Interview

Performance support and answer management database with digital asset management – An interview with Daniel Duncan of Zimmer, Inc

Daniel Duncan

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ABSTRACT Michael Moon interviews Daniel Duncan of Zimmer, Inc. on the management and use of DAM as a performance support system for Answer database. The interview explores some little-discussed dimensions of knowledge worker productivity and the maturation of knowledge towards a community of practice.

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MM: We're here with Daniel Duncan of Zimmer. Let's start off with a little bit of a background in terms of your personal career.

DD: Well, my background is in educational systems technology and instructional design. The majority of my graduate work at Purdue University placed a strong emphasis on educational media and digital asset management (DAM). Since 1998, I've been interested in the idea of building corporate repositories of information that could be accessed quickly and easily by all members of an enterprise.

MM: Before you were at Zimmer, you were in graduate school? Or were you working someplace else?

DD: No. Actually I was on the West Coast in the San Francisco Bay area. I had my own consulting business. I did that for about 4 years. Before that I was in the Midwest doing instructional design in the bulk pharmaceutical industry.

MM: In the area of instructional design and knowledge systems?

DD: Yes. And learning management systems.

MM: What's the nature of Zimmer's business?

DD: Zimmer is a pure-play orthopedic device manufacturer. The company designs and manufactures lots of different types of replacement joints, different types of bone repair devices and dental implants.

We also have a biologics division that deals with tissues, and a computer-assisted solutions division that deals with technologies to help health-care professionals in the operating room.

MM: That's quite a diverse portfolio.

DD: Yes, it is.

MM: So it'd be fair to say that you're in a regulated industry, where you have an unusually high level of audit scrutiny?

DD: That's correct. Yes.

MM: Is the particular regulation that governs your particular company an Food and Drug Administration (FDA)? Code of Federal Regulations (CFR)?

DD: It's Code of Federal Regulations Part 820.

MM: For those that aren't familiar with that, what does that mean in terms of creating media and communicating with people?

DD: Well, specifically, I provide document management services. That's the team that I'm with here at Zimmer.

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If you're not familiar with the Code of Federal Regulations or the laws that govern medical device quality, it provides a great deal of guidance in terms of the fact that everything we do as a company has to be documented. All of our procedures and standards. All of our practices and specifications.

All of that information is regulated, in a sense. Or controlled. So that we are always operating in a state of control.

MM: In many respects, the things that you do – as a matter of course – just as a function of regulatory compliance ... Other firms will eventually get around to them in terms of really having documented procedures and pretty explicit workflows and processes in terms of how things get done.

DD: Another big aspect of that, too, is the change management that's involved in all of that.

An example would be if I want to change one engineering specification within our company, there needs to be a thorough 'where used' analysis or 'impact' analysis. To see all the touchpoints up and downstream that that change could impact.

Inadequate impact analysis can have detrimental effects on the quality of our devices.

MM: As it relates to digital asset management, what capability does Zimmer have today?

DD: We have one DAM. Well, we have engineered the North Plains Telescope product in such a way that not only does it serve as a digital asset repository, but the metadata that surrounds all of that information helps us meet a number of other regulatory and compliance expectations.

We've built a library of all of our training documents within the DAM. So we've basically got all kinds of metadata information cataloged. Most of it's related to different types of analysis work that's part of that systematic process of developing sound and effective instruction.

Whether it be needs analysis information or an instructional analysis. Maybe it's a Six-Sigma type of analysis. Or maybe it's a process analysis. Any number of different types of performance analyses that can be performed to help the bottom line.

MM: Let me see if I understand that right. Many companies deploy a DAM system such as Telescope in order to manage a collection of media assets.

You've taken the metadata framework of Telescope and populated those fields. Not so much with metadata, *per se*. But you've populated it with copy. Text as it would relate to a passage in a manual or documentation. Did I understand that right?

DD: We really are using Telescope as a metadata management tool. Surrounding various different types of media objects, as you mentioned, whether it be video, e-learning courseware, images, presentations, PDFs, technical drawings, surgical techniques and all of those different types of assets that we have.

MM: And in that context, metadata as it relates to those objects would describe what's in the image. What product it's associated with. Perhaps where it's been used.

DD: Yes. Now the next stage in our project will involve that aspect that you were just discussing earlier. It's our goal to move away from a world of traditional document authoring. We want to move away from the world where documents are written.

MM: In Word documents?

DD: Yes. In a word processor. To a system where we're doing true knowledge and content management, using robust XML technologies. We hope to have that capability to be able to manage blocks or chunks of information in such a way that it can be purposed and repurposed, based on its need. Based on its intended audience. All the different factors that will go into it.

MM: Based on the rules that you've associated with that particular block of text?

DD: That's right. Yes.

MM: If I understand that right, what you've said is that you intend to shift – if not transform – the way that Zimmer creates and manages knowledge.

DD: Yes. Knowledge and, in general, the way we communicate and manage change.

MM: Which means that you will author or write things. You might write them in Word, but ultimately, the storage receptacle – the container for the text and the formatting – is no longer a Word Document, or a Word Document in a content management system, but is, actually a database or metadata record.

DD: Right.

MM: This database record happens to be in a DAM system. That allows you then to do all

sorts of interesting transformations on the data in the database.

Transformations also include things like formatting and parsing out particular words as metadata and search terms – and things like that.

DD: And even how it's compiled. We'd love to get to the point where we have raw text that's being managed in a knowledge and content management system. But on the back-end, there might be Shockwave-based animations being generated automatically, that are published and managed in the DAM as a reusable learning object.

MM: I've talked to companies more in the marketing service area that do just that. They publish to their DAM media and text. In this case, copywriting things. Copy-text. Taglines and slogans.

Then on the back-end, when they need to generate 2500 sets of banner ads to three or four different IAB standards, it's simply a matter of publishing and placing those particular banner ads to a CMS system.

With very little manual labor associated with that, other than, 'Go do it'.

DD: Right.

MM: Similarly, I've talked to Telescope users that have implemented exactly what you're doing, to create magazines and books.

DD: Yes. e-Catalogs, in a sense.

Our engineers here at Zimmer, for example, are able to generate these very elegant 3D PDF-based renderings of all of our products. The beauty of that is, onscreen, it can be turned and manipulated. You have a couple different views of that object – whether it be wire-frame or maybe you want to change your lighting effect.

MM: Or exploded mechanical views. Yes.

DD: Yes. Or even get a very, very close-up view. Right now, our surgeons and health-care professionals only get to see a static image of a product. Now imagine them being able to go into a catalog that's powered by a DAM that's coupled with a knowledge and content management system.

Then they can say, 'Well, I wish I could just manipulate that image around so that I could see exactly what I want to see'. Now they'll have that capability along with the ability to obtain precise measurements.

MM: Another thing that follows from what you just said ... Adobe's done some extraordinary things with respect to their 3D Acrobat capability. Including being able to take a complex engineered product engine – body part – and also put into the PDF as attached data, the building materials. All the engineering specifications or performance criteria in terms of each element. Its tolerances and so on.

A lot of the engineering analysis that would have gone on in a separate system is now embedded in the PDF. And using an XML standard called XMP, they expose that metadata for essentially easy transfer or transmission of key engineering data that's embedded in the file, to other engineering and Computer Aided Design (CAD) systems.

DD: Right.

MM: As well as product life cycle management and supply chain management systems, where they need to have that building material data.

In addition to that, these 3D Acrobat PDFs also allow you to embed hyperlinks. So the idea then – if I'm looking at a particular engineered part, I can say, 'I can go to the hyperlink. It launches my browser and takes me to a website where I can now perhaps take it to another level. Or see the new version or alternate versions that were not necessarily in the PDF'.

DD: Right. That's all part of our vision.

MM: About how many users of your DAM system do you have today?

DD: Well, we're currently only in the pilot stage of our project. At this point in time, we have trained all of what we're calling our 'Super Coordinators'. These are key folks in the company that are actively involved in media-creation or documentation services. They provide management or oversight to their team.

MM: About how many people is that?

DD: About a dozen people.

MM: So you've got this core team that's in the process of vetting the whole deployment, and working on the user experience, at least from a super-user perspective.

DD: Yes. Very much so.

MM: And I imagine once they get all up-to-speed and onboard and get your metadata framework developed out, you'll expand it to a larger group of people. Right?

DD: That's our goal. Yes. We're also currently actively involved in the FDA validation of the

technology, as well. We hope to have that done by mid-November.

MM: What does the FDA validation typically entail in this kind of a system?

DD: It entails identifying the requirements of the system. How do we intend for it to be used? Also, how does that relate to FDA and other worldwide standards that we have to adhere to as a company, in order to be able to sell our products?

We're essentially testing against the requirements. But we're also testing against the regulations that drive good documentation practices. We consider our rich media to be documents just like a work instruction or a procedure.

MM: It's funny you'd say that – especially given your background in instructional technology and learning management systems. As you know, the human brain processes this visual spatial data many, many times faster than we can read.

In fact, I saw one study that indicated that the visio-spatial processing capability of the visual cortex processes information 5000 times faster than we can read. Again, I'm sure there'll be some argument whether it's 5000 or 1000. But it's many times faster.

That basically says that if you want to communicate a lot of information in a short amount of time, you want to do so with multidimensional visualizations.

DD: Textual information alone just doesn't cut it.

MM: That's right. As our good friend Edward Tufte of *Visualizing Information and Development* has called it, 'Multivariate Visual Information'.

Basically, in terms of the future of publishing and knowledge creation, that says there will be a pretty dramatic shift to rich media.

Especially multimedia data that is also analytically constructed. As opposed to it just being artistically there, there's some underlying logic and data driving the visualization process or the visual depiction process.

DD: That's right. Yes. It's funny that you mentioned visualization. Ultimately, that's one of our end goals with capturing all of these various metadata points. As I've told the folks at North Plains, 'In a few years we are going to gather an extraordinary amount of data. So what? Let's build some type of application that's running on the back-end or within the DAM

that essentially allows us to create visualizations of our company from light bulb-to-tombstone'.

To be able to visualize the processes. All of our business processes. Particularly those that surround the actual manufacture of our products. So that we can better manage more effectively and more efficiently. And at a higher level of quality.

MM: I had a conversation with a Chief Information Officer (CIO) just this morning about that very subject. In which he mentioned that each of the workflows there's a packaging workflow, a direct-mail workflow, a catalog workflow a display-advertising workflow and a video workflow. Each one of those represents a fairly well-established tradition with a fairly well-established language by which they have conversations.

He went on to say that really at the end of the day, workflows are conversations.

And that as soon as you make that leap that workflows are conversations, and that each reflects a discipline, a practice or a legacy, you begin to see these structured conversational technologies as XML schemas.

All that is just a uniform structured way of describing, in data, a conversation about how we do things.

So it seems to logically follow from what you've just said that on the back-end of these DAMs – assuming that your DAM now isn't a conversation engine – vis-à-vis structured XML schemas with content ... It seems entirely logical that a DAM in its future iteration really becomes a factory, an engine for driving these structured conversations now visualized, using XML and other kinds of visualization technologies.

DD: I like to think of it as an enterprise dashboard.

MM: To that end, one of the things that we're seeing is that DAM is really about a metadata management system. It's really a system for managing metadata.

The real value in the DAM is the metadata that allows us to find the file and turn it into certain things.

DD: Well, we've taken that approach so far as to say, 'Okay. We've got rich media, obviously, that we need to catalog. But we've got lots of other information scattered throughout the organization'.

If you went in to the Library of Congress and wanted to find something, you'd expect to be able to go to one spot, one card catalog or one search engine and be able to have some criteria to be able to search for what you were looking for. And then ultimately know where to go to find it.

We're hoping to be able to use our DAM to essentially create an enterprise card catalog. An answer management system.

I need information. I need it now. And I need to know where to go to get it. Every transaction in the DAM is a report based on specific business requirements.

MM: I think that you're definitely on the right track. It seems to me as a function of my conversations with other master-class DAM practitioners that you're going to follow a metadata maturity model that starts off with simple metadata describing the file. Then to descriptive metadata describing the context of using the file.

Then ultimately, a faceted classification system or a faceted taxonomy that describes how various stakeholders within the organization depict the entire collection of files.

There might be one facet that simply describes the entire collection. Sometimes referred to as a corporea. The entire collection from the point of view of lines of business. There might be another way of looking at that entire collection of assets in terms of geographic use rights.

Then beyond a faceted taxonomy, we're probably now talking about things like topic maps. Where if I'm thinking about this particular orthopedic bone replacement, well, what are all the other things that are associated with that particular application of your technology? Including medical practices, drug therapies, et cetera, et cetera.

Then finally, you're going to be talking about ontologies.

Which are kind of natural organic ways by which we organize the universe.

DD: Yes. It all boils down to defining what is the smallest manageable unit of information within our company. I think that's even going to vary based on the type of information that we're cataloging.

MM: Again in this conversation that I had with Carlos earlier today, there were two things that

he said that really resonate with what you just said. One thing that we talked about is that oftentimes assets – physical files that I want to use or transform – not only exist in somebody else's system, but that system exists outside of the corporate firewall.

How can I, first of all, find assets that are outside of my DAM system? And under a different governance model – that is ... behind somebody else's firewall?

We hit upon the notion that the asset that I want or may want that lives in somebody else's system is actually best characterized as a URL.

DD: Right. Yes. We have a lot of information that is as simple as a URL or permalink.

MM: In fact, the entire Googleverse is nothing but one big URL management system. Isn't it?

So now we're talking about then developing metadata describing what's connected to the URL.

To your point, one of the smallest units of knowledge may be a URL. Some of the most interesting work with respect to those URLs we find in Twitter and Twitter Streams. Specifically, these tiny or compressed URLs.

So it may well be that some of the most valuable assets that we have in our DAM are nothing but URLs.

DD: Yes. I'm glad to hear that. I feel the same way.

MM: That means that I can not only describe it in metadata, but I can associate it to various policies. Use, rights and permissions. Including under what conditions I can retrieve it and under what conditions I can transform it or do something with it.

DD: And what are the conditions for it even being available for people to find it?

MM: I think you're absolutely correct. Part of a DAM administrator or a DAM services director's job is to ask and answer the question, 'What are the basic units of information or knowledge?'

DD: Right. And how does that align to your documentation practices? And how does that align to the learning management system?

MM: So in and of itself, data has no meaning. It's just red, green and blue dots – and whatever else it is, we make up. Right?

DD: Right.

MM: So what really gives anything meaning in terms of a basic unit of information ... What

gives it meaning is the social context that I put it in. Or that I frame it in.

You could say that a knowledge management system is almost an oxymoron. You're not really managing objects. You're managing contextual frameworks by which I connect the red, green and blue dots into meaningful patterns.

DD: It's like a big family tree manager.

MM: I find that endlessly fascinating in that context generates value.

DD: Right.

MM: And ultimately, DAM is about codifying and structuring context by which things take on value – and that that value persists because I can search and find it and store it and transform it.

DD: Yes.

I think we've found that the best analogy we can give folks is the universe analogy. In the sense that you have a sun and around that sun you have planets. Then those planets might have moons orbiting them. That, in essence, is what we're doing. We're establishing those solar systems of information within our company.

MM: Let's come back again to the specifics of DAM as regards Zimmer.

From a business perspective or from an event that happened, what drove Zimmer to make the investment in a DAM?

DD: I've mentioned the knowledge management project that we're involved in. I feel that very early on in the project, we recognized that we needed to have a DAM system in place before we could even begin thinking about the transition from traditional document authoring to a more managed system.

I heard a lot of requirements from the team that said, 'Well, we want to be able to incorporate animations, for example, into our documentation. We want to be able to incorporate drawings and e-learning and tests and quizzes'. To essentially establish the linkages that exist within the company that can't necessarily be captured with a traditional file-share system.

MM: If I could summarize what you've just said so far, it's that your intention of communicating knowledge and information basically broke the paradigm of Word files and PowerPoint slides.

And as a function of needing more efficient ways of communicating more complex things

such as your products, you recognized that you needed to have a foundation. A publishing foundation. Or some sort of foundational technology that would allow you to compose or develop or build these more complex communication products.

DD: The analogy that I gave to our executives that they seemed to relate to was, 'Everybody has a tool shed or a workshop. If you go into most peoples' workshops, they've probably got a bunch of mix-matched nails and screws and other types of hardware'.

'If you were going to start organizing all that, what would you do?'

I just kind of threw that question out to the executives. They always come back with, 'Well, maybe I'd get some baby food jars. Or maybe I'd go to the hardware store and buy some of those plastic bins'. For example.

'I'd start the process of organizing and sorting things out, based on different criteria'. We'd say, 'Okay. Great. That's exactly what we need and want to be able to do with all of our documentation'.

We want to start that process of essentially throwing information into bins or containers, so that we can create these hierarchical relationships that exist between information.

For that information to be able to change dynamically without having to use a folder tree, for example, that's manmade. Because our information is organic. It's changing constantly.

MM: Well it's not only organic, but it's multimodal. Right?

DD: Right.

MM: Some of it's highly visual. Some of it's static. Some of it's dynamic. Some of it has an infinite degree of freedom. You just twirl that 3D model around and around. Upside down, left, right and so on.

So you had a proliferation of these multimodal content types. But the underlying business driver was we need more effective ways of communicating and engaging our customers in how to use our products.

DD: Yes. And to be able to find the answers to their day-to-day operational questions, just in the sense of knowing how to do their jobs. And knowing how to do it well.

So we have employees that are confident in what they're doing. They're satisfied with their work.

MM: Right. I also want to get to the framework or the context by which you connected those dots, and the way that you did.

We were saying that you had this vision. You came into Zimmer with a particular vision in terms of how to create and manage knowledge, and to make access to knowledge and information an easier and more satisfying process.

In particular, one of the things that filtered or colored your vision was your experience in instructional design, curriculum development and, more specifically, learning management systems.

So your experience and what you know about learning management systems in particular, and perhaps content management more generally. And more specifically, compare-and-contrast learning management systems and content management systems with DAM highlighting the strengths and weaknesses.

DD: Well, I would say that one of the things I'm really interested in as a practitioner is the relationship that exists between the practice of structured writing and a number of other disciplines. The first of those being the whole discipline of process and performance improvement.

How do you go into a complex work situation and conduct an analysis to figure out what all the systems are that are involved. And what all the duties are that are involved. And what the tasks are.

Even drilling down into the specific 'do' and 'know information'. I think that's one of the sides of the pyramids, and how that relates to the documentation that needs to come out of that.

MM: Let me see if I understood what you said, Daniel. You said that part of how you've approached and unpacked your vision into more practical operational strategies is that – first and foremost – you look at information within the context of an overall management process control framework such as Lean or Lean Six Sigma. Or some other sort of quality management process improvement method.

DD: Right. Yes.

Even looking at a swim lane RACI (a type of Responsibility Assignment Matrix commonly

used in project and quality management diagram. Who's responsible? Who's accountable? Who consulted? Who was informed? What are in the inputs and what are the outputs?

Yes, there are a lot of different quality-improvement concepts that fuel that discipline.

MM: That's a powerful insight. You're saying that I've got this structured, repeatable process and a disciplined framework by which to really start to understand not just knowledge and information, but the creation and management of knowledge and information within a process improvement framework.

DD: Right.

And how that organization should be organized in such a way to create effective documentation.

MM: So in many respects what you're saying Daniel is that it's almost recursive.

DD: Yes.

MM: Which is to say it doubles back upon itself. What's interesting about recursive knowledge loops is that as it cycles back upon itself it feeds a new cycle of insights, which stimulates another cycle of improvements.

While it doesn't necessarily cycle off into hysteria or schizophrenia or some other endless 'do' loop, what it does have the net effect of doing is as you've already kind of suggested ... It really comes back to who needs to know what, in order to perform a job.

DD: That's right.

MM: Then as you're cycling through here, you're constantly taking away. You're editing out the noise of what that person needs in that particular part of the workflow. What decisions that person has to make. What they have to effect or do.

DD: Right.

MM: So you start to look at what gets in their way. What gets in their way is noise.

DD: Right.

Or just simply the inability to find the information. And that's a big contributor to the noise.

MM: Another metaphor to use is that you are increasing the signal-to-noise ratio of delectable pieces of information and/or knowledge that directly contribute to the performance of individual jobs.

DD: Right.

If we do our analysis correctly, we should end up with what looks like a big apple pie. At the center of the pie, we should have a set of core knowledge, skills and attitudes that are common to all of our employees throughout the company. Then as you begin to make your way to the edge of the pie pan, for example, now you're getting into very specific and very job- and task-oriented types of information.

MM: From your perspective of learning management systems in particular, are you familiar with popular learning management systems?

DD: Yes, I am.

MM: What are some of the ones you're most familiar with?

DD: I'm most familiar with SAP, SABA and Plateau.

MM: Another one, I guess, is more of a traditional one – Blackboard.

DD: Right. Blackboard and Web CT. I don't really consider those to be Learning Management Systems (LMS). Those are systems geared toward facilitating web-based learning activities and collaboration.

Content delivery or content facilitation systems, for lack of a better term.

MM: How would you quickly define a learning management system?

DD: A learning management system gives us the capability to be able to push out desired units of information to our employees or beyond, and effectively captures an audit trail that that assignment has been completed.

MM: So you're looking at knowledge as a process manufacturing problem to solve?

DD: Right. There's usually a push aspect to it versus more of a casual browsing aspect of becoming competent in your roles and responsibilities and work.

MM: As you are familiar with these LMSs as they relate to the capabilities of DAM, how would you compare the two?

DD: Well, I would say that through our DAM – through Telescope – we have essentially built an Learning Content Management System (LCMS). We've built a learning content management system that will allow us to be able to manage content with a greater degree of agility than what we'd been doing before, by just using file servers and things along those lines.

I guess I should say that throughout all of our 17 sites worldwide, each one of our sites is off developing content.

It's all one-offs. Now as an instructional designer, if I build some type of learning object, for example, and it's cataloged in the DAM, other practitioners within our company will be able to reuse that information. And it drives the whole concept that there's one and only one version of the truth.

MM: Fascinating.

In partnership with another firm involved in English-language learning for adults, we approached it in a very similar manner, in terms of what we call 'network learning objects'.

We used the noun modifier 'network' to indicate that we were delivering this content to mobile phone users.

It would take a lot of the Sharable Content Object Reference Model (SCORM) metadata – the metadata model promulgated or propagated by the United States Department of Defense (DoD) – the shared content object reuse model ... and extend that. To include things like learning skill level required, cognitive mind styles. Are you a watcher, doer, talker, listener?

As well as testing metrics. What specific tests would we use? What kind of tests? For example, what manner of quantification would we use to ascertain or to validate successful acquisition of this as a skill?

DD: Right.

MM: That was all part of the metadata associated with – to your point – a learning content management system.

DD: Right.

MM: Could I get your working definition of a learning management system from the lens of DAM? We kind of know what digital asset management is. But how would you then describe LMS, as you're familiar with it?

DD: Well, this goes back to that idea of the pushed events versus the audit trail. I think that's the next evolution in training and development for us as a company. Right now we are 100 per cent a push-event enterprise. We don't necessarily capture those informal learning events that may happen because maybe you have an ambitious employee that wants to move on to a different skill set. As part of their development in order to do that, they may go off and perform their own

research of all the information they need in order to do that job well.

So through an integration between an 'answer management' system and a learning management system, we can provide a means for our employees to be able to obtain that information quickly and easily. But also to still capture the audit trail, that they did indeed complete a certain set of predefined requirements or criteria, to indicate they've successfully completed the training requirement.

MM: It's fascinating. There's a well-known scholar named John Seely Brown. He was at one point the Chief Technology Officer (CTO) for Xerox Parc.

He wrote a fabulous book about 10 years ago called *The Social Life of Information*.

He talks about how the tacit knowledge of practitioners almost never gets written down and structured. The real value in training and education is how to structure and harness the tacit information of subject matter experts and practitioners.

It's his conviction that adults learn best through peer-to-peer interactions in small groups.

And that conversation is primarily the process of encoding new information.

DD: Right.

MM: And conversation amongst practitioners – focusing on how to do something – is in fact the accelerated learning process.

DD: Right.

MM: Then you could say that the learning management systems move away from managing content to managing and structuring conversations. And they move from being LMSs to performance management systems because the learn-to-do or the read-to-do ... That cycle becomes almost instantaneous.

DD: That's right. Yes.

And those conversations can be structured using tools such as on-the-job training packets, for example.

They provide not only the procedural information that's needed, but also the critical success factors that are part of that information.

MM: Also, the contextual cues, in terms of what's important and what's not. What to pay attention to and what is just noise.

DD: That's right.

Another thing we have to focus on, too, is non-optimal performance conditions. All too often I think we focus only on the perfect state. We forget to include information like if your instruction is to turn the handle $\frac{1}{4}$ clockwise. What happens if you turn it $\frac{1}{4}$ counter-clockwise? Are there safety implications there?

What do you do if there's an earthquake, for example? What happens if there's a fire in the building?

MM: You bring up another great point that I first got exposed to in the work of Michael Gerber and the 'e-Myth Mastery', which was really perfected by David Allen in the 'Getting Things Done' guide.

It's the notion of creating action plans for the worst possible conditions.

DD: Right.

MM: David Allen was all about having documented workflows and trusted action management systems. He relates the story about how he was on an airplane trip, sitting across from somebody. When they got talking, the guy shared with David Allen that he was an ergonomics expert. Specifically, in human engineering systems for use in the Antarctic.

As they got into that, he said, 'Yes. I have to write instruction manuals'. For example, how to reignite the furnace – or how to turn on a critical life support system in the Antarctic, where it's 80 below zero.

When it's truly 80 below zero and the heat's off, and you're standing in the gale force wind of 50 or 70 mph, what kind of manual or instructions do you write?

He said, 'What you do is you write low-context. You assume nothing'.

He describes putting together a whole life support system for an Antarctic science mission with that level of specificity, assuming worst possible conditions.

DD: Right.

It's a very similar situation in a regulated manufacturing company.

MM: Imagine coming into a small business where you've documented everything from how to fax something to how to make a cup of coffee?

All of that now is encoded into a learning content management system, as you've described. Such that you can now start to

systematize all the activities and practices within a particular business operation.

Now what's fascinating about that particular perspective is that then you can put together a performance checklist. So you can literally say, 'Okay. Here are the 10–15 regular activities that you do on a daily basis. When you do them, hit this checkmark'.

Not on a piece of paper, but on a web form.

DD: That checklist can be packaged in a scenario-based assessment that follows the 'show-me, let-me-try and test me' model.

MM: Not 'captures' real work, but 'is' real work.

DD: It is real work that accurately captures real work that measures against true performance metrics based on policy, standards and practices.

MM: The point that so few people really get is reporting is real work.

Without feedback, you are a cancerous agent in an ecosystem.

DD: You're essentially modeling non-performance.

MM: Yes. So there's no higher order of functions like process control or orchestration

without feedback loops of work being completed. Work that we've already agreed is necessary and strategic in adding value.

DD: Right.

If we take it even purely away from the learning side, into just-in-time (JIT) information, we envision that as computer hardware becomes more mobile and more flexible, we will be in a position to support immediate, on-demand acquisition of learning objects.

Wouldn't it be great if there were a bar code or a Radio Frequency (RF) chip on this phone that I'm talking to you on? If I wanted to know as a new employee how to set up my voicemail, I'd take my mobile Internet device and scan the phone. Lo and behold, I've got all the information I need about how to use the voicemail system at Zimmer.

MM: Perfect. So now you're describing not an app store, but a knowledge store.

DD: Yes. A performance store.

MM: Yes. Fabulous.

MM: This sounds like a great place to conclude our interview. Thank you so much, Daniel.