

**Integrating Risk & Knowledge  
Management  
For effectively Managing Projects**

By

**Muhammad Awais & Dr. Irfan Zafar**

**Abstract**

The research work explores how using Knowledge (KM) tools and techniques can help develop the implementation of Risk Management (RM). The findings of the research work will be applicable to all the organizations involved in utilizing KM and RM. It is one of the first attempts by the researcher to find similarities between KM & RM under the umbrella of project Management (PM). This carves out a combinational theme as to how they can be combined for effective project management, especially at the early stages of the project. A detailed understanding of the Risk and Knowledge management was carried out which was followed by investigating the published reports of various international organizations. This was done to come up with a sustainable framework. This then led to our primary research which involved interviewing the project managers. Identifying the risks at the very start of the projects mitigated the fallouts which lead towards the collapse of many projects. The tools involved in the Risk management were thoroughly looked into while keeping in mind the similarities between the risk and knowledge management.

The study has helped in addressing as to how the knowledge management (tools) can really help the deployment and deployment of risk management. The most significant part of the research pertains to the development of a generic model which can be applied to any organization involved in executing different projects. More importantly, it has furthered a new concept in the field of project

management thus enhancing its scope and applicability.

**Research Background & Literature Review**

According to the research carried out by Chapman & Ward, 2003 [1], the higher rates of failures can be substantially reduced if the same are managed/mitigated in a professional manner. Earlier researches carried out were more focused towards looking at threats while ignoring the proactive approach of devising mechanisms for its mitigation. This ultimately led to extreme uncertainty and ultimate collapse of the projects.

“With the increasing size of organizations and aggregating complexity, the necessity for the effective and efficient management of knowledge becomes critical” (OECD, 2004) [2]. Keeping this in picture, over the year’s knowledge management has received a lot of attention in various literature reviews. When we look at the knowledge and risk management, we see lots of similarities but there is a lot of gap as far as using the knowledge management tools/techniques in the risk management devised processes execution.

If we look at the basic concept of risk, it manifests itself when we see uncertainty. Generally things become uncertain when we lack the requisite backend information. And when we are dealing with projects of varying magnitude, this lack of information leads to uncertainty which eventually increases the amount of risks involved. Now it is up to the project managers to either use these risks as an opportunity to benefit the project execution or look the other way thus converting them into real threats. It is all about gathering and rationalizing the information we have to our benefit. Having the right information and using it as an input to various processes is a key to success and catalyst to mitigate the risks.

In today's world where data warehousing or data mining is the driving force behind the success of various ventures, the interpretation of data has become all the more important to basically manage the projects with the right knowledge. The project managers should carefully have to look at as to how to interpret the data, make solid assumptions and use this knowledge as building blocks for the execution of the projects. And these have to be carried out at the initial stage of the project instead of doing it later when things have already started to crumble. "KM plays a pivotal role in this situation to ensure an effective RM process by providing the context and learning possibilities. This enables RM not only to manage risks but in turn to deal with the entire context adjoining the risks for effective understanding and mitigation" (Emblemsvåg, 2010) [3].

### ***Aim, Objectives & Scope***

The main aim of the research is to find out as to how, at the early stages of the project, the knowledge management techniques/tools can be applied to the risk management processes/procedures. Its effective implementation has to be looked into for the benefit of risk management procedures/practices.

The objectives of the research can be summarized as;

- (a) Identification of Risk Sources (at early stage of the project)
- (b) Knowledge management Tools identification
- (c) Exploring KM/RM similarities & identifying situations where knowledge management techniques can be used / implemented for managing risks.
- (d) Improving risk management tools using knowledge management vision

Hence the scope of the research work comes down to taking care of the projects failures because of not taking into account the risks involved. This in turn occurs when we have insufficient knowledge, information or data at hand to start with. Lack of coordination among the stakeholders and absence of information sharing mechanisms contribute adversely towards the greater risks.

The research specifically addresses this issue by identifying the risks when the scope of the project and the stakeholder's expectations are being defined or outlined. At the start of the project a lot of information is available in the scattered form and it is at this stage one has to group together these fragmented pieces of information into a knowledge reservoir.

### ***Research Method & Limitations***

The research is qualitative in nature which involves primary and secondary phasing. In the primary phase the literature review was carried out which was then followed by secondary analysis which was based on international publications/reports from reputed organizations. The literature review analysis was then tested in the second phase through the conduction of various interviews from the relevant professionals who are directly involved in the execution of the projects.

Although the said research can be implemented at various stages of the project, however keeping in view its vastness and complexities, early stages of the project were taken into account this limiting its scope to a much focused portion of the project. However this research can be extended to the other phases of the project with relative ease considering its generic framework.

### ***Research Organization & Structure***

It is a well-structured research with the following organization;

- Background/Introduction & Literature Review
- Knowledge & Risk Management
- Research Methodology, Design & Data Collection
- Data Analysis & Research Findings
- Models/Conclusions/Recommendations

### Knowledge Management

We have come across different kinds of revolutions in the technology. From the invention of machinery to a pure digital world and entering into a life of virtual reality, we have crossed various barriers in the technological evolution. However the biggest transformation which took place was in the field of Knowledge Management. With the capability to transform raw data into information and information into knowledge and then translating that knowledge into actionable steps has come to be the key factor in the success of any project or endure. This requires the classification of Data (it is raw in nature with no meaning), information (processing of the raw data), knowledge (understanding developed by analyzing the available information) and finally the wisdom (an unadulterated blend of refined knowledge and gained experience). These are clearly described in figure-2.1.

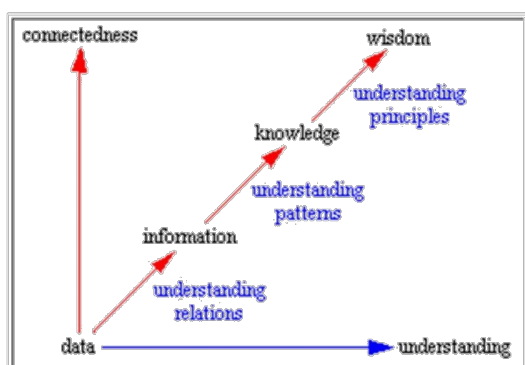


Figure 2.1: Data Connectedness-Understanding

### Knowledge Loop

Once we have learned the art of data connectedness & understanding, we need to understand the steps involved in the creation of knowledge loops (Nonaka & Takeuchi, 1995, p. 130) [4] Figure-2.2.

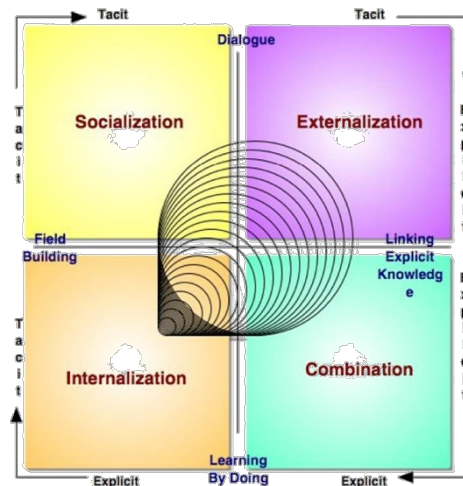


Figure 2.2: Knowledge Loop

This knowledge loop involves the following essential elements;

- Socialization
- Externalization
- Combination
- Internalization

Table 2.1 describes each of them independently.

Socialization	Exchange of information by directly sharing one's experiences
Externalization	Creating explicit concepts i.e. formal models, hypothesis
Combination	Organizing Knowledge through structuring

Internalization	Learning by doing approach by transforming into tactical knowledge
-----------------	--

**Table 2.1: Socialization, Externalization, Combination & Internalization**

Different organizations however describe knowledge management in their own particular context. For some it is the conveying of the very precise information to the concerned individuals at the right time thus enabling them to utilize this information for ultimately improving the working or the performance. To some it is a structured process designed to address the business needs which are in line with company vision, mission, priorities and company financial benefits. So every business has its own dynamics but they all share the common vision of having the right knowledge at the right time and with the right people.

**Knowledge Management (KM) Strategies & Domains**

The Knowledge Management strategies have been classified under two broad categories;

- Source
- Focus

Knowledge Management			
Source	External	Internal	
	Outside Sources	Within the Organization	
Focus	Explicit	Tacit	
	Knowledge Storage using IT	Person to Person Communication	

**Table 2.2: Strategies for Knowledge Management**

Once the KM strategies have been outlined, we need to look at its relationship with the processes. Hence knowledge management bifurcations in various domains need to be outlined. Table 2.3 shows the segments which support the knowledge management adaptations.

Best Practices & Knowledge Sharing
Instilling Knowledge Sharing responsibility
Gaining benefit from past experiences
Knowledge integration in processes, products and services
Considering knowledge as a product
Using knowledge for Innovation
Connecting & building human networks of experts
Building/Mining customers knowledge bases
Value of Knowledge understanding & measurement
Intellectual capital/assets utilization

**Table 2.3: Knowledge Management Domains**

In order to take benefit out of the above domains, we need to have the right methods, relevant tools and the right techniques. These include;

- Communities Formations for facilitating knowledge sharing and learning
- Knowledge Databases Creation
- Transforming learned lessons into strategies
- Brainstorming Groups
- Organizing Intellectual Capital (harnessing knowledge)
- Conducting Knowledge Audits to ensure efficiency in information utilization
- Monitoring and Reporting (Benchmarking)

Apart from the above, the role of Information and Communication Technologies (ICT) cannot be ruled out. Without having the ICT infrastructures in place, nothing can be achieved in terms of knowledge sharing and management.

It should also be noted that although many KM infrastructures and processes are in place, however more integration and coordination is required for their proper implementation. Additionally, the organizational culture also has to change in order to adopt this knowledge revolution. Decision making in terms of available knowledge is getting momentum thus at times overpowering the gut feelings or intuitions, thus requiring a very fine

balance and equilibrium.

### **Risk Management**

The word Risk has a historical perspective with its roots in the Italian language. We basically look at the risk having a randomness and unpredictability. There can be many choices out of which we have to choose, thus bringing the element of risk into it. In recent times the most relevant theory relating to risk has been the probability theory. Here that randomness is given a weightage of probability or otherwise of an event taking place. This also throws light on human nature which thrives on curiosity to explore the hidden dimensions of life. Future developments led to the statistical theory which relied on information to make decisions.

### **Classification**

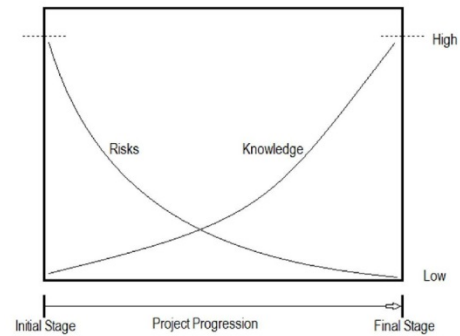
The risk factor comes from the following;

- Internal Factors
- External Factors

When we look at the internal factors, they include the availability of requisite resources. Similarly the external environment also increases the risk factor. Both these types of risks involve active management for mitigation. There can be many definitions of risk but one thing is common, its uncertainty and then taking it into account the past experiences in the form of complications and challenges which occurred in the past and damaged the project in one way or another.

It is also important here to distinguish between knowledge and uncertainty during any project execution. Uncertainty always increases when there is a lack of knowledge or information. This leads to lack of taking decisions. Figure-2.3 establishes a relationship between risk and knowledge at the various stages of the project. We note that as the

knowledge about the project increases over a period of time, the risk reduces. Similarly if we look at the initial stage of the project, the knowledge about various factors (information availability) is low, hence the chances of the risk increase.



**Figure 2.3: Project Stages (Risk vs Knowledge)**

It is interesting to note that during the project progression stage; there comes a point when certain equilibrium is reached whereas the risk is declining in the presence of a limited knowledge. However our challenge is total elimination of risk with maximum available knowledge. This requires a proactive approach through active anticipation, recognizing and then applying the requisite managing skills. This further requires indulging and involving all the stakeholders. However as mentioned earlier, the uncertainty hinders the decision making. Few of the hindrance factors include;

- Lack of available information
- Lack of assessment thus causing wrong decisions
- Lack of predicting results

### **RM Process**

There are six key stages in the risk management process i.e.

- Context Establishment

- Internal & External parameters
- Aims and Objectives
- Risk evaluation basis
- Constraints
- Framework development
- Resources measurement
- SWOT Analysis
- Identifying Risks
  - Risk Finding
  - Risk Recognizing
  - Describing Risks
  - Risk Breakdown Structure
- Analyzing Risks
  - DELPHI Tool
- Evaluating Risk
  - Risk Criteria
- Response to Risk
  - Avoiding
  - Reducing
  - Insurance
  - Toleration
  - Risk Elimination
- Feedback (Monitoring)

**Techniques**

There are various RM Techniques used which come under the following types;

- (a) Quantitative
- (b) Qualitative

Quantitative Techniques
Monte Carlo Analysis
Scenario Planning
Sensitivity Analysis
Expected value analysis
PERT (Program Evaluation and Review Technique)
Fuzzy set analysis
Risk data quality assessment
Decision Tree Analysis
Modeling and Simulation
Probability Distribution

**Table 2.4: Quantitative Technique**

Qualitative Techniques
FMEA (Failure Mode and Effects Analysis)
Fault tree analysis
Event tree analysis
Risk Probability and Impact Assessment
Probability and impact matrix
Cause-Consequence Analysis
Risk Data Quality Assessment
Risk Categorization
Risk Urgency Assessment
Delphi Technique
Brainstorming
Assumption analysis
Checklist analysis
Expert Judgment

**Table 2.5: Qualitative Technique**

Various tools are used to follow the above mentioned techniques. Table-2.6 shows some of them.

<b>Risk Register</b>	<b>Risk Catalogue</b>
<b>Spread Sheets</b>	<b>Focus Group Discussions</b>

**Table 2.6: Tools for Techniques Evaluations**

It should be strictly noted that the wrong use of the tools can be disastrous because it will eventually lead to making the wrong decisions thus destroying the entire project.

**Research Problem**

As the organizations are developing into complex entities, the need for knowledge management has increased over the years. It is observed that there is substantial overlapping between knowledge and risk management. However not many researchers have used the knowledge management principles in the risk management processes. This directly

affects the umbrella field of project management. This gap needs to be filled by the researchers, requiring extensive research and analysis.

### ***Aims and Objectives***

The main objectives of the research are;

- (a) Identification of Risk Sources (at early stage of the project)
- (b) Knowledge management Tools identification
- (c) Exploring KM/RM similarities & identifying situations where knowledge management techniques can be used / implemented for managing risks.
- (d) Improving risk management tools using knowledge management vision

### ***Research Methodology***

As detailed in chapter 1, the research is qualitative in nature which involves primary and secondary phasing. In the primary phase the literature review was carried out which was then followed by secondary analysis which was based on international publications/reports from reputed organizations. The literature review analysis was then tested in the second phase through the conduction of various interviews from the relevant professionals who are directly involved in the execution of the projects.

The research will include;

- Primary & Secondary Research
- Literature Review (Knowledge & Risk Management)
- International Publications Analysis/review
- Interviews
- Presentation of a Sustainable Model

### ***Research Process & Design***

The following steps in the design of the research will be employed;

- Qualitative Approach used
- Literature Review (Knowledge & Risk Management)
- Data Collection through many sources including published reports, business reports etc. of International organizations (United Nations, International Monetary Fund, World Bank, International Labor Organization, World Health Organization, Organization for Economic Co-operation and Development etc).
- Journals, Articles & Books reviews
- Conduction of Interviews with experienced professionals working on different projects to verify the collected data through literature review investigations
- Conclusions based on primary and secondary research

### ***Interviews***

The interviews were conducted so as to complement the findings from the researched work. The main theme of the conducted interviews was not to divulge into the explanations, rather they were intended to look at the conformity aspect. This helped in integrating the secondary research carried out in the first phase with the primary research carried out through the semi-structured interviews. The conducted interviews covered the following blend of fields;

- Telecommunications
- Construction

- Manufacturing
- Oil and Gas
- Energy & Power

The main reason for selecting the companies related to their expertise in the areas of knowledge and risk management. The profiling based on the nature of projects and the project managers involved (having extensive experience) was done. The main objectives of the interview can be summarized as;

- Use of KM & RM in the organization
- Use of requisite Tools
- Evaluation of Risks (early stages of the project)
- Interviewed Professionals perspective (KM & RM)
- Feedback from the interviews for integrating/incorporating Knowledge and Risk management in the organization

The semi-structured interviews were followed by open ended questions. A template was specifically designed for this purpose. The interviews were conducted with ample time in hand (around one hour, each interview).

**Analysis of Secondary Data**

The secondary data analysis forms the basis for conducting the primary research. This involved extensive study of the companies and organizations. The following five parameters (initial project stage risk factors) were selected for the secondary data analysis;

- Lack of Information
- Lack of Shared Context
- Inadequate Information Flow
- Absence of common Framework
- Absence of Linkages

Lack of Information	
WHO through experience of its diverse projects have recognized that the process of knowledge production and synthesis is costly and slow.	WHO, 2006
Due to this progression being expensive, some of the aspects of knowledge generation could be turned down which leads to the lack of information. As regards its slow nature, there may be poor or no access to relevant information due to the ambiguity about knowledge being produced by the time it is required. As a result, there is a gap between expected and available information sources.	UNESCO, 2009
The gap between an actual situation or the perception of it and the required or expected situation.	Maylor, 2010, p.338
Lack of Shared Context	
This is the first step in the RM process as already described in the literature review section. Uncertainty in the context of projects is the lack of information which is apparent as the difference between the available and desired information for performing an activity.	Amvik & Sjöholm, 2007
Embedding the process of defining a collective context into the organizational culture is a challenging but necessary endeavor.	UN, 2010
A SWOT analysis solves this purpose by submitting the risks with threats and opportunities and the organizational capabilities for strengths and weaknesses.	Emblemvåg, 2010
Inadequate Information Flow	
The lack of information bundled with the poor information flow among the different teams and individuals act as obstacles and become apparent with their hindering effects.	Mabudafnan, 2002
The resulting effect of this restricted flow is the constrained synergy among the initiatives taken which are not aligned with each other and may cause conflicts. Moreover, this can lead to inability in consideration of all involved factors and variables necessary to take a decision.	Maylor, 2010
Absence of Common Framework	
While executing projects in different nations across continents, WHO has reckoned that there is an absence of a common framework for knowledge transfer and translation.	WHO, 2006
At the UN office, the departments and programs are utilizing their own different methodologies based on one of the numerous RM standards presently existing. As a consequence, there is a lack of consistency in the processes which leads to different approaches for identifying, evaluating, reporting and responding to risks even in the same project through different stages.	UN, 2010
With the increase in continuous innovations, knowledge sharing and concepts of learning by doing, there is a need to develop comprehensive framework or common platform to fill the know-do gap in parallel with the systems to deal with it.	WHO, 2006
Absence of Linkages	
Scarce information combined with inadequate network systems restricts the formation and development of the links and connections between different knowledge domains.	UNESCO, 2009
Different systems are used by the departments which are not compatible with each other thus leading to complexity in executing mutual actions and co-ordinated decisions. The intricate arrangement of the technological structures does not promote intersectional collaboration.	UNESCO, 2009

**Table 4.1: Secondary Data (Literature Review)**

**Analysis of Primary Data**

For the primary Data Collection, a questionnaire (16 respondents) was developed having four unique parts.

Interview	
Date	
Interview Conducted By	
Interviewed Official	
Designation of the Official	
Organization/Department	
No of Years in Service (Experience)	



Part 1 (to ascertain presence of KM/RM & use of tools)	
1	Implementation of Knowledge Management Practices in the organization (a) Initial (b) Introductory (c) Growing (d) Developed
2	How KM is Perceived in the organization (a) Being done but with a different nomenclature (b) Being done at the management level (c) It is part of the strategic business goals (d) Others (specify)
3	Strategies & Policies (a) Knowledge Management Policy is documented (b) Organization has a culture of supporting and promoting KM (c) Workers retention plans in place (d) Acquiring of knowledge done through collaborations (e) Others (specify)
4	Tools-Techniques-Methods employed for knowledge Management (Weightage: 1-Almost Nil, 2-Low, 3-Moderate, 4-High, 5-Very High) (a) Practicing Communities (b) Database of Knowledge (without using technology) (c) Database of Knowledge (with Technology) (d) Brainstorming (e) Benchmarking (f) Mapping of Knowledge (g) Lessons Learnt (h) Best Market Practices (i) Rewarding (j) Story Telling (k) Special Designations like "Chief Knowledge Officer" etc (l) Others (specify)
5	Use of Risk Management Tools (Weightage: 1-Almost Nil, 2-Low, 3-Moderate, 4-High, 5-Very High) (a) SWOT (b) PESTLE (c) Risk Catalogue-Register (d) Team/Group discussions (e) Failure Mode-Effects Analysis (f) Decision Tree (g) Event Tree (h) Fault Tree (i) Risk Impact/Probability Assessment

Part 2 (verification of results at initial stage of the project)	
1	Degree to which below sources (of risks) affect the organization you work in (Weightage: 1-Almost Nil, 2-Low, 3-Moderate, 4-High, 5-Very High) (a) Information Unavailability (slow or lack of it) (b) Information Flow Inadequate (c) Absence of Mutually defined context (d) Absence of Framework (e) Lacking Linkage System (f) Others (specify)

Part 3 (similarities between KM & RM: officials perspective)	
1	Perspective on similarities between approach/techniques of KM-RM (a) Both focus on capturing, acquiring and creating information and knowledge (b) Both emphasize on sharing and disseminating knowledge throughout the organization (c) Both stress on re-using/applying existing knowledge to the full extent (d) Both concentrate on collaboration for solving the problems (e) Others (specify)

Part 4 Open ended (integrating knowledge management into risk management-officials feedback)	
1	Effectiveness of utilizing Knowledge Management Tools/Techniques into Risk Management Tools/Techniques.
2	Suggestions for improvement (RM & KM) and their mutual functioning.

Table 4.2: Questionnaire

The industries, projects and sample/frequency are detailed in the table below;

Industries	Company	Project	Officials Interviewed
Telecommunications	PTCL	Optical Fiber (GPON)	4

	UFone	3G Deployment Project	6
Construction			
	Ammar Builders	Islamabad Expressway Housing Scheme	2
Manufacturing			
	HIT Taxila	Project X	2
Oil & Gas			
	Dewan Petroleum	Salsabil Gas Plant Expansion	1
Energy and Power			
	Hubco Power Plant	1,320 MW imported coal fired power plant (at Hub)	1

Table 4.3: Industry/Organizations/Projects/Sample Size

Various projects which were studied included Gigabit Passive Optical Network (GPON) by PTCL. The below diagram depicts the complete network architecture of the various network architectures being deployed.

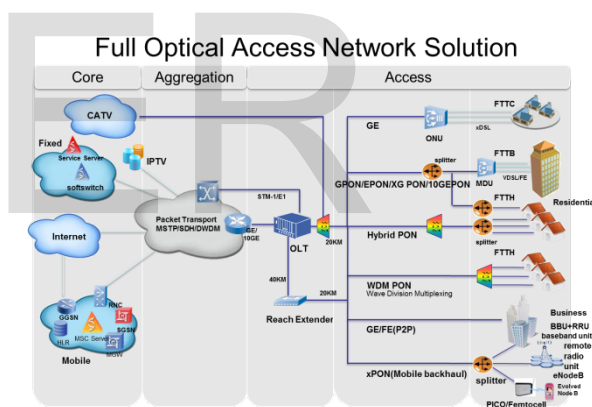


Figure 4.1: Optical Access Network (Source: PTCL Network Architecture)

Similarly 3G expansions by Ufone plus various other projects were studied while keeping KM and RM in mind.

Once the raw data was collected, the following steps were done;

- Analysis of the Content
- Interpretation of the Data

The four parts/segments of the questionnaire consisted of the following domains;

- (a) To ascertain presence of KM/RM & use of tools
- (b) Verification of results at initial stage of the project
- (c) Similarities between KM & RM: officials perspective
- (d) Integrating knowledge management into risk management (official's feedback & Suggestions for improvement)

The preliminary discussion/outcome of the primary research is detailed below against each attribute.

***(a) To ascertain presence of KM/RM & use of tools***

- Knowledge Management is gradually and systematically making its presence felt in the organization's
- Organizations are incorporating KM in the form of company strategies
- Internal sharing within the organization in the form of social networks
- An open culture of sharing ideas is growing
- Organizations are relying more on the SWOT Analysis
- Knowledge management is being done at the organizational levels
- Risk Management is done at the Project Levels
- KM and RM are both being implemented in collaboration

***(b) Verification of results at initial stage of the project***

- Information unavailability is considered as the prime factor for risk at the start of the projects
- The problem multiplies when the information flow is also slow
- Different projects should have some common framework and a reference model
- Structured projects with integrated risk assessment/mitigation processes are required

***(c) Similarities between KM & RM: officials perspective***

- Knowledge and Risk management both require the participation of the internal/external stake holders and contractors/consultants at the very onset of the projects
- All the stake holders are perceived as the partners to the business
- Knowledge Management Support Systems need to be deployed
- Knowledge dissemination and its acceptance is key to success
- The flow of information is in all directions (360 degrees)

***(d) Integrating knowledge management into risk management (official's feedback & Suggestions for improvement)***

- Benchmarking is needed
- Gap Analysis is must to identify risks/limitations
- Peer-to-Peer networking of employees is needed for information sharing
- Experiences sharing needed
- Feedback mechanisms should be strong

- Projects should be categorized as small or big depending on their complexities.
- Small projects will require lower level tools or techniques
- Big projects will require specialized tools

With the findings from the literature review, coupled by the primary analysis through the questionnaires, we are now in a position to move on to the next step of detailed discussions and then recommending different sustainable models based on our findings.



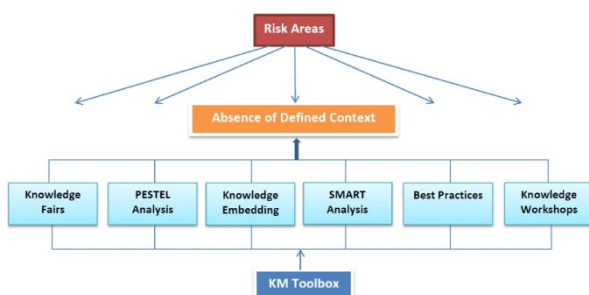
Going forward with our qualitative research findings, now we are in a position to focus on the three particular areas on which to build our models.

Three prime outcomes from the research include;

- Knowledge Management Tools
- Commonalities between Knowledge and Risk management
- Knowledge and Risk Management Integration

**(a) Knowledge Management Tools**

In order to create a model for coming up with the most suitable knowledge management tools, the following sustainable generic models are presented from Figure-5.1 through figure 5.5.



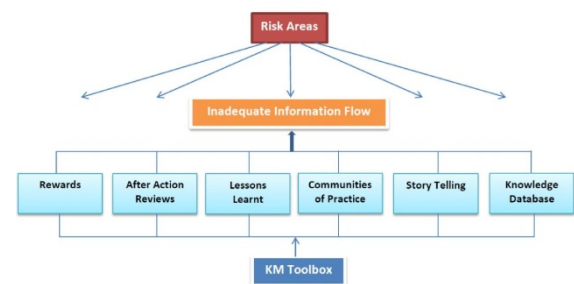
**Figure 5.1: Knowledge Management Toolbox**

**(Information Unavailability)**

Figure 5.1 lists the Knowledge Management Toolbox (information unavailability) comprising of six factors which include brainstorming, following of the best practices, keeping in mind the past experiences, learning's based on cross projects understanding, the effective use of the intellectual capital we have which can be mapped to our knowledge database.

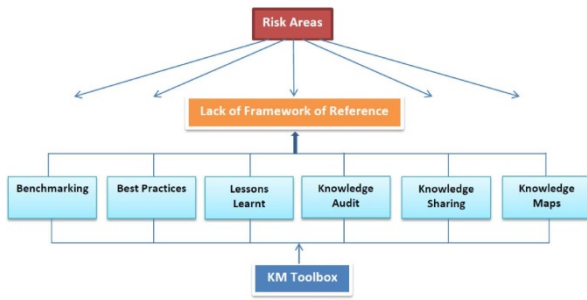
**Figure 5.2: Knowledge Management Toolbox (Context Absence)**

Figure 5.2 lists the Knowledge Management Toolbox (context absence) comprising of various factors which include holding of the knowledge fairs, using of tools and embedding of the knowledge. Once implemented, these will take care of the context absence creating risks.



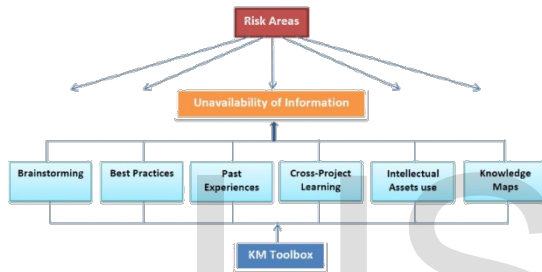
**Figure 5.3: Knowledge Management Toolbox (Information Flow Inadequacy)**

Figure 5.3 lists the Knowledge Management Toolbox (information flow inadequacy) comprising of rewards, reviewing, learnt lessons, common practices, storytelling and finally the creation of knowledge databases.



**Figure 5.4: Knowledge Management Toolbox (Framework)**

Figure 5.4 & Figure 5.5 lists the Knowledge Management for incorporating the right parameters to address framework and linkages issues.

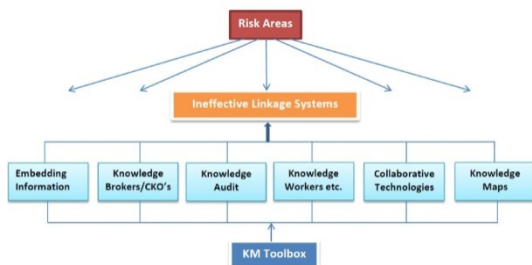


**Figure 5.5: Knowledge Management Toolbox (Linkages)**

**(b) Commonalities between Knowledge and Risk management**

The next step involves finding commonalities/similarities between KM and RM. Based on the literature review and the primary analysis, the following commonalities exist;

- Accumulation of Knowledge

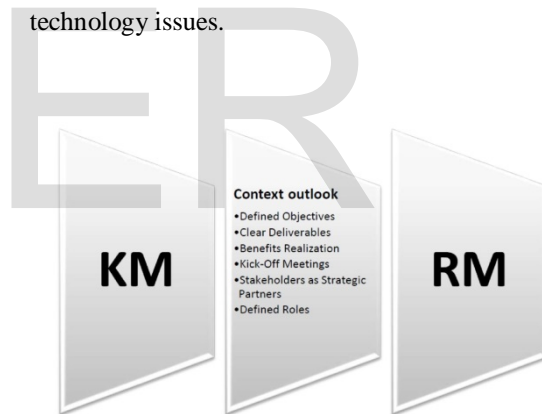


**Figure 5.7: KM-RM Integration (Contextual)**

- Dissemination of Knowledge
- Recycling (reprocessing) of Knowledge
- Human and Technical Collaboration
- Issues/problems encountered
  - o Presence of up-to-date information
  - o Information bombardment (overload)
  - o Right Technology

**(c) Knowledge and Risk Management Integration**

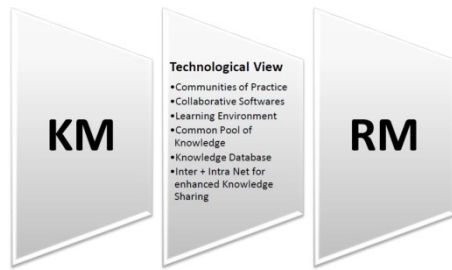
Figures-5.6 through 5.9 presents the devised model for Knowledge and Risk Management integration through using the perspective of the people, the context, prevailing organizational structure and the technology issues.



**5.6: KM-RM Integration (Perspective of the People)**



**Figure 5.8: KM-RM Integration (Organization Structure)**



**Figure 5.9: KM-RM Integration (Technology)**

### **Conclusions/Recommendations**

Following are the conclusions/recommendations coming out of the extensive research work;

- New and dynamic approach towards Knowledge and Risk Management integrations was devised.
- Identification of the sources of risks at the early start of the project identified.
- The developed Models can be easily implemented at the start of the projects to mitigate the risks.
- As the models are generic, hence they can be effectively used for any project.
- KM and RM Tools and Techniques have been identified.
- Primary (questionnaires) and Secondary (literature review/reports etc.) done to come up with a generic sustainable model.
- Similarities between KM and RM were examined.
- Strategic dimensions are created for the execution of any project.
- Segmentation of different areas of research can help the monitoring and the execution of the project at any stage in terms of risks involved.
- Through this research, Project Management is redefined in terms of incorporating Knowledge and Risk Management.
- The research has academic and industrial value, both.

- For future research, this grey area has been identified and can be extended to the middle and end of the projects in addition to the start of the projects.

### **References**

- [1] *Chapman and Stephen Ward, published in 2003 by John Wiley & Sons, Ltd. ISBN 0-470-85355-7.*
- [2] *The Organization for Economic Co-operation and Development (OECD) 2004. <http://www.oecd.org/corporate/ca/corporategovernanceprinciples/31557724.pdf>*
- [3] *Emblemsvåg, J. (2010). "The augmented subjective risk management process". Management Decision. Vol. 4, No. 2, pp.248 – 259.*
- [4] *Nonaka & Takeuchi, 1995, p. 130*