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Australian National Survey: Preliminary Findings

Report 2001-016-A-05

The research described in this report was carried out by

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Project 2001-016-A
Critical Success Factors For Organisations In Information And Communication Technology-Mediated Supply Chains

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Stage III – National Survey

The National survey was the third phase in an ongoing initiative to identify critical success factors in ICT mediated supply chains. This study has been designed to harness the tacit and explicit knowledge to be found on the subject from the widest range of appropriate sources. At its core is the assumption that, provided with the fullest list of candidate success factors, a representative sample of experienced industry-based practitioners will (with the aid of statistical analysis) reveal a set of critical success factors. A postal survey has been judged to be the most appropriate mechanism for achieving this outcome.

Delphi Study Findings

The Delphi study applied a methodologically rigorous variant of an established technique to a complex problem. In doing so, it harnessed the intellect and experience of a diverse group of experts, to achieve a high degree of unanimity that has ultimately generated a strong set of statements.

Although these statements could not be used alone to drive an organizations ICT strategy, further analysis of the findings was considered better judgement. The primary purpose of the Delphi was therefore to identify the cutting edge of current thought in regards to success factors for ICT mediated supply chains. This served two purposes: firstly to check for completeness of the list of candidate success factors - derived from the literature - and to guide content of the national survey of the Australian Construction Industry.

Resulting from the Delphi study was the confirmation of several candidate success factors. These were part of a group retrieved from supply chain and ICT literature in construction. During the course of the Delphi study several key areas that would be addressed in the National survey were identified. These were broadly identified as:

1. Technology
2. Project Structure and Processes/ Industry Structure and Processes
3. Business Process
4. Human Factors

Although Delphi output did fall into these broad groups, the content, once analysed, revealed that these areas were comprised of a network of sub-dimensions. The following broad categories (see Appendix A for a complete version of the survey) were identified and used as the template for the National Survey:

1. ICT mediated supply chain context
2. Project organization structure and culture
3. Business environment
4. Supply chain management technology and support environment
5. Contractual and procurement environment
6. Barriers to adopting ICT mediated supply chain
    a. Organisational culture
    b. Organisational resource commitment
7. ICT value perception
8. Risk attitude
9. Legal aspects
10. Technological aspects

SURVEY RESEARCH METHODS

Survey research is considered the most efficient means to sample large populations. Ideally, structured interviews are preferred for yielding reliable data, but given the diversity (both geographically and vocationally) of the sample group a survey method was considered to meet sampling validity and reliability criteria.

The survey was also the second part in a planned triangulation method. The preliminery phase, was a literature review of areas relating to construction supply chain success and ICT. The Delphi study was the official first phase followed by the national survey and finally a series of case studies of various organisations is to be completed to test the findings of the first two phases.

However, the national survey had two primary aims:

1). to find support or otherwise for the findings of the Delphi study and
2). to further develop material for the case studies.

Rationale for Methodology

A National survey was undertaken with the aim of gathering data that would be representative of the current construction industry in Australia. In so doing, population sizes of representative parties in the industry were estimated and allocated a corresponding percentage of the 2500 surveys being distributed.

Participants

The participants consisted broadly of the following groups:

- Clients
- Main Contractors
- Sub Contractors
- Architects
- Engineers
- Quantity Surveyors
- Other

Inclusion criteria consisted of the organization being listed in a publicly available medium. Population sizes were estimated based on National databases and where applicable, the governing bodies of these different groups (eg RAIA, AIQS). A database of participants was created and a pilot sample of 500 surveys sent out. Participant response rates were calculated and the further 2000 survey group numbers were adjusted accordingly.

National Survey

The survey was divided into several components. The first section established the basic demographic data of the participant. As anonymity was maintained at all times, groups were established using the self report questions of Section A (see Appendix A).

The second section of the survey addressed the level of technology that each organization utilised. From this, participants were identified as low, medium or high end users.

Question Development and Selection

Based on the findings of the Delphi study several key areas were identified for further investigation. During the initial phase of the Delphi study several content domains were

identified from the literature. A content domain refer to the constituent parts that require investigation for a topic to be better understood.

Following the conclusion of the Delphi exercise, a new set of content domains were named. The process of drafting questions for the survey involved the definition of each new content domain or where appropriate a list of its defining features. From this list questions were drafted reflecting different aspects of each domain. The original drafting process yielded a group of 200 possible questions addressing all of the content domains. A panel was established to accept or reject the sample item. Forty seven scaled questions were derived.

Section C determined the type of technologies used in different facets of the construction processes, and whether the organization participated in these types of processes. Low end users (determined in section B) did not complete this section, but were forwarded to Section E addressing Barriers to New Technology in Project Teams.

Section D addressed issues related to New Technology and Project Success. Participants were asked to indicate their level of agreement / disagreement relating to a series of statements. Section E addressed Barriers to New Technology for low - level users.

In sections D, E and F all 1 – 100 response format was adopted. This choice was thought to limit social acquiescence, floor and ceiling effects and provided participants with a broad spectrum of response choices.

The survey was sent out in two waves. The first was intended to run as a pilot test to gauge response rate and identify and flaws that may have been missed in the editing process. However after the initial 500 surveys were sent, no issues relevant were identified and a further 2000 were distributed.

The expected response rate was 10% or 250 surveys. However the response rate at this time has reached 13% and surveys continue to arrive though with decreasing frequency.

RESULTS

Distribution of participants

Title	Percentage (%)
Client	5.9 %
Principal Contractor	6.3 %
Sub-contractor	45.5 %
Architect	22.8 %
Engineer	6.9 %
Quantity Surveyor	12.5 %

Table 1 indicates that a large percentage of respondents were sub-contractors. The method adopted for the sampling of respondents was intended to over sample this group, as they make up a large proportion of the construction industry, creating a more representative sample.

Table 2: Technology usage by participants

Level of Technology	Percentage (%)
Low level	23.3 %
Medium level	48.5 %
High level	28.2 %

Table 2 reflects the level of technological engagement adopted by participants. It can be seen that most respondents engage with technology at a medium level. This level of engagement is typified by the use of email communications, WAP enabled mobile devices, Internet and web based project collaborations.

Table 3: Level of technology engagement by different groups

Title	Low N (%)	Medium N (%)	High N (%)
Client	1 (5.6%)	8 (44.7%)	9 (50%)
Principal Contractor	0 (0.0%)	12 (63.2%)	7 (36.8%)
Sub-contractor	48 (35.3%)	57 (41.9%)	31 (22.8%)
Architect	10 (14.7%)	31 (45.6%)	27 (39.7%)
Engineer	2 (9.5%)	17 (81%)	2 (9.5%)
Quantity Surveyor	9 (23.7%)	20 (52.6%)	9 (23.7%)

Within the different groups the use of technology differed. Clients were reported as medium to high end users as were Principal contractors. Alternatively Sub-contractors tended to engage with technology at a lower level compared to industry counterparts with far more respondents reporting low levels of new technology use. The results indicate that most participants engage in technology at a medium levels.

Table 4: Itemised technology use

Technology	Usage (% of respondents)
Land phone	97 %
Fax	96.7 %
Mobile	96.4 %
Stand alone PC	74 %
Networked PC	70.1 %
Email	89.1 %
WAP enabled mobile device	11.2 %
Internet	60.5 %
Web based project collaboration	28.9 %
Integrated design software system	13.8 %
ERP	4.9 %

Table 4 examined the different types of technologies that differentiate low, medium and high end users. Almost all participants reported the use of low-end technologies (land phone, fax, mobile, stand alone PC and networked and shared databases). However with the exception of the internet, the general trend was that technology use declined as the technologies became more sophisticated.

A factor analysis was run on Section D (see Appendix C for data). The factors appear to load into a seven-factor solution that explained 59% of the variance (see Appendix C). The factors have been given the preliminary labels (see Appendix B for questions):

Factor 1: Organisational commitment
Factor 2: Organisational attitude
Factor 3: Industry regulation
Factor 4: Investment drive
Factor 5: Rights and duties
Factor 6: Guarantee/ Protection/ Assurance
Factor 7: Communication structure

These factors will be the basis of the case studies. A factor analysis was run on Section D which addressed barriers to ICT uptake (see Appendix E for data). The factors appear to load into a four-factor solution that explained 64% of the variance (see Appendix F). The factors have been given the preliminary labels (see Appendix G for questions):

Factor 1: Financial Dimension
Factor 2: Confusion of Technology
Factor 3: Culture of the Industry
Factor 4: Drive for New Technology

4.0. DISCUSSION

Preliminary findings suggest that most of the construction industry in Australia engage with technology at a medium level of usage. Further analysis will elucidate the reasons for technology adoption or otherwise. However thus far it is clear that construction industry participants do use technology in the day-to-day operation of their businesses and organizations.

Sub-contractors reported the lowest level of technological engagement. Given the often-small business size in comparison to other groups and the nature of their employment that this group have not engaged in often expensive and risky technologies was predicted. Further analysis will determine if there is a relationship between the number of employees and the level of technological engagement reported by participants. Or whether occupation or project type is a better predictor of technological engagement.

An important aspect is the type of work that the respondents typically engage in. For example, Architects were more likely to use 3D modelling tools compared to a Sub-Contractor or Quantity Surveyors because the nature of work requires the frequent use of this type of technology. Therefore the specialisation of different occupations is an important criterion for assessing technology use.

Response rate for the survey was satisfactory; the sample met size and group criteria for statistical robustness. However further research will concentrate on developing a larger database for Clients and Principal Contractors, within Australia the number of Clients was limited, therefore it is vital to obtain an accurate and thorough database of all major Clients in the construction industry. It is further suggested that a definitive list of organisations who consider themselves Principal Contractors be collected with demographic details of the organisation, to determine more accurately the size and make-up of principal contractors in the construction industry.

The factors that have been identified represent the issues considered relevant to industry participants responding to the survey. The names given to the factors represent the combination of questions that loaded onto that factor. See Appendix B and D for a list of the questions in groups of factors. *Factor 1*: Organisational commitment appeared to reflect questions addressing the relationships that organisations maintain with other project participants when considering the use of ICT. *Factor 2*: Organisational attitude included issues of the provision of technology specifications in projects and whether there was an industry push to have technology specifications enforced or included in contracts. *Factor 3*: Industry regulation was the external regulation or guidelines for issues of technology use. *Factor 4*: Investment drive captured issues for the push for engaging in new technologies and the financial benefits/liabilities of doing so. *Factor 5*: Rights and duties: captured issues related to the usage of project information and the level of access participants in a project have to project information. *Factor 6*: Guarantee/ Protection/ Assurance captured the issues related to the guarantee that the information within a project is used for the purposes that were stipulated within contractual agreements. *Factor 7*: Communication structure referred to the types of communication networks organisations use within and between project partners.

This preliminary analysis has satisfied the suggestion that different groups within the construction industry use technology differently and with varying levels of engagement. Further research will determine the attitude of participant groups toward the use of these technologies and the impact they have on organisational functioning. Further analysis will also elucidate the areas that different groups within the construction industry consider the critical success factors for ICT mediated supply chains.

Appendix A

1. Please indicate the type of activity your organisation performs (please tick appropriate box. You may tick more than one box).
   - Project management
   - Contracting (principal)
   - Trade sub-contracting
   - Specialist sub-contracting
   - Architectural
   - Engineering
   - Financial services (QS)
   - Other
2. Please indicate your position/primary role in your organisation (please tick appropriate box. You may tick more than one box).
   - Project/construction manager
   - IT manager
   - Operation/SC manager
   - Senior/Strategic manager
   - Other
3. Please indicate in which sector(s) your organisation is active (please tick appropriate box. You may tick more than one box).
   - Residential
   - Commercial
   - Industrial
   - Retail
   - Civil (transport)
   - Civil (power and water)
   - Social infrastructure
   - Other
4. Please indicate what types of procurement your organisation has experienced (please tick appropriate box. You may tick more than one box).
   - Lump sum tender
   - Design and build
   - Management contracting
   - Partnering
   - Joint ventures
   - Public/private partnerships
   - Others
5. Within Australia, in how many states are you active? (please tick appropriate box. You may tick more than one box).
   - NSW
   - QLD
   - VIC
   - SA
   - WA
   - NT
   - ACT
   - TAS

6. Do you operate overseas?
    - Yes
    - No
7. Please indicate how many years your organisation has been in business?
8. Please indicate the approximate number of employees in your organisation?
9. Please indicate the average annual turnover of your organisation in the last three years.
10. Please indicate the number of different clients that your organisation has done work for in the past five years.
    - Approximate number of one-off clients?
    - Approximate number of repeat clients?

Section B

Please tick any of the technology that you currently use.

- Land phone
- Fax
- Mobile phone
- Stand alone PC
- Networked PC/Shared database
- Email
- Use of WAP enabled mobile device
- Internet
- Web based project collaboration
- Integrated design and construction management software system
- ERP system across organisation and projects
- Own web-server/project collaboration/logistics tools
- 3D/4D modelling and virtual reality communication

Section C

Rating	Description
NA	We do not engage in this type of work
0	New Technologies are not used
1	**Stand alone applications** – e.g. word processors, spread sheets, BQ,CAD applications, Telephones (teleconferencing) etc
2	**Shared applications** - e.g. Documents or designs shared on a network, Video conferencing applications
3	**Virtual applications** - 3D/ 4D models (virtual reality) and Web based/Online software applications and communication tools

Functions	Rating	Functions	Rating
Business planning (organization and project)		**Financial/Resource Management**	
Meetings with partners and collaborators		*Financial forecasting (cash-flows etc)*	
Managing corporate/business knowledge base		*Company accounts & payroll*	
Strategic planning (making decisions on long term plans)		*Project cost planning*	
Customer support (customer information and marketing)		*Sub contractor payment*	
Designing Stage		**Construction**	
Briefing process (client and other stake holders)		*Project communication*	
Drawings documentation and communication		*Purchasing/logistics (inventory)*	
Design collaboration with other consultants/contractors		*Project planning (time)*	
Tendering stage		*Plant and machinery management*	
Preparing tender documentation (BQ and estimating)		**Facilities management**	
Tender contractual documentation and communication		*Maintenance planning and operations*	
Obtaining supplier quotations		*Building performance monitoring*	
Accessing/managing pricing information		*Leasing and contractual activities*	

Section D

12. Organisational objectives are more efficiently achieved with the use of new technology
13. New technology use in our organisation is considered successful
14. The use of new technology gives competitive advantage
15. The use of new technology for communication between project participants encourages effective collaboration

16. Using new technology improves our purchasing and logistics control
17. Using new technology does not help us align our business processes with our trading partners
18. Using new technology assists us with the formation of strategic relationships with our trading partners.
19. The successful management of relationships with trading partners is reliant upon the commitment of senior management.
20. The adoption of new technology for project communication/management is usually imposed on participants by a powerful organization within the project
21. The adoption of new technology for project team management must be supported by a “champion” within the project
22. Customer demand is the primary driver for the adoption of new technology.
23. External pressures exerted by competitors trigger an organization’s adoption of new technology.
24. The fragmented nature of some construction projects hinders the effective operation of new technology
25. The guarentee of information security is crucial for the success of new technology usage
26. An open-minded attitude to sharing project information using new technology is uncommon within a project team.
27. New technology in a project team tends to work best for organizations who engage in long term collaborative relationships (e.g. partnering)
28. The commitment of the employees is essential for the success of new technology initiatives
29. Use of new technology requires continuous investment in human resource development through training and development
30. Provision for usage of emerging technologies in the present standard conditions of contracts is inadequate
31. Introducing government regulations which stipulate a minimum technology requirement in project teams will improve the adoption and use of new technology
32. Stipulation of one industry wide technology standard (like Australian Standard) is essential for the success of using new technology in project team communication
33. For new technology led project communications, transparency/trust in information transactions is essential
34. Organisations commit to new technology investment as a project based tactical decision- in large projects only when Return on Investment (ROI) can be recovered at the end of the project
35. Organisations commit to investment in new technology, based on strategic decision-considering ROI recovery with long term engagement with project team partners.
36. Acknowledging that not all information (especially commercially sensitive information of an organisation) will be available to project team participants is important for usage of new communication technologies among project teams.
37. Identifying the ownership of the intellectual property of project information is an important aspect in the success of engaging new technology in a project team.
38. Multiple online systems led by different participants (architects, project managers, contractors) tend to work negatively in the project team.
39. The powerful new technology promoter (e.g. main contractor) in the project team should support the weak or small organizations (e.g. Sub contractor) to successfully use new technology in that project

Section E

40. Engaging with new technology is made difficult due to the need to align your organisational processes with others in the project team
41. There is no drive from project team members (contractors/consultants/partners) to use new technology
42. Drive to adopt new technology within your organization is lacking
43. The rate of change of technology is unattractive in terms of time commitment required to engage in new developments
44. Low profit margins in the construction sector do not allow for the active use of new technology
45. The high cost of new technology investment tends to discourage such ventures
46. The cost of training staff on new technologies discourages these developments
47. Our organisational culture does not believe in engaging with hi-tech new technologies for doing business
48. Lack of trust in the information security of new technology tends to discourage involvement
49. Ownership of the intellectual property of project information threatens new technology use.
50. Adoption of new technology is considered risky as the contractual forms available are not tried and tested
51. The sharing culture and transparency required to use new technology is uncomfortable for our organization
52. New technology investments do not give a decent direct financial return
53. Lack of technology standards (eg Australian Standards) can make using new technology confusing
54. Advice in new technology engagement in the construction industry is hard to obtain (due to lack of consultants or cost involved)

Section F

55.My organisation's financial situation for the past two years has been positive
56. My organisation's competitive position/market share for the past two years has been good.
57. My organization hands over jobs to clients within the agreed project duration
58. My organization has avoided doing large rectification work in our projects by doing things reasonably well in the first instance
59. Project cost overruns are not common in our organization
60. Comments

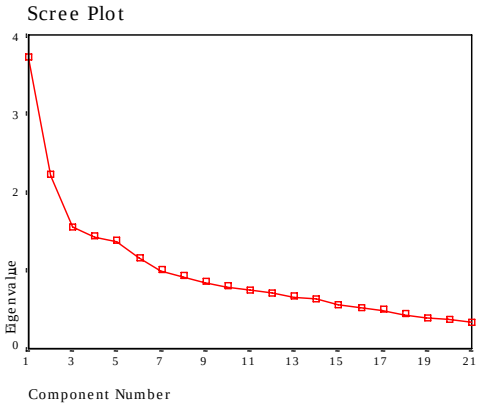
Appendix B
Factor analysis with relevant cases

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.716	17.695	17.695	3.716	17.695	17.695	2.305	10.977	10.977
2	2.222	10.579	28.274	2.222	10.579	28.274	1.976	9.412	20.389
3	1.553	7.393	35.667	1.553	7.393	35.667	1.888	8.991	29.380
4	1.431	6.814	42.480	1.431	6.814	42.480	1.860	8.859	38.240
5	1.378	6.562	49.043	1.378	6.562	49.043	1.827	8.698	46.937
6	1.165	5.549	54.592	1.165	5.549	54.592	1.376	6.551	53.488
7	1.003	4.778	59.370	1.003	4.778	59.370	1.235	5.882	59.370
8	.927	4.416	63.787						
9	.859	4.092	67.879						
10	.795	3.785	71.664						
11	.755	3.596	75.260						
12	.719	3.426	78.686						
13	.671	3.193	81.879						
14	.638	3.040	84.919						
15	.568	2.706	87.625						
16	.532	2.534	90.159						
17	.502	2.390	92.549						
18	.446	2.122	94.671						
19	.400	1.906	96.577						
20	.376	1.789	98.366						
21	.343	1.634	100.000						

Extraction Method: Principal Component Analysis.

Appendix C



Component Matrix[a]

	Component						
	1	2	3	4	5	6	7
SMEAN(Q27)	.568		-.371				
SMEAN(Q24)	.558						.317
SMEAN(Q33)	.535	-.325					
SMEAN(Q28)	.530	-.317		.320			
SMEAN(Q36)	.525				-.352	.333	
SMEAN(Q29)	.521				.412		
SMEAN(Q35)	.518				-.331		
SMEAN(Q25)	.510			-.304		-.364	
SMEAN(Q37)	.506					.326	-.364
SMEAN(Q30)	.463			-.376			-.411
SMEAN(Q19)		-.554			.308		
SMEAN(Q32)		.538	.524				
SMEAN(Q26)		.500	-.386				
SMEAN(Q23)	.331	.495					.338
SMEAN(Q22)		.477		.329			-.319
SMEAN(Q31)		.412	.606	-.348			
SMEAN(Q20)	.347	.314	-.408		.379		
SMEAN(Q21)				.469	.442	.430	
SMEAN(Q34)	.418				-.478		
SMEAN(Q39)	.384		.330			.475	
SMEAN(Q38)				-.374		.384	.485

Extraction Method: Principal Component.

a. 7 components extracted.

Appendix D

Factor – 1– Organisational Commitment
19. The successful management of relationships with trading partners is reliant upon the commitment of senior management.
28. The commitment of the employees is essential for the success of new technology initiatives
29. Use of new technology requires continuous investment in human resource development through training and development
33. For new technology led project communications, transparency/trust in information transactions is essential

Factor – 2 Organisational attitude
26. An open minded attitude to sharing project information using new technology is uncommon within a project team.
27. New technology in a project team tends to work best for organizations who engage in long term collaborative relationships (e.g. partnering)
30. Provision for usage of emerging technologies in the present standard conditions of contracts is inadequate
20. The adoption of new technology for project communication/management is usually imposed on participants by a powerful organisation within the project

Factor 3 –Industry Regulation
31. Introducing government regulations which stipulate a minimum technology requirement in project teams will improve the adoption and use of new technology
32. Stipulation of one industry wide technology standard (like Australian Standard) is essential for the success of using new technology in project team communication

Factor 4- Investment drive
23. External pressures exerted by competitors trigger an organisation's adoption of new technology.
34. Organisations commit to new technology investment as a project based tactical decision- in large projects only when Return on Investment (ROI) can be recovered at the end of the project
35. Organisations commit to investment in new technology, based on strategic decision-considering ROI recovery with long term engagement with project team partners.
*22. Customer demand is the primary driver for the adoption of new technology.

Factor 5- Rights and duties
36. Acknowledging that not all information (especially commercially sensitive information of an organisation) will be available to project team participants is important for usage of new communication technologies among project teams.
37. Identifying the ownership of the intellectual property of project information is an important aspect in the success of engaging new technology in a project team.
39. The powerful new technology promoter (e.g. main contractor) in the project team should support the weak or small organizations (e.g. Sub contractor) to successfully use new technology in that project

Factor 6 –Gurantee/Protection/Assurance

21. The adoption of new technology for project team management must be supported by a “champion” within the project
25. The guarantee of information security is crucial for the success of new technology usage

Factor 7 -Communication structure
24. The fragmented nature of some construction projects hinders the effective operation of new technology.
38. Multiple online systems led by different participants (architects, project managers, contractors) tend to work negatively in the project team

Appendix E

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.598	39.989	39.989	5.598	39.989	39.989	3.736	26.688	26.688
2	1.687	12.047	52.035	1.687	12.047	52.035	2.640	18.859	45.547
3	1.367	9.763	61.798	1.367	9.763	61.798	2.023	14.449	59.996
4	1.038	7.414	69.212	1.038	7.414	69.212	1.290	9.216	69.212
5	.933	6.662	75.874						
6	.735	5.250	81.123						
7	.607	4.337	85.460						
8	.428	3.058	88.518						
9	.369	2.634	91.152						
10	.332	2.374	93.526						
11	.309	2.208	95.734						
12	.262	1.875	97.609						
13	.209	1.493	99.102						
14	.126	.898	100.000						

Extraction Method: Principal Component Analysis.

Appendix F

Rotated Component Matrix [a]

	Component			
	1	2	3	4
SMEAN(Q45)	.829			
SMEAN(Q46)	.809			
SMEAN(Q52)	.790			
SMEAN(Q44)	.770		.335	
SMEAN(Q54)	.671	.459		
SMEAN(Q48)		.833		
SMEAN(Q49)		.695		
SMEAN(Q51)		.677		.402
SMEAN(Q50)	.399	.579		
SMEAN(Q53)	.514	.531		
SMEAN(Q43)			.854	
SMEAN(Q42)			.785	.352
SMEAN(Q47)	.462		.516	
SMEAN(Q41)				.950

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix G

Factor 1 – Financial Dimension

44. Low profit margins in the construction sector do not allow for the active use of new technology
45. The high cost of new technology investment tends to discourage such ventures
46. The cost of training staff on new technologies discourages these developments
52. New technology investments do not give a decent direct financial return
54. Advice in new technology engagement in the construction industry is hard to obtain (due to lack of consultants or cost involved)

Factor 2 – Confusion of Technology
48. Lack of trust in the information security of new technology tends to discourage involvement
49. Ownership of the intellectual property of project information threatens new technology use.
50. Adoption of new technology is considered risky as the contractual forms available are not tried and tested
51. The sharing culture and transparency required to use new technology is uncomfortable for our organization

Factor 3 – Culture of the Industry
42. Drive to adopt new technology within your organization is lacking
43. The rate of change of technology is unattractive in terms of time commitment required to engage in new developments
47. Our organisational culture does not believe in engaging with hi-tech new technologies for doing business

Factor 4 – Drive for new Technology
41. There is no drive from project team members (contractors/consultants/partners) to use new technology
53. Lack of technology standards (e.g Australian Standards) can make using new technology confusing

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