Lecture – 21
Analysis, Design of KM System

Okay, so now we are moving to fifth week and fifth module, and in the forth module, basically we talked about how to capture codified knowledge and what would the process of system and then we also talked about the knowledge architecture, how we are going to have a good knowledge management team, so that it is in to effective. In the same continuation, now what we are going to discuss is that how we create a blueprint for the knowledge management system.

And then what are the different techniques involved in it, we will try to explain it as simple words as possible. Then third part of this week is how to develop the prototype and go for deployment in the system, right. So we start with the designing in knowledge management program.

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Topics Covered

- Develop the knowledge management architecture.
- Understand and select the architectural components.
- Design for high levels of interoperability.
- Optimize for performance and scalability.
- Understand repository life-cycle management.
- Understand and incorporate requisite user interface considerations.
- Position and scope the knowledge management system.
- Make the build-or-buy decision and understand the tradeoffs.
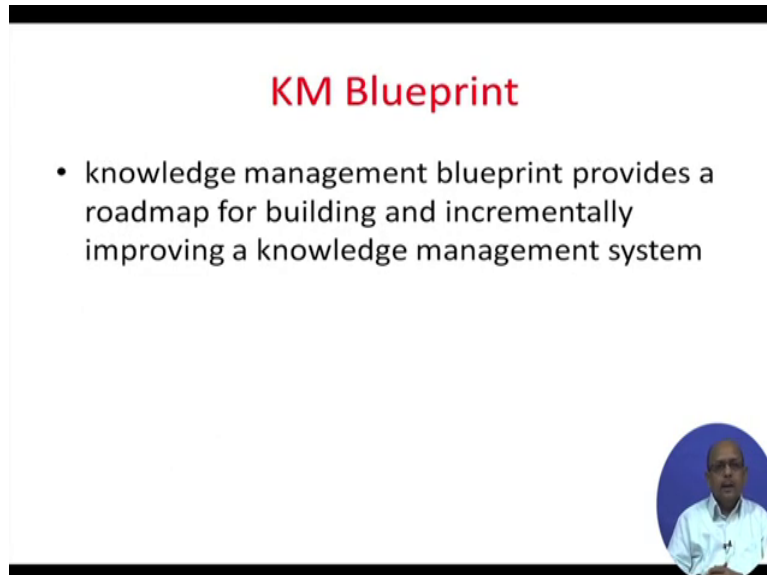- Future-proof the knowledge management system.

The various things that we are likely to cover here is that how to develop a architecture for the knowledge management, we are also looking to the various components okay and then we have to see that it has a higher level of interoperability, we also look into that system that is designed okay is meant for performance and it is a scalable means that suppose the number of users go up in it is possible to use the similar systems right.

Then you have to look into the repositories because repositories are the place with the knowledge content is kept, so we have to look it from the lifecycle management perspective because the repositories grow old over a period of time, issues related repositories what kind of knowledge to be put in what kind of knowledge not to put in. Then will look into the requisites which is important for user interfaces and then where it is going to have positioned as far as KM is concerned.

And then we have to see whether buy or building, so you have to go for a trade off, as architecture is responsible for this, that whether you are going to have the architecture that is to build in within the organization or we have the architecture that is to be outsourced experts or other places right. Then how can develop a good knowledge management system okay, which is scalable which can be used in the future, okay.

And which cannot be penetrated into by the hackers okay, viruses' attacks are not taken, therefore these are the various issues of the architecture which we are likely to cover in the next two half an hour lectures right.

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So we start with knowledge management blueprint, what is knowledge management blueprint is? See basically it is a roadmap okay and you know what a road map is? So roadmap tells you that from this place to how you going to reach to another place okay and then it also tells you that how to reach there, right so it is a roadmap for building and incrementally improving a KM system.

So it is the roadmap which tells you that how is you going to develop a knowledge management system, so it provides you a guideline okay, that what kind of knowledge management system is to be build and how do you build a knowledge management system. So a blueprint is basically nothing else, but it is a kind of you can say final prototype, because everything there is in the final prototype would be included in the knowledge management system okay.

So if you look the architecture of a knowledge management system you would be able to understand that how the system works, what are the different components of the system okay and then how it works, it is like a building you have, for a building you have architecture, so it is like a building architecture which gives an idea about the kind of building it is. So similarly knowledge management architecture will give an idea about the kind of knowledge management system that it is been adapted right.

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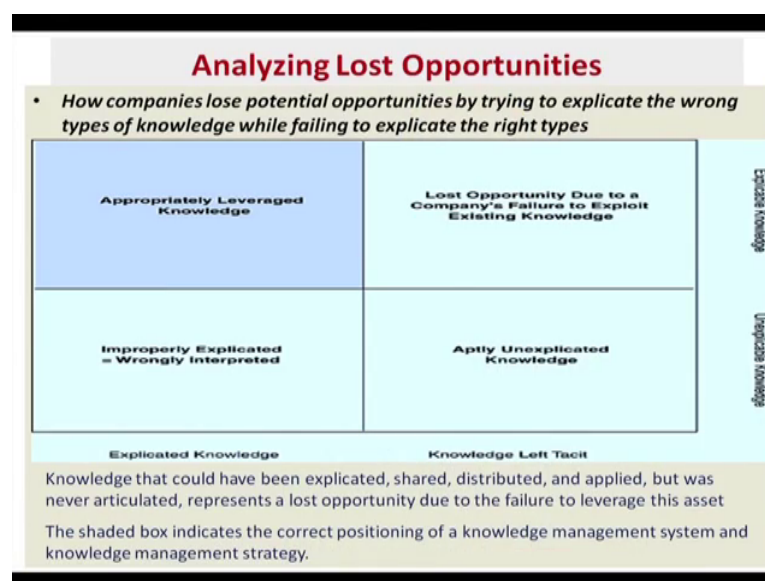
So when you going to develop a knowledge management system, so you have to see that how it is going to help the companies to grow and develop, right. If you are going to develop knowledge management system which is not good probably you are going to lose the opportunities okay. So here we are trying to analyze that how we can basically get opportunities or how we can look into or exploit opportunities which are likely to be last, right.

If you are going to explicate wrong type of knowledge in the system then what will happen? Okay then you cannot explicate or come out with right kind of knowledge; especially it is to

with the explicit knowledge right, not the tacit knowledge right. So explicit knowledge is what? Declarative knowledge, procedural knowledge right, they are explicit knowledge right. And other kind of knowledge is non-explicit.

Like tacit knowledge these kind things right. Now if you look at this quadrant it talks about that how you can leverage with this knowledge, provided it is explicit right so pretty explicit is expletive, explicit can we try it and that is where you get better leverage from the knowledge right because the knowledge is explicated right. Now if you look at this part you are going to lose opportunities, you will do the part to do because you are not able to exploit, explicit knowledge right because it is a level in the tacit form here also.

So this is a major concern that is where you are and where the KM system here again there is not a problem because that is will. You have explicit knowledge that can be used but the only thing is that if the knowledge that there has been explicit if it is not correct it is wrongly interpreted then you cannot have a leverage, so this is the best thing but for that here. You have to see that how the tacit knowledge is transferred to explicit knowledge right.

So the knowledge that is explicit shared and distribute it and transferred but never articulated the presidency lost opportunities, so and I am not talking about lost opportunities here you are losing the opportunities because you are not going to leverage this particular less it okay if you look at this shaded box, what does it talks about, the correct positioning of KM system because here you have been able to form tacit into explicit and this is the right kind of knowledge which is going to help you.

So you need to ensure that you are not going to lose opportunities is because you are not able to exploit the existing knowledge whether it is available in explicit form or tacit form right, so what do you need to do is that you need to ensure that tacit knowledge is transformed into explicit and the kind of explicit knowledge that is available to you is the right kind of knowledge right.

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The KM Architecture

- IT is a great enabler for sharing, application, validation, and distribution of explicit knowledge.
- Its weakness become apparent when companies try to use the same techniques and systems to leverage tacit knowledge.
- With that in mind, the KM architecture should be seen as an enabler for KM and not a complete solution: a means and not an end in itself.

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Now based on this the argument we are going to see that what kind of KM architecture should be there right. You remember we already talked about the role of IT system so IT system actually helps you to share application and say apply or validate and distribute explicit knowledge, see IT does not help you to share or apply tacit knowledge because it is personalized, it is person to person based.

But when it comes to explicit knowledge that is where a IT plays a very important role, so it is important to ensure that whatever knowledge is available in your going to make it explicit to those companies which are not able to transform the tacit knowledge into explicit knowledge they will not be able to make use of IT to share or distribute explicit knowledge because it is not available in explicit form right.

But if you are going to use IT systems to share tacit knowledge then it does not value any leverage, because tacit knowledge is person-to-person based right, it can come out with using community of practices and teams, collaborations and creating a knowledge sharing culture where person are going to share the knowledge with other person. But IT did not help there so we to see that what is the role of IT in the system, IT basically provides to a leverage specifically for explicit knowledge right.

So make sure that our IT becomes an enabler in the KM architecture not a complete solution because it does not act about tacit knowledge right then moving to other issues.

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(Source: Designing the KM Blueprint form Tiwana, A.: Knowledge Management Toolkit, 2002)
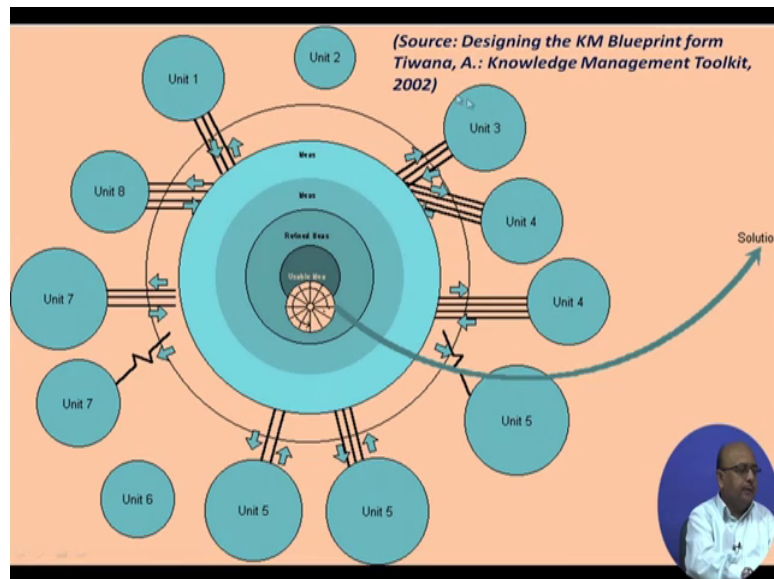
See when you are going to design and KM blueprint okay, if look at the these are the different units of the organization and they are going to coordinate their activities and used each units in the if you look at the shadows and shadows, sorry that arrows that is coming out of coming it means that they are going to share their knowledge right and this is a knowledge management centre, when you come out with usable ideas so if look at that yes ideas are coming from different sources.
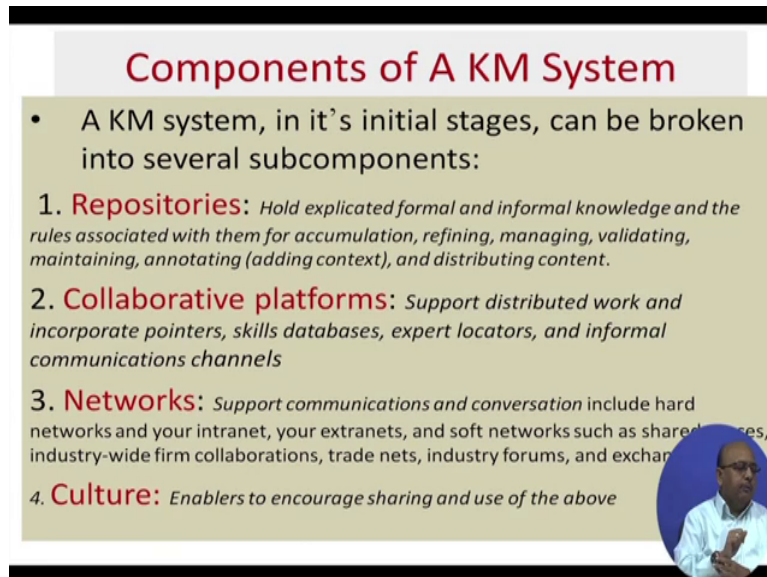
It is coming and it is going to different units so the idea gets refined in the process that you have ideas here, again have ideas here, and ideas here and once it is filtered and refined menu come out with certain ideas which could be useful and these usable ideas help you to provide a solution right, in order to a reach to this useful idea that your ideas that is coming from different sources has to be evaluated and filtered so that you come out with something that is to be useful.

If you look at this, you can very well, very clearly see that want to design a KM blueprint make sure that the flow of idea is good okay and people are ready to share the knowledge and it is available in explicit forms, so ideas coming here, then it is making it could be further translated and refine means what? That this, maybe at this place it is available in the tacit form, but as you move up which is codified and refined and then it is going to be available in explicit form.

Because unless ideas are available in explicit form after refinement then you can use it otherwise it cannot be used, that is very important that different part organization to share

information, knowledge okay which is available tacit form, it is to be transferred into explicit form okay.

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Now for the different kind of the different components of a knowledge management system, now if you look at the different components of the knowledge management system these there are several components and the four major components are repositories, then you have collaborative platforms, then you have networks and finally will discuss about the role parts of the culture.

Now let us talk about repositories, repositories were what? Repositories are nothing else, it is like containers are different kind of containers various shapes and sizes of containers which fold or which hold knowledge either in the form of explicit or tacit right, but these were containers which hold knowledge either informal or formal way okay, then to see that how these knowledge is being kept into these repositories again and whether they go through this was of refining, managing and validation and maintaining and then annotating.

And you are going to add context to it and then how this is going to be distributed, so if you look at repositories, these are nothing else but knowledge hubs and in order to store and retrieval IT is going to be a major enabler in the process right, but whatever is being stored into these are knowledge or knowledge centers or repositories okay as to be ensure that it is refined, refined in the sense by the raw knowledge may not be useful.
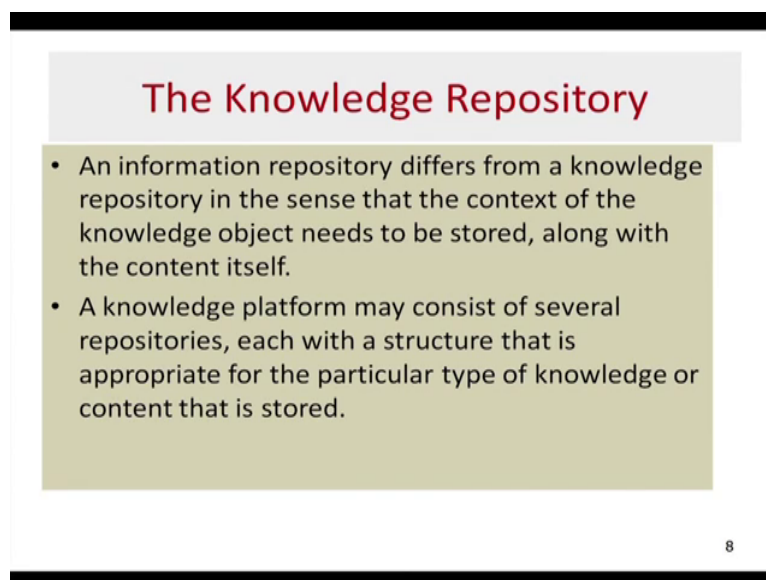
It is more meaningful and interpretable okay, it is managed using IT system which is validated because people are able to make use of it, it is maintained by the IT system and then X, knowledge developers are able to add context to it that in what way can be used, where can be used and that is how you are going to add context and then you should have a good interface so that you are able to distribute the content to the relevant person for the job, so that is about repositories.

Then you have to have collaborative platforms so you go far distributed work and that you have a skill databases, yellow pages, directories, expert locators and communication channels, through which were going to collaborate to put things or knowledge element into the repositories will service the fact of further.

Then you have networks, networks basically provide you support in terms of communication and conversion okay, it may include your hardware, software, an intranet okay and these kind of things okay through which you are connected through your networks, collaborators, vendors, through which are going to exchange information and knowledge and then you need to develop a very collaborative culture okay.

So that people are encouraged and motivated to share their knowledge and also relates to the use of it is okay, so now after discussing about the various component of the system let us talk about them one by one okay.

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The Knowledge Repository

- An information repository differs from a knowledge repository in the sense that the context of the knowledge object needs to be stored, along with the content itself.
- A knowledge platform may consist of several repositories, each with a structure that is appropriate for the particular type of knowledge or content that is stored.

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So the first one is knowledge repository, so we need to differentiate between a knowledge repository and information repository okay, in what way it is different? In knowledge repositories has a context added to it while an information repository does not have contact context related to added it to right, for example a knowledge repository and an information grip of repository can be divided into two categories.

Say for example we have a number of students in the class okay, who have passed out year wise okay, now if data is there and the number of placements that is available year wise okay, now the number of students who passed out of number placements this information is available in the repository, so this is a information repository, now how it becomes a knowledge repository okay.

Once context is added to that, how are you going to add context that becomes relevant because this is not a very useful knowledge though it provide you some meaning, some sense together you can save you are going to organize, a number of percentage of placement is eighty percent, ninety percent, that you can calculate by looking at the number of pass outs and number of placement offers that is received by these pass outs received right.

But how are going to add context to this, it is possible only when you say okay, what the quality of the placement, who are one of the good companies which are taking these students okay, say what kind of students are being placed, what kind of CV should be there for a better placement, so you are adding context of this because it is going to help you to take certain decisions may be for the future for those who are to pass out, they should apply for these kind companies which offer better packages.

Which offer better working opportunities, so that is how you are going take certain decisions so this kind of knowledge if it is going to relevant for decision-making for next year placement, then become knowledge, that is how the converting this knowledge sorry information into a knowledge and that is how you can differentiate a knowledge repository from a information repository okay.

Knowledge repository you can have different and a platform right, which each will have a structure depending upon the kind of knowledge that you want. Let us see what are the different kinds of a structure for knowledge repositories.

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The Knowledge Repositories

(Source: Tiwana, A.: Knowledge Management Toolkit, 2002)
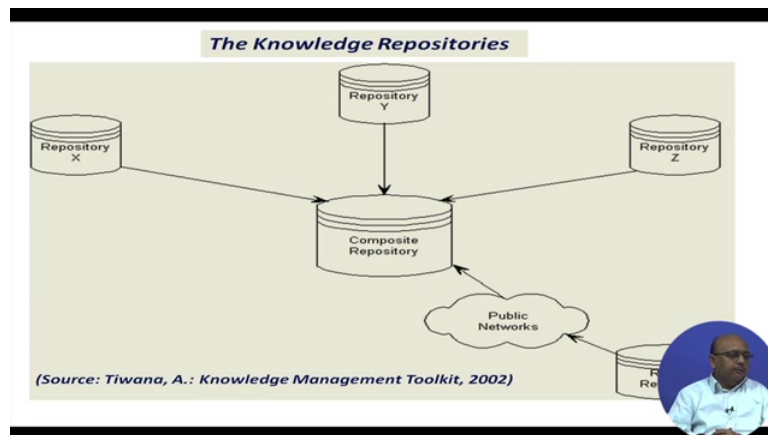
Say these are the different repositories, repository X,Y,Z and this will all the repositories may be having different kind of content right and this is a composite repository from a you have distributed them into different kind of and each one of them belong to a specific set of knowledge base right, repository Y may belong to one set of data or one set of information, this may be relate to another set.

And that is in this repository composite repository is connected through the networks okay and is also connected through the remote repository, so that that is how the information accumulates into the this process, so you have different repositories and then combine repositories like they could be different servers and is a network server, through which they are connected and that is how we are going to have repositories.

So that is how it is connected to repositories which are not very close or may be outside organizations as well right.

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Elements of knowledge content recorded by the Repositories

Declarative knowledge such as significant and meaningful concepts, categories, definitions, and assumptions

• *Procedural knowledge* such as processes, sequences of events and activities, and actions

• *Causal knowledge* such as rationale for decisions, rationale for rejected decisions or alternatives, eventual outcomes of activities, and associated informal pieces

• *Context* of the decision circumstances, assumptions, results of those assumptions, and informal knowledge such as video clips, annotations, notes, and conversations

So what kind of knowledge content is created by the repositories, if you look at this there could be three different kind of repositories, sorry knowledge that would be created, declarative, procedural and causal? Declarative which is very, very important, like significant and meaningful concepts what it is? How it works? What is a definition, various assumptions related to theory and this kind of thing, which is well-known, so this is a explicit knowledge.

Then procedures, procedure basically talks about processes how certain things are done like a man was guidelines with a so these are related procedural knowledge right, processes, sequence of events and activities and actions that is to be taken suppose that certain activities is to be done and then there is a failure, then what kind of actions to be taken, so there are certain fixed processes the standard operating processes, that is to be adopted in order to remove the failures right, so this is relate to procedural knowledge.

Then coming to causal knowledge, causal knowledge is different in the sense that talks about the cause effect relationship okay, if this has happened of this breakdown and happened in this could be the reason and that is how you relate cause with the effect and that provides a rational part for taking certain decisions or not taking certain decisions or the provides the alternatives get that what is to be done in a particular course of action okay.
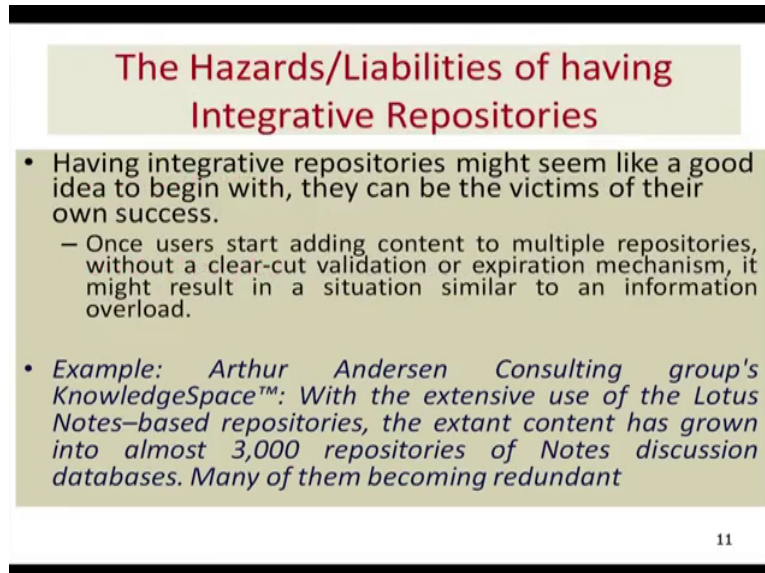
And then to get certain informational pieces this is what needs to be done, then you get it and collectively from the group of individuals and then try to relate it okay, So causal may not be perfectly causal, because that could be correlation aspects you can relate certain things with

the cause right and then finally the most important thing that you are going to add to the knowledge repository that it must have a context okay.

That supposed to take a particular decision, suppose you are going to hire a person a software engineer right, then you look into the requirements of the job, look in the qualification of the person you try to match it, and there is a fix process that you follow that is what we call procedural knowledge, now but this procedural knowledge may not help you to select the right candidate okay, then you have to add context that is under what circumstances you are going to select a particular candidates.

Suppose there for the five people were equally good, so you are going take certain assumptions whatever those are circumstances of the work, then you to add certain dimensions okay, whether the candidate to selected will be able to work as a team, whether compatible, so you are going to other things and then you are going to gather this information from other sources okay, which are going to add to the decision when it comes to selecting a candidate right so this is what writes to a context.

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Now moving from context further okay, will also need to discover that you were going to have an integrative repositories and what happens, integrative repositories and so have a composite repositories right, so what other of the Hazards or liabilities of having this kind of repositories right. It is good to have composite repositories or integrative repositories but it may not be good certain regions right.

Because everything comes to one place okay and then what happens the good information over, in what it is going to be there because each knowledge that is to be put into the content or the repositories has to be validated okay, so since the nature of knowledge is evolving you cannot say that this knowledge is going to be useful tomorrow okay, so each content in repository has a clear-cut validation are expiration right.

So if you are not going to take it out that knowledge which is not relevant which is obsolete are outdated then it will also within the repositories and then extracting the kind of knowledge that will require may not be good, may not be appropriate for the users right so it is very, very important to re-examine that what kind of knowledge is being kept in the repositories because you we all this follow the principles of garbage in and garbage out.

So what you are going to put in an order and to put out so there must be specific criteria to decide what you are going to put in and what you are going to put out right, for example and we have taken a case where company called Arthur Andersen consulting group okay they have a actual knowledge architecture that is known as knowledge base is a trademark okay and they basically extensively use Lotus Notes-based repositories.

What actual happens that all the discussion that used to happen relate to generation idea are knowledge creation was there, then what happened the repositories have drawn up to such an extent and in short timeframe that very difficult to store and maintain manage this things, at the same time many of the things that where there become redundant because you know that nature of technology's specially related to the computers are looking, keep on changing very fast because the life cycle is very, very short.

That is what happens many of the things that discussions that were put on the main databases become redundant right, so it is very important to understand a hazards or liabilities of having integrative repositories and also make sure that what needs to be kept in and what needs be kept out. And then has to be safeguarded the side what kind of knowledge is how sorry how to validate the knowledge and what kind of knowledge should be taken out from the repositories. So that can reduce the problem of information overload.

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Content Centers

- When one is trying to integrate multiple function- or department- specific repositories into one central repository, one should pay close attention to content centers that are typically good candidates for integration.
- Examples of content centers include
- *Production department*
- *Customer services*
- *Market intelligence and competitive planning*
- *Employee resources and the human resources department*
- *Administrative department*
- *Sales and marketing*
- *Finance*
- *Business partners and suppliers*

Now coming to the content centers, these are the knowledge of basically so if I am going to integrate multifunction department specific repositories that are into one central repositories okay and then you have to see that what are the various content centers okay which you need to be integrated together right, for example and in ERP system we have different content centers okay.

For example, we have content related to student, related to the hostel management, relate to the accounts, relate to the HR or the staff, so these contents are and then there is a need for integrating these contents together right, so in an organization, there could be various departments still can create knowledge or have content centers separately relate to various apartment and then you go for integrating them, so that you have a integrative repositories.

For example a content centre may have, contents, specific contents or knowledge content related to production department, or the customer departments, or market intelligence, or HR departments, or administration or sales and marketing, finance or your external stakeholders and partners and suppliers, so for each one of them you have built separate system and then you see that how you can integrate this together, the basic objective of integrating this systems together.

To ensure that all of them are integrated in such way so that the duplication efforts are reduced and at the same time the relevant knowledge goes to the relevant person right, not all the knowledge goes to all the other person.

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A sample checklist for competitive knowledge

These are on the checklist that can be used for having integrated to in repositories okay, you have to see that what is there you especially for your competitors and for yourself and the competitors knowledge is coming somewhere maybe from public, traditional organization and professional, automations investors and government of nations right and the extent to which you are going to put them in the system right.

By newspaper articles okay, search firms, consumer groups, trade publications, so the knowledge coming from different sources what you can do you can make one repository that is used by the public, the employees, other by the trade and professional organization, other from the government and those who deal with the government organizations right or the investors okay and you have alternatives how you are going to be done right.

And what competitor is talking about themselves and what you are going to talk about what is the competitor and accordingly you see that we are going to develop your content centre make it relevant, so that you integrate it and would be used right.

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Open and Distributed Systems

- The use of open systems ensures that employees can obtain information they need from any place and at any time.
- Adherence to industry standards ranging from HTML, XML, TCP/IP protocols, and ODBC may help you to implement the KM system quickly, and easily extend and customize it in the future.
- Content might be distributed across multiple platforms, devices, servers, and locations, the ability of the knowledge management system to build upon this characteristic is crucial.

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And another issue related to this is open and distributed system, when I am talking open and distributed system means, we have to see that open system what happens, whenever you want an information you can have access to it right, it is an open system, so login using a password you get this information from the KM right and then you follow standard protocols like you using intranet using HTML, using internally to have a stable TCP/IP protocols which you will feel to implement the KM system very quickly.

And can extend it to the future or customizing depending upon the requirement of the users, now you have to see that this open system is also distributed it means, this is going to be distributed across various platforms and devices, servers and locations, for example we have an ERP systems but we have nodes, which are available in different departments, different symptoms and they are connected to it okay.

So that KM system is useful for not only with the accessing data from the open system, but could be accessed from anywhere using any kind of platform or servers right.

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Knowledge Aggregation and Mining

- Anyone who has used a search engine on the Internet can tell you, simple keyword searches often result in a meaninglessly large number of hits.
- To save users from this, a well-designed KM system should include a mechanism to cluster search results appropriately in different prespecified content categories.

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Then moving to the third part that is aggregation and data mining right for example the knowledge aggregated in one place in the knowledge repository but it is very structured, codified and classified right, so you have software which help you to search the data right by example you have Microsoft, you have Google are the search engines and the if you type particular keyword what happens if generate a lot of resources, information right.

So this is not very, very useful, if you are going for mining data that is going to be relevant and useful you need to develop a KM system which can cluster relevant information from the search engine, which could be relevant for you right, so you can go far having the specified content categories okay depending upon the domain and the knowledge area which you are looking for to right, that kind of knowledge architecture is better.

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From Skills Databases to Knowledge Directories

- Skills databases Help to locate subject mater experts both within and outside their organizational bounds. While such a mechanism is useful, it needs to be kept up to date. Example- Microsoft
- A knowledge directory takes the concept underlying skills databases one step further by linking people to their skills, experiences, know-how, insights, and contributions to discussions and debates within the knowledge management system.
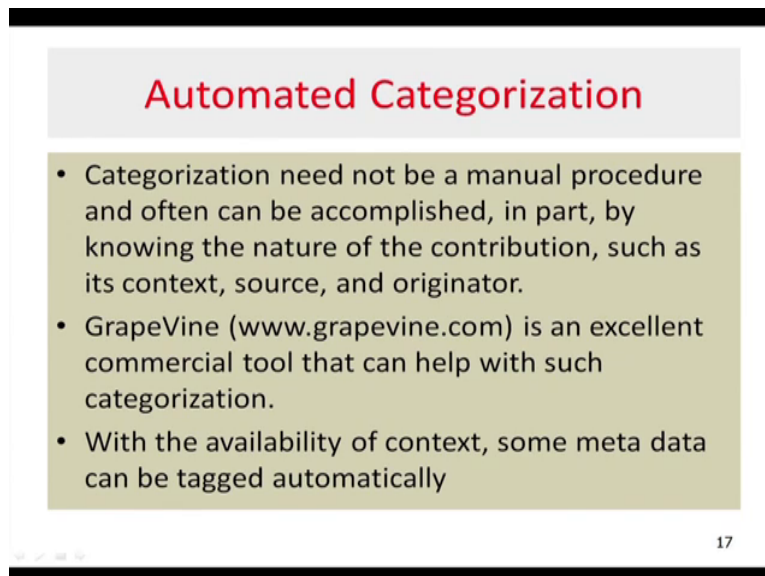
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You can also have a skill databases and knowledge directories okay that it is actually it you look at skill databases it helps to basically see that our you can get what a expert in the reliability relevant information without any boundaries okay it is really useful when you have information about the experts, subject matter experts, especially or domain experts like Microsoft updates this kind of databases.

Where you can get it, then you also have a knowledge directly like Yellow Pages and these kind of things okay, where the idea is to have been skilled databases and moving further one step with you also have detailed things related to the experts like the rest skill-based experiences, what they know okay and how they can contribute to these kind of things is within the knowledge system survival skill databases.

And knowledge directories could be part of the knowledge architecture or knowledgebase system.

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Then you also have provision for automated categorization in a knowledge management architecture make sure that it is not done manually but you have automated system, so that whatever is being contributed is being codified and put to a context right so I will has information related to what the context in which the state was applied, what is the source of information, okay from where it has come and once you have codified and classified information in the KM system.

Make sure that it is done automatically or you have a procedure system where you are not going to do this kind of thing manually okay, one example that identifies like to Grapevine is a tool which helps you to do this kind of categorization, which is here goes for a automation of context right and if context is available in on the types of metadata to this one.

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Then you can go far personalized content filtering into Push Delivery also right, personalized content filtering nothing else that how the process categorizing takes place, like whether it is audio, or a video, or the text or images okay for example when you go for Google search you know you go for personalized content filtering, you can search images, you can search videos or you can listen the things okay, you can hide the text version also, that is one way to look at it okay and then you have a user profile basically the define context the content.

And define the content type okay, so that basically helps you to get the relevant content.

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The Collaborative Platform

- Provides the pipeline to enable the flow of explicated knowledge, its context, and the medium for conversations
- Provides a surrogate channel for defining, storing, moving and linking digital objects, such as conversation threads that correspond to knowledge units
- Enables the content of the KM system with a high degree of flexibility to make it meaningful, useful, and applicable across the many possible contexts of use (and abuse).
- Empowers the users.
- The user can either search for content or subscribe to content

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And then you have a collaborative platform local, collaborative platform nothing else but that is how the explicit knowledge and context actually is flowed okay using a particular media now that you have to provide a surrogate channel for defining, storing, moving or linking visual objects like Amazon traits are that corresponding to knowledge and so you need to have a medium provision that is basically the technology which helps you, to enable the content of KM system with high degree of flexibility to make meaningful, useful.

And acclaim and an applicable across possible context and sometimes you know it is abused also and when you are going for, in now violating certain copyright rules and these kind of things, but it empowers users to make use of things as and when they want using the smart medium right so you can search for the content I have can subscribe for the contents of the definitive from regular basis right, thank you.