-Z0-9]{9}">
    </structureObjectRule>
```

Figure 9 - Checking values against patterns

The values in the @valueAllowed attribute above are effectively used to further restrict what the Schema says about the element (or attribute) and obviously you must take care when using patterns to make sure that you do not specify patterns that conflict with what the schema says. The patterns are expressed in regular expressions and if you have to write a BREX you should make yourself familiar with the syntax and I'd recommend again W3S Schools.

NON-CONTEXT RULES

```
<nonContextRule>
  <DecisionRef toDecisionIdentifier="TANK BR 2341T">
    <objectPath>All data modules must be approved by the Chief Service Engineer before they can be set to test verified and exchanged with partners.</objectPath>
  </DecisionRef>
  <DecisionRef toDecisionIdentifier="TANK BR 2341T">
    <objectPath>Record all data exchanges in the export control register.</objectPath>
  </DecisionRef>
</nonContextRule>
```

FIGURE 10 - NON CONTEXT RULE EXAMPLES

Non-context rules are rules that cannot be checked automatically using XML and hence they will have no XPATH statements to worry about. In fact the specification says that they are rules which cannot be related to any particular Schema or context, which is the same thing.

While one can understand why the non-context rules were in the BREX before BRDOC was invented, we have to question why they are now documented in two places – I suppose the role of the BREX is becoming solely for automated checking and BRDOC will be for documentation. One thing is for sure, if they weren't in BREX, the BREX would not be a complete list of rules.

The <nonContextRules> element announces the start of this block. It contains one or more <nonContextRule> elements beneath it each with one rule specified and the structure very similar to the <structureObjectRule> except that there are no <objectPath> or <objectUse> elements, these are replaced by a <simplePara>. The non-context rules are typically self-explanatory and you can see some examples above.

SNS RULES

To complete our technical article on the construction of a BREX, we need to look at the standard numbering system (SNS) block. Although we are discussing it last, it appears at the top of the BREX before the context rules. The SNS rules are designed to allow the exchange of the numbers and technical names of the system, sub-system, sub-sub-system between organisations. There can be more than one set of SNS defined in a single BREX and this could be for example, the airframe data and the aerospace ground equipment data, or the bike data, the lights and the brakes.

The SNS rules block starts with the element <snsRules> which in turn has an SNS description element called <snsDescr> for each set of SNS rules represented in the BREX. At first glance, it looks like the SNS rules can be used to exchange the complete breakdowns for the project from system to sub-system to sub-sub-system to assembly code to disassembly code and its variant; if it did, it would be far more useful as then it could be used to check that data module technical names match the standard numbering system. The restriction that the <snsRules> go as far as the sub-sub-system and no further is intentional – it is meant to provide the choice made by the project on the equipment breakdown based on the fact that S1000D in Chapter 8 provides the first three levels. Is it possible to check the technical names used in the data modules matches its SNS? The answer is yes (by using context rules and structureObjectRules) but not in an elegant way and there remains no standard way of exchanging the complete SNS down to the disassembly codes and the technical names.

```
<snsRules>
  <snsDescr>
    <snsSystem>
      <snsCode>72</snsCode>
      <snsTitle>Engine</snsTitle>
      <snsSubSystem>
        <snsCode>3</snsCode>
        <snsTitle>Compressor Section</snsTitle>
        <snsSubSubSystem>
          <snsCode>1</snsCode>
          <snsTitle>Low Pressure Compressor</snsTitle>
        </snsSubSubSystem>
        <snsSubSubSystem>
          <snsCode>1</snsCode>
          <snsTitle>High Pressure Compressor</snsTitle>
        </snsSubSubSystem>
      </snsSubSystem>
    </snsSystem>
  </snsDescr>
</snsRules>
```

Figure 11 - Some SNS rules

TESTING YOUR BREX

When you have a BREX, test it so that you are sure it works. Most off the shelf S1000D systems will allow you to import it. But it's not difficult to create your own BREX checker if you are proficient in XSL-T.

When testing, create data modules that you know should pass and some that you know should fail. Document the rules (use the rule identifiers) in a list and add pass/fail results for each test. If you have implemented the layered BREX check that the layers are working and the rules are overridden and specialised as required.

WHAT'S COMING NEXT?

This concludes our technical description of how to create a BREX. In the final business rules article we will look at the business rules document (BRDOC) and provide guidance on how to create one.



THE SHIPDEX PROTOCOL

The shipping community is facing the big challenges of the Internet of Things and Big Data management. These challenges introduce the need to produce and manage a huge amount of data on-board and ashore.

It is a significant step ahead into the standardization of technical information inside the shipping community where concepts and methodologies like "Logistic Support Analysis" (LSA) are not yet implemented.

Indeed, Shipdex is currently the only effective solution to build, manage, exchange and use well-structured and standardized information (in mandatory XML structures) that can be imported automatically into the technical documentation repositories (under the name of Shipdex Common Source Data Base – CSDB) and into any IT system

Taking advantage of this huge amount of data requires a different way of thinking: how data is built and used, how much of it we can handle, how fast we can process and analyse it, and where and how decisions are made.

The Shipdex Protocol (www.shipdex.org) is the perfect solution to dramatically simplify how to produce, manage, exchange and use huge amounts of equipments technical data that is currently coming from different sources, in different formats and often with a different quality.

Shipdex gives a way to produce technical data in an electronic and standardized format.

Shipdex is a "simplified" customization for the shipping community of the well-known S1000D specification (www.s1000d.org) developed by:

- ASD (Aerospace and Defence Industries Association of Europe)
- AIA (Aerospace Industries Association of America)
- ATA (Air Transport Association e-business program)

This means that Shipdex implements a sub-set of features defined into the S1000D specification to exchange technical information in a neutral and standardized format.



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databases.

All the technical information developed and provided in Shipdex format has the same internal electronic structure regardless who is the maker and what is the equipment.

In addition, Shipdex is the most effective solution to create CMMS databases (with equipment's configurations, maintenance plans, catalogues information, etc.) importing automatically the data, as provided by manufacturers, without errors and in minutes instead of a time consuming and error prone data retyping.

Shipdex is not just a chance to simplify and automate business processes; it is a step change in capability that provides unprecedented opportunities in business integration and customer connection.

WHEN AND WHO DEVELOPED SHIPDEX?

In early 2007 many ship-owners were building a number of new vessels and they were concerned about the manufacturers technical manuals that were provided in paper format (sometimes just photocopies) or, in the best case, PDF format.

All those ships were equipped with a Computerized Maintenance Management System (CMMS) to optimize and manage the day-by-day maintenance and spare parts processes on-board every unit.

At that time, the CMMS databases were created manually, retyping all the technical information



MARCO VATTERONI

A former Italian Navy officer. He served for 7 years as software programmer.

Then he worked for some Italian software houses.

More recent experiences:

- 2002-2006 Italian Fincantieri shipyard (Navy Division): program manager in CBTs and S1000D technical publications projects for Italian and German Navies.
- 2006-2016 SpecTec Group (Shipping market) (www.spectec.net): ILS and Shipdex manager. In 2007 he developed the Shipdex protocol, based on his experience with S1000D
- he acts as technical manager inside the non-profit Shipdex organization since the beginning on 2007.
- Special observer member in S1000D and S5000F Steering Committee

He is the founder and director of the Shipdex Consulting Ltd (www.shipdexconsulting.com) created in July 2016.

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website: www.shipdexconsulting.com



electronic technical publications management

provided in paper or PDF manuals. It was an "antiquated" procedure that required months to be completed and, obviously, the resulting databases were not very reliable. For example, retyping thousands of spare parts numbers was a long, boring and often error prone activity.

Those ship-owners were unhappy to build their databases in such an outdated way, so they looked for a solution: a protocol allowing to produce, manage, exchange and re-use standardized electronic technical information.

The idea to develop the Shipdex protocol (SHIP DATA

Shipdex is currently the only effective solution to build, manage, exchange and use well-structured and standardized information

EXCHANGE) was born.

Some preliminary meetings were held to create the first Shipdex organization that was composed of the so called "Founder Members", a group of important manufacturers, ship-owners and an IT company:

Alfa Laval, MAN Diesel & turbo, Yanmar, Grimaldi Group, Intership Navigation, MacGREGOR and

is assisted by **Shipdex Protocol Maintenance Group (SPMG)** composed, at least, by a representative of each Executive Member plus "joined members" selected by SPSC.



The SPMG is in charge to maintain and update the Shipdex Protocol.

In order to comply with its engagements the SPMG can be assisted by specific Shipdex Protocol Task Groups (SPTG-xxx) composed, on a volunteer basis, by representatives of SPSC and SPMG.

SpecTec Group

This group decided to base the Shipdex protocol on the established S1000D specification, selecting the information sets deemed necessary to the maritime community. The first "usable" Shipdex 1.1 issue was released on 20th April 2009 and was based on the S1000D 2.3 issue, the latest issue of S1000D available at that time.

TODAYS SHIPDEX ORGANIZATION

The "Shipdex Executive Members" group has been recently created and it has replaced the former "Founder Members group".

It is composed of some of the members which were original "Founder Members" or Members that have contributed actively to the design, construction and diffusion of the Shipdex protocol.



The Executive Members have set up the **Shipdex Protocol Steering Committee (SPSC)** composed of a representative from each Executive Member.

The SPSC is in charge to govern the Shipdex organization.

In order to comply with its engagements the SPSC



Figure 1 - Shipdex Organization chart

TECHNICAL INTRODUCTION TO SHIPDEX

THE SHIPDEX DATA ORGANIZATION

Shipdex protocol is currently at issue 3.1, released on 20th November 2017.

The first and very important concept to understand is that Shipdex is a way to produce standardized electronic information that can be used for different purposes. The technical manual is just an output that can be created at a later stage just putting together selected Shipdex information already produced and stored into the so-called "Shipdex Common Source Data Base (CSDB)".

The information covered by Shipdex 3.1 is collected into the following "information sets".

- Description and operation
- Maintenance procedure
- Troubleshooting
- Illustrated parts data (spare parts, support



- equipment and supply catalogues)
- Service Bulletin/Letter
- Maintenance Planning

THE SHIPDEX DATASET

A Shipdex dataset is the collection of all the information related to a specific system/equipment in a given configuration as designed by the manufacturer. This information is produced in a modular form, called Data Module (in XML format), that is defined as the “smallest self-contained information unit within a Shipdex dataset”.

There are very few rules defining the granularity of information and how many data modules should be included into a dataset:

- One data module for every single maintenance task
- One data module for every catalogue illustration
- No mandatory rules for Descriptive, Operational, Trouble-shooting and Maintenance Planning information

The modularization concept allows you to re-use single data modules for different purposes and for different data sets. For instance, a data module showing the General Warnings can be re-used in different datasets for different equipment without any data duplication.

That means saving time and money in producing Shipdex datasets and, mostly, in updating them. Every data module can refer (link):

- any other data module, to create a kind of net (i.e. a maintenance task can link a spare parts catalogue or a descriptive data module or another maintenance task, etc.)
- any other technical publication in Shipdex format
- information objects (illustrations, drawings, multimedia contents)
- external documents (PDF or MS Office formats)

Figure 2 shows a simple product break-down with all the data modules related to every physical

component.

MAIN BENEFITS USING SHIPDEX DATA

FOR MANUFACTURERS

Shipdex is a different way of thinking how to build technical information. Manufacturers must focus the attention on the product they want to describe and on the information they want to exchange with customers. The main goal is not the technical manual but the set of information related to the product.

The best effort must be concentrated to analyse the product, defining which information must be produced and how to modularize it to allow the highest level of re-usability that also means to avoid data duplication.

Shipdex data is produced in accordance with mandatory and fully S1000D compliant XML schemas; this means that software interfaces can be developed to automatically transfer data from corporate IT systems, as Product Lifecycle Management” (PLM) or engineering systems, into Shipdex data modules. These interfaces allow you to re-use existing and reliable information, to save time/money in producing Shipdex datasets and to assure a full coherence between engineering and Shipdex data.

The Shipdex data production process is always managed under Quality Assurance, as every data module must be approved by a QA checker and have assigned an issue date and an issue number before the official release.

Shipdex information, collected into a corporate CSDB, can be retrieved, selected and exported to produce, based on customer requirements, the following types of output:

- Shipdex datasets
- Technical manuals in PDF format
- Interactive Electronic Technical Publications (IETPs)
- Computer Based Trainings (CBTs)

Shipdex data modules are produced in XML format and contain information only: “data

separated from layout” concept.

To give a layout to a Shipdex data module/dataset an electronic “Style Sheet” is required. Every manufacturer can create their own style-sheet library to have multiple “customized” layouts to be applied to the same Shipdex datasets to fill specific customer requirements.

Changes to already delivered Shipdex data can be released using Service Bulletin/Service Letter in Shipdex format, in accordance with Shipdex standard rules.

Shortly: higher data quality at lower cost

FOR CUSTOMERS

Today, customers are receiving technical manuals from different manufacturers in different:

- Structure and composition
- Electronic format (or just in paper)
- Layout

Shipdex allows customers to receive all the technical information in a standardized electronic format (Shipdex dataset) or in a packaged manual (PDF or IETP) with a specific layout based on the preferred style sheet.

Software interfaces can be developed to import Shipdex information into corporate IT systems as Enterprise Resource Planning (ERP) or Computerized Maintenance Management Systems (CMMS) reducing the time and the cost to create those databases.

In addition, customers can create their own corporate CSDB to archive all the Shipdex information coming from different manufacturers for different products. All this information can be retrieved to check which technical information is already available in the company and to which equipment installed on which ship this information is applicable.

Manufacturers Service Bulletin/Service Letter in Shipdex format can be used to automatically update the CSDB and ERP or CMMS databases avoiding the risk to use not updated information (i.e. obsolete spare parts).

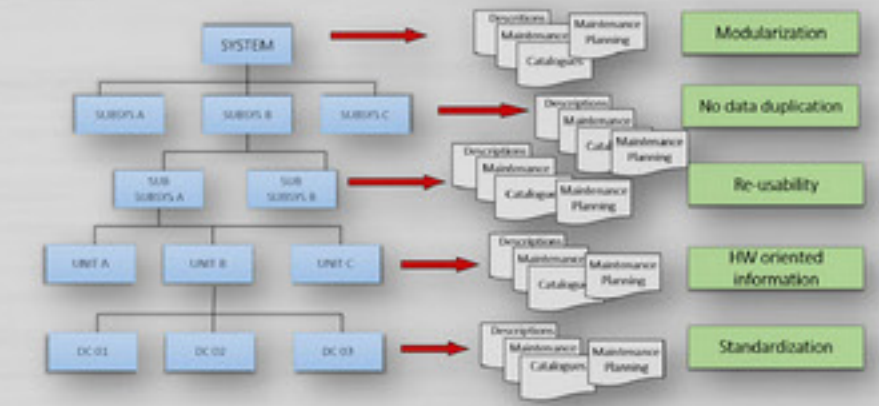


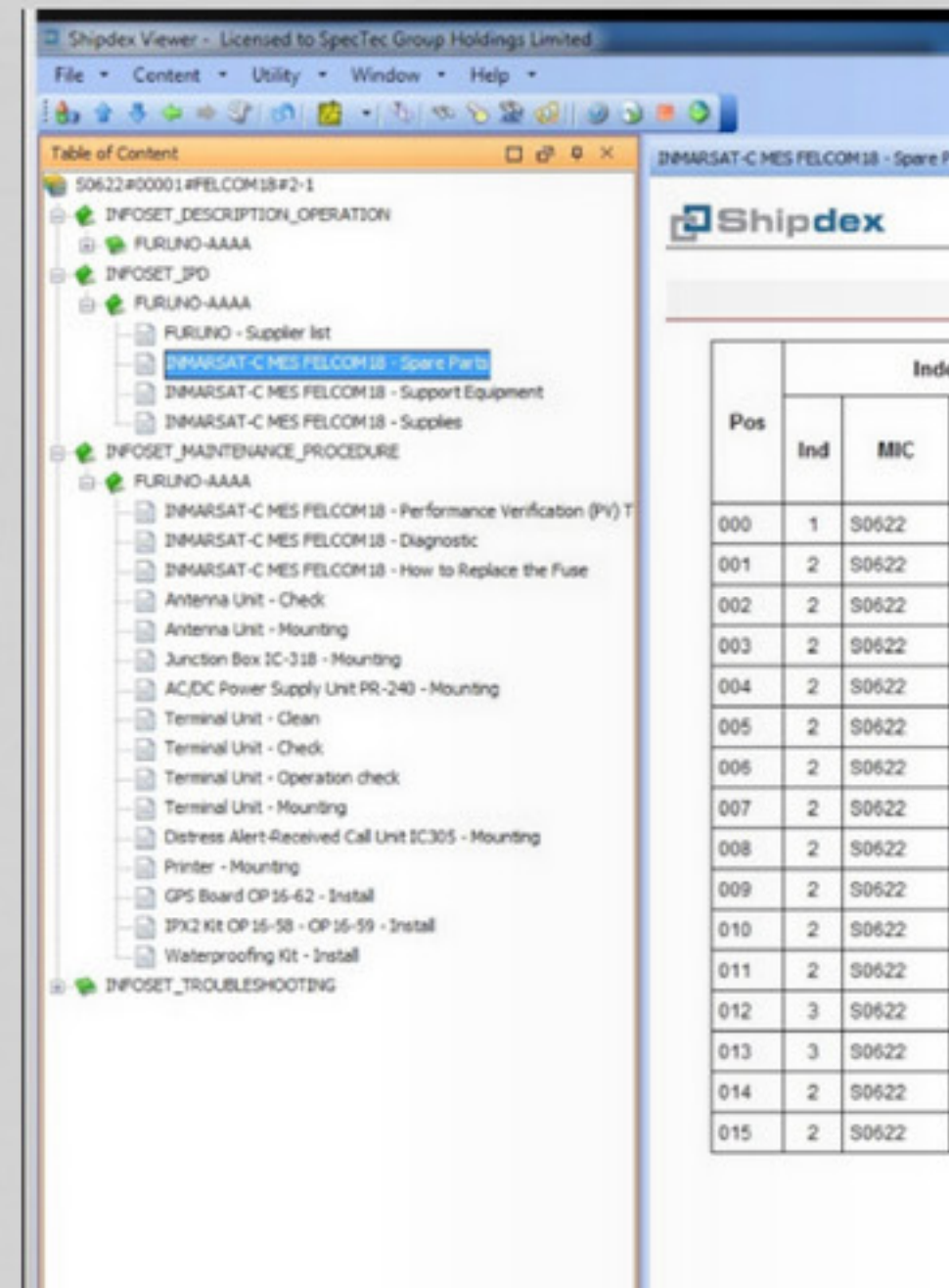
Figure 2- Simple Product Breakdown

The Shipdex Viewer

The Shipdex Organization has developed a powerful Shipdex Viewer, a browser to navigate through Shipdex datasets, quickly retrieve information and print the whole or single parts of the datasets.

The Shipdex Viewer can be downloaded, free-of-charge, from the Shipdex website (www.shipdex.org) together with some simple demo datasets.

The Shipdex Viewer will be the subject of the next Shipdex article.





TCS

ADOBE TECHNICAL COMMUNICATION SUITE 2017 AUTOMATION

THE FOURTH AND FINAL PART OF OUR IN-DEPTH LOOK AT ADOBE'S TECHNICAL COMMUNICATIONS SUITE 2017

Adobe's Technical Communication Suite has been given its biennial refresh. In my previous articles for the TDW magazine we looked at Adobe FrameMaker 2017, Adobe RoboHelp 2017 and Captivate 2017. This final article will get deep into automaton and integration using ExtendScript.

Out of the box, TCS 2017 provides several very powerful publishing applications. Between them they cover every aspect of technical publishing except illustration. For many users that's all you would ever need. Perfect creation and editing environments for the author and a wide range of output options.

As you become familiar with your chosen TCS application more and more power becomes evident. You may be working on a DITA project or perhaps your own in-house standard. Then one day there's something that seems just too difficult to achieve. Maybe FrameMaker doesn't present footnotes the way you would like, or perhaps RoboHelp isn't handling MS Word file import the way you need.

Product limitations can be extremely frustrating as they nearly always mean that you have to do more work if you are to deliver what is expected. It's at times like that when a hasty decision could be made to switch to a different product which claims to do exactly what you want. But is that the sensible thing to do? A new product will take time to master and will require extensive development to replace existing templates and associated components. Why not add the missing features to the products you already know?

PART 4

IAN PROUDFOOT

 Technical Communication

DO IT YOURSELF?

I don't want to trivialise the work required to add a new feature or perhaps automate a tedious, repetitive task, but also it isn't something you should be afraid to try. Don't expect to change the technical documentation world overnight with your first attempts at automation. Keep it simple and learn from what has already been achieved. You may surprise yourself.

Do you want to try it? Well, this article isn't a scripting tutorial. There are plenty of those already. Rather it's a chance to show you what can be done and hopefully illuminate the best path to success. I'll use a couple of FrameMaker based examples at either end of the complexity spectrum. We'll finish on a brief introduction to cross application integration.

As a FrameMaker developer and tech pubs consultant I've seen many cases where a struggling tech pubs department could lighten their workload if they had access to more focussed tools. Unfortunately the idea of automation can be seen as too big a step on limited budgets. They 'know' it will be far too expensive to implement and so that path is already closed. I understand that this type of decision is often controlled by an IT department who may object to incursions into their territory. It's always difficult to divert from the day-to-day production work. But what if a couple of week's effort now pays for itself in productivity gains in just a few months? That's exactly the way I got started and I've never looked back, never regretted my choice.

Of course scripting isn't for everyone, so why not budget for the work by sub-contract? In that case the important skill is to be able to specify your requirements very precisely. A small amount of time spent upfront will mean you get the TCS add-in that you need, nothing more, nothing less. The following case studies should help.

INTRODUCING EXTENDSCRIPT

Adobe's ExtendScript is the common scripting language that can be found in many Adobe applications. It was already well established in the Creative Suite before being added to some TCS products. ExtendScript is actually an extension of a relatively elderly version of JavaScript, so don't

expect it to support all of that language's latest features.

WHAT CAN YOU DO WITH EXTENDSCRIPT?

If you are working with FrameMaker, then the good news is that you have access to almost everything that FrameMaker provides through its normal user interface. Your imagination is the only limit! Scripts can even be triggered through dynamically generated menus or toolbar buttons.

RoboHelp scripting capabilities appear somewhat weaker as it seems that some expected functions and interactions have little or no coverage. However, that could just be a false impression created by the rather scant documentation... With RoboHelp great things are still possible, but be prepared for some disappointment. Captivate takes a different approach and offers no integrated ExtendScript functionality. Instead it makes use of the 'Common JavaScript interface' for adding dynamic features to your Captivate content. We won't be covering that here.

SCRIPTUI

Both FrameMaker and RoboHelp support ScriptUI, a powerful part of ExtendScript that gives you the tools to build user interface components such as Windows, Dialogs and Palettes. A well designed dialog can make your scripts much more powerful. Rather than limit the script to a single function, why not add a whole set of features in one easy to access dialog?

A SIMPLE EXAMPLE FOR FRAMEMAKER

Let's have a look at a common pain point for anyone who creates book files from an XML source file. The workflow goes like this. Open an existing XML file as a FrameMaker book. Everything works as expected. You have a correctly assembled book containing the expected number of perfectly formatted FrameMaker documents, but some essential parts are missing. There are no generated files and the page numbering properties are not yet correct.

You now have more work to do which could possibly take some time. Setting up a table of

contents, list of figures, list of table and an index. After that you may need to adjust the numbering properties for some of the files in the book. None of those tasks are difficult and they're quite acceptable if you only have to perform them once, but these chores becomes a huge waste of time if you have to do it every time every time you open a book from XML.

The perfect reason to let ExtendScript do all of the hard work...

PLAN THE SCRIPT

It's tempting to dive straight into the development, but take a short time to carefully analyse your real requirements. Don't be too ambitious, start with the core processes:

1. The script must only process FrameMaker book files.
2. It will generate a Table of Contents (ToC), a List of Figures (LoF) and a List of Tables (LoT).
3. These three generated files will be added after the Cover page file and before the Preliminary file.
4. A generated Index will be the last file before the back cover file.
5. The Preliminary pages including the ToC, LoF and LoT will use sequential lower case roman numerals for their page numbers.
6. All other pages will be numbered with the Chapter number followed by the page number which starts at 1 for each chapter.

When itemized this way we can get a clear idea of what is has to be included in your script. However this is just a top level view of the steps. Some parts demand further clarification:

- Setting-up the generated files in your script is effectively the same as using the Set up dialog for a ToC, Index or any other generated file. List all of the paragraph formats or element name that must be included in each type of generated file.
- Setting up the page numbering properties which is also identical in principle to using FrameMaker's interface. List the index

marker types that are to be used for index generation.

That's all the script has to do, but let's consider a nice-to-have feature:

- Instead of having to use the Script Library, why not add a 'Format book' menu command?

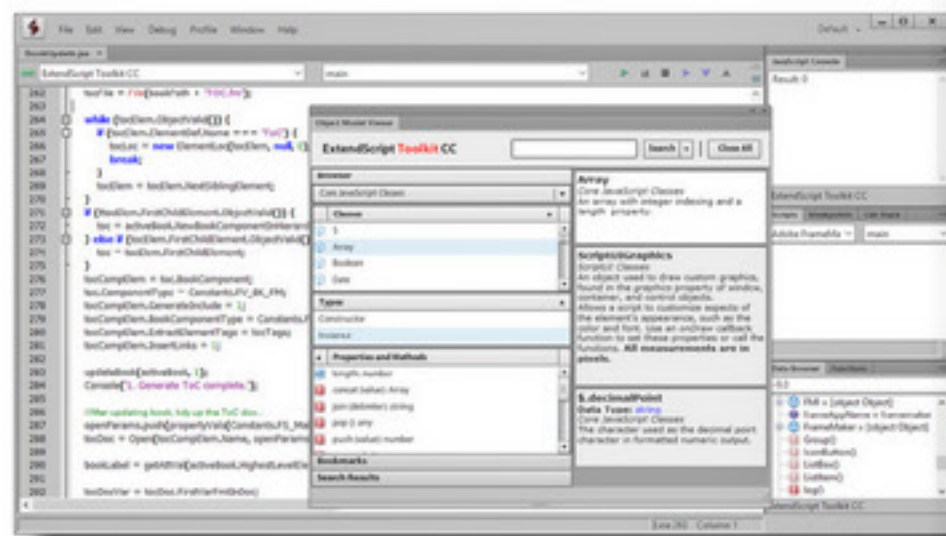
If I were presented with these requirements as a project specification I would be delighted - they're simple and unambiguous.

DEVELOPING THE SCRIPT

If I had enough space in this article, I would also show the way to write the script. In lieu of that I'll just run through the general concepts in relation to our short specification.

THE EXTENDSCRIPT TOOLKIT

This is the free script editor and debugger that can be downloaded as part of Adobe's Creative Cloud. It will be aware of your TCS apps as soon as you start it for the first time. It's not the greatest script editing tool, but it does an adequate job. As well as a tabbed area for editing your scripts there is an interactive JavaScript console, a very useful data browser and several other debug panels.



An essential tool is the integrated Object Model Viewer which allows you to find short, but helpful descriptions for all properties and methods for any selected classes. Actually, that last sentence is only partially true. The information is helpful and accurate for the Core JavaScript Classes and the ScriptUI classes, but is utterly useless for The FrameMaker and RoboHelp Object Models. I've been complaining about that since FM10 and it's about time the TCS team fixed it!

DEVELOP THE SCRIPT

Starting from an empty script I would add these components step-by-step. At each stage I test the script against a real FrameMaker book.

1. Test that a book file is selected, if not, present an alert message to tell the user to select a book file.
2. Build the ToC file
 - (a) Create a new file for the ToC and save it with a suitable name.
 - (b) Insert the ToC in the correct location in the book.
 - (c) Build a list of all paragraph formats or element names that are used to generate the ToC.
 - (d) Set the file type to mark it as a generatable file.
3. Repeat the build procedure for the LoT, LoF and Index.
4. Update the book. First pass creates the generated content.
 - (a) Set the page numbering properties for each file according to the specification.
 - (b) Save each file.
 - (c) Update the book. Second pass updates the generated pages with the correct page numbers.
5. Iterate over each file in the book.

It really is as easy as that. Just 50 lines of ExtendScript delivers so much power. I've used such a script on very complex multilingual documents. Manually the set-up of the book would take 12 minutes minimum every time you open the XML file, using the script just 45 seconds for a book with 35 chapters about 800 pages.

TRY IT FOR YOURSELF

Rather than fill up the pages of the TDW magazine with ExtendScript examples you can download this BookUpdate.jsx script from the iTp-X website. Then you can use it any way you like for free. Just navigate to <http://itp-x.co.uk/extendscript/> then

follow the instructions provided.

The script is very easy to configure for your own book files - either structured or unstructured. To make it even easier to use it adds itself as a menu command to FrameMaker's Book file menu.

S1000D: A LARGE SCALE EXTENDSCRIPT PROJECT FOR FRAMEMAKER

While our first example was a good starting place there's almost no limit to what you could do if you really let your imagination run wild! The introduction of S1000D support in FrameMaker 10 was implemented entirely in ExtendScript. I designed and coded the entire project with the exception of a few parts which were undocumented at the time. It has been present in all versions of FrameMaker since then, when the project was originally conceived with several goals in mind:

- Provide some built-in S1000D support, the same was being introduced for DITA;

If instructions are not clear, people can die

1. To make safety-critical instructions easy to read, use specification ASD-STE100 (ASD Simplified Technical English).
2. To make sure that the text conforms to ASD-STE100, use a checker.
3. For a free trial of the TechScribe checker for ASD-STE100, refer to www.simplified-english.co.uk.

ASK MIKE



Mike Ingledew has been supporting organisations achieve tech data success for over 20 years - here he answers some questions that came in to us at TDW.

Have you spoken to any industry bodies about what you are doing at TDW?

This is a good question and one we have been asked a few times now. The short answer is yes and we have disclosed some of the ideas we have for TDW which would align nicely with those involved in these organisations.

However it became quickly obvious that there was an issue, these bodies do not focus nor understand the markets in which we operate. Standards and specifications are a black art to them and how the market 'ticks' is also unknown to them.

So we quickly took the decision to 'do our own thing', we can move quicker, deliver what the market needs and be in control of our own destiny.

So yes we have but they lead to nothing for the various reasons I stated.

I see you use Adobe TCS - we would like to do the same, will it work on a MAC?

Adobe software in the main is cross platform (Photoshop, Indesign, Illustrator and so on), until you get to the Adobe Technical Communication Suite!

Adobe's FrameMaker does not run on a MAC natively, Acrobat does, as does Captivate - the issue then becomes one of licence agreement. If you have watched any of our videos on YouTube I have talked about this 'frustration' before.

We have successfully run Adobe TCS on a MAC hardware which was Intel® based - we used some software which allowed us to run both Windows and MAC OS on the same system and use files between two environments - FrameMaker performed pretty well. You should also consider any third party applications you may have and confirm with your supplier that they support partitions - not everyone does!

Your question has given us the idea to produce a full tutorial on this and how we did it! So thanks!

SEND YOUR QUESTIONS TO:

memberservices@techdataworld.com

SEARCH: ONEMICHAELINGLEDEW

in

t

ig

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When did you get into technical documentation?

A very good question and one I plan to (when time allows) produce a blog/vLog on.

My early interest started completely by accident. We were preparing some vehicles to go to sandy operating environments and we had to follow some 'user guides' it was clear to me that the guides were poorly written, although I had no concept of what a technical publication was at the time.

I took it upon myself as a young nose guy to write better instructions and submit them to the manual holder. I also produced some articles for a MoD magazine advising operators on how best to perform some common tasks. Looking back now this was my accidental fall into technical publications.

After a career as an aircraft engineer I decided to formally train as a technical communicator and moved into technical publications and modern information production this way - so slightly by accident if I am totally honest!

Will you be doing more tool-type tutorials? We really liked your Xmind video and it gave us a great deal to think about.

Absolutely! We have around twenty planned, we will be doing a scheduled stream of them. The feedback we have had on our tester tutorial (Xmind for S1000D) went down a storm, we had a mass amount of interest and questions as well as a number sending in their ideas on how they too could see a use for such tools.

We also have some additional content planned in the same kind of genre which we hope will be as much use to the community. Many will be made available for free of charge via our YouTube and other social channels - deeper tutorials will still only be made available via TD-iQ for TDW subscribers.

Some of your older videos have vanished - can we still see them?

Earlier this year we had a bit of a website issue! Our server failed and so did the back-ups, the positive around this issue was it brought forward our desire to change the website layout and content. We had to take the difficult decision to leave some of the legacy videos in the past!

However our YouTube channel does still have this content listed and available so you can find all of our videos there. Although when we look back now we see how poor they were in terms of production not technical content of course!

Where have your PODCASTS gone? I really enjoyed listening to them!

Thanks for your email - we have temporarily decided to stop the production of the PODCAST this is due to a couple of reasons, mainly the content we currently produce is very visual and secondly we have some other ideas in this area - so they will likely be back!



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ALLAN WEBB LIMITED ARE A LEADING SUPPLIER OF TECHNICAL DOCUMENTATION, INVENTORY MANAGEMENT, NATO CODIFICATION, OBSOLESCENCE MANAGEMENT, PROCUREMENT, SUPPORTABILITY ENGINEERING, DATA CAPTURE AND TRAINING SERVICES PROVIDING VITAL SUPPORT TO BOTH GOVERNMENT AND COMMERCIAL CLIENTS FOR OVER 50 YEARS. ALLAN WEBB HAS A REPUTATION FOR QUALITY THAT HAS ENABLED THE COMPANY TO GROW INTO NEW INDUSTRIES WITH CONFIDENCE AND EASE.

OVER 130 PERMANENT STAFF EITHER EMPLOYED AT OUR OFFICES OR WORKING AT CLIENTS PREMISES PROVIDE TECHNICAL SERVICES DIRECTLY TO THE MINISTRY OF DEFENCE (MoD), DEFENCE MANUFACTURERS, AEROSPACE, MARITIME, IT, OFFSHORE, POWER GENERATION, UTILITIES, MEDICAL, FINANCIAL AND LOCAL GOVERNMENT AUTHORITIES. THIS INVOLVES COMPREHENSIVE INTEGRATED LOGISTICS SUPPORT AND COMPLETE PARTS DATA MANAGEMENT SOLUTIONS, COMPRISING DATABASES THAT TRACK AND PREDICT SYSTEM LIFE CYCLES AND HELP COMBAT OBSOLESCENCE.

ALLAN WEBB OFFERS A COMPREHENSIVE RANGE OF SERVICES FROM THE CREATION AND SUPPLY OF INDIVIDUAL ELEMENTS OF DOCUMENTATION, TO THE MANAGEMENT AND DELIVERY OF ENTIRE SUPPORT PACKAGES. WE ARE A PROACTIVE SUPPLIER THAT DRIVES OUR PART OF THE PROJECT FORWARD TO MEET CUSTOMER MILESTONES. OUR EXTENSIVE EXPERIENCE ALLOWS US TO DELIVER A HIGH QUALITY (RIGHT FIRST TIME), EFFICIENT SERVICE, PRODUCING TECHNICAL DOCUMENTATION FOR A VARIETY OF TARGET AUDIENCES INCLUDING OPERATING INFORMATION, MAINTENANCE INFORMATION AND TRAINING INFORMATION.

AUTHORING SERVICES, ILLUSTRATION SERVICES, TECHNICAL DOCUMENTATION, S1000D, TECHNICAL WRITING

ASPIRE CONSULTING LTD



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ASPIRE HAS BEEN PROVIDING NICHE SYSTEM ENGINEERING SERVICES FOR OVER TWO DECADES. WE SPECIALISE IN THE OPTIMISATION OF COMPLEX SYSTEMS AND PROCESSES, WE ARE EXPERTS IN THE APPLICATION OF SUPPORTABILITY ENGINEERING TECHNIQUES: INTEGRATED LOGISTICS SUPPORT (ILS) & LOGISTIC SUPPORT ANALYSIS (LSA); MAINTENANCE OPTIMISATION, INCLUDING RELIABILITY CENTRED MAINTENANCE (RCM) ANALYSIS AND MSG-3 STUDIES, MODELLING & ANALYTICS, AND ADVANCED TECHNICAL PUBLICATIONS.

ASPIRE PROVIDES EXPERT TRAINING IN THESE SUBJECTS, TO DATE WE HAVE TRAINED OVER 2,000 PEOPLE IN 10 COUNTRIES AROUND THE WORLD.

IN ADDITION TO OUR SUPPORTABILITY ENGINEERING HERITAGE, OUR BRANDS PROVIDE IT SECURITY AND SUPPORT, SPECIALISED SOFTWARE DEVELOPMENT AND INNOVATIVE APPLICATIONS OF TECHNOLOGY, UTILISING, AMONGST OTHERS, MOBILE APPS, AND THE INTERNET OF THINGS.



SUPPORT, ILS, LSA, RCM, MODELLING



ASN INGENIEURSGESELLSCHAFT MBH & Co. KG

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YOUR SPECIALIST IN TECHNICAL DOCUMENTATION



WE AT ASN INGENIEURSGESELLSCHAFT MBH AND Co. KG ARE SERVICE PROVIDERS IN TECHNICAL DOCUMENTATION FOR THE AIRCRAFT INDUSTRY, THE SECTOR OF RENEWABLE ENERGIES, SHIP BUILDING, MECHANICAL ENGINEERING AND MILITARY DOCUMENTATION. WE BASE OUR SERVICES ON THE INTERNATIONAL SPECIFICATIONS OF ATA, ASD, ANSI AND DIN. LOCATED IN HAMBURG A CITY WITH AVIATION-, SHIP BUILDING- AND ENERGY PRODUCTION-INDUSTRY, WE RELY ON OUR QUALIFIED STAFF AND OUR LONG TERM EXPERIENCE. OUR CUSTOMERS ARE INTERNATIONAL OPERATING COMPANIES.

WE PRODUCE DESCRIPTION AND OPERATION MANUALS, MAINTENANCE MANUALS AS WELL AS MATERIAL AND SPARE PARTS DOCUMENTATION. TEXT IN ENGLISH OR GERMAN INCLUDING THE REQUIRED TECHNICAL ILLUSTRATION. NEW DOCUMENTATION AS WELL AS UPDATES ARE PRODUCED TO THE REQUIREMENTS OF ATA iSpec 2200 (ATA 100), ATA 104, ATA 2000, ASD S1000D, S2000M AND ASD-STE100 SIMPLIFIED TECHNICAL ENGLISH, TDv, MIL-SPEC OR BD007, RDS-PP FOR RENEWABLE ENERGY PRODUCTS, 2006/42/EG MACHINE INSTRUCTIONS OR DIN EN ISO 14121, Ril 900.503, Ril 900.504, Ril 984 26, Ril 915 02, 2006/861/ EG (RAILWAY TSI), 98/ 37/ EG, VDI 4500, DIN EN 62079, ISO 3864, ANSI Z535 OR OTHERS.

DUE TO OUR LONG TERM EXPERIENCES IN THE SECTOR OF TECHNICAL DOCUMENTATION PRODUCTION WE SUPPORT OUR CUSTOMERS IN TAILORED TRAININGS AND WORKSHOPS.

TECHNICAL AUTHORING, TECHNICAL AUTHORING TRAINING, ILLUSTRATION SERVICES, ASD S1000D & ATA iSpec 2200

BMT



BMT IS A LEADING INTERNATIONAL DESIGN, ENGINEERING, SCIENCE AND RISK MANAGEMENT CONSULTANCY; WE ARE AN EMPLOYEE BENEFIT TRUST (EBT), WHICH GUARANTEES OUR INDEPENDENCE TO DELIVER WITHOUT ANY POTENTIAL CONFLICT OF INTEREST FROM EXTERNAL STAKEHOLDERS. OUR MARKETS INCLUDE VESSEL DESIGN, PORTS AND TERMINALS, OIL AND GAS, WATER AND ENVIRONMENT, BUILDINGS INFRASTRUCTURE AND RAIL AND DEFENCE.

TO SUPPORT THESE MARKETS BMT HAS A COMPREHENSIVE TECHNICAL DATA AND DOCUMENTATION CAPABILITY DELIVERED BY A TEAM THAT HAS ALL THE REQUIRED SKILLS, EXPERIENCE, SOFTWARE APPLICATIONS AND TEMPLATES REQUIRED TO PRODUCE TECHNICAL DOCUMENTATION TO INDUSTRY AND MILITARY PUBLICATION STANDARDS, INCLUDING ISO 8879, DEFSTAN 02-40, DEFSTAN 00-600, ASD AIA S1000D (INTERNATIONAL STANDARD FOR TECHNICAL PUBLICATIONS), JOINT SERVICE PUBLICATIONS (JSP) 181 TO 188, JSP(D) 543, AESP 0100-P-005-010 AND AESP 0100-P-011-013. TECHNICAL AUTHORING IS FURTHER SUPPORTED BY OUR DRAUGHTSMEN AND ILLUSTRATORS TO CREATE 2D/3D ILLUSTRATIONS, ANIMATIONS, PHOTOGRAPHS AND INTERACTIVE ILLUSTRATIONS AS REQUIRED.

WE USE OUR 6 STAGE THROUGH LIFE SYSTEM OF 'INTELLIGENT AUTHORING' COVERING DEFINITION, AUTHORING, ILLUSTRATION, COMPILATION, DELIVERY AND MAINTENANCE; THIS PREVENTS MISINTERPRETATION AND ELIMINATES AMBIGUOUS INFORMATION FOR THE EFFECTIVE AND EFFICIENT GENERATION AND MAINTENANCE OF TECHNICAL PUBLICATIONS. BMT ENSURES THAT THE INFORMATION CONTAINED IN DOCUMENTATION IS ACCURATE, CONCISE, CONSISTENT, UNAMBIGUOUS AND COMPLETE.

TECHNICAL AUTHORING, ILLUSTRATIONS, CSDB, IETPs, ILS

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WITH MORE THAN 190,000 PEOPLE, CAPGEMINI IS PRESENT IN OVER 40 COUNTRIES AND CELEBRATES ITS 50TH ANNIVERSARY YEAR IN 2017. A GLOBAL LEADER IN CONSULTING, TECHNOLOGY AND OUTSOURCING SERVICES, THE GROUP REPORTED 2016 GLOBAL REVENUES OF EUR 12.5 BILLION. TOGETHER WITH ITS CLIENTS, CAPGEMINI CREATES AND DELIVERS BUSINESS,

TECHNOLOGY AND DIGITAL SOLUTIONS THAT FIT THEIR NEEDS, ENABLING THEM TO ACHIEVE INNOVATION AND COMPETITIVENESS. A DEEPLY MULTICULTURAL ORGANIZATION, CAPGEMINI HAS DEVELOPED ITS OWN WAY OF WORKING, THE COLLABORATIVE BUSINESS EXPERIENCE™, AND DRAWS ON RIGHTSHORE®, ITS WORLDWIDE DELIVERY MODEL.

CAPGEMINI'S PRODUCT AND ENGINEERING SERVICES BRINGS TOGETHER DEEP DOMAIN AND TECHNOLOGY EXPERTISE FOR BOTH THE DIGITAL AND THE PHYSICAL WORLD OF PRODUCTS. A RECOGNIZED LEADER, WITH OVER 10,000 ENGINEERS ACROSS THE GLOBE AND 30+ YEARS OF EXPERIENCE, P&ES OFFERS A HIGHLY DIFFERENTIATED, COMPREHENSIVE PORTFOLIO OF SERVICES AND SOLUTIONS TO MEET THE NEEDS OF DIGITAL ENGINEERING IN A CONNECTED WORLD.

CAPGEMINI'S DIGITAL TECHNICAL CONTENT MANAGEMENT (DTCM) IS AN EVOLUTION FOR TECHNICAL PUBLICATIONS BY BRINGING INTERACTIVITY INTO CONSUMPTION OF TECHNICAL DATA. DTCM ENABLES SIMPLIFICATION AND VISUALIZATION FOR PRODUCT USE AND SERVICEABILITY. IT INITIATES DIGITAL TRANSFORMATION THROUGH INCORPORATION OF INTERACTIVE 3D, AR, VR AND MULTI-PLATFORM MOBILE INTERFACES.

TECHNICAL PUBLICATIONS, AR/ VR DATA, DIGITAL, MRO DOCUMENTATION, AEROSPACE ENGINEERING

DCS SONOVISION UK LTD



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DCS SONOVISION UK LTD PROVIDES TECHNICAL PUBLICATIONS, COMPUTER BASED TRAINING, INTEGRATED LOGISTIC SUPPORT (ILS), GRAPHIC DESIGN, ANIMATION, MARKETING AND TRANSLATION SERVICES TO THE DEFENCE (LAND, SEA AND AIR), AEROSPACE, ENERGY (NUCLEAR, OIL AND GAS), MARINE, COMMERCIAL ENGINEERING, ELECTRONICS AND

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- DATA MODULES (S1000D), ARMY EQUIPMENT SUPPORT PUBLICATIONS (AESP), AIRCRAFT PUBLICATIONS (AP), BOOK OF REFERENCE (BR), AIRCRAFT MAINTENANCE MANUALS (AMM), ROTORCRAFT MAINTENANCE MANUALS (RMM), STRUCTURAL REPAIR MANUALS (SRM), COMPONENT MAINTENANCE MANUALS (CMM), ILLUSTRATED PARTS CATALOGUES (IPC), SERVICE BULLETINS (SB), AIRCRAFT SCHEMATIC DRAWINGS (ASD), FLIGHT MANUALS (FM), COMPUTER BASED TRAINING (CBT)

TECHNICAL PUBLICATIONS, TECHNICAL AUTHORING, TECHNICAL ILLUSTRATING, COMPUTER BASED TRAINING, S1000D

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CDS DEFENCE SUPPORT IS AN AWARD WINNING TECHNICAL CONSULTANCY PROVIDING HIGH QUALITY, INNOVATIVE SERVICES TO CLIENTS IN THE GLOBAL DEFENCE SECTOR. WITH OVER 50 YEARS OF EXPERIENCE AND AN ABSOLUTE COMMITMENT TO QUALITY THE COMPANY HAS A WELL-DESERVED REPUTATION FOR PROVIDING ITS CLIENTS WITH COMPLETE PEACE OF MIND. CDS DS WORK DIRECTLY WITH THE UK MoD TO ENSURE THE SAFE AND EFFECTIVE USE OF ITS EQUIPMENT PORTFOLIO AND ALSO HELP TO SHAPE THE DEVELOPMENT OF FUTURE LEADERSHIP IN THE ARMED FORCES VIA OUR TRAINING AND EDUCATION SERVICES.

CDS DS COMPREHENSIVE RANGE OF SERVICES INCLUDES TECHNICAL DOCUMENTATION, INTEGRATED LOGISTICS SUPPORT (ILS), TRAINING, SAFETY MANAGEMENT, INFORMATION ASSURANCE (IA) AND PROGRAMME MANAGEMENT. OPERATING FROM GOVERNMENT-APPROVED SECURE PREMISES, OUR TEAM OF EX-MILITARY ENGINEERS IS EXPERIENCED AT MEETING TOUGH DEADLINES ON URGENT OPERATIONAL REQUIREMENTS AS WELL AS LONG-TERM PROJECTS.

WE PRIDE OURSELVES ON WORKING EFFECTIVELY WITH OUR DEFENCE SECTOR PARTNERS TO ENSURE THE BEST POSSIBLE SOLUTION FOR MILITARY END USERS. WE EMBRACE THE WHOLE FORCE APPROACH AND ARE DELIGHTED TO BE SIGNATORIES TO THE ARMED FORCES COVENANT AND RECIPIENTS OF THE DEFENCE EMPLOYERS RECOGNITION SILVER AWARD FOR OUR SUPPORT TO ARMED FORCES RESERVISTS IN THE COMPANY.

CDS DS IS CONVERSANT WITH ALL RECOGNISED MILITARY AND COMMERCIAL STANDARDS.

TECHNICAL DOCUMENTATION, TECHNICAL ILLUSTRATIONS, AUTHORING SERVICES, INTEGRATED LOGISTICS SUPPORT, AESP

ETTEPLAN



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OUR SERVICES COVER ENGINEERING, TECHNICAL DOCUMENTATION, EMBEDDED SYSTEMS AND IoT SOLUTIONS. OUR CUSTOMERS ARE THE WORLD'S LEADING COMPANIES IN THE MANUFACTURING INDUSTRY. OUR SERVICES ARE GEARED TO IMPROVE THE COMPETITIVENESS OF OUR CUSTOMERS' PRODUCTS AND ENGINEERING PROCESSES THROUGHOUT THE PRODUCT LIFE CYCLE. THE RESULTS OF ETTEPLAN'S INNOVATIVE ENGINEERING CAN BE SEEN IN NUMEROUS INDUSTRIAL SOLUTIONS AND EVERYDAY PRODUCTS.

AUTHORING SERVICES, ILLUSTRATION SERVICES, STE CHECKER

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S1000D, CSDB, XML, BREX, BPM

HiCo-ICS GmbH



HICO DELIVERING
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SINCE 1997, HICO HAS ESTABLISHED ECONOMICALLY ATTRACTIVE, EFFICIENT AND SUSTAINABLE SOFTWARE SOLUTIONS AS WELL AS SERVICES FOR "INTEGRATED PRODUCT SUPPORT (IPS)" IN VARIOUS INDUSTRIES.

HICO IS A FULL-LINE SUPPLIER FOR INTEGRATED PRODUCT SUPPORT (IPS). THE FOCUS IS THE WHOLE PRODUCT LIFE CYCLE AND THE SERVICE LIFE CYCLE OF OUR CUSTOMER'S COMPLEX TECHNICAL PRODUCTS AND SYSTEMS.

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HICO SOLUTIONS ARE BASED ON GLOBALLY RECOGNIZED SPECIFICATIONS AND INTERNATIONAL STANDARDS (SUCH AS ASD/AIA/ATA S1000D®, ATA iSpec 2200 OR IETD-EXPORTSTANDARD) AS PART OF THE ASD SUITE OF ILS-SPECIFICATIONS AND STANDARDS FROM THE ATA E-BUSINESS PROGRAM.

CSDB, IPS SYSTEM INTEGRATION, TECHNICAL AUTHORING SERVICES, 2D/3D ILLUSTRATION SERVICES,

GPSL LIMITED



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GPSL PROVIDES, DEVELOPS AND DELIVERS APPLICATIONS AND SOFTWARE TO SOLVE COMPLEX BUSINESS CHALLENGES IN VARIOUS ENVIRONMENTS.

AS A GLOBAL PTC CHANNEL AND SERVICE PARTNER, WE PROVIDE IMPLEMENTATION, CUSTOM CONFIGURATION AND INTEGRATION SERVICES FOR CUSTOMERS ACROSS MOST INDUSTRY SECTORS.

OUR TEAM INCLUDES SOME OF THE MOST EXPERIENCED LEADERS, PROJECT SPECIALISTS AND DEVELOPERS IN THE WORLD. WHETHER YOU ARE LOOKING TO ADDRESS YOUR PRODUCT DEVELOPMENT CHALLENGES, EXPAND YOUR CAD CAPABILITIES, MANAGE YOUR PRODUCT CONTENT FROM CONCEPT TO SERVICE, OR AUTOMATE YOUR CONTENT PUBLISHING ENVIRONMENT, WE SIMPLY FIND THE BEST ROUTE TO THE RIGHT SOLUTION.

THE TECHNOLOGY WE INSTALL OR CUSTOMIZED SOLUTION WE DEVELOP IS TAILORED TO YOU. THE JOURNEY IS DIFFERENT, BUT THE END RESULT IS THE SAME: A SOLUTION THAT WORKS.

ARBORTEXT, CREO, XML CONTENT MANAGEMENT SOLUTIONS, PUBLISHING SOLUTIONS

JANA, Inc.



jana

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JANA IS A TECHNICAL DOCUMENTATION SERVICES COMPANY WITH 45 YEARS OF EXPERIENCE IN PROVIDING BEST-IN-CLASS TECHNICAL DATA AUTHORING AND MANAGEMENT SERVICES. JANA'S SERVICE AND SOFTWARE SOLUTIONS ARE EMPLOYED BY SEVERAL OF THE WORLD'S LARGEST AND MOST SUCCESSFUL COMPANIES.

JANA'S CORE BUSINESS IS THE AUTHORING, ILLUSTRATING, PUBLISHING AND DELIVERY OF TECHNICAL PUBLICATIONS. REGARDLESS OF THE INDUSTRY, JANA'S CLIENTS KNOW THAT THEY CAN RELY ON OUR BROAD BASE OF TECHNICAL KNOWLEDGE AND EXPERIENCE TO DELIVER ON THE PROMISE OF A FINAL DELIVERY WHICH IS HIGHLY ACCURATE AND ON-TIME.

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AUTHORING SERVICES, ILLUSTRATION SERVICES, S1000D, ATA iSpec 2200, DOCUMENTATION SOFTWARE CONSULTING

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Lionbridge

LIONBRIDGE INTERNATIONAL OPERATES AS AN INTEGRATED CONTENT DEVELOPMENT, TRANSLATION AND TRAINING SOLUTIONS ORGANISATION WITHIN THE LIONBRIDGE TECHNOLOGIES, INC. GROUP OF COMPANIES THAT

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TECHNICAL AUTHORING, ILLUSTRATION SERVICES, TRAINING, INTEGRATED LOGISTICS SUPPORT, DOCUMENTATION SERVICES

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THE RAYTHEON EAGLE TEAM HAS PRODUCED LOGISTICS SUPPORT SOFTWARE FOR OVER TWO DECADES. THE EAGLE LOGISTICS SUPPORT ANALYSIS RECORD (LSAR) TOOLKIT IS USED BY THOUSANDS OF ANALYSTS AROUND THE WORLD TO DEVELOP LOGISTICS DATA TO THE FOLLOWING SPECIFICATIONS; MIL-STD-1388-2B, ASD S3000L, DEF-STN-0060 AND GEIA-0007.

EAGLE PUBLISHING SYSTEM IS AN AUTHORING TOOL AND COMMON SOURCE DATABASE (CSDB) USED TO PRODUCE AND MANAGE ASD S1000D DATA FOR INTERACTIVE ELECTRONIC TECHNICAL MANUALS. EPS IS FAST, POWERFUL, INTUITIVE AND ROBUST AND INCORPORATES FEATURES FOR PROGRAM MANAGEMENT AND DATA DEVELOPMENT, ON TIME AT MINIMAL COST. EASY TO USE PRODUCTIVITY TOOLS INCLUDE AN INTEGRATED EDITOR WITH A REAL-TIME PREVIEW. DATA MODULES CAN BE LINKED TO EAGLE LSAR RECORDS TO POPULATE PROCEDURAL, FAULT, MAINTENANCE SCHEDULES AND ILLUSTRATED PARTS TECHNICAL DATA DIRECTLY FROM ENGINEERING DATA. AUTHORING CHANGES MADE IN EPS FLOW BACK TO THE LSAR. AUTHORS CAN PREVIEW THE DATA WITH A CHOICE OF INTEGRATED IETM VIEWERS.

EAGLE WEB CAN GIVE CUSTOMERS REVIEW ACCESS TO THE LSAR AND TECHNICAL PUBLICATIONS DATA WITH COMMENTING CAPABILITIES USING NOTHING MORE THAN A BROWSER. THE EAGLE MAINTENANCE MANAGEMENT INFORMATION SYSTEM (MMIS) IS A THIN-CLIENT TOOL USED TO SUPPORT FIELDED SYSTEMS WITH ASSET TRACKING, CONFIGURATION MANAGEMENT, FRACAS, WORKFLOW AND MORE.

CSDB, EAGLE PUBLISHING SYSTEM, EAGLE EDITOR, EAGLE LOGISTICS TOOLKIT, LSAR

O'NEIL & ASSOCIATES, INC.



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FOR 70 YEARS, O'NEIL & ASSOCIATES (ONEIL) HAS SPECIALIZED IN CREATING PRODUCT SUPPORT DOCUMENTATION TO SERVE THE AEROSPACE, MILITARY, AND INDUSTRIAL MARKETS. OUR CLIENTS OFTEN DEPEND ON US TO ENHANCE THEIR PROCESSES; INFUSE NEW TECHNOLOGY; OR CREATE ENTIRELY NEW PRODUCT INFORMATION SUPPORT SYSTEMS, eLEARNING TOOLS, AND INTERACTIVE ELECTRONIC TECHNICAL MANUALS (IETMs). EACH YEAR, WE PRODUCE TENS OF THOUSANDS OF GRAPHICS, ANIMATIONS, MODELS, AND DIAGRAMS.

OUR CLIENTS DEPEND ON US TO: AUTHOR SUPPORT MATERIALS THAT TAKE ADVANTAGE OF NEW TECHNOLOGIES, CREATE A COST-EFFECTIVE IETM, DEVELOP eLEARNING TOOLS AND PROGRAMS, COMPLY WITH S1000D™ STANDARDS, CREATE DATABASE-DRIVEN AUTHORING SYSTEMS FOR SERIAL-NUMBER-SPECIFIC MANUALS

THE LATTER INVOLVES IMPLEMENTING A CONTENT MANAGEMENT SYSTEM TO OUTPUT A TECHNICAL MANUAL COVERING A USER'S PARTICULAR SERIAL-NUMBERED PIECE OF EQUIPMENT, INSTEAD OF A RANGE OF MODELS. THESE CUSTOM MANUALS CAN BE PROVIDED IN 40 DIFFERENT LANGUAGES AND PREPRINTED AND SHIPPED WITH THE PRODUCT. OFTEN, THE MANUALS ARE DELIVERED VIA THE WEB.

WE SERVE CUSTOMERS WORLDWIDE FROM OUR CORPORATE HEADQUARTERS LOCATED IN MIAMISBURG, OHIO (JUST SOUTH OF DAYTON), AND SEVERAL OTHER LOCATIONS AROUND THE WORLD. WE OFFER OUR CUSTOMERS AN EXCELLENT SOURCE OF CAPACITY, EXPERTISE, TECHNOLOGY, AND QUALITY.

TECHNICAL WRITING, TECHNICAL ILLUSTRATING, CONTENT MANAGEMENT SYSTEMS, S1000D, ATA iSpec2200

RTP-UK LTD



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ILS - ILS SERVICE FOR MILITARY AND CIVIL SYSTEMS AND EQUIPMENT, SAFETY CASE, SYSTEM DEVELOPMENT SUPPORT BASED ON RELIABILITY AND MAINTAINABILITY STUDIES, LIFE CYCLE COST (LCC) CALCULATION

TECHNICAL DOCUMENTATION: RTP OFFERS ITS CUSTOMERS VAST EXPERIENCE IN BOTH THE MILITARY AND CIVIL DOMAINS. ITS AUTHORS, ENGINEERS AND SPECIALISTS OPERATE IN A MILITARY AND CIVIL ENVIRONMENT, ALLOWING AN INTERDISCIPLINARY APPROACH TO LAND, SEA AND AIRFORCE PROGRAMS. WITH OVER 300 STAFF, OPERATING IN AN INTERNATIONAL ENVIRONMENT, TOGETHER WITH ADDITIONAL LOW COST OFF-SHORE PRODUCTION FACILITIES, CUSTOMERS CAN BENEFIT FROM THE COMPANY'S SPECIALIST KNOWLEDGE IN MULTINATIONAL PROGRAMS.

TRAINING SOLUTIONS: RTP IS CAPABLE OF DEVELOPING AND DELIVERING: ANALYSIS OF TRAINING NEEDS (TNA TO JSP822 IF REQUIRED), GENERATION OF TRAINING MATERIAL TO DSAT QUALITY STANDARDS; e-LEARNING MATERIAL, ELECTRONIC TECHNICAL DOCUMENTATION, MODELING & SIMULATION, COMPUTER/WEB BASED TRAINING (CBT/WBT), CAI FOR CLASSROOMS, LEARNING MANAGEMENT SYSTEMS (LMS/LCMS), PROVISION OF TRAINING PERSONNEL, SCORM COMPLIANT

AUTHORING, ILLUSTRATING, ILS, SAFETY, TRAINING

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SDL PLC.



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SDL IS THE GLOBAL INNOVATOR IN LANGUAGE TRANSLATION TECHNOLOGY, SERVICES AND CONTENT MANAGEMENT, INCLUDING TECHNICAL CONTENT CREATION, MANAGEMENT AND DELIVERY SOLUTIONS FOR THE AEROSPACE AND DEFENCE INDUSTRY. FOR MORE THAN 20 YEARS, SDL HAS TRANSFORMED BUSINESS RESULTS BY ENABLING EIGHTEEN OF THE TOP 20 AEROSPACE AND DEFENCE LEADERS TO MANAGE AND PUBLISH TECHNICAL DOCUMENTATION USING COMPLEX INDUSTRY STANDARDS SUCH AS S1000D AND iSPEC 2200 TO DELIVER ACCURATE, UP-TO-DATE CONTENT.

S1000D, AUTHORING, PUBLISHING, DELIVERY, TECHNICAL DOCUMENTATION

WEBX SYSTEMS LTD.



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WEBX SYSTEMS DEVELOPS AND SUPPLIES A RANGE OF HIGH-END SOFTWARE PRODUCTS FOR THE DEFENCE AND AEROSPACE INDUSTRIES. WEBX'S FLAGSHIP PRODUCTS INCLUDE ULTRACSDB™, ULTRAXML™, ULTRAAUTHOR™, ULTRAPORTAL™ AND ULTRAETP™ ADDRESS THE NEEDS OF HIGH-END GLOBAL TECHPUBS USERS. WEBX'S YEARS OF EXPERIENCE IN DEVELOPING AND SUPPLYING CONTENT LIFECYCLE MANAGEMENT SOLUTIONS TO THE INDUSTRY ALLOWS IT TO PROVIDE QUALITY PROJECT MANAGEMENT AND CONSULTING SERVICES.

CSDB, S1000D, ATA iSPEC, LSAR, IPC

SEMCON PRODUCT INFORMATION UK



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SEMCON IS AN INTERNATIONAL TECHNOLOGY COMPANY THAT DEVELOPS PRODUCTS AND PRODUCT INFORMATION BASED ON HUMAN NEEDS AND BEHAVIOURS. WE STRENGTHEN OUR CUSTOMERS' COMPETITIVENESS BY ALWAYS STARTING FROM THE END USER, BECAUSE THE PERSON WHO KNOWS MOST ABOUT THE USER'S NEEDS

CREATES THE BEST PRODUCTS AND THE CLEAREST BENEFITS TO HUMANS. WITH MORE THAN 2,000 SPECIALISED EMPLOYEES, SEMCON HAS THE ABILITY TO TAKE CARE OF THE ENTIRE PRODUCT DEVELOPMENT CYCLE, FROM STRATEGY AND TECHNOLOGY DEVELOPMENT TO DESIGN AND PRODUCT INFORMATION.

SEMCON GROUP HAS OPERATIONS IN MORE THAN 30 LOCATIONS IN SWEDEN, GERMANY, UK, BRAZIL, HUNGARY, INDIA, CHINA AND NORWAY. OUR INTERNATIONAL PRESENCE MEANS THAT WE HELP OUR CLIENTS GLOBALLY BY UTILISING NETWORKS OF SPECIALIST RESOURCES FROM DIFFERENT REGIONS OF THE WORLD.

SEMCON HAS EXTENSIVE EXPERIENCE IN WORKING WITH COMPANIES OPERATING IN CHALLENGING ENVIRONMENTS, WITH TECHNICALLY COMPLEX PRODUCTS. WE ARE USED TO DESCRIBING COMPLEX PRODUCTS IN A SIMPLE MANNER. SEMCON'S PRODUCT INFORMATION OFFER COVERS THE ENTIRE INFORMATION DEVELOPMENT CYCLE - FROM STRATEGY, INFORMATION DESIGN, DEVELOPMENT AND PRODUCTION TO DISTRIBUTION. THE INFORMATION IS MADE AVAILABLE IN AN APPROPRIATE MANNER FOR THE USER - WHICH TODAY MEANS MORE FREQUENT DISTRIBUTION VIA DIGITAL SOLUTIONS, SUCH AS ANIMATIONS, MOBILE APPS, VIRTUAL AND AUGMENTED REALITY.

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