Configuration Management
Guest was Kim Robertson

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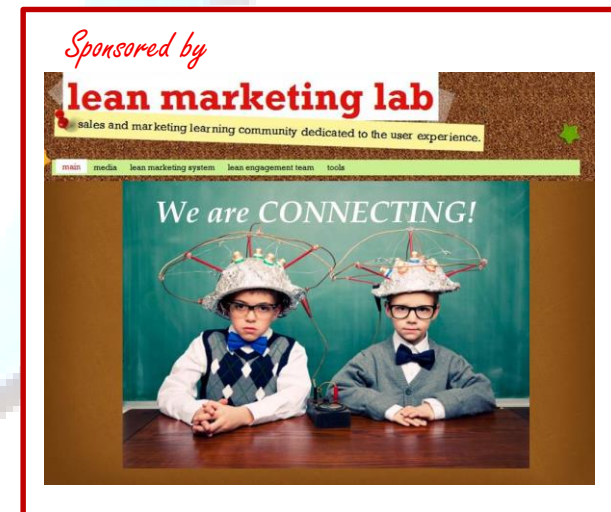# Business901   *Podcast Transcription*

Implementing Lean Marketing Systems

Transcription of Interview

Joe: *Welcome everyone! This is Joe Dager, the host of the Business901 Podcast. With me today is Kim Robertson. Kim is an associate of Value Transformation and co-author of a soon to be released book on Configuration Management: Theory, Practice, and Application. He started his first company at the age of 18 and has an extensive background spanning 40 years in all aspects of business and aerospace. Kim, thanks for joining me. The introduction just begs the question, what business did you start at the age of 18?*

Kim: When I was 18, I started a business with wildlife art. I had always been fascinated by very antiquated and antique items were they were covered with inlaid wood which was known as marquetry, similar to parquet floors, and I wanted to see if I could take it to the next level. What I did was research not only the wood but the types of density of cell structure, what happened with it with various different types of finishes so that I could study refraction and reflection activities going on within the wood and best utilized that for the wildlife art. Starting from contrasting colors of walnut and birch, I ended up at the end of

the piece of my career with over 450 different types of wood from all over the world and pieces were selling for upwards of $3700. The first piece I sold was for 1500, and thankfully the economy has been what it was over the recent years and I got a call recently saying that one of these have been resold for $ 850,000. Even though, I'm no longer in the market, they still let me know what's going on with the pictures.

Joe: *How did that traverse into aerospace and configuration management?*

Kim: Well, I started out at the University of Utah and ended up with a degree in math and physical sciences. I had dropped out six months before getting my degree and went back after the Hunt Brothers manipulated the silver market and the bottom fell out of the art market, as a result, so I wasn't getting return on my time for doing the work in the marquetry art. I went back to school, finished up, I specialized in finite geometries, and those are mini systems where there are certain rules that control how the system operates. Based upon the work with the marquetry where I was doing my own marketing, and my own supply management, my own data management, and assuring the integrity of the pictures themselves by doing the field work for photography in the National Forest up in Wyoming and as well as up in Yellowstone, I decided to see if I could translate all of that knowledge into something else.

I was hired into Martin Marietta at that time which was working on a program called the NX Missile as a systems engineer writing specifications for the forward module. That transitioned into a job into contracts which transitioned to one in finance, and then eventually into supply chain management. When the savings and loan fiasco happened, I got a job with the

Resolution Trust Company, a part of the FDIC helping clean up the savings and loan activity as a contracting officer for the feds. I had always wanted to get into ball aerospace and the opportunity came up there and so after doing a stint at Rocky Flats cleaning up the trigger manufacturing site there for radioactivity as a supply chain manager, I transitioned over to the Ball Aerospace Organization and we started a new arm of ball aerospace that dealt specifically with commercial applications, so I was able to bring everything I had to bear in that relationship knowing the commercial went a little bit above the international market.

Joe: *So it sounds like you've done a lot of cleanups where they were pretty messy.*

Kim: Yes, it helps to have an organized mind when you do things like that and the systems perspective of how data flows and what it means to not only the initial design development of a product but the later roll out and final disposition of the end products as well as the support that has to happen along the way certainly has played its part. So I was playing a much larger role than a traditional configuration management person would. The story goes on; we have put up satellites for the work done are now giving you all the weather data you have SNBP. We had satellites that we worked on that measured the ozone depletion as well as every satellite that Digital Globe currently has on orbit from QuickBird to the WorldView 3 were programs that I helped with. So it's been very exciting seeing all of that information come down and being able to orchestrate the backend of it to assure that those who were the creatives, the design engineers, and the systems engineers had the tools at their disposal to do what they needed to do.

Joe: *Well tell me, what is your book, your upcoming book Configuration Management, can*

you give me a quick overview?

Kim: Configuration Management as practiced today deals a lot with EIA-649 and some of the ISO standards and its evolved in the US from problems they had during World War II and I've always thought maybe the backstory is more interesting than that. So I traced things back to about 8,000 years ago in China where they had hammer mills in mass production and you may have heard of the Terracotta warriors that were put in the ground around 210 BC and that was the brutal side of Qin Shi Huang in China. Well there they found about 3000 kilometers apart interchangeable parts in the crossbows and they also found that after looking at 30,000 arrowheads that they found in the Terracotta Warriors, that they had difference in length of only .22 millimeters. So this got me curious to see how many people in configuration management practicing today knows about the back story about everything.

For example in the area of computer software, most of that trails back to Boolean Algebra, but Boolean Algebra traces back to the Xi'an with 64 set relationships for who was where in the family structures. All of these could be represented by ones and zeros and so then we have the binary language generated out of that for the computer systems that we all rely on today. Other things that we had was manufacturing for mass production not only with the Terracotta Warriors in 210 BC but around 256 BC, Carthage was actually giving the same plans for manufacturing of their ships to all of the ports where they traded so they could build the ships on the spot. If there was damage, replace things like the prow with Cronin and Prune type construction which was totally new. We look at this type of putting let's say interchangeable parts in the US is based upon a myth about Eli Whitney. In truth, Eli Whitney's company true interchangeability until years after he died, and people had it long

before he did here in the States. He got the idea for interchangeability from a pamphlet that was grabbed by Thomas Jefferson when he was ambassador to France. The history of it is just fascinating.

So we start out with the history. The ground people in what the terminology is that's used because the terminology today is a mess. Some people say CM is configuration management while if you're in IT world, CM means Change Management, and they're totally different. Change Management is a part of Configuration Management. What really gets people in trouble seems to be in the data area because we don't do enough interlocking of data and metadata to assure we can get out of the system the information we need. We were into that with Resolution Trust Company where towards the end of it, they asked us how many of the awards we made for cleaning up all of these properties that has been repossessed by the banks were awarded to small disadvantaged known businesses and of those, what was awarded to areas in economic distress. We never had that information requirement upfront, so we didn't build it in the system so without the hooks, we couldn't retrieve without spending millions of dollars to go back and look at every contract that have been awarded for six years.

Joe: Your book starts out giving you just a brief overview of some history behind Configuration Management. It's much more that you dive into the configuration of data. You dive into much more because it's certainly just not an airplane book from what I saw of it.

Kim: No it's not and the book itself is in a couple sections. The first section has some chapters giving you the background and the terminology and where things came from so

that there's a common lexicon of words and definitions and concepts that you can apply later. Then we go into areas that are traditionally seen as configuration management which is a management of the configuration of whatever it may be. It could be a person's configuration. What you put on when you woke up today consists of some clothing, a wallet, you know what's in the wallet pretty much, you know how much change is in your pocket, you have a medical history, all of that is your personal configuration. Well, every item is produced, or every item that's developed and not produced has that same type of back story to it. So we explore how to go about doing math the simplest way based upon some 190 years of experience combined between the people that were involved with doing some of the research with us and comments that we receive from groups on LinkedIn and discussions, and it's been fascinating the take that different people have o what CM is. So we're trying to explain all of that it just from an aerospace or DOD Military US Government standpoint, but across all of the infrastructure regardless of what business product-centric piece of the market you're in.

We pick up from there and then we describe how configuration management activities can support each one of the infrastructure elements; program management, finance, contracts, law, supply chain, your stockrooms, your manufacturing facilities, and all of that. From there, we go on and say well here are some actual examples of things that went wrong, and we end up at the end of the book with all of the configuration management standards that we could find that are applicable today, as well as some of the historical ones. So we were very lucky to have some tie-ins to various governments around the NATO Organization, and they were willing to help us with identifying what standards they had before they converted to the STANAG NATO Standards. We were able to put all that together for people for reference

within whatever business sector they happen to be. So we've taken it from a basic definition of what it means, how it applies across the enterprise, and then zero in on here's what you can do in different product areas as well as the lessons learned.

Joe: *One of the parts that jumped out of me was some of the statements right away that you made in the heading of the poor handling of data. I think you mentioned that 30% of the knowledge worker's times are used for looking for data and even at that, there's only a 50% success rate.*

Kim: Yes, that's a problem across industry. That one actually came from another book that I got that information from. Basically, we don't have the data linked. So for example, if you have a subcontract; with the subcontract you have a purchase order, you have a statement of work, you may have some specifications. After that, you have data that they're going to send it to you which is usually supply chain data lists. Nobody is hooking those together within their product data management or product lifecycle management systems. They can tell you every piece part and who the vendor was that goes into the buildup of the final item, but they can't tell you where the data was, what the receiving's factual report actually said about the information or much else. That's very bad when you're trying to do any type of quality assessment on why things aren't working the way you thought they would within test before you field something. Or in the case of things like the switch the GM had, where did you go wrong with that piece of it and basically that gets back to one of the premises that if two things don't look the same, aren't of the same quality, don't look alike, don't keep the same number and we find that that goes on quite a bit. There have been cases of airlines where it's time to replace an engine and they order a new engine for the jet aircraft, the

engine shows up and it doesn't fit on the wing because they made a change, but they didn't change the top assembly number.

And so we have all of those types of activities that we need to take a look at and integrate them together somehow. We have this problem with the Lean-type activities as well. Lean Six Sigma is something that is very popular right now. Lean Six Sigma I believe says you're going to have two bad parts after every million or so. A couple of years ago, there was a company that ordered a couple million resistors all of the same value from another company and they had a Lean Six Sigma requirement and the company they'd ordered from, the supplier kept saying, we're going to have to hold off a couple weeks, giving you this last supply data management report. I said well okay, and so then eventually the report came in and there was a shipment of resistors and there were two resistors typed to this note on top of it saying, we didn't know why you wanted two bad resistors, but it took us eight weeks to find them, since they were working at an Eight Sigma level. So a lot of that, you have to know what your suppliers are capable of before you let your requirements on them because otherwise you may be forcing them to do work and costing you money that you don't have to spend.

Joe: *I think about the data, I think that the inaccuracies that you point out in the data and the lack of cross-references and coordination between all these data, and from a layman's standpoint it sounds like here we are back to this old file cabinet thing that 80 to 90% of whatever we put in the file cabinet, we never retrieve again. What we did retrieve, a lot of it was inaccurate and though that was in the paper world, is data much better?*

Kim: One advantage you had with the paper world was at least you could retrieve it. What we see a lot with the information technology, these activities are that some people make uninformed decisions that the data isn't required, and so they may dispose of it. We've had some cases where I was involved in a program where the decision was made, we're just paying too much for backing up servers and so we're not going to back anything after three months. We'll backup nightly, we'll back up weekly; we'll backup monthly. We'll save three monthlies and then when we save the fourth; we'll throw the first one away. Lo and behold an entire program's worth of data went missing and it happened four months or more before it was discovered and the customer was asking questions because the units were still on the field, and nobody could find any of the information. As far as data retention itself goes, I don't think that we're much better because the IT organizations and the programmatic aren't really communicating or understanding if they are talking what the actual requirements are and often its retention for 10 years after disposal of the last unit which with an automobile maybe 40 years from now. On a space asset, some of them would have been up there 35 years. Voyagers have been up there almost 30 years I believe, and it is still going. All of that data is still being retained some place.

Which brings us to a secondary problem is what happens, because the computers are going and involving so quickly. You're talking about possibly having quantum computers now which would give us something besides buying a recode because you'd end up with 16 possible states for an answer making things not black and white or ones and zeros but shades of gray or Technicolor if you would. So we have some of the missions where we actually archive the computers, the operating systems, the software and everything else because 15 years from now, all of that evolve and there will be no way to actually communicate with a spacecraft

that was in orbit. The same thing is going on, on the ground. The last launch of the space transportation system, they were sourcing all 86 boards off of eBay to keep the systems running in order to make that last launch because the hardware was so old, and we have the same thing going on with the data. How do you keep it current and we've been struggling with that for a long time. The portable data format or PDF has been a great help with that because PowerPoint and those types of things, when you move them from one server to a lesser cost, storage type of retention sometimes get corrupted and you can't ever retrieve them again, but PDF's still seem to be good.

Joe: *Configuration management is supposed to help us with all these problems and to me, it sounds good but how does configuration management or what are the keys there to make all these things right as we just talked about?*

Kim: If you look for them in ISO or EIA standards, you'll find some definitions that came out from the military and were developed. Lots of people on the EIA standards I know personally and they work for companies like Boeing, which have large government contracts and that sort of thing. Basically, if you want to understand what configuration management is, you have to go back to the beginnings. At one time say with Leonard Da Vinci, he could make a painting or a sketch in any qualified person be it a wheelwright or whatever, we'll be able to look at that, understand it and say, oh okay you need an 18 foot diamond or wheel, I can make you one of those. They were all built on a similar pattern.

Today things are so specialized that you don't have a core group of people like the guilds used to be that are controlling things. Your design is now split up between so many design

functions that there is nobody looking at the entire configuration, how it interplays. This is really important with some of software development where you may take certain functions of the software, develop them in their own developmental stream and then reintegrate them back into the whole, but if you're not keeping communications open which is the information management or the management of the data associated with the product you're developing, when they do go to reintegrate them to the main software, it's moved off someplace else and they find they spent months developing the wrong thing.

I remember at one company, they were producing vehicles to work at the Vandenberg Air Force Base and because there was a fly speck or a little piece of whiteout if you will on the copier, when the copy of the speck was made and sent to the design department, it said that it had to filter out 3.6 x 10 to the third microns; well it came out minus 3 microns, so they were actually getting down to whether we're trying to design a filter for this Volvo white truck that would filter out cigarette smoke.

You have to ask questions. You have to make sure that everything is understood, and you can't do that all the time with net meetings or what we call a transactional environment with texting or emails. Actually you have to sit down face to face occasionally and have a synergy of discussions and pick up on the body language and ask questions and work things out that way. It happens very well in some companies, take the Bugatti Veyron that was produced by Volkswagen. It is a marvelous machine; the fastest production luxury car there is. It goes faster than the Formula 1 car, but it comes with air conditioning, leather seats, seats five and all that type of stuff. Then we try and compare that to something that isn't produced with the same type of integration of information exchange or management of the data

exchanged and you end up with things like the exploding Pinto. If you're not talking, then things are going to go awry, and CM and data management part of configuration management can help with that. As I said earlier, keeping things organized so the creatives can do things and understand what it is they're doing is probably the biggest goal of configuration and management and everybody does it.

It used to be that there was one department called configuration management, and information technology, systems engineering, and all of that were part of it. As these have grown to the complexity of the programs and products that we're making, so have the data integration needs. The book that we wrote tries to circle around and say, okay you've got your own charters but you're all doing part of what used to be considered the configuration and data management job. You might have people in the quality organization looking at things and saying, okay what's the disposition of this item? Is it used as is, is it scrapped, is it reworked, or something like that? Well, that has go back into the configuration process somehow. I'm not sure if it still happens but International Harvester for example, with every vehicle used end up with a parts list of the parts that were actually used on that vehicle because you have authorized parts substitutions and then you have program authorized part substitutions. So if you don't keep track of even those, you won't know what the final configuration and if something goes wrong, you won't know if it's limited to the units that had a particular configuration or all units. You don't have the granularity built into the system,

Joe: *You quoted some things about traceability and food and the data configuration and data trail for traceability. When I saw that, it was like-- here we are talking basically from*

field to fork, is there a data path even in that supply chain from the farmer to the consumer that we can find?

Kim: Yes, yes, very much so. You may have remembered the Wisteria issues they had with the Rocky Ford cantaloupes grown here in Colorado that were distributed nationwide. The fact that the Wisteria was found in the soil where these were grown, and the company voluntarily destroyed all their crops and sanitized their land for the Wisteria contaminant and went from there. But we have standards that are international now dealing with the quality of how food is prepared, how we move it from location to location and it does more than food and drug administration checking to see if your processing plant is okay. It also carries from the time the item is produced to the end of shelf life and how to disposition some of these things. When we moved from the alkaloid type batteries to the NiCad batteries and to the mercury batteries, disposition at the end of the flow became eve more critical. Your CFL light bulbs are another example of that, moving from incandescent to CFL's. So we at this point, international regs as well as US Federal regs control a lot of what data has to be gathered, what has to be tracked, through to end disposition.

Joe: *We just talked about how much time we spend looking for data and success rate, and then we go back to how much inaccuracies are within the data when we actually find it, and we talk about the lack of data cross-references. These are title headings or sub-chapter headings in your book a long with inadequate data safeguards. We look at a supply chain with numerous handoffs. I mean going all the way through the system, can I believe the data?*

Kim: It depends on how it's organized. The biggest problem that we have with most data is there isn't a single source of truth in the enterprise. We go back to the filing cabinets. In my filing cabinet, I have the first revision of a specification because that's the part I worked on. I hand it off to somebody else; they have a second one, but it has the same date on. The two items are not the same even though they have the same date on, and there's not a single source of truth. Within the data systems that we have to be able to implement in order to survive in the world marketplace let alone assure the safety of the people who consume our products, we need to get much better at that sort of thing. One of the things that's helped that is some of the products that we have with databases, if they are in controlled source with some sort of revision control or change control where you check something out, work on it, check it back in and it has a different version number, that certainly helps.

The other thing that we need to do is to look at the world around us and say, how is this data going to be used? And that isn't as easy as it sounds. You can take a look at any product that has been developed and as soon as it hits the market, people find them uses for. Who would have envisioned for example that the iPhone would now be capable of taking and processing multiple pictures to make a 3D object that could then be ported into something like a 3D printer for printing a replica of say an antique coin where the original is so valuable that no one dare touch it because its old and its fragile and it might break. But if they make a replica out of it in plastic or even in metal, then you have something people can actually study and find out how it was manufactured.

And this leads us to some recent developments in the museum world. The Smithsonian has started a 3D scanning project to scan every one of its assets. This is being picked up by

other museums that are taking not only 3D scans but RMI's and combining them, with the combination of that and what we have with something like the ability to print in 3D which kind of is now printing working kidneys that would be acceptable size of a dog's kidney with the eventual goal of getting everybody off of the waiting list for these products, how do you control that? And we have the capability that we'll have very soon to replicate most of the human organs. So what do we do; is the printer certified to a certain level? What happens if this design is printed on a machine that isn't recently certified and there are anomalies built into it that could be life-threatening? And this is taking it to the extreme, but these issues are before us right now and we need to take a look at how it might be used and not just how do you plan to use it as far as the data that you're collecting and what hooks you put into the system itself.

Joe: *Without configuration management, we have to be somewhat predictive.*

Kim: Yes. You can take a look for example at any one of the satellites that's been orbited by our space capable nations. I'll just take the ice set satellite which was built primarily to measure the deterioration of the thickness of the ice at the polar caps, where all of a sudden they found that if you have this technology, you could measure the amount of deforestation going on in the rainforest because it took a laser bounce off of whatever the tallest object was, and then the next year it would measure again and see if anything had changed. Well, that's very good for ice where you're talking about inches but it's even better for things like rainforests where you're talking about hundreds of feet of difference in elevation just because of deforestation. So when you look at these things, you have to be a little be farsighted and maybe 'science-fiction' if you will and say, okay based upon what we know today, what can

we extrapolate this might be used for in the future and how do we put those data hooks in the system?

Joe: *Are we saying that configuration management needs to be used by everyone? That everyone -- a department leader let's say and even maybe down to the individual has to sit back and organize for lack of a better word his own desktop computer and into some type of configuration and have that consistency throughout an organization or department that needs to take place?*

Kim: Yes, it should be department-wide because otherwise you have still pipe centers of excellence for the data retention or data management if you will. If you don't have a consistency of how you organize your data and how you label your data, then you're not going to be able to have any consistency in how you go later and find that data. For example, lots of people even on a server or file server will put the date and time of the object. So they might say, 01-10-2015. Well, when that gets into the server, and it sorts on ASCII format, it's going to end up putting all the January data together regardless of year. So if you haven't got a taxometry set-up for the data structure you're going to be having for your enterprise that says, okay for all these files, we'll put the year and four digits first, then your data is not going to sort properly and you're going to end up having to do a secondary shred through the data to find out what you're looking for.

Ideally you'd be able to go into a system and say, okay I know that Joe created this report dealing with a trade show that he went to in 1997. I don't remember the name of the tradeshow, and I don't remember what the subject was, but we should be able to find it in

the system. Well if you haven't built the hooks in upfront and don't have a consistent way of labeling things, you're going to end up with the search that's not effective at all, and 50% of the searches result in data and out of those 30% result in data that may be usable. So once you start doing these types of things, you really up the ability to find information and you drive those curves dramatically. This is an enterprise-wide effort. This is enterprise data management if you will.

Joe: *How does metadata play in all this discussion? I mean can you give me a short description of what's going to happen with metadata in the future and maybe what should we be on the lookout for?*

Kim: Metadata is data about data. So for example I may be working on a program for customer A; I have engineering drawings, I have engineering analyses and all that type of stuff, you may end up in your database with a metadata field saying what the company name is or what the contract number is, you could later sort and say okay we know that the data was for this company, can it be reused for somebody else? Without that data identification, you may never be able to research that. For example, you may have a specialty type of a steering mechanism on a vehicle and the vehicle was short live because the market wasn't ready for it. For example, an all-wheel drive. The first attempts at all-wheel drive were very successful as far as the vehicles went, but they were not very successful as far as the market went. Now you find all wheel drives every place. Had that data not been properly marked so that it could be retrieved, you would have had to go back to the drawing boards spending millions of dollars to regenerate the technologies instead of simply leveraging them forward.

Joe: *A lot of people want to control their own data. They want control of it. They're generating it. Can they have ownership? Is that ever really going to be feasible?*

Kim: It depends on how you define that thing that you're trying to control. I'll give you an example. I have intellectual property that I feel is mine which may be photographs of family; it may be the types of things that you would share with people on your Christmas card and that sort of thing. If you are putting that information on Facebook for example, I believe a clause is still in the Facebook use agreement that as soon as you post something, Facebook can use that information any way they want to sell it to somebody else. So once you do that and sign up for that agreement, you have lost control of your personal IP. When it comes to things like patented technologies and trademark type technologies, countries have different ways of looking at it. For example, some companies say, we don't care who built this IC chip; we'll give a patent to every new application for it. So if you originally built it for a cell phone and now all of a sudden somebody has it saying, oh we'll use that same technology for your garage door opener so you can open your garage from your cell phone; that would be two patents.

Once we get to some sort of international standard for what that IP means worldwide, it's going to be a lot easier to protect it. Right now, you'll find it's kind of anybody's game but it has been for years. Back in antiquity, for example, intellectual property and data encryption took different forms. There are historical records of this fellow who wanted to get information about a city out of the people that were going to invade the city, and so he had some trusted servants and he shaved their heads and he tattooed the instructions on their heads, let their hard grow and sent them out. It was a very early form of IP security. In Sumner, they used

to have little clay balls that they put tokens inside. In the token maybe here's three measures of wheat, two measures of metal, and four measures of beer, and once those were put inside the clay ball and both people's seals were put on it, that was a binding protected piece of IP until that clay ball was broken. You could say, oh okay, you're Fred, you've worked for me a week, so you want me to pay you your metal and your wheat and your beer.

The idea that all of this is new is not true; it's just become more critical as we reach the population densities that we have. It was much easier to control when your nearest neighbor was 20 miles away. Now that your nearest neighbor is nano-seconds away in the electronic world, it gets very hard to control. I don't think we're ever going to really get there. I think that we're making great strides, but a lot of that is based on trust, and some of the problems we find is based upon different definitions of what IP really is. For example in the US, we say we patented this design wherever you use it. In Japan they say, we patented this usage of that design, whatever it is. So, of course, there's going to be disconnects until we come to a common language.

Joe: *What's the best way for someone to contact you and learn more about the upcoming book?*

Kim: They could contact me through the Value Transformation's Website. I could give you that. Kim.robertson@valuetransform.com.

Joe: *They can contact you on LinkedIn also, correct?*

Kim: Yes, I'm also on LinkedIn. Feel free to contact me. I am available to answer most questions. I was just helping somebody earlier this morning with questions about what type of product lifecycle management systems there are out there and if there is a preference for one versus the other.

Joe: *When is the book scheduled to publish?*

Kim: The book is available now on Amazon.com and distribution will start in May. Before we go, I wanted to give you the source for where the information came about for the amount of data that is retrieved and how much is valuable. That information is from a book called *Data Driven*: *Profiting from Your Most Important Business Asset,* published by the Harvard Business Review Press and the author is TC Redman. It's an excellent book for people that would like to know more about data itself and big data and metadata from a total system viewpoint.
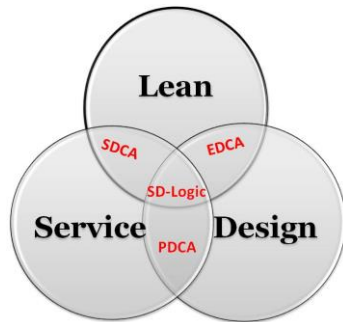
Joe: *I would like to thank you very much Kim. I appreciate it. This podcast will be available on the Business901 iTunes Store and the Business901 Website. Thanks again Kim!*

Kim Thank you, sir.

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