



## Management of Various Risks over Years in SDLC

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**Abstract:** This paper presents a survey on project management risks analysis, classification in Risk management stages like Risk identification, Risk analysis, Risk planning and Risk monitoring throughout software development life cycle (SDLC) phases published during 1988 to 2010. The main focus of paper is to understand the work carried out for risk aware project management underpinning assumptions if any. It also provides a sound foundation for risk aware business, process and project management by identifying the gaps/shortcomings with managing risks in SDLC.

**Keywords:** Project management, Risk, Risk management, Software development life cycle, Risk management phases

### 1 INTRODUCTION

Statistics has indicated that 53 % of software development projects have been behind budget and schedule and unable to deliver features originally specified; 31 % of development projects ended in premature cancelling or termination and only 61 % of them satisfied original specified requirement features [84]. A recent survey indicates only 26% of software projects succeeded in 1999, 34% in 2003 and 32% in 2009 [76]. The low rate of success can be attributed mainly to certain approaches in project management which increase the risk of failure.

Project management is chiefly associated with planning and managing change in an organization which in turn can be concerned with anything, particularly introducing or changing things, in any area or function, for example: people, staffing, products and services materials, manufacturing and production, IT and communications, equipment storage, distribution, finance, administration, acquisition and divestment, purchasing, sales, selling, marketing, human resources development and training, customer services, quality, health and safety, legal, professional, technical, scientific, research, development and anything else which needs planning and management.

Risk is the probability of harm or loss from an engineering project or product which could have adverse consequence in terms of Safety (individual and community); environment (human and flora/fauna); and cost (project or process)[4]. Risk is absolutely critical in project management [119] and Information technology projects [120,121]. To avoid project doom, it is important to understand the risks that get generated, often unconsciously, in project management like errors in estimation, requirements overload, lack of project charter, integration anomalies and lack of productivity during early stages of project.

This proposal covers extensive analysis on the work carried out during years 1988 to 2010 for risk aware project management in SDLC phases. To accomplish this complete literature has been classified on the basis of various parameters such as type of risk, type of risk management phases, tools, techniques, models, strategies employed in SDLC from 1988 to 2010. The proposed classification is useful in identifying shortcomings in existing risk management methodologies.

### 2. METHODS USED IN PROPOSED WORK:

In this section method, tools and techniques used for classification and analysis has been discussed.

The work has been organized into Qualitative, Quantitative, Descriptive and Predictive categories. Furthermore, 101 articles have been classified into theoretical model, surveys, case studies, action research or exemplary approach according to geographic scope which can be International, national, regional.

The main results are presented in the Table C where the details of 101 articles have been studied, analyzed, coded as shown in tables A, A1 and B. Table A which has classified the number of papers appeared in years from 1988 to 2010 according to conferences (C), Journals (J), IEEE transactions (E), Symposiums (S), World Congress (WC) which are publications of interest.

Table A: Distribution of work according to publications :

	C	E	S	J	WC
<b>Time span</b>					
1988-2010	33	62	4	1	1

In the table A1 various classification codes has been given according to kind of study, approach, geographic scope and

where that work has been presented.

Table A1 : Classification codes for publications

<i>T1 : Kind of Study</i>	<i>T3 : Approach</i>
A - Modeling	Ql -Qualitative
B - Theoretical or Conceptual	Qn -Quantitative
C- Literature Review	Ds -Descriptive
D -Simulation	Pr -Predictive
E -Survey	<i>T4 : Article Presented In</i>
F -Case Study	C -Conference
G -Action Research	J -Journal
H -Experimental	S -Symposiums
I - Empirical	E - IEEE Transaction
N -exemplary	WC -World congress
<i>T2: Geographic Scope</i>	
Na -National	
In -International	

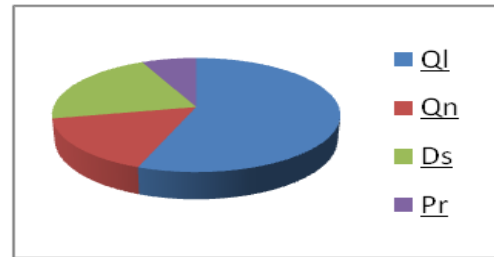


Figure 3: T3-Type of Approach

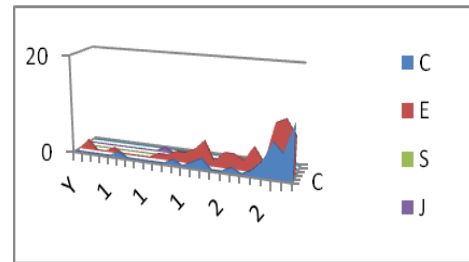


Figure4: Work risk management/ year

### 3 RESULTS OF THE CLASSIFICATION OF THE PROPOSED WORK:

This section discusses the outcome of the proposed classification as discussed in section 2 .In theFigure1 it has been indicated that risk aware project management has evolved over years showing a great increase in 2008-2010. Classification of articles according to kind of study (T1) demonstrated that modeling has been the most dominating type of study from 1988 to 2010 as shown in Figure2.

In the Figure3 it has been shown that in the time span of 22 years (1988-2010) Qualitative studies has been most promising and prominent approach.

Classification done in section-2 by table-A is shown by Figure4. It is clearly indicated by Figure4 how publications on Risk aware project management after 2004 have been increased sharply.

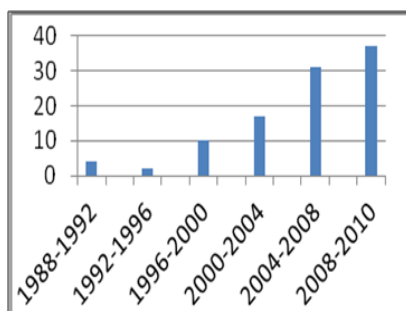


Figure1:ProjectRisk management 1988-2010

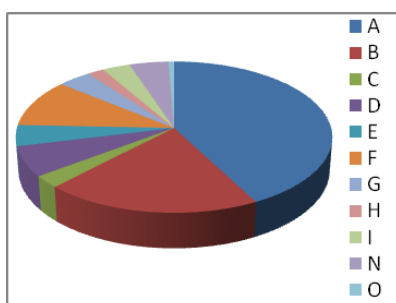


Figure2: T1-Kind of study

### 4 DATA ANALYSIS ON THE RISK AWARE PROJECT MANAGEMENT:

This section deals with an extensive analysis of project risks management approaches used in SDLC. Various I have considered the following approaches: Risk identification, analysis, planning and monitoring [115].

*Risk Identification:* Risk identification is approached by gathering all information about resources like project management plan and risk management plan by assignment of roles and responsibilities. Identification of risks is primarily done by Documentation reviews[74], Brainstorming, Checklist analysis[51], Diagramming techniques, Cross functional teams, Delphi technique, Interviewing, Surveys[26,51,72,85], Root cause identification, Force field analysis and Nominal group techniques[33],structure model analysis [72] or by operational survey [51]. Risks has been identified based on system being approach[57] , dimensions of distributedness [107] and strategic dimensions [39].It can also be done by Data collection technique [93], Dempster-Shafer Evidence theory [93] also. Multi attribute group decision making [27], Linguistic judgment Illustrated helped in identifying potential risks involved in software processes [25].

*Risk Assessment and estimation/Risk analysis:* Risk projection activities come into picture like reflecting the perceived likelihood of a risk, estimating the consequence and impact of risk on project and product, keeping track of the overall accuracy .Methods for analysing risks can be probabilistic approach [11, 19, 31, 53, 84] ,Decision tree and decision focus [11], rate of change of probability for reliability risks [53],Probability and impact [31],Propagation probability [84].Questionnaires are also another famous technique for risk analysis[21,24,69,102].Likewise other methods are Risk metrics[48,77,89] ,Actor vulnerability metrics [32] and security metrics[79] ,Likelihood and loss expectancy [40,41], impact and consequence [36],Risk exposure [23],Failure metrics [101] and severity of failure[67] .Risk coefficients was estimated to predict risk[13,109]. On basis of financial pricing [94], Cost fluctuation method [108],

Severity of failure [67] Likewise, Cognitive maps [110] ,fuzzy methods [12,100] .

*Risk Planning:* It can be handled either by avoiding or making a contingency plan to minimize the risk. Generally detailed study, changing technology, using consultants, conducting market research, rearranging costs, adopting step wise decision methods, adopting alpha beta approach, acquiring company or technology by licensing [83]have been used. Risk Scoring ,Risk Out and Risk measure based on optimization algorithm was proposed in design and requirement gathering phases of SDLC phases [20].Another methods can be Risk pre-warning index based on Rough Set theory [64],Classification based approaches ,Pair wise Preference Learning[66] based on fuzzy logic ,Non monotonic predicates for dynamic workflows[81], Nearest Neighbor Rules [64].Based on Brownian Motion ,Profit rate and Volatility rate [19],Metrics [55,83], Vector valued time series risk can be planned efficiently.

*Risk Monitoring:* It comprises of regularly assessing and monitoring each of identified risks. Risk monitoring and identification has been proposed specifically by an industrial survey [70] and Rough set theory [59].

*Risk aware Project Management Models:* Various project risk management models has been proposed in past for e.g. SoftRisk for systematic risk automation [80], SEI standards based [62], Software Risk Evaluation Model [122],Team Risk Management model for routine risk identification and analysis by every member of a project team [123], RiskItmodel [124] for supporting multiple goals and stakeholders, Capability maturity based model [15] with control policies ,3-D Active matrix model [58] .Likewise simulation modelling [74] and risk aware business environment approach has been used to take care of business risks [78]. Two more models are RIMAM [29] and EPRAM model to find out requirements risks.

Table B1: Analysis codes for risk aware Project management publications:

<b>A1 : Type Of Risk</b>	<b>A3 :Risk handling Phase</b>	<b>A4 :Mode of evaluation</b>	<b>A5 :Risk management model</b>
a -Project life cycle risks	Ri -Risk Identification	Rs- Rough set theory	Rdm - Risk development model
b -International	Ra -Risk Analysis	Cp - Coloredpetrinet	Dbm - Dimensions based
c -Supply Chain	Rp -Risk Planning	Ct -Cognition Theory	Irm - Integrated risk management
d - Decision Making	Rm - Risk Monitoring	Sm -State Machine	Pmb - Process Modelling based
e -Business	All - All phases	Gb - Graph based	Mrm - Maintenance risk based
u - others	None - none of the phases	Ub -Uncertainty based	Abm - Architecture based
g -Structural	<b>A4: Mode of evaluation</b>	Vb -Vector time series	Rif - Risk identification based
h -Reliability	Sb - Scenario based	Ic -Impact and consequence	Dem – DEMATEL
I -Offshore	Tm - Specific algo/method/theorem/model	Co - Confidence based	Ctm - cognitive transformations
j -Outsourcing	Me -Metrics	Se - Severity based	Rem - Risk evaluation based model
k -Knowledge Transfer	Si -Simulation	Fp - Financial pricing	Rim - Risk identification & Mitigation
l -Reverse Logistics	Pb -Probability Based	Ot -Others	Sem -Security based model
m -Strategic Information	Ca - Cartography based	None - none of the above	Sem -Security based model
n -Software	We -Risk Weighting	Iv - IV & V	Ramm- Risk assessment and manage
o -Safety/security	Qn - Questionnaire	Ri - Risk index	Rtb -Testing based
p -Economic/Cost	Su - Survey	Ds - Dampstershafer theory	Crm - Continuous risk management
q - Quality	Li - Risk Listing	Sp -Stress point analysis	Ide - IDEF3
<b>A1 : Type Of Risk</b>	<b>A4: Mode of evaluation</b>	<b>A4: Mode of evaluation</b>	<b>A5 :Risk management model</b>
r- Relational	Rr - Risk Relationship	Ac- Architecture pattern	Ata - ATAM
s -Dynamic workflow	Fa- Fuzzy approach	Rl- Risk likelihood	Rpm - Risk prediction model
t - Entrepreneurship	Tb- Tree based	Cu - Copula method based	Sra - Software risk assessment model
v –Operational	Rn- Reasoning case based	Bb- Behaviour based	Amm -Asset Management model
<b>A2 : SDLC phase</b>	Dc - Data collection	<b>A5:Risk management model</b>	Sor – SoftRisk
R-Requirement	Br -Brownian motion based	Ism - interpretative structural model	Sis - SIS framework
D-Design	Fm - Failure mode & effect	Hzo - HAZOP fault tree	Gqm - Goal question metric

I-Implementation	Sb - Simulation based	Rsdlc-Risks in SDLC framework	Rpb - Risk property based
T-Testing	Ge - Genetic algorithm	Rfb- Risk Function fluctuation based	Sqm -Structure equation model
M-Maintenance	Da - Diagrammatic approach	Ham - hazard analysis model	Sps-Software process simulation
All –All stages	Re -Risk Exposure / Score	Oth –Others	Gto – GTOPSIS
None –None	Cb - Classification based	Rob - Risk optimization based	Mod- 3 model framework

**5 RESULTS OF DATA ANALYSIS ON PROJECT RISK MANAGEMENT:**

Results for data analysis are as follows:

*Result 1:* In *Figure6* distribution of publications related to project risk management phases for time period from 1988 to 2010 shows that risk analysis and risk identification phases has been explored the most but less work has been done in risk planning and risk monitoring phases.

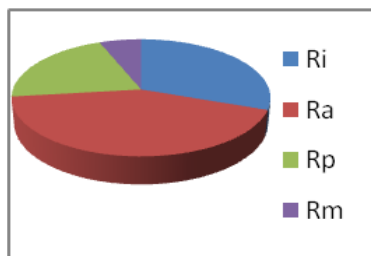
*Result2:* Distribution done according to SDLC phases in last 22 years indicates that design and requirement gathering has been focused in past years for project risk management but testing and maintenance phases still need to be explored as shown in *Figure7*.

*Result 3:* Risk identification in case of requirement, design and implementation has been explored the most but less work has been done in testing and maintenance as per *Figure8*.

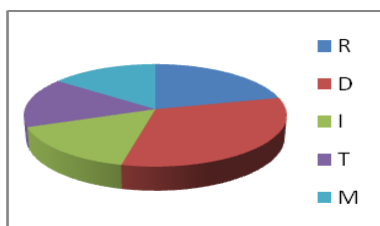
*Result4:* As per distribution in project risk analysis phase for SDLC cycle in *Figure9* it is shown that risk analysis in requirement, design, implementation phases has been focused in past years for risk management but testing and maintenance phases still need to be explored .

*Result 5:* As distributed per project risk planning in *Figure10*, It has shown that risk planning in case of requirement, design and implementation, testing has been explored the most but less work has been done in maintenance phase.

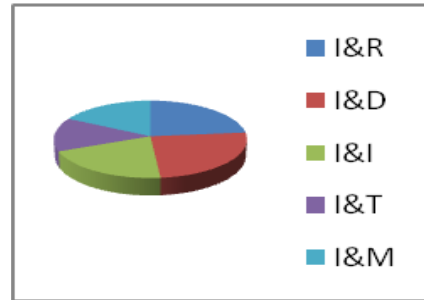
*Result 6:* As shown in *Figure11*, results show that risk monitoring in case of requirement, design and implementation, testing has been taken care the most but less work has been done in case of maintenance.



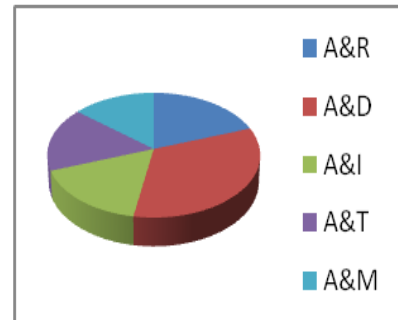
*Figure6: A2: Project Risk management phases*



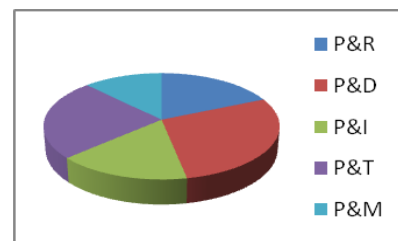
*Figure7:A3: SDLC phases*



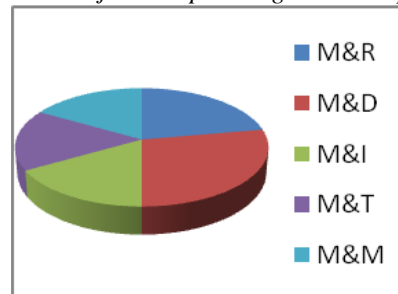
*Figure8: Project Risk identification in SDLC*



*Figure9:ProjectRisk analysis in SDLC phases*



*Figure10: ProjectRisk planning in SDLC phases*



*Figure11:ProjectRisk monitoring in SDLC*

6 Table C:

<i>Publication</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>T4</i>	<i>A1</i>	<i>A2</i>	<i>A3</i>	<i>A4</i>	<i>A5</i>
A.lee.G[18],1988	B	In	Ds,Ql	E	M	None	Rp	Re	Sis
R.J.Mulvihill[36],1988	A,F	In	Ql,Qn	E	a,o	D	None	Ic	Hzo
Vasantha.k[83],1991	B	In	Ds	E	A	None	Rp	Me	None
<i>Publication</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>T4</i>	<i>A1</i>	<i>A2</i>	<i>A3</i>	<i>A4</i>	<i>A5</i>
Erik weyer[63],1992	A,N	In	Ql	C	G	None	Rp	Vb	Bfr
Alan webb[11],1996	B	In	Ql	J	a,e,n	None	Ri,Ra	Pb,Tb,Da	Ram
Nick. L[37],1996	A,N	In	Ql,Qn	E	A	R,D	Ra	We	Ide
Rick Kazman[71],1997	B,H	In	Ql	E	Q	R,D	None	Sb	Ata
Ray S.B[38],1998	B	In	Ds,Ql	E	A	D	Ra	Sm	Ram
Norman F.[101],1998	A,F	In	Ql,Qn,Pr	E	H	T,M	Ra	Re	None
J.M.Wise[82],1998	A	In	Ql,Ds	C	N	D	Rp	None	Rrb
Michelle M.[39],1999	A,B	In	Ql,Ds	E	O	D,M	Ra,Ri	Pb	Dbm
Rajesh karki[57],1999	A,B	In	Ql,Qn,Pr	E	O	D,M	Ri,Ra	Pb	Dbm
Cynthia C.[54],2000	B	In	Ql	E	a,n	All	Ri,Rp	Iv	Rff
Say-WeiFoo[79],2000	A	In	Ql,Ds	E	a,n	None	Ri,Ra	Li,Qn	Sra
Ayad A.K[80],2000	A	In	Ds,Ql	E	a,n	None	All	Qn	Sor
Paul.G[97],2000	A,D	In	Ql	C	P	None	Ra	Sb	Oth
Anne.F[1],2001	B	In	Ds	E	a,n	None	Ri	None	None
Ryan A,[70],2001	A,B	In	Ql,Pr	E	A	All	Ri,Rp,Rm	Tm	Epm
E Solvang[65],2001	F,D,A	In	Ql	C	P	M	Ri,Ra,Rp	Si	Mrm
Hany H.[22],2001	A,G,H	In	Ql	E	H	None	Ra	Cp	Ramm
James M.[51],2001	B,E	In	Ds,Ql	E	O	D,I,T	Ri,Ra	Su	Ham
Tore. M[40],2001	B	In	Ds,Ql	S	H	D,M	Ra	Rl	Ram
Tahir Choulli[19],2001	A	In	Ql	C	E	None	Rp	Br	Rob
David P.[86],2001	A	In	Ql	E	O	D,I,T	Ra,Rp	Me	Rtb
Sherif M.[5],2002	A	In	Ql	E	H	D	Ra	Fm	Ram
John A.Farquharson[8],2003	F,H	In	Qn	S	D	D,I,M	Ri,Ra	Tb,Ri	Ham
A.Ben Hamza[64],2003	A,D	In	Ql	E	G	None	Rp	Cb	None
Andrzej.W[108],2003	N,A	In	Ql,Qn	E	A	D	Ri,Ra	Ot	Mrm
Y.V.Marcov[125],2003	A	In	Ql,Pr	E	H	None	Ra	Sb	Oth
Gary Mcgraw[41],2004	B	In	Ds	E	F	D	Ra	Tm	Crm
Shahrokhi M.[42],2004	A	In	Qn,Ql	C	A	D	Ra	Sp	Ram
Eyke.H[66],2004	A	In	Ql	E	P	None	Rp	Cb	Oth
AnthonyKwok[84],2004	A	In	Ql	E	a,n	None	Ri,Ra	Pb	None
G.Reza,[24]2005	B,E	In	Ql,Ds	E	I	None	Ri,Ra	Qn,We	None
Norman F.[53],2005	A	In	Ql,Pr	E	H	R	Ri,Ra	Pb	Rpm
James M.Eri[107],2006	A,B	In	Ql,Ds	E	A	None	Ri,Ra	None	Dbm
KE-YIN JIN[20],2006	A	In	Ql	E	A	R,D	Rp	Ri	Rem
EngSeng[31],2006	A	In	Ds,Ql	E	A	R,D	Ri,Ra	Pb	Mod
Pravin.M[55],2006	A,F,N	In	Ql	E	a,n	T	Rp	Me	None
<i>Publication</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>T4</i>	<i>A1</i>	<i>A2</i>	<i>A3</i>	<i>A4</i>	<i>A5</i>
Poornima.R[44],2006	A	In	Ql,Ds	C	N	D	Ra,Ri,Rp	Ac	None
Richard E.[43],2006	A	In	Ql	E	H	D	Ra	Co	Amm
Moshiur B[77],2007	A,G	In	Qn,Ql	C	E	None	Ri,Ra,Rp	Me	Pmb
XieKefan[10],2007	B,A	In	Ql	E	E	R,D,I	Ra	We	Bmr
Denizkasap[33],2007	B	In	Ds	C	A	R	Ri	Li	Rif

Valerie Wyatt[73],2007	A,F	In	Ql	C	a,n	R	Ri	Me,Li,Iv	Rif
Leila Meshkat[45],2007	A,B	In	Ql	E	A	D	All	Rl	Crm
Zhen-yu [16],2008	A,B	In	Qn	C	A	R,D,I	All	Tm	Irm
Sana.Kh[26],2008	E	In	Qn,Pr	E	A	None	Ri,Rm	Su	Abm
SamanehBarati[34],2008	A,B	In	Ql,Qn	E	A	None	Ri,Rp	Tm	Rif
Young -hwan[7] ,2008	A	In	Ql	C	F	R	Ri,Ra	Rn	Rem
Liu Ren[32],2008	A,D	In	Ql,Qn	E	A	None	Ri,Ra	We,Li	Ramm
S.M.H.Moj.[27],2008	F	In	Ql,Qn	E	A	R,D,I	Ri,Ra	Me,We	Gto
Jiangping Wan[98],2008	I	In	Ql	E	A	None	Ri,Ra	Me	Ism
R.Boumen[50],2008	F,A	In	Ql,Qn	E	A	T	Ra	Gb	None
Md. Forhad[62],2008	C	In	Ds	C	A	None	All	Su	Sei
Kim W.[72],2008	C	In	Ql,Ds	E	R	None	Ra	Su	Hyp
Prabhdeep.S[81],2008	A	In	Ql	C	S	None	Rp	Gb	Rrb
Jacques.S[56],2008	B	In	Ds	E	E	T	Ra	Pb,Se,Tm	Rbt
Song.G[103],2008	B	In	Ds	E	r,t	None	Ri	Bb	None
Jing-feng Y.[106],2008	A,E	In	Ql	C	A	None	Ri,Ra	Fm	Sqm
DaniellChrun[87],2008	A,E	In	Ql,Ds	S	O	None	Ra,Rp	Me	None
I. Tashi[88],2008	A,B	In	Ql,Ds	C	O	None	Ra	Me	None
Khalid. S[89],2008	A,B	In	Ql,Ds	C	O	All	Ra	Me	Gqm
M.K.Nayak[105] ,2008	A,B	In	Ds,Ql	E	N	All	Ri,Rp	Dc	Cor
Stefan Jakoubi[78],2009	A,D	In	Ql,Pr	E	E	None	All	Tm	Pmb
Xiaoyu Li[59],2009	A,I	In	Ql	E	A	None	Rp,Rm	Rs	Rfm
XU Hui[6],2009	F,G	In	Qn,Pr	C	B	None	Ri,Ra	Li	Rif
Li Ya-Feng[25],2009	N,A	In	Qn,Ql	WC	C	None	Ri	Me	Dem
Nina A.Abra[110],2009	A,G,N	In	Ql	E	D	None	Ra	Ct	Ctm
JIN Ju-Liang[12],2009	D,F,G	In	Qn,Ql	E	P	None	Ra	Si,Fa	Ram
Ellen Souza[48],2009	B,I	In	Ql	E	A	T	Ra,Rp	Me	Gqm
BasitShahzad[30],2009	B,I	In	Ds	C	a,n	All	Ri,Rp	None	Rim
Huizhe Yan[100],2009	A	In	Qn,Ql	C	L	None	Ra	Fa	Rem
<i>Publication</i>	<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>T4</i>	<i>A1</i>	<i>A2</i>	<i>A3</i>	<i>A4</i>	<i>A5</i>
Liu yong[61],2009	A	In	Ql	C	C	None	Ra	Cb	Rpb
Jingjing [102],2009	A	In	Ql,Qn	C	I	None	Ra	Re,Me	Ramm
Muhammad.S[67],2009	A,I	In	Ql,Qn	E	H	None	Ra,Rp	Se	Oth
Masanori.A[92],2009	D	In	Ql,Qn	E	E	None	Ri	Sb	None
Xiao Fu[85],2009	E	In	Ql	E	A	None	Ra,Ri	Pb,Su	None
Nan Feng[35],2009	A,F	In	Ql	E	A	None	Ri	Ge,Cb	None
Dapengliu[74],2009	C,D	In	Ql,Ds,Pr	S	a,n	All	All	Rw	Sps
W.-H.Tsai[21],2009	B,A,O	In	Ql	E	E	None	Ra,Rp	Qn,Dc	None
QI Baoku[58],2009	F	In	Ql,Qn	E	A	All	All	Me	Dbm
Yu. Wang[76],2010	A,B	In	Ql,Ds	E	A	None	Ri,Ra,Rp	Ic,Me	Rdm
luis. Nasci[9],2010	F	In	Ql,Ds	C	E	None	Ri,Ra	Ca	Abm
ZouWenPing[99],2010	B	In	Ql,Ds	E	A	R,D,I,M	Ri,Ra	Rr	Rsdlc
Jung-Ho[14],2010	G	In	Ql	E	F	None	Ra	Me	Sem
Feng Ziqin[28],2010	A	In	Ql	C	P	None	Ri	Me,Li	Rif
BI Xiao[93],2010	N	In	Ql,Qn	E	K	None	Ri	Ds	Rif
Nik Z[95]. 2010	A,E	In	Ql	E	O	All	Ri,Ra	Li,We	None
Ellen S[47],2010	F	In	Ql,Pr	C	A	T	Ri,Ra,Rp	Re	Rtb

Bu Xianjin[13],2010	A,F	In	Ql	C	V	None	Ra	Rc	None
Mohd.Sadiq1[23],2010	A	In	Ql	C	A	None	Ra	Re	Sra
J.Rox[46],2010	N	In	Ql,Ds	E	A	R,D	Ra,Rp	Ub	None
Michel.B[94],2010	B,A	In	Ql,Qn,Ds	E	n,a	None	Ra	Se,Fp	None
Dengseng.W[117],2010	D,A,F	In	Ql	E	n,a	R	Ra	Cu	None
Ling Tian[111],2010	A,B	In	Ql,Ds	C	p,e	None	Ri,Ra	Qn,Ic	Dbm
Lu Xinyuan[96],2010	A,I	In	Ql,Qn	C	K	None	Ra	Rs	None
Shakeel A.[69],2010	B,C	In	Ql,Ds	C	A	R,D,I,T	Ra	Qn	Bmr
Vojo .B[49],2010	A,D	In	Ql,Pr	C	H	T	Ra,Rp	Sb,Me	Sib
Hong Kang[109],2010	A,B	In	Ds	C	a,k	None	Ri,Ra	Rc	Rfm
BasitShahzad[29],2010	A	In	Ql	C	A	All	Ri,Rp	n.a	Ria

*Where T1: Kind of study; T2: Geographic area;T3: Approach;T4: Article presented in ;A1: Type of risk ; A2 : SDLC phase ;A3: Risk Management phase ; A4 : Risk mode of evaluation ; A5 : Risk management model*

#### 7 Conclusions:

Various conclusions we have found out from this research. Risks in project management has got a sharp inclination in past due to great development in software engineering perspectives. Modeling and conceptual studies has been the most prominent type of studies in the past. Qualitative and descriptive approach has been explored the most and Risk identification ,analysis phases have been worked upon the most in past year. Information gathered from past indicates that Project risk management in requirement gathering, design and implementation has been explored well but stress on testing and maintenance has been very less.

#### 8 FUTURE WORK

Future perspectives needs concentration on other means of type of studies like action research, Experimental and exemplary to make project risk management an effective process. In addition, Predictive approaches need to be explored so that risk can be predicted in advance. Furthermore, perspective should be to concentrate on project risk planning and monitoring phases with motive to work more on testing and maintenance phases of SDLC cycle.

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