

Chapter 6

Results

6.1 Introduction

Results obtained in Preliminary Field Survey Questionnaires in stage 1 and 2 and Organizational questionnaire are given in Tables and the corresponding graphs are shown in figures.

6.2 Preliminary Field Survey Questionnaire for Individuals –stage 1

Survey data obtained for above is shown in Table 6.1 Questionnaire have been numbered 1-31. Qualitative ranking was tabled for each sub components of major components such as Feasibility Studies, Engineering Design, Construction and Operation and maintenance. In each column, maximum, minimum and the average values were calculated. Out of these maximum figures, again the maximum, minimum and average figures were calculated.

6.3 Preliminary Field Survey Questionnaire for Individuals –stage 2

Considering the data in Table 6.2, status of each task was analyzed graphically against the qualitative ranges. The results are appeared in graphical form from Figure 6.1 to 6.40.

Figure 6.1 shows the ICT usage in Data Collection sub component in Feasibility Studies. About 30% indicates that the usage is Low. About 4% indicates that the usage is very low

Figure 6.2 shows the ICT usage in Data Checking and Analysis sub component in Feasibility Studies. About 18% indicates that the usage is Low. About 2% indicates that the usage is very low . The 39% indicates the use is in Moderate condition.

Figure 6.3 shows the ICT usage in Selection of Project alternatives sub component in Feasibility Studies. About 24% indicates that the usage is Low. About 3% indicates that the usage is very low. More than 50% indicates the use is Moderate. The 14% indicates the use is in High condition.

Figure 6.4 shows that the ICT usage in Environment Impact Assessment sub component in Feasibility Studies. About 24% indicates that the usage is Low. About 4.8% indicates that the usage is very low. The 38% indicates the use is in Moderate condition.

Figure 6.5 shows the ICT usage in Other items sub component in Feasibility Studies. About 9.6% indicates that the usage is Low. About 11.5% indicates that the usage is very low.

Figure 6.6 shows the ICT status for very High category in Feasibility Studies. About 13.4% indicates that the ICT use is Very High in Data Collection. About 9.6% indicates that the ICT use is very high in Data Checking and Analysis. Nearly 1% says ICT usage in selection of project alternatives is Very High.

Figure 6.7 shows the ICT status for High category in Feasibility Studies. About 25% indicates that the ICT use is High in Data Collection. About 30% indicates that the ICT use is high in Data Checking and Analysis. Nearly 14% says ICT usage in selection of project alternatives is High.

Figure 6.8 shows the ICT status for Moderate category in Feasibility Studies. About 29% indicates that the ICT use is Moderate in Data Collection. About 27% indicates that the ICT use is Moderate in Data Checking and Analysis. About 56% says ICT usage in selection of project alternatives is Moderate.

Figure 6.9 shows the ICT status for Low category in Feasibility Studies. About 29% indicates that the ICT use is Low in Data Collection. About 18% indicates that the ICT use is Low in Data Checking and Analysis. Nearly 24% says ICT usage in selection of project alternatives is Low.

Figure 6.10 shows the ICT status for Very Low category in Feasibility Studies. About 3.8% indicates that the ICT use is Very Low in Data Collection. About 1.9% indicates that the ICT use is Very Low in Data Checking and Analysis. Nearly 2.8% says that ICT usage in selection of project alternatives is Very Low.

Figure 6.11 shows the ICT usage in Pavement sub component in Engineering Design. About 17% indicates that the usage is Low. About 15% indicates that the usage is very High. The 35% indicates the use is in Moderate condition.

Figure 6.12 shows the ICT usage in Drainage sub component in Engineering Design. About 21% indicates that the usage is Low. About 8% indicates that the usage is very High. The 47% indicates the use is in Moderate condition.

Figure 6.13 shows the ICT usage in Bridges and Culverts sub component in Engineering Design. About 6.7% indicates that the usage is Low. About 3.8% indicates that the usage is very High. The 57.6% indicates the use is in Moderate condition.

Figure 6.14 shows the ICT usage in Lighting sub component in Engineering Design. About 38% indicates that the usage is Low. About 17% indicates that the usage is very High. The 19% indicates the use is in Moderate condition.

Figure 6.15 shows the ICT usage in safety sub component in Engineering Design. About 31% indicates that the usage is Low. About 3.8% indicates that the usage is very High. The 26% indicates the use is in Moderate condition.

Figure 6.16 shows the ICT status for very High category in Engineering Design. About 15.3% indicates that the ICT use is Very High in Pavement. About 8.6% indicates that the ICT use is very high in Drainage. Nearly 3% says ICT usage in Lighting is Very High.

Figure 6.17 shows the ICT status for High category in Engineering Design. About 31% indicates that the ICT use is High in Pavement. About 8.6% indicates that the ICT use is high in Drainage. About 17.3% says ICT usage in Lighting is High.

Figure 6.18 shows the ICT status for Moderate category in Engineering Design. About 57% indicates that the ICT use is Moderate in Bridges and Culverts. About 47% indicates that the ICT use is Moderate in Drainage. About 35% says ICT usage in Pavement is Moderate.

Figure 6.19 shows the ICT status for Low category in Engineering Design. About 38% indicates that the ICT use is Low in Lighting. About 31% indicates that the ICT use is Low in safety. Nearly 6% says ICT usage in Bridges and culverts is Low

Figure 6.20 shows the ICT status for Very Low category in Engineering Design. About 25% indicates that the ICT use is Very Low in Safety. About 1.9% indicates that the ICT use is Very Low in Drainage.

Figure 6.21 shows the ICT usage in Road Pavement sub component in Construction. About 24% indicates that the usage is Low. About 1% indicates that the usage is very low. About 37.5% indicates that the usage of ICT is Moderate.

Figure 6.22 shows the ICT usage in Bridges and Culverts sub component in Construction. About 18% indicates that the usage is Low. About 46% indicates that the usage is Moderate.

Figure 6.23 shows the ICT usage in Lighting sub component in Construction. About 26% indicates that the usage is Low. About 24% indicates that the usage is very low. About 30% indicates that the usage is Moderate.

Figure 6.24 shows the ICT usage in Drainage sub component in Construction. About 47% indicates that the usage is Low. About 2.8% indicates that the usage is very low

Figure 6.25 shows the ICT usage in Safety sub component in Construction. About 45% indicates that the usage is Low. About 20% indicates that the usage is very low. About 23 % indicates that the usage is Moderate.

Figure 6.26 shows the ICT usage in Provision for Utilities sub component in Construction. About 34% indicates that the usage is Low. About 38% indicates that the usage is very low. About 17 % indicates that the usage is Moderate.

Figure 6.27 shows the ICT status for very High category in Construction. About 13.4% indicates that the ICT use is Very High in Pavement. About 7.6% indicates that the ICT use is very high in Drainage. Nearly 2% says ICT usage in Lighting is Very High.

Figure 6.28 shows the ICT status for High category in Construction. About 23% indicates that the ICT use is High in Pavement. About 16.3% indicates that the ICT use is high in Drainage. About 14.4% says ICT usage in Lighting is High.

Figure 6.29 shows the ICT status for Moderate category in Construction. About 46% indicates that the ICT use is Moderate in Bridges and Culverts. About 25% indicates that the ICT use is Moderate in Drainage. About 37% says ICT usage in Pavement is Moderate.

Figure 6.30 shows the ICT status for Low category in Construction. About 27% indicates that the ICT use is Low in Lighting. About 45% indicates that the ICT use is Low in safety. Nearly 18.2% says ICT usage in Bridges and culverts is Low

Figure 6.31 shows the ICT status for Very Low category in Construction. About 20% indicates that the ICT use is Very Low in Safety. About 2.8% indicates that the ICT use is Very Low in Drainage.

Figure 6.32 shows the ICT usage in Safety and Investigation sub component in Operation and Maintenance. About 14.4% indicates that the usage is Low. About 8.6% indicates that the usage is very low . The 30.7% indicates the use is in Moderate condition.

Figure 6.33 shows the ICT usage in Rehabilitation sub component in Operation and Maintenance. About 27% indicates that the usage is Low. About 5.7% indicates that the usage is very low . The 33.6% indicates the use is in Moderate condition.

Figure 6.34 shows the ICT usage in Estimation sub component in Operation and Maintenance. About 7.6% indicates that the usage is Low. The 63.4% indicates the use is in Moderate condition.

Figure 6.35 shows the ICT usage in Preventive Maintenance sub component in Operation and Maintenance. About 43.2% indicates that the usage is Low. About 12.5% indicates that the usage is very low . The 34.6% indicates the use is in Moderate condition.

Figure 6.36 shows the ICT status for very High category in Operation and Maintenance. About 27.8% indicates that the ICT use is Very High in Survey and Investigation. About 10% indicates that the ICT use is very high in Estimation. Nearly 2% says ICT usage in Preventive maintenance is Very High.

Figure 6.37 shows the ICT status for High category in Operation and Maintenance. About 27% indicates that the ICT use is High in Rehabilitation. About 18% indicates that the ICT use is high in estimation. About 6% says ICT usage in Preventive Maintenance is High.

Figure 6.38 shows the ICT status for Moderate category in Operation and Maintenance. About 63.46% indicates that the ICT use is Moderate in Estimation. About 34.6% indicates that the ICT use is Moderate in Preventive Maintenance. About 33.6% says ICT usage in Rehabilitation is Moderate.

Figure 6.39 shows the ICT status for Low category in Operation and Maintenance. About 43.2% indicates that the ICT use is Low in Maintenance. About 27% indicates that the ICT use is Low in Rehabilitation. Nearly 7.7% says ICT usage in Estimation is Low

Figure 6.40 shows the ICT status for Very Low category in Operation and Maintenance. About 5.7% indicates that the ICT use is Very Low in Rehabilitation. About 8.6% indicates that the ICT use is Very Low in Survey Investigation.

The overall assessment of ICT status in major components appears in Figures 6.41 – 6.44. Figure 6.41 indicate the usage in Feasibility Studies. About 33.6% of the sample respondents indicate that the ICT usage in Feasibility Studies is Moderate. Only 6% indicates it as Very High. Similarly, Figure 6.42 indicates the ICT usage in Engineering design. In this case 37.3% as Moderate and 6.92% as very High. Figure 6.43 indicates that the ICT status in Construction has 32.6% respondents as Low and 5.6% as Very High. Figure 6.44 shows that the ICT status in Operation and Maintenance has about 40.6% of the sample in Moderate state, where as 6.7% respondents are of Very Low category.

6.4 Organizational Status

Considering the sample interviewed it was observed that nearly 50% has very high experience in road infrastructure development work. Majority of these organizations carry out road construction and maintenance work. Staff strength is very high in construction related organizations. Few organizations who carry out feasibility studies and engineering design. Research and Training are also conducted in very few organizations

6.4.1 Institutional Role.

Organization's Institutional role in the use of ICT was analyzed and summary results are appeared in Table 6.5. Considering the above values, it is observed that in Sri Lanka Navy and Sri Lanka Ports Authority, the institutional role in the use of ICT is very high. The primary work of these organizations is not concerning road sector development.

6.4.2 Management Instruments

The aggregate indicator value is as shown in the Table 6.6. Indicator value taken as a percentage of the maximum obtainable rank is shown in the Figure 6.47. It is observed that the percentage for management instruments for ICT use varies from 5% to 35%. Out of the sample, many organizations will fall between 10% to 35%.

6.4.3 Overall ICT Status Indicator

The overall ICT status indicator in road sector organizations were considered using the parameters 1) Enabling Environment, 2) Institution Role, and 3) Management Instruments. The results are shown in Table 6.7 and graphs shown in Figure 6.49. Organization 9 indicates the highest figure which is about 68%. The lowest figure which is 13% represents the organization 13. Ten organizations indicate a value more than 30%.

6.4.4 Self Assessment by the Organizations

Results pertaining to each sub section of self assessment by the organizations are shown in Figures 6.50 – 6.54. Figure 6.50 indicates the staff ICT competence. Organization 12 gets the highest figure of 70%. Many organizations fall below 40%.

Self competence in road development work is shown in Figure 6.51. All organizations fall below 50%. Self ICT competence graph is shown in Figure. 6.52. According to the graph, Organization 12 gets the highest figure which is little more than 50%. Two organizations have the lowest value-10%. National ICT status in Road Development shows in Figure 6.53. Organization 12 and 14 get the highest figure of 60%. National ICT trend is indicated in Figure 6.54. According to the graph, in three organizations the value is 80% Nine organizations indicate that the National ICT trend is 60%.

6.4.5 Overall Average Result in major components

Overall average results in ICT usage in major components of road sector development is shown in Figure 6.55. About 35.4% of the sample indicates that the ICT usage is in Moderate State. About 25.5% indicates it as Low where as 7.5% indicates it as very High.

6.5 Summary

It is observed that the ICT status in many sub components of major tasks falls below 50%. In many situations is in between Moderate to Very Low states. The ICT status in road sector organizations is in between 20%-70%



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Table 6.1 Survey of ICT in Road Sector Infrastructure Development and Management

Questionnaire Serial No	FEASIBILITY STUDIES					ENGINEERING DESIGN					CONSTRUCTION						OPERATION & MAINTENANCE						
	i	ii	iii	iv	v	i	ii	iii	iv	v	i	ii	iii	iv	v	vi	i	ii	iii	iv			
1	15	15	30	40	0	35	30	30	0	5	40	30	5	15	2	8	5	30	30	35			
2	15	40	15	30	0	40	20	20	0	20	40	40	0	10	0	10	0	35	30	35			
3	20	15	25	35	5	30	35	25	0	10	35	35	0	15	5	10	15	25	30	30			
4	10	40	30	15	5	40	25	25	0	10	40	30	5	10	0	15	20	35	25	20			
5	10	15	25	45	5	30	25	30	5	10	35	30	2	10	15	5	20	10	30	40			
6	15	30	40	15	0	40	25	20	0	15	30	40	0	10	10	10	0	40	35	25			
7	15	15	25	45	0	35	30	30	0	5	40	30	5	15	5	5	10	20	35	35			
8	10	50	30	10	0	40	25	20	5	10	45	35	5	10	5	0	5	20	40	35			
9	20	15	20	40	5	30	35	25	0	10	40	30	0	15	10	5	15	10	35	40			
10	35	30	25	10	0	35	25	20	5	15	40	40	0	10	0	10	10	20	35	35			
11	20	15	25	30	10	35	20	25	5	15	30	40	0	10	20	0	0	30	40	30			
12	30	15	15	20	20	23	27	10	20	20	10	10	10	35	15	20	20	25	35	20			
13	25	10	25	15	25	20	15	20	15	30	30	35	20	5	0	10	50	35	25	35			
14	20	15	25	40	0	10	30	40	0	20	30	10	0	20	40	0	0	30	30	40			
15	25	25	25	20	5	25	35	15	0	25	15	15	15	15	20	20	25	25	25	25			
16	10	10	20	20	40	20	20	20	20	20	10	15	10	15	10	40	30	35	15	20			
17	15	30	15	30	10	10	15	20	15	40	30	15	20	15	10	10	20	20	30	30			
18	15	25	5	35	20	30	30	30	0	10	10	10	10	40	30	0	35	40	5	20			
19	20	30	20	30	0	25	10	45	10	10	10	20	30	40	0	0	20	25	25	30			
20	20	10	10	30	30	10	25	20	15	30	25	15	20	20	10	10	10	30	40	20			
21	10	30	20	20	20	10	20	30	20	20	10	10	10	30	20	20	15	45	15	25			
22	10	25	40	20	5	30	20	10	20	20	15	5	30	15	20	15	30	45	15	10			
23	10	15	25	10	40	30	10	40	0	20	10	30	10	10	10	30	20	35	35	10			
24	10	20	40	20	10	30	15	15	15	25	40	10	0	10	20	20	0	35	30	35			
25	18	35	22	25	0	12	12	20	18	38	33	12	17	12	26	0	0	45	25	30			
26	28	12	33	27	0	10	15	45	0	30	15	30	0	15	25	15	0	45	45	10			
27	25	15	15	15	30	10	20	40	10	20	40	30	0	30	0	0	0	40	35	25			
28	40	20	35	5	0	5	15	25	35	20	10	10	20	20	40	0	30	20	30	20			
29	35	25	25	15	0	15	15	25	5	40	25	20	0	35	10	10	35	30	25	10			
30	10	20	30	20	20	37	22	13	14	14	12	18	30	20	10	10	10	20	30	40			
31	5	35	20	35	5	35	20	35	0	10	10	10	20	20	20	20	0	35	45	20	Max	Min	Avg
Max	40	50	40	45	40	40	35	45	35	40	45	40	30	40	40	40	50	45	45	40	50	30	40
Min	5	10	5	5	0	5	10	10	0	5	10	5	0	5	0	0	0	10	5	10	10	0	5
Avg	18	23	24	25	10	25	22	25	8	19	26	23	9	18	13	11	15	30	30	27	30	8	19

**Table 6.2 : Preliminary Field Survey of ICT in Road Sector Infrastructure
Development & Management**

1. Feasibility Studies.

	Very High		High		Moderate		Low		Very Low		No comment	
Data Collection	14	13.46%	26	25.00%	28	26.92%	31	29.81%	4	3.85%	1	0.96%
Data Checking & Analysis	10	9.62%	32	30.77%	41	39.42%	19	18.27%	2	1.92%		
Selection of project Alternatives	1	0.96%	15	14.42%	59	56.73%	25	24.04%	3	2.88%	1	0.96%
E.I.A	6	5.77%	17	16.35%	40	38.46%	36	34.62%	5	4.81%		
Other Project	0	0.00%	2	1.92%	7	6.73%	10	9.62%	12	11.54%		
Total	31	5.96%	92	17.69%	175	33.65%	121	23.27%	26	5.00%	2	0.38%

2. Engineering Design

	Very High		High		Moderate		Low		Very Low		No comment	
Pavement	16	15.38%	33	31.73%	37	35.58%	18	17.31%		0.00%		
Drainage	9	8.65%	22	21.15%	49	47.12%	22	21.15%	2	1.92%		
Bridges & Culverts	4	3.85%	32	30.77%	60	57.69%	7	6.73%		0.00%	1	0.96%
Lighting	3	2.88%	18	17.31%	20	19.23%	40	38.46%	21	20.19%	2	1.92%
Safety	4	3.85%	12	11.54%	28	26.92%	33	31.73%	26	25.00%	1	0.96%
Total	36	6.92%	117	22.50%	194	37.31%	120	23.08%	49	9.42%	4	0.77%

Table 6.2 (A) : Preliminary Field Survey of ICT in Road Sector Infrastructure Development & Management

3. Construction

	Very High		High		Moderate		Low		Very Low		No comment	
Road Pavement	14	13.46%	24	23.08%	39	37.50%	25	24.04%	1	0.96%	1	0.96%
Bridges & Culverts	6	5.77%	29	27.88%	48	46.15%	19	18.27%		0.00%	2	1.92%
Lighting	2	1.92%	15	14.42%	32	30.77%	28	26.92%	25	24.04%	2	1.92%
Drainage	8	7.69%	17	16.35%	26	25.00%	49	47.12%	3	2.88%	1	0.96%
Safety	3	2.88%	7	6.73%	24	23.08%	47	45.19%	21	20.19%	2	1.92%
Provision for utilities	2	1.92%	5	4.81%	18	17.31%	36	34.62%	40	38.46%	3	2.88%
Total	35	5.61%	97	15.54%	187	29.97%	204	32.69%	90	14.42%	11	1.76%

4. Operation & Maintenance

	Very High		High		Moderate		Low		Very Low		No comment	
Survey & Investigation	29	27.88%	19	18.27%	32	30.77%	15	14.42%	9	8.65%		0.00%
Rehabilitation	6	5.77%	28	26.92%	35	33.65%	28	26.92%	6	5.77%	1	0.96%
Estimation	11	10.58%	19	18.27%	66	63.46%	8	7.69%		0.00%		0.00%
Preventive Maintenance	2	1.92%	7	6.73%	36	34.62%	45	43.27%	13	12.50%	1	0.96%
Total	48	11.54%	73	17.55%	169	40.63%	96	23.08%	28	6.73%	2	0.48%

Table 6.3: Preliminary Fields Survey of ICT in Road Sector Infrastructure Development - Overall Status

	Very High		High		Moderate		Low		Very Low		No comment	
Feasibility Studies	31	5.96%	92	17.69%	175	33.65%	121	23.27%	26	5.00%	2	0.38%
Engineering Design	36	6.92%	117	22.50%	194	37.31%	120	23.08%	49	9.42%	4	0.77%
Construction	35	5.61%	97	15.54%	187	29.97%	204	32.69%	90	14.42%	11	1.76%
Operation & Maintenance	48	11.54%	73	17.55%	169	40.63%	96	23.08%	28	6.73%	2	0.48%
Total	150	30.03%	379	73.29%	725	141.55%	541	102.12%	193	35.58%	19	3.40%
Overall Average		7.51%		18.32%		35.39%		25.53%		8.89%		0.85%

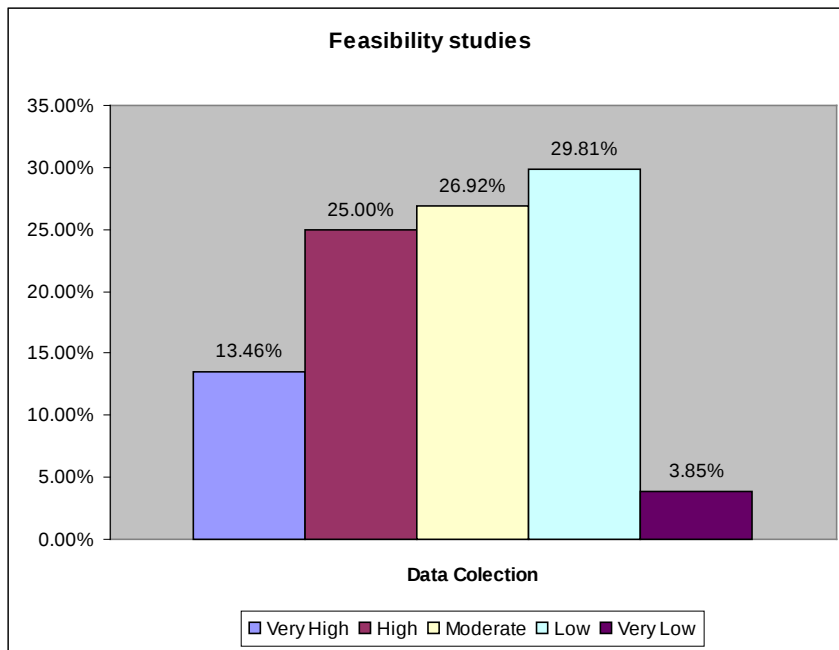


Figure 6.1: ICT Status for Data Collection

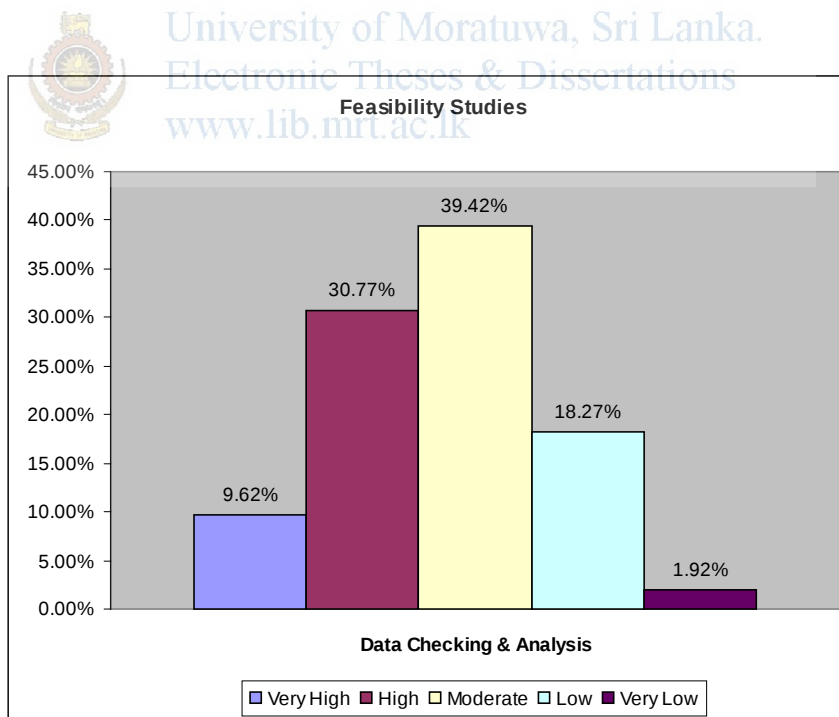


Figure 6.2 : ICT Status for Data Checking and Analysis

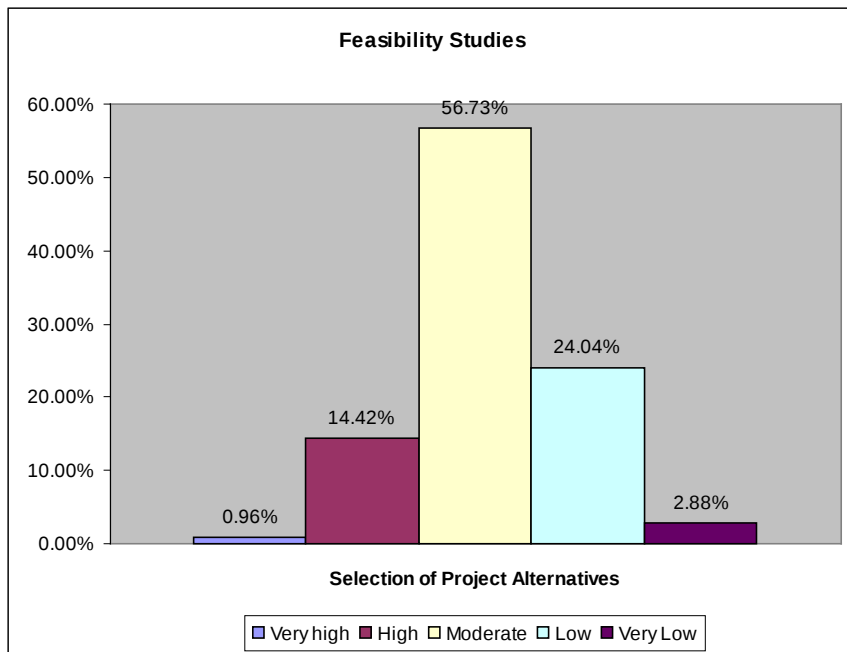


Figure 6.3 : ICT Status for Selection of Project Alternatives

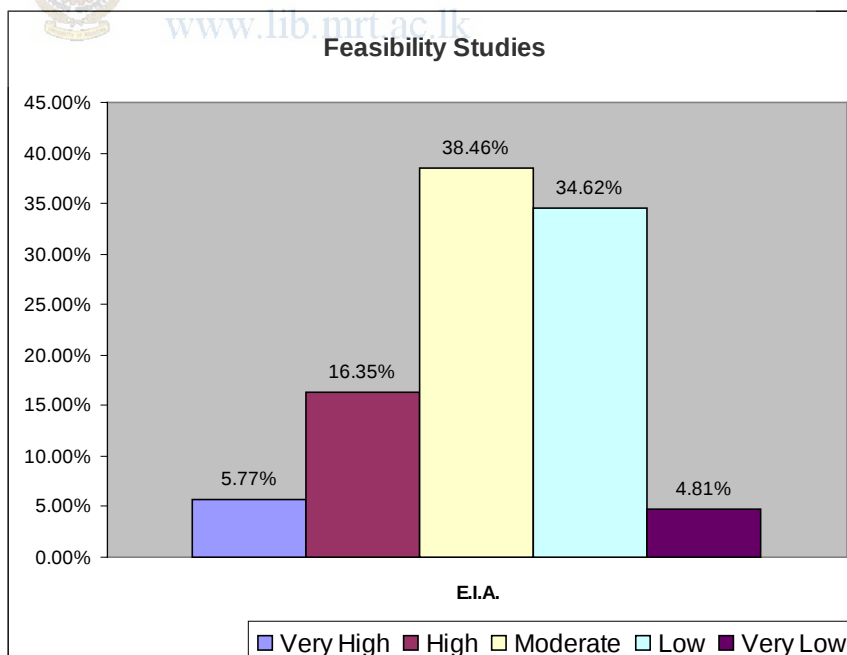


Figure 6.4 : ICT Status for E.I.A

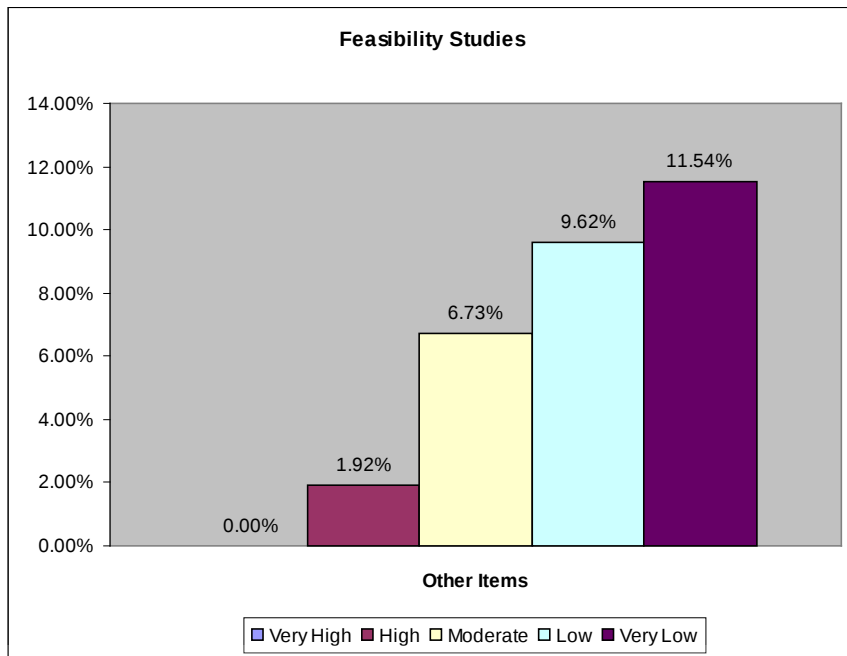


Figure 6.5 : ICT Status for Other Items
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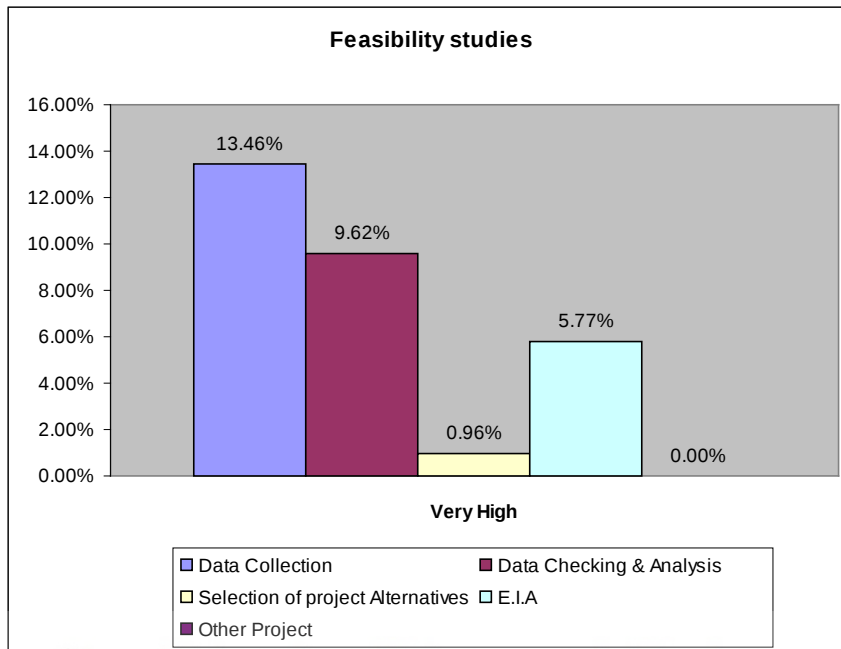


Figure 6.6 : ICT Status for Very High Category in Feasibility Studies

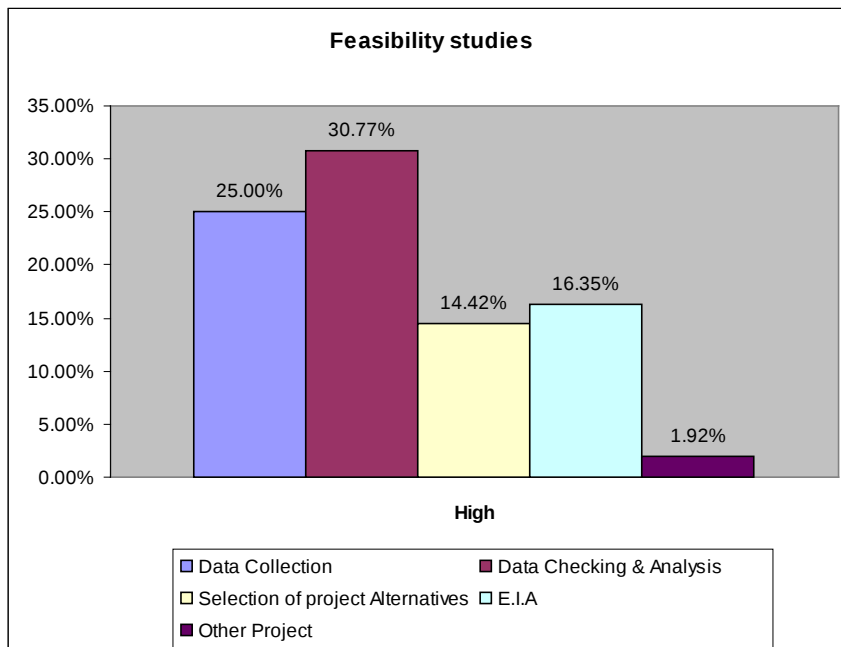


Figure 6.7 : ICT Status for High Category Feasibility Studies

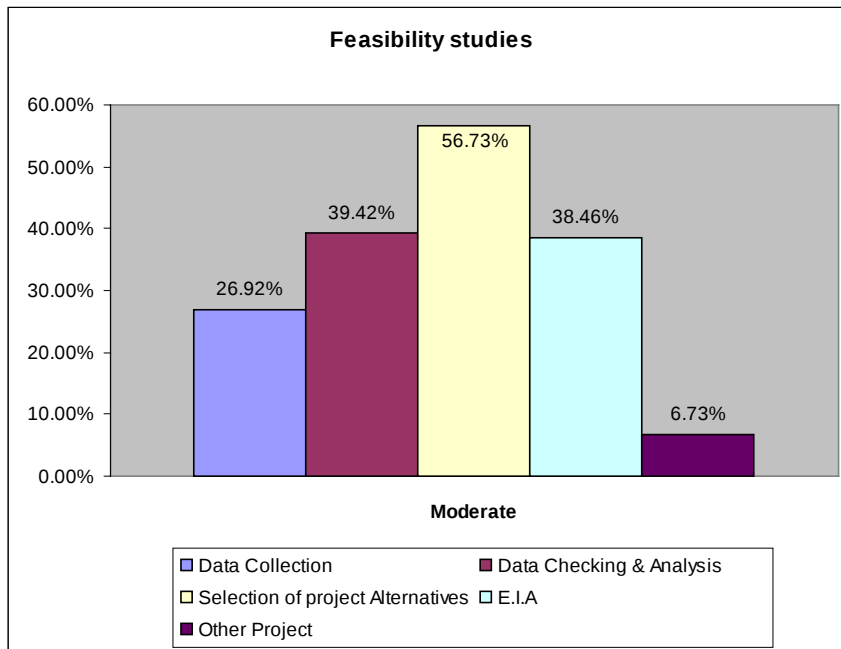


Figure 6.8 : ICT Status for Moderate Category in Feasibility studies

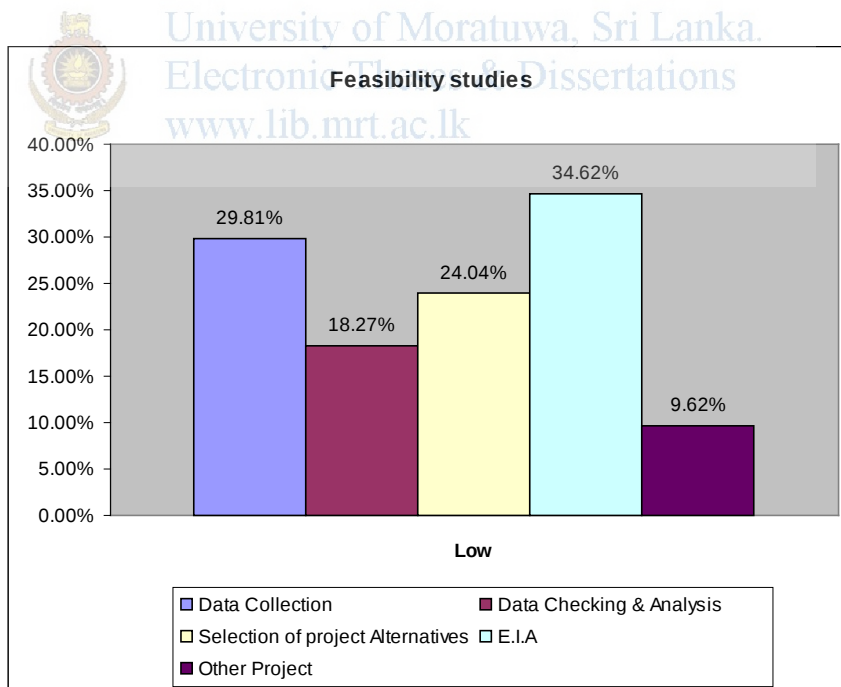


Figure 6.9 : ICT Status for Low Category in Feasibility Studies

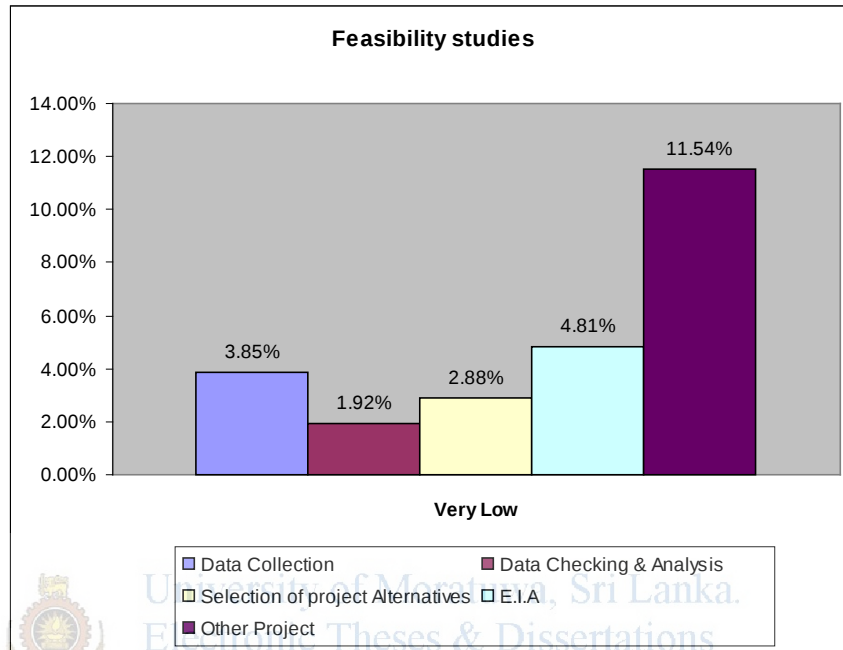
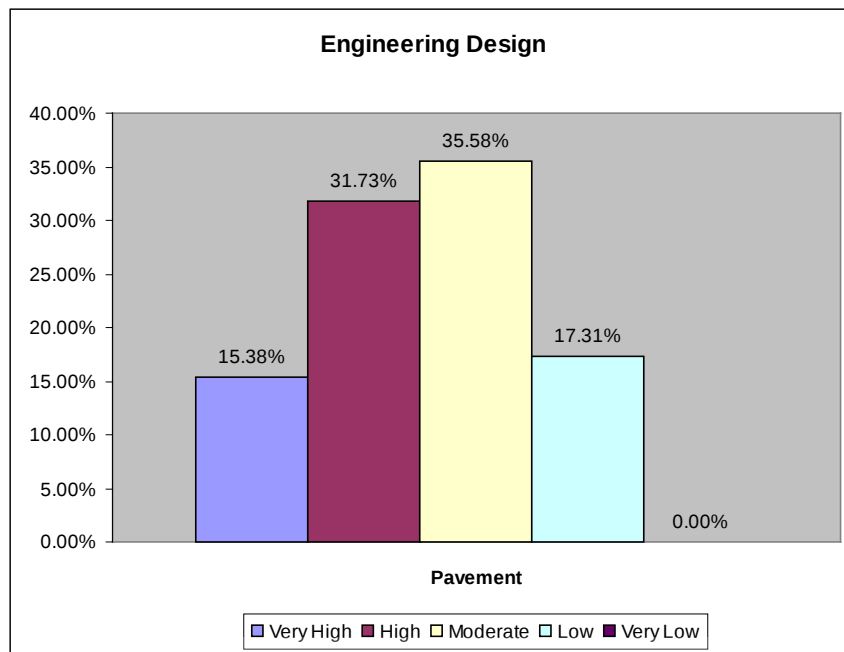


Figure 6.10 : ICT Status for Very Low Category in Feasibility studies



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Figure 6.11 : ICT Status for Pavement

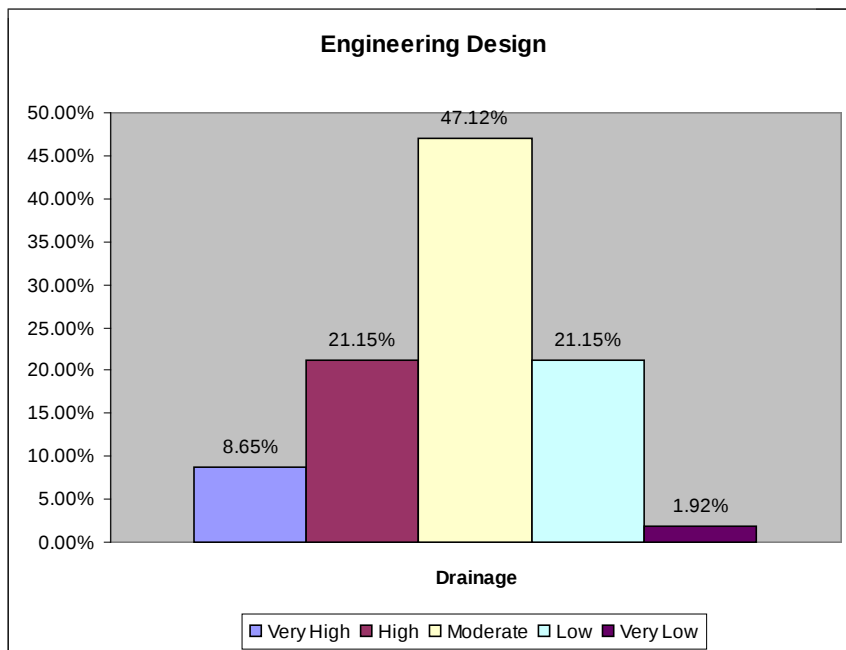


Figure 6.12 : ICT Status for Drainage

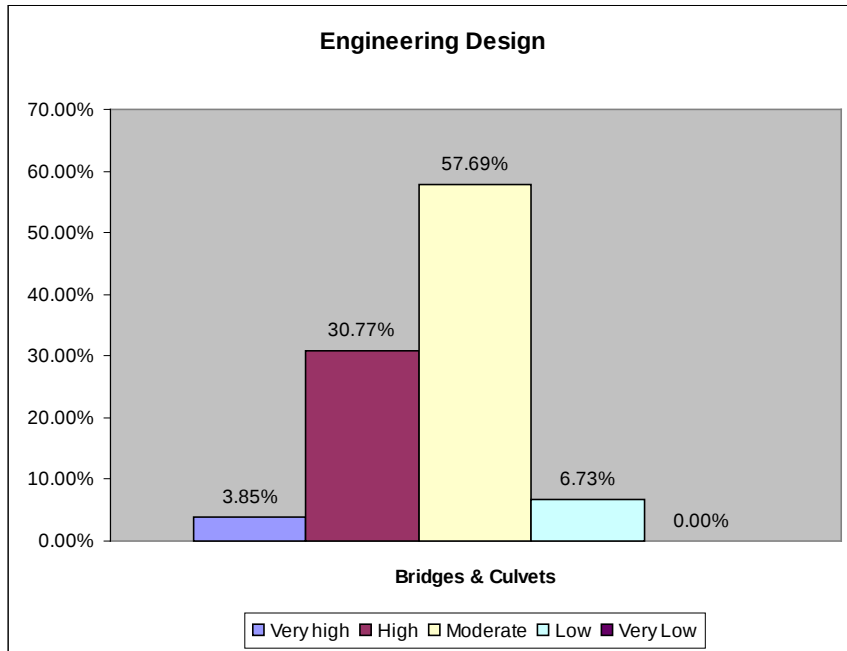


Figure 6.13 : ICT Status for Bridges & Culverts

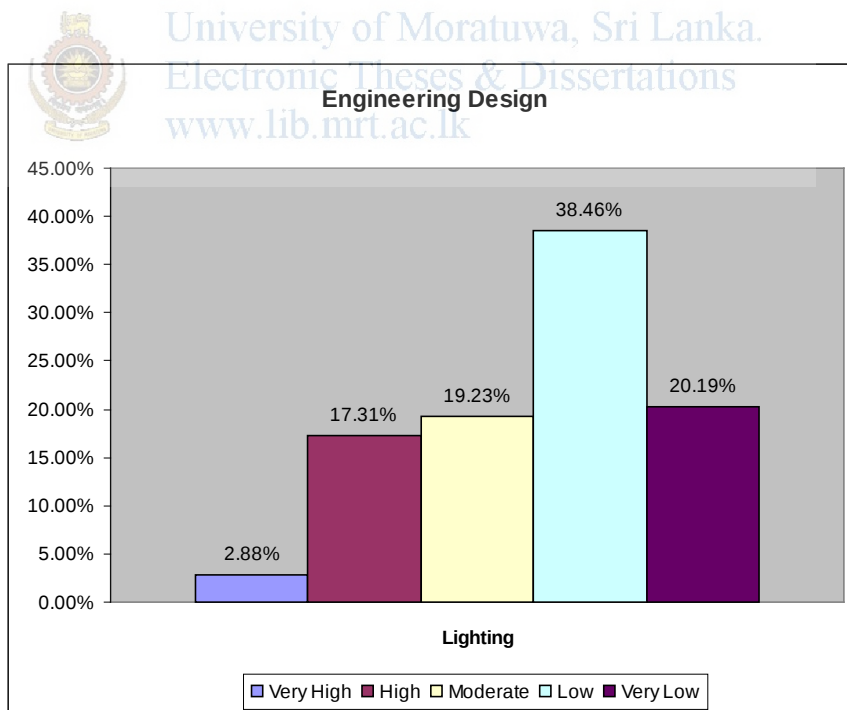


Figure 6.14 : ICT Status for Lighting

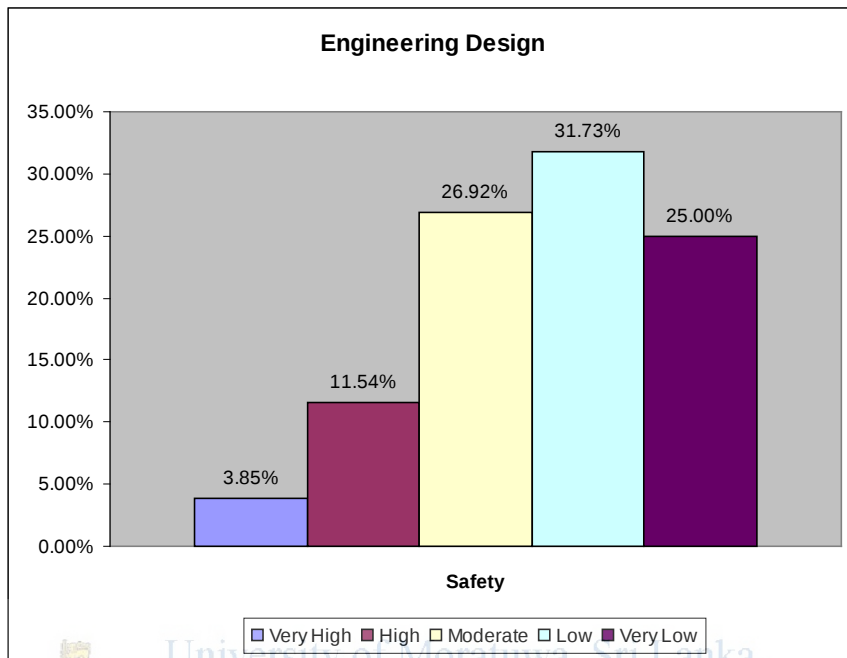


Figure 6.15 : ICT Status for Safety

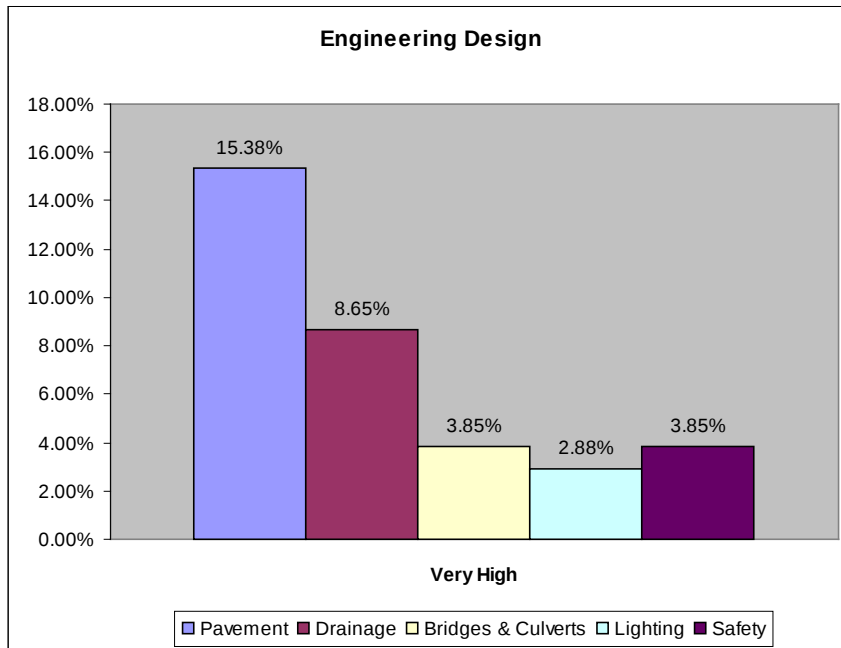


Figure 6.16 : ICT Status for Very High Category in Engineering Design

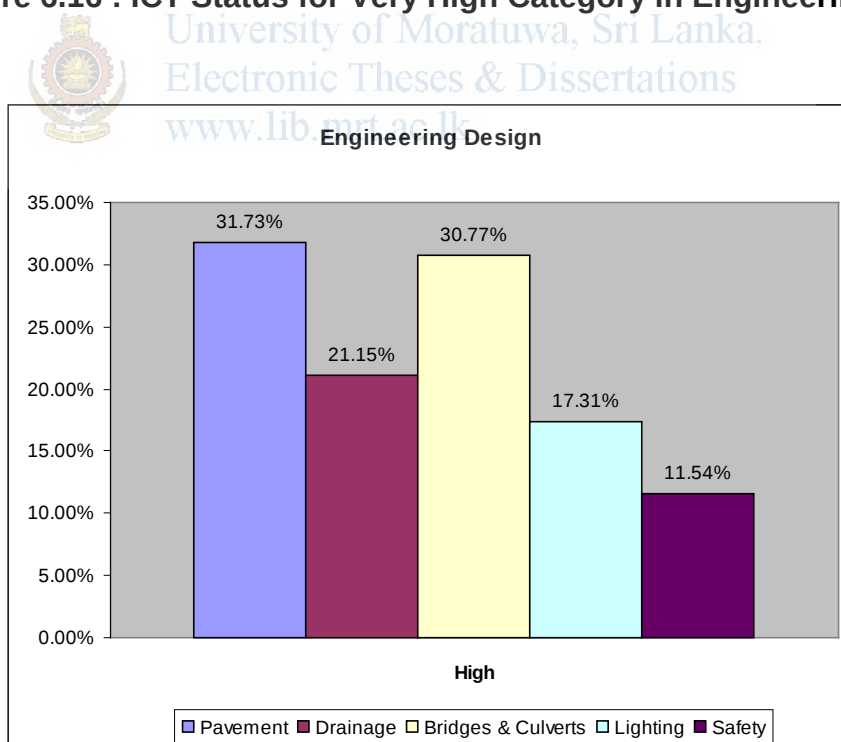


Figure 6.17 : ICT Status for High Category in Engineering Design

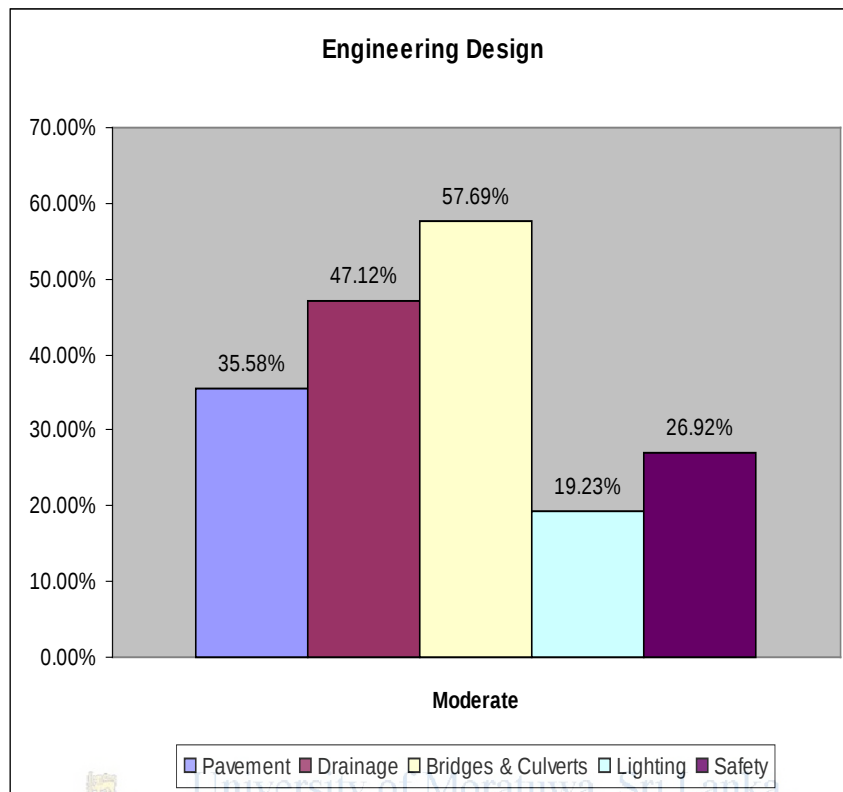


Figure 6.18: ICT Status for Moderate Category in Engineering Design

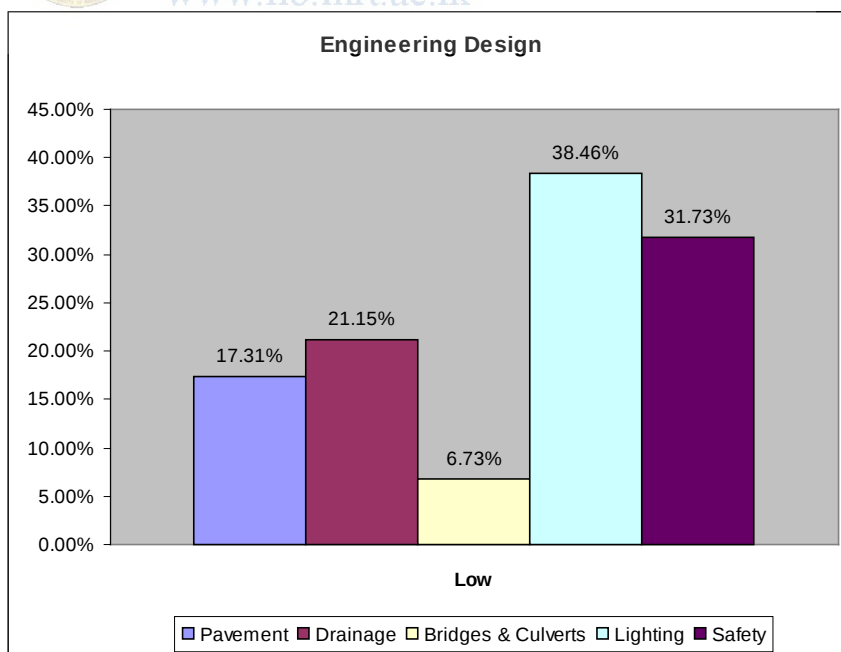


Figure 6.19 : ICT Status for Low Category in Engineering Design

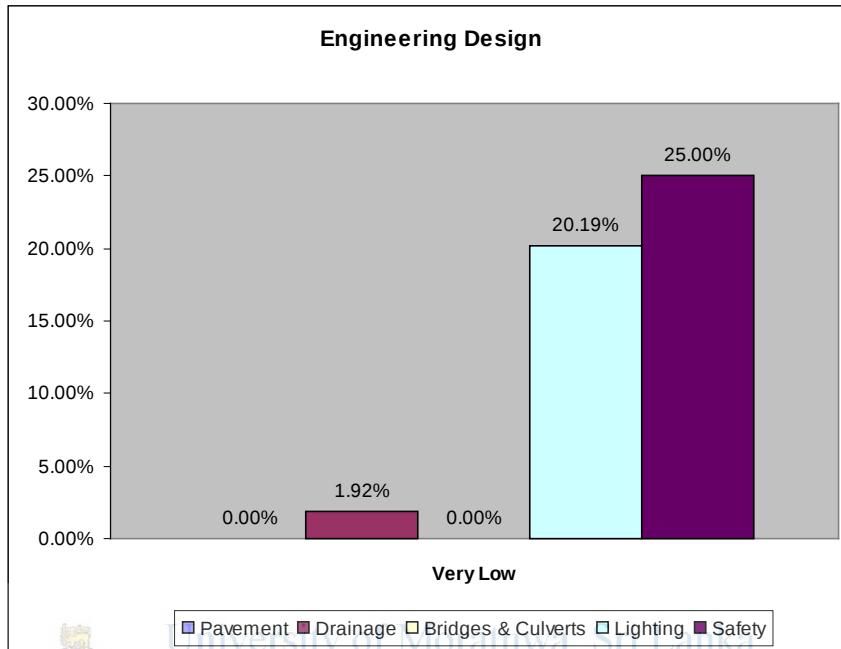


Figure 6.20 : ICT Status for Very Low Category in Engineering Design

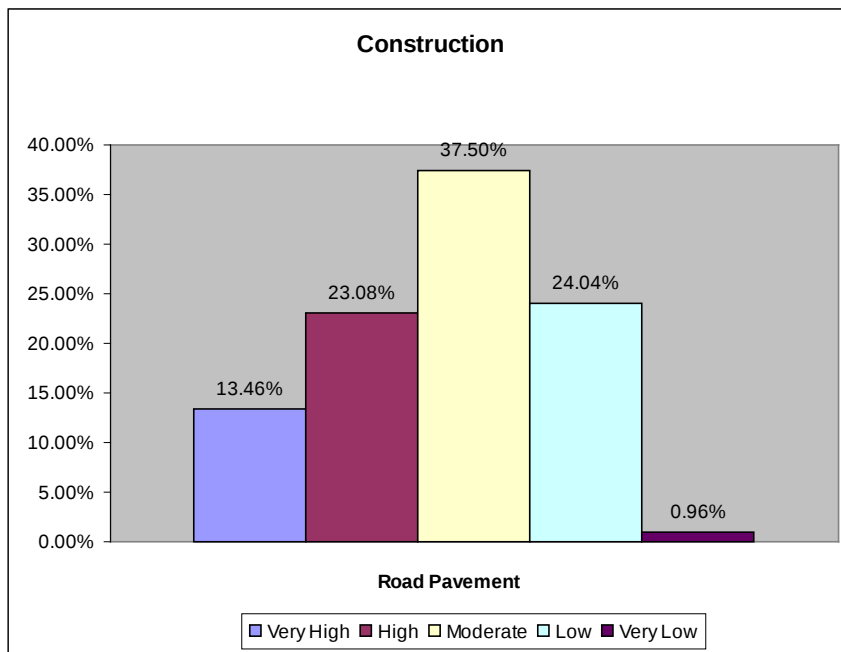


Figure 6.21 : ICT Status for Road Pavement

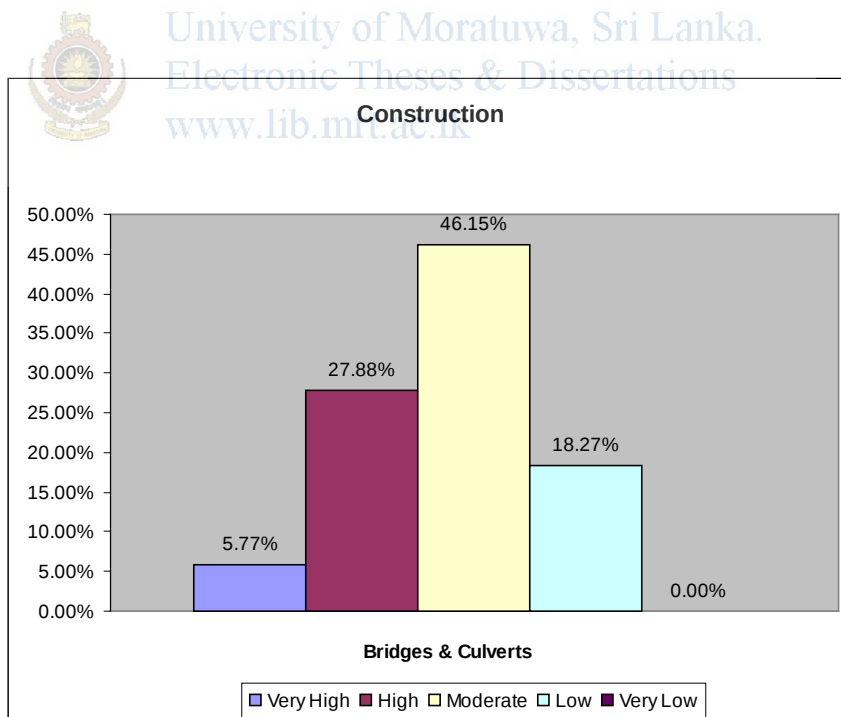


Figure 6.22 : ICT Status for Bridges & Culverts

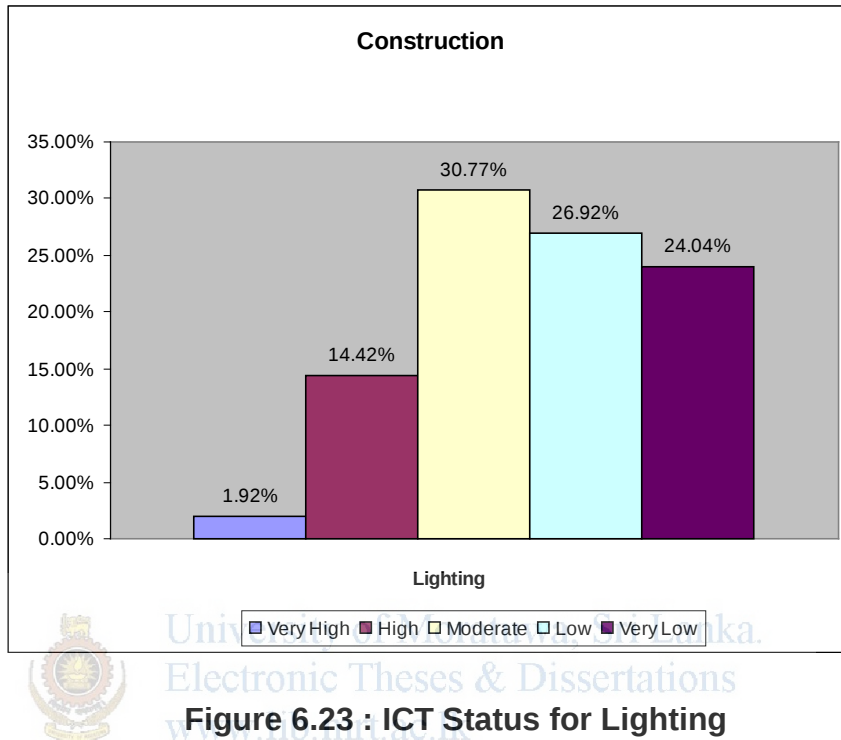


Figure 6.23 : ICT Status for Lighting

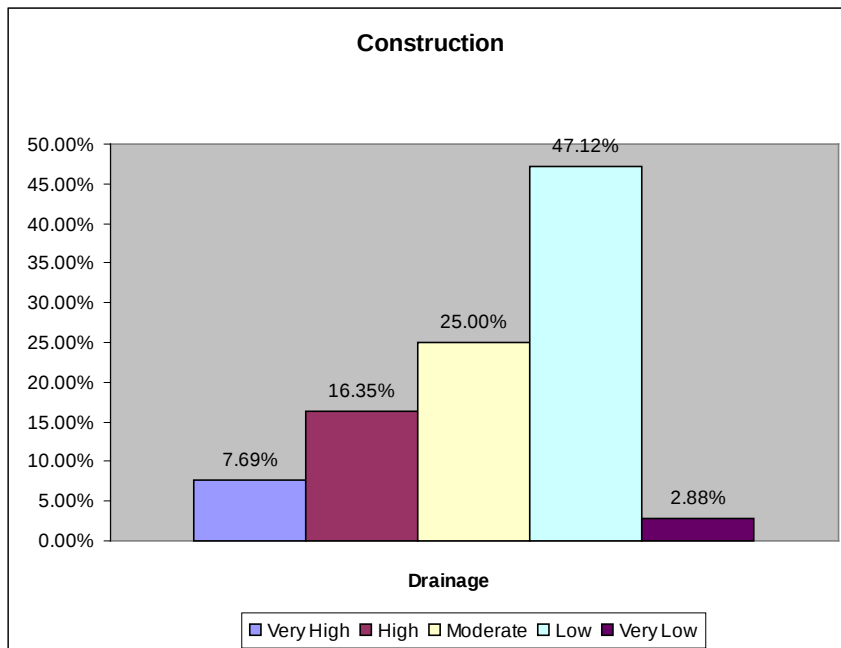


Figure 6.24 : ICT Status for Drainage

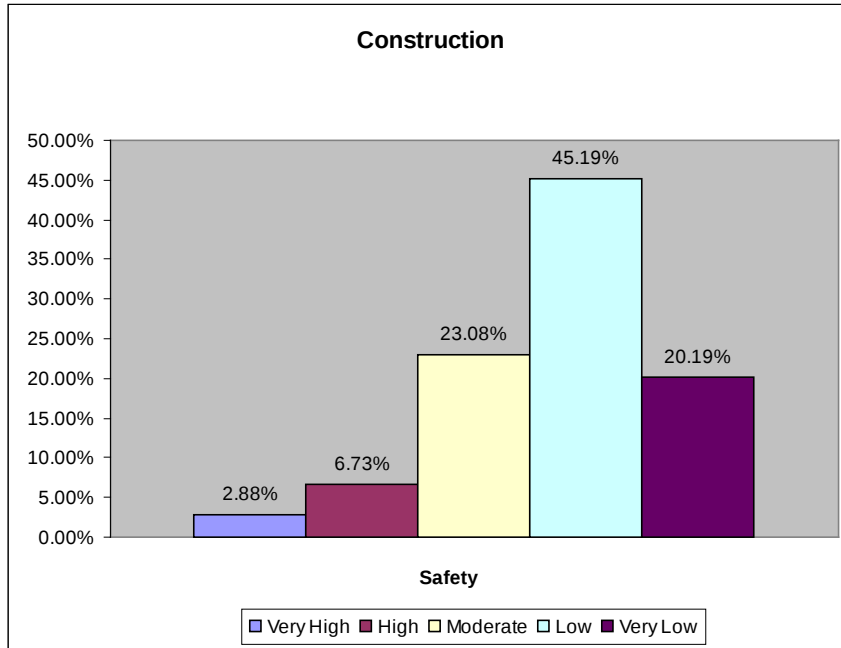


Figure 6.25 : ICT Status for Safety

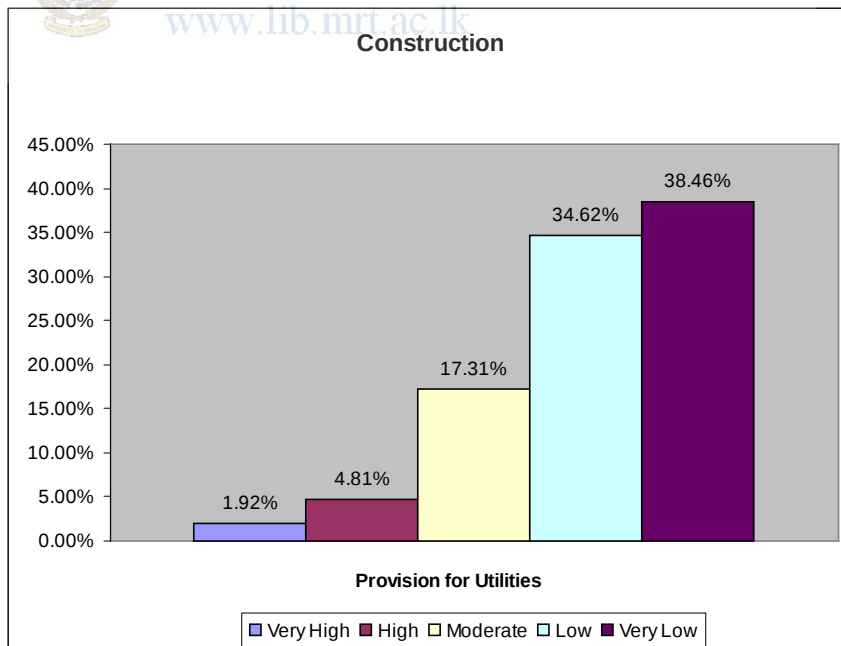


Figure 6.26 :ICT Status for Provision for Utilities

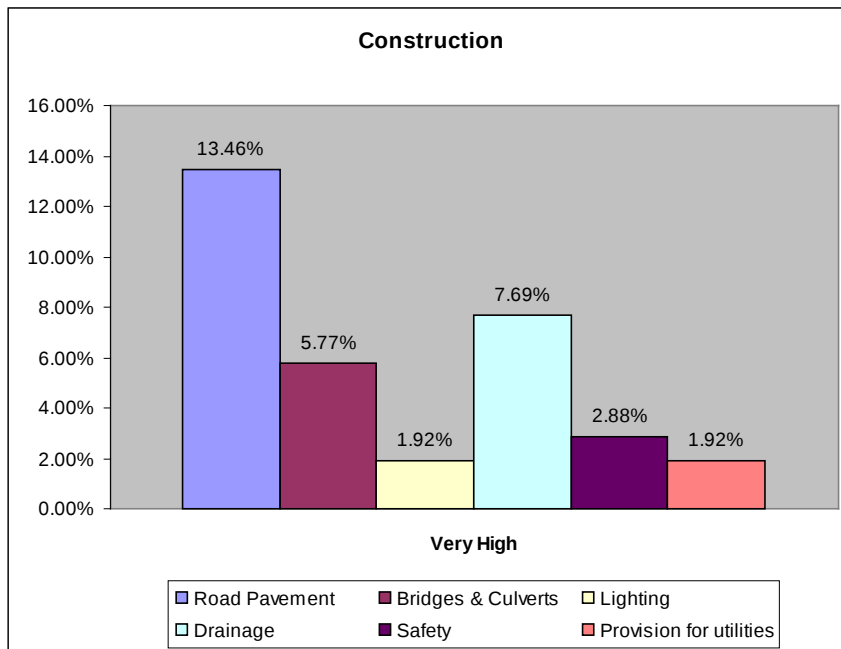


Figure 6.27 : ICT Status for Very High Category in Construction

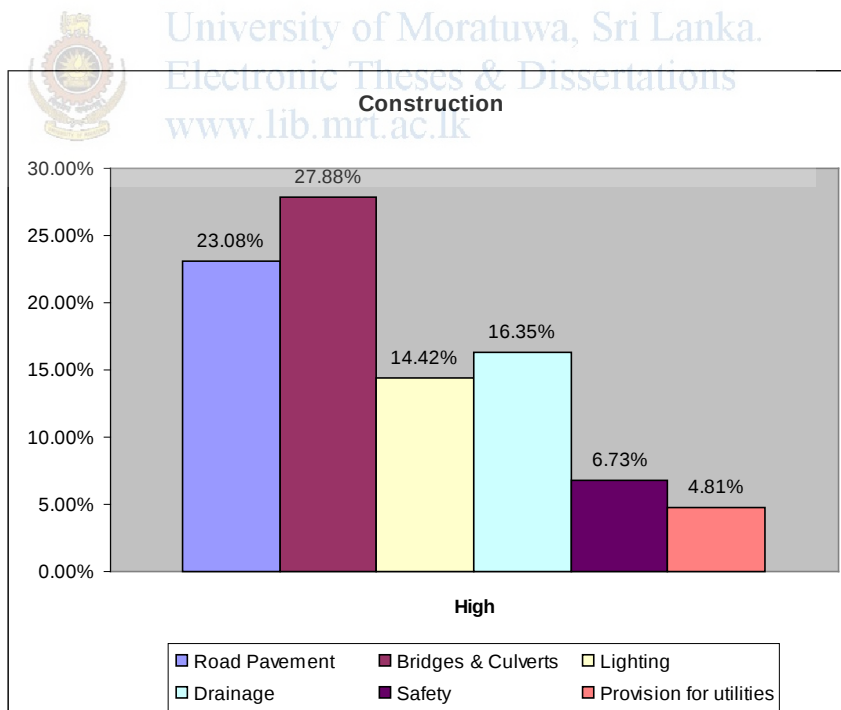


Figure 6.28 : ICT Status for High Category in Construction

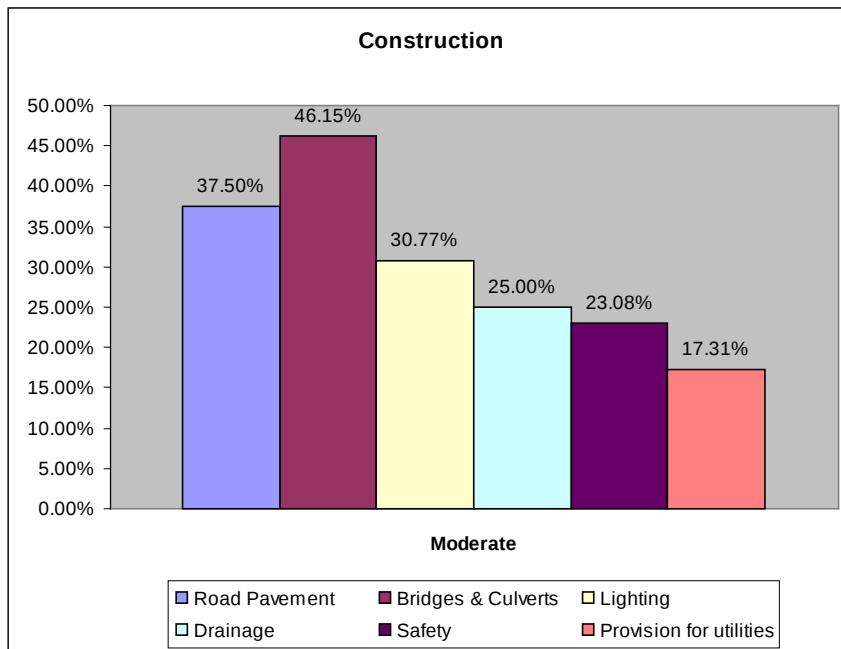


Figure 6.29 : ICT Status for Moderate Category in Construction

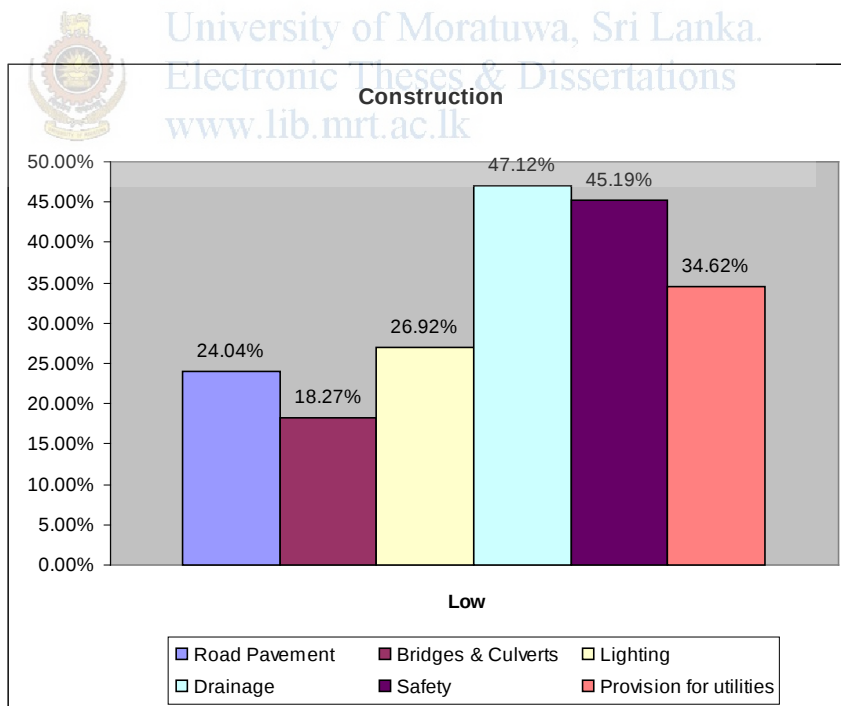


Figure 6.30 - ICT Status for Low Category in Construction

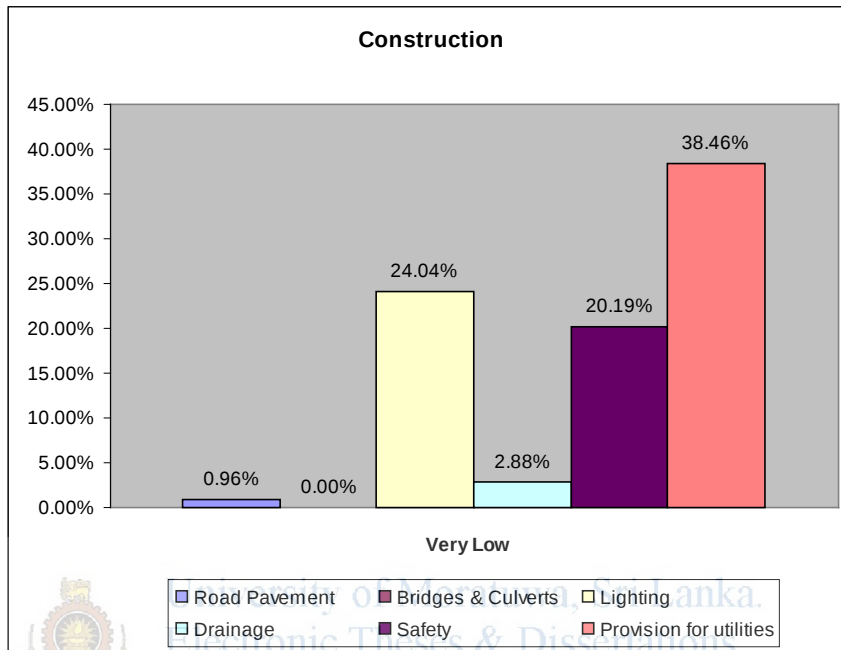


Figure 6.31 : ICT Status for Very Low Category in Construction

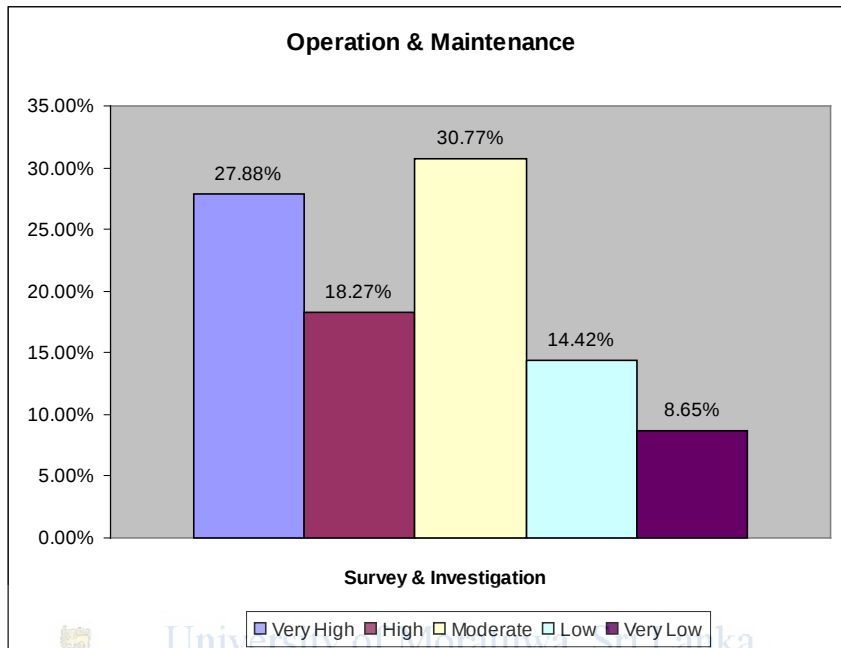


Figure 6.32 : ICT Status for Survey & Investigation

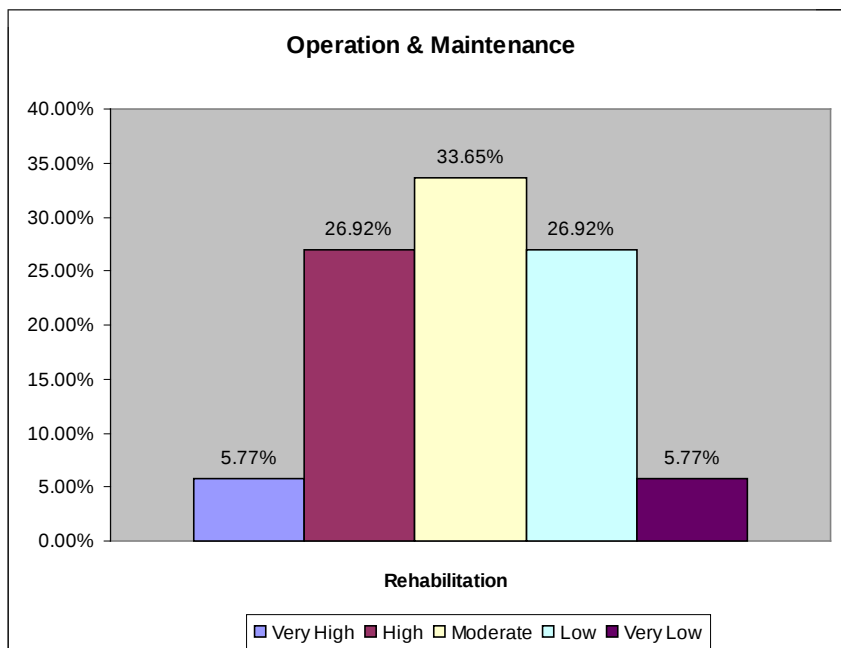
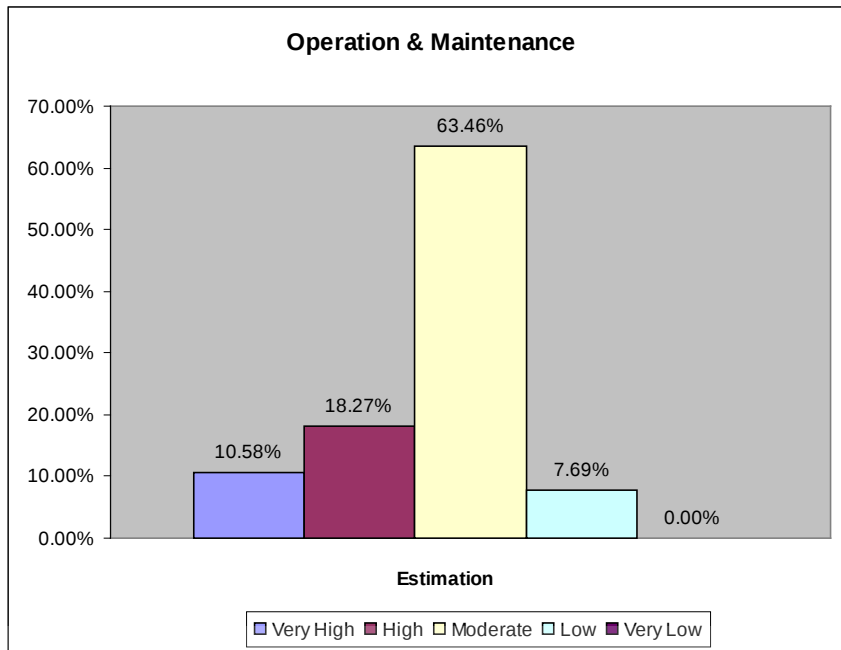


Figure 6.33 : ICT Status for Rehabilitation



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Figure 6.34 : ICT Status for Estimation

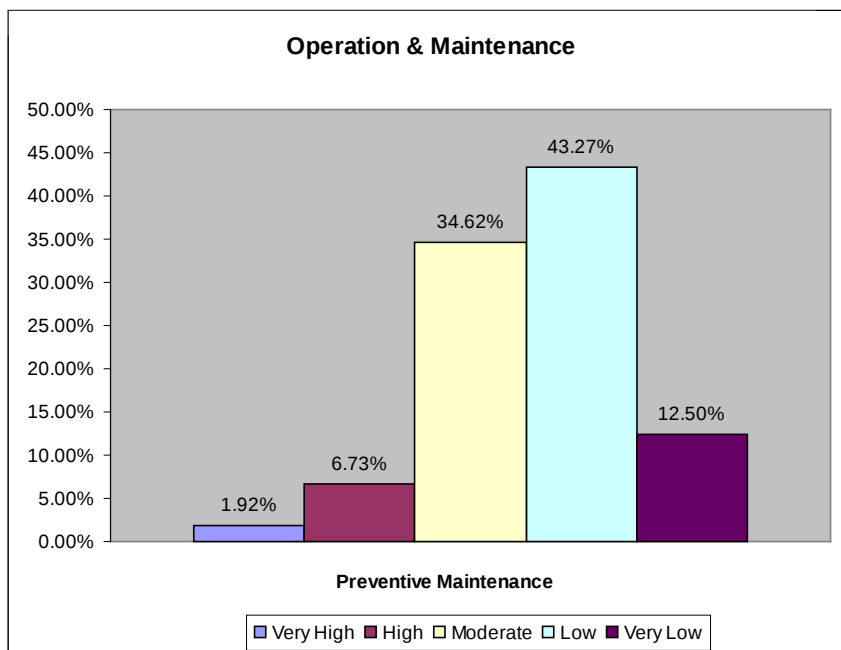


Figure 6.35 : ICT Status for Preventive Maintenance

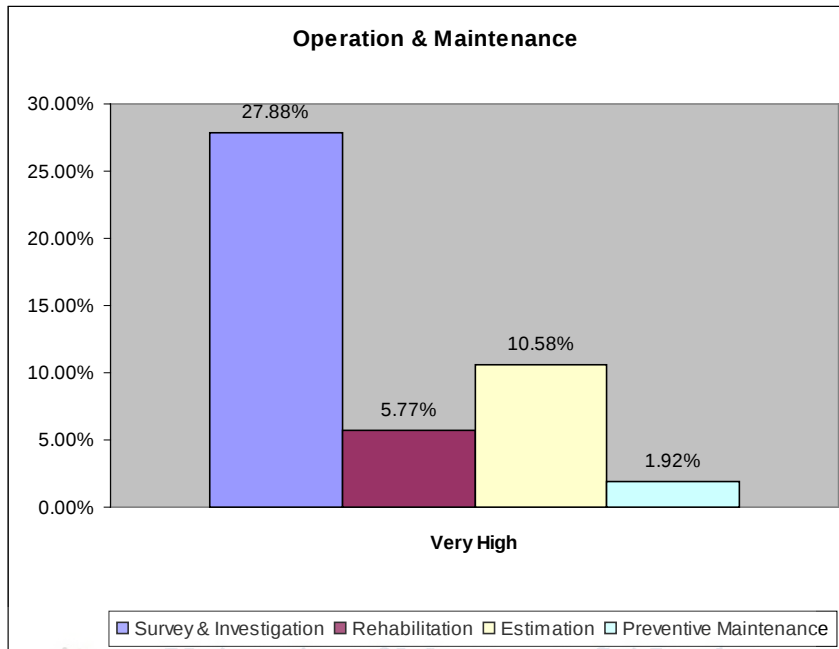


Figure 6.36: ICT Status for Very High Category in Operation & Maintenance

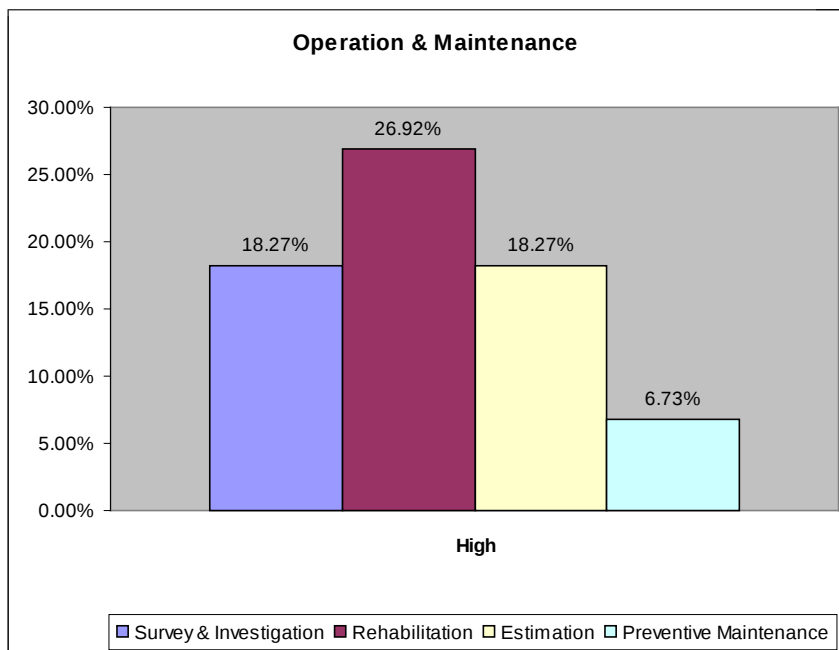
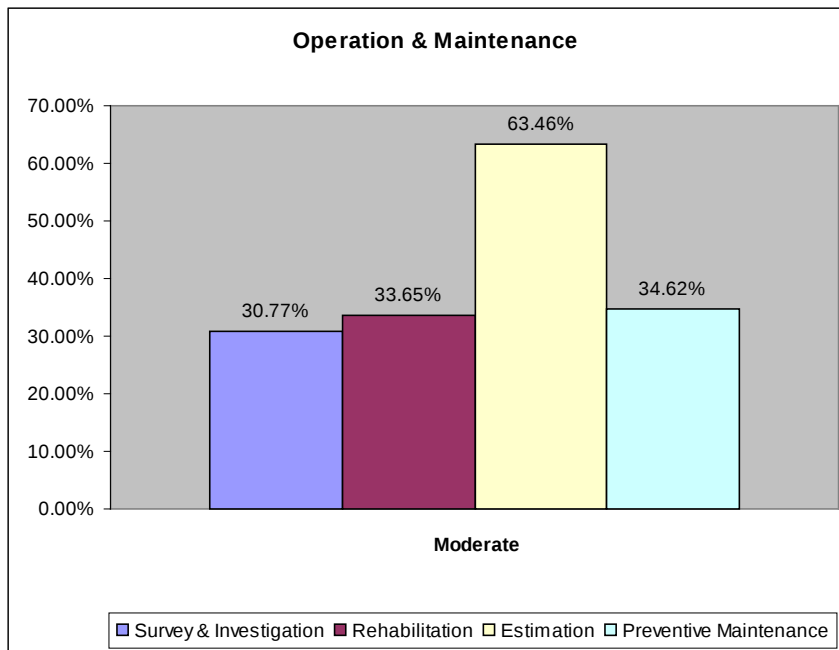


Figure 6.37 :ICT Status for High Category in Operation & Maintenance



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Figure 6.38: ICT Status for Moderate Category in Operation & Maintenance

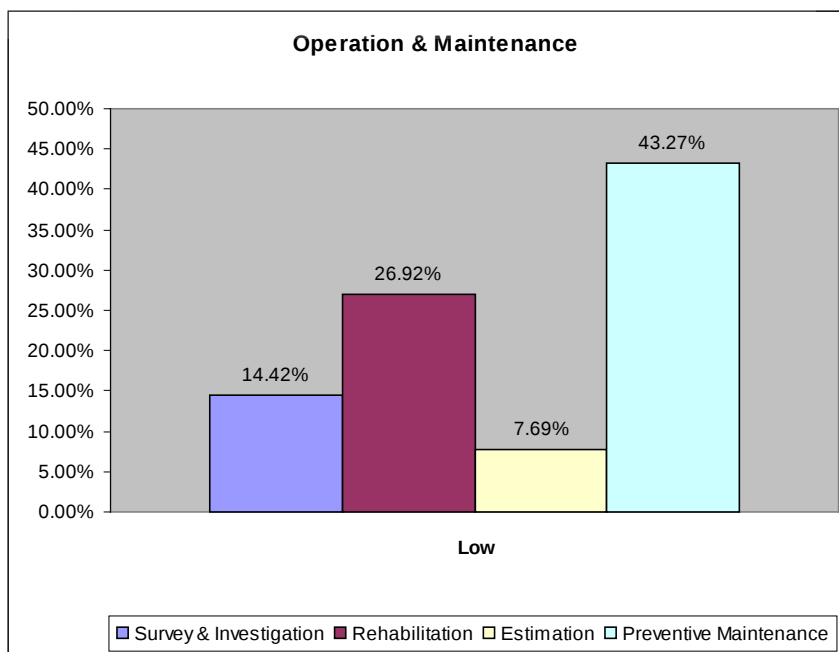


Figure 6.39 - ICT Status for Low Category in Operation & Maintenance

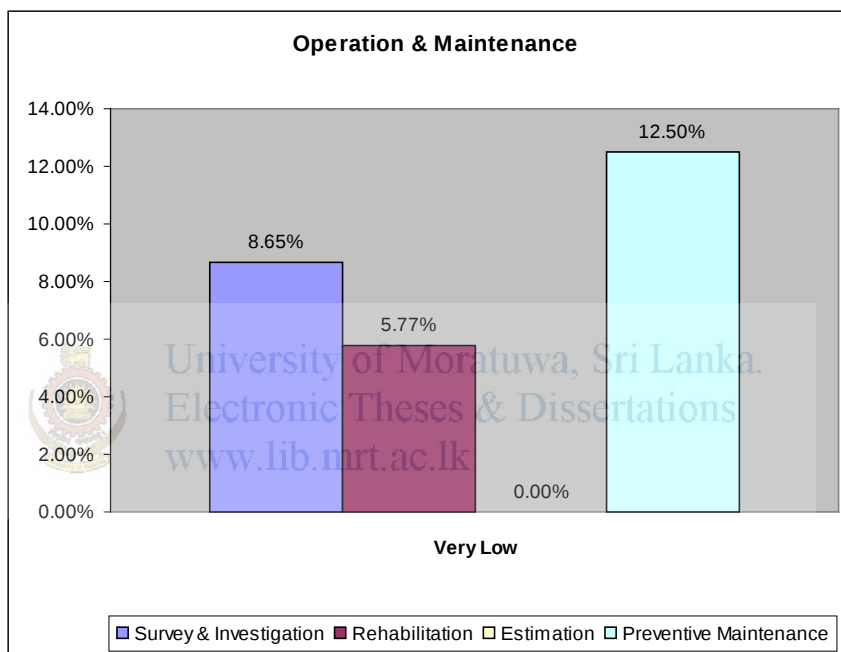


Figure 6.40: ICT Status for Very Low Category in Operation & Maintenance

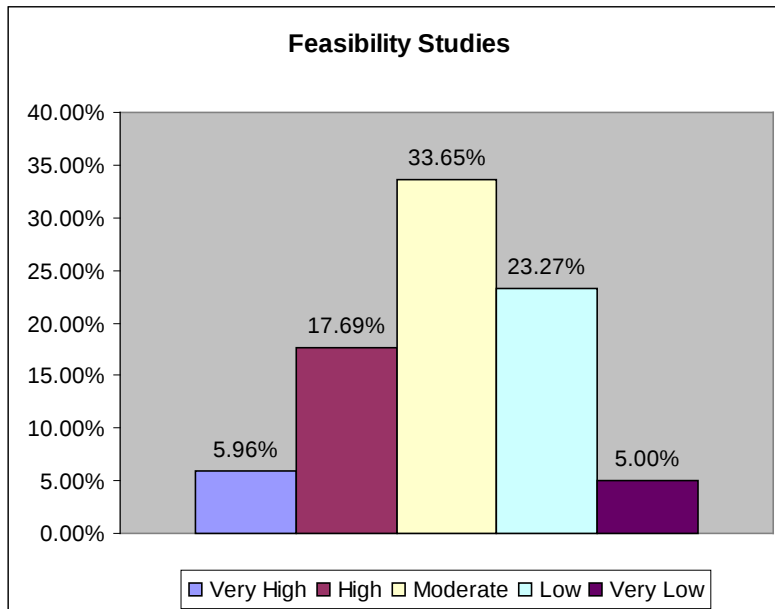


Figure 6.41: ICT Status in Feasibility Studies

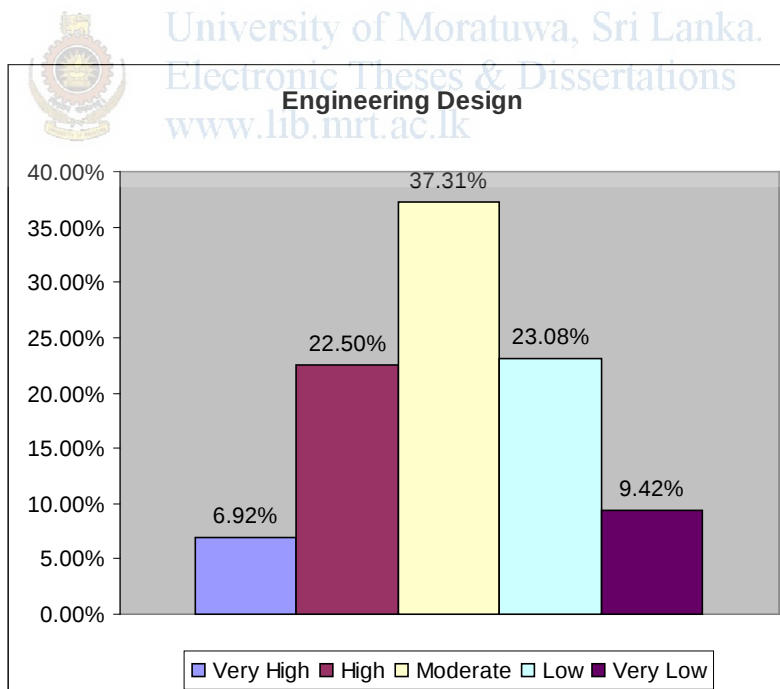


Figure 6.42: ICT Status in Engineering Design

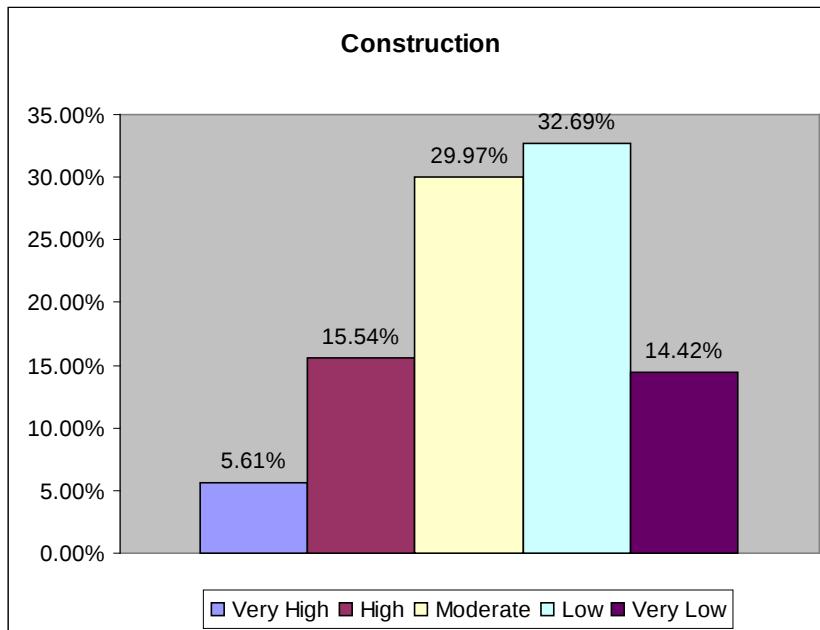


Figure 6.43: ICT Status in Construction

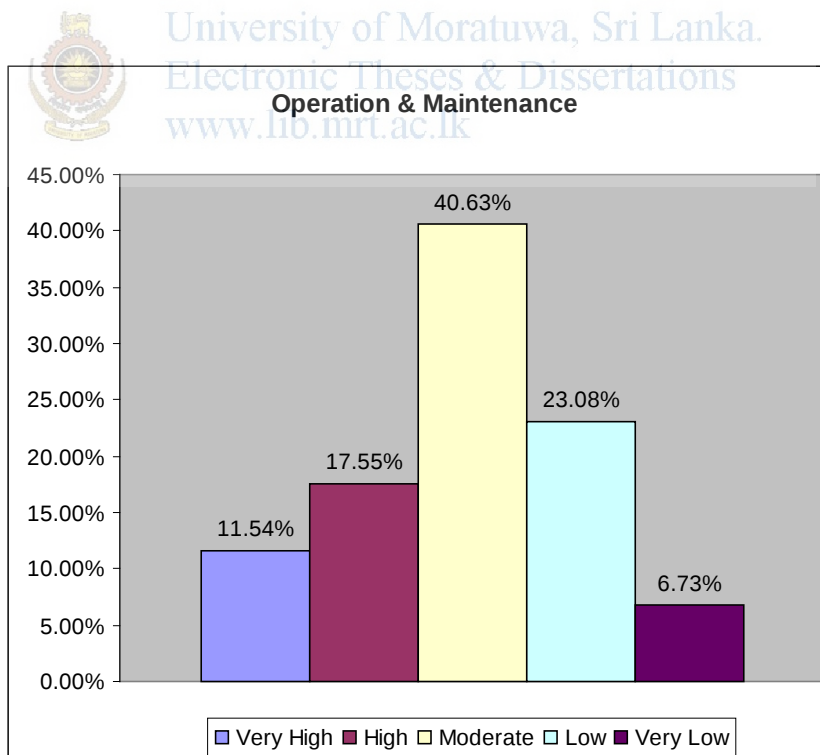


Figure 6.44: ICT Status in Operation and Maintenance.

Table 6.4: Assessment of Enabling Environment

Enabling Environment for ICT Use in Sample Organisations													
	Enabling Framework - Policy and Goals						Facilitation Funds and Staff Support						
	Component Question Numbers					Sum	Component Question Numbers						Sum
	2.1	2.2	2.3	2.4	2.14		2.6	2.7	2.9	2.11	2.12	2.13	
Org 1	9	9	3	2	2	25	4	4	9	7	4	4	31
Org 2	1	1	3	0	0	5	2	2	9	2	2	2	18
Org 3	9	1	3	9	0	22	4	4	1	4	2	2	15
Org 4	1	1	0	4	2	7	7	7	9	7	2	2	34
Org 5	1	9	6	9	2	27	5	5	1	5	2	2	21
Org 6	1	9	3	5	2	20	5	5	1	5	2	2	21
Org 7	9	1	3	5	2	20	5	5	9	5	4	4	32
Org 8	9	9	3	4	2	26	4	4	9	4	7	7	34
Org 9	9	9	6	5	0	29	9	9	9	9	5	7	49
Org 10	1	9	6	9	2	27	5	5	1	5	2	2	21
Org 11	9	9	3	5	2	28	4	4	1	7	5	5	26
Org 12	9	9	6	7	0	31	7	7	9	7	7	7	45
Org 13	1	1	3	0	0	5	2	2	1	2	2	2	10
Org 14	9	9	3	7	4	32	4	4	9	4	5	5	31
Org 15	9	1	3	0	0	13	5	5	1	4	2	2	19



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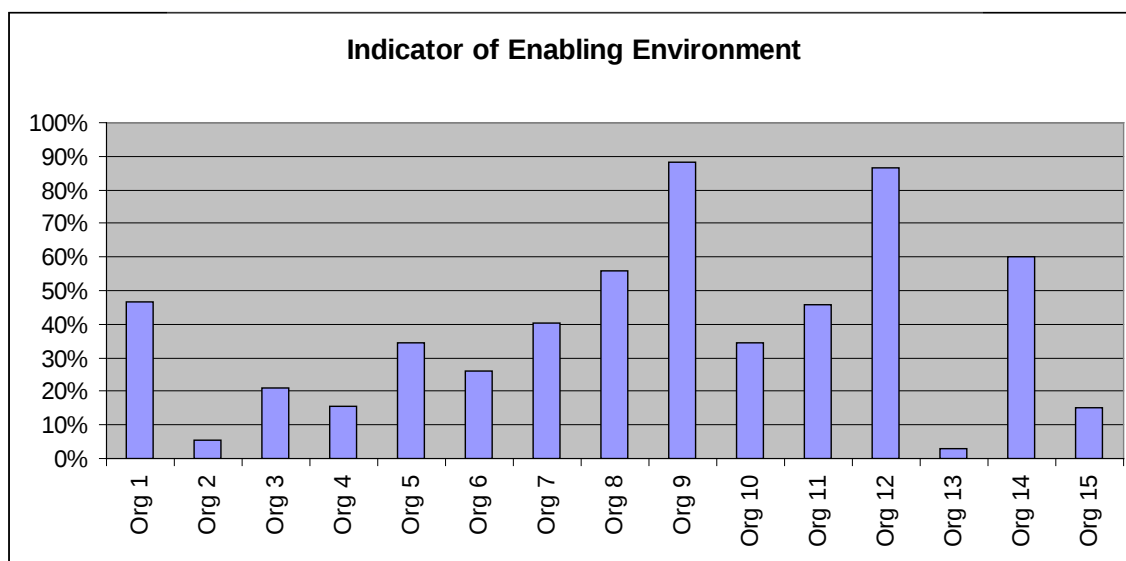


Figure 6.45 – Variation of Enabling Environment Indicator in Each Organization.

Table 6.5: Assessment of Institution Role

	Institutional Role for ICT Use in Sample Organizations						
	Component Question Numbers						Sum
	3.1	3.3	3.4	3.5	3.6	3.7	
Org 1	9	5	9	2	2	4	31
Org 2	9	0	1	2	2	1	15
Org 3	1	0	9	2	2	0	14
Org 4	9	0	1	2	2	1	15
Org 5	9	2	9	2	2	2	26
Org 6	9	2	9	5	5	2	32
Org 7	9	4	9	4	4	3	33
Org 8	9	6	9	7	7	6	44
Org 9	9	9	9	5	7	9	48
Org 10	9	2	9	2	2	2	26
Org 11	9	8	1	5	5	1	29
Org 12	9	9	9	7	7	2	43
Org 13	1	5	1	2	2	2	13
Org 14	9	6	9	5	5	9	43
Org 15	1	2	1	2	2	2	10



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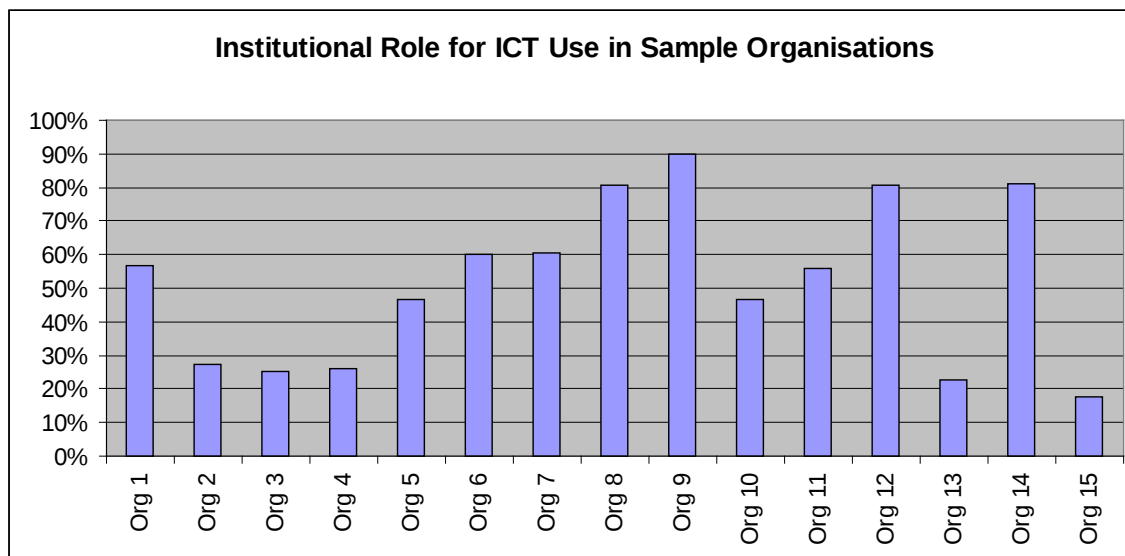


Figure 6.46: Variation of Institutional Role Indicator in Each Organization

Table 6.6: Assessment of Management Instruments

	Management Instruments for ICT Use in Sample Organisations								
	Component Question Numbers								Sum
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	
Org 1	6	5	5	0	0	0	1	1	18
Org 2	2	4	0	0	0	0	0	0	6
Org 3	4	6	6	0	0	1	1	1	18
Org 4	2	8	3	0	3	2	0	2	20
Org 5	5	3	1	3	0	1	0	0	13
Org 6	5	3	3	3	0	0	0	0	15
Org 7	3	7	1	0	2	0	0	1	14
Org 8	5	6	1	0	1	1	0	0	14
Org 9	6	4	0	0	5	1	0	6	21
Org 10	5	3	1	3	0	1	0	0	13
Org 11	5	6	7	0	1	3	5	1	29
Org 12	6	4	4	3	1	1	1	3	24
Org 13	3	6	1	0	0	1	0	0	10
Org 14	9	4	5	3	3	1	0	0	25
Org 15	3	4	0	3	0	1	0	0	11

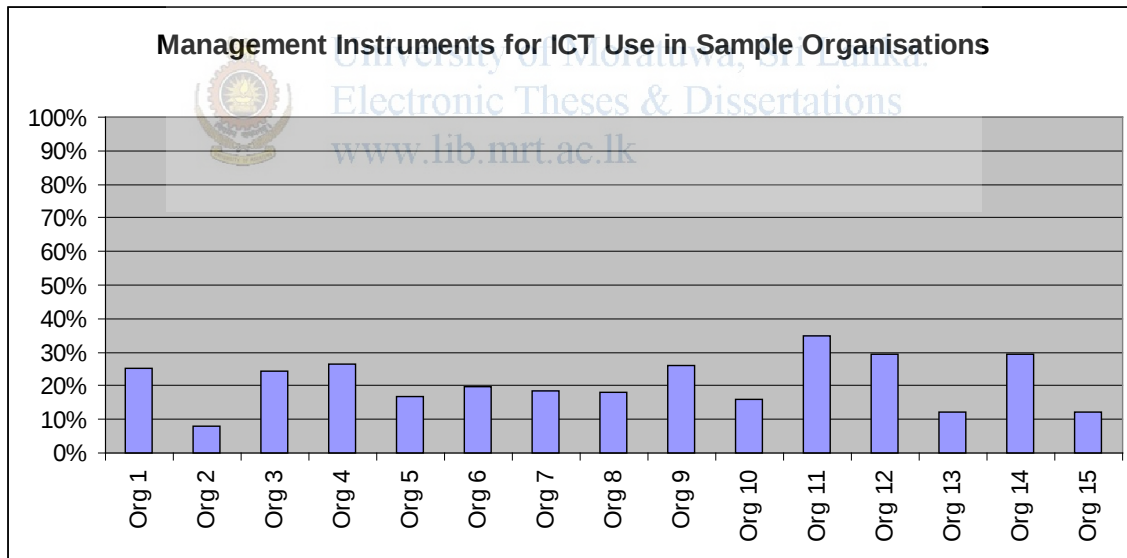


Figure 6.47: Variation of Management Instruments Indicator in Each Organization

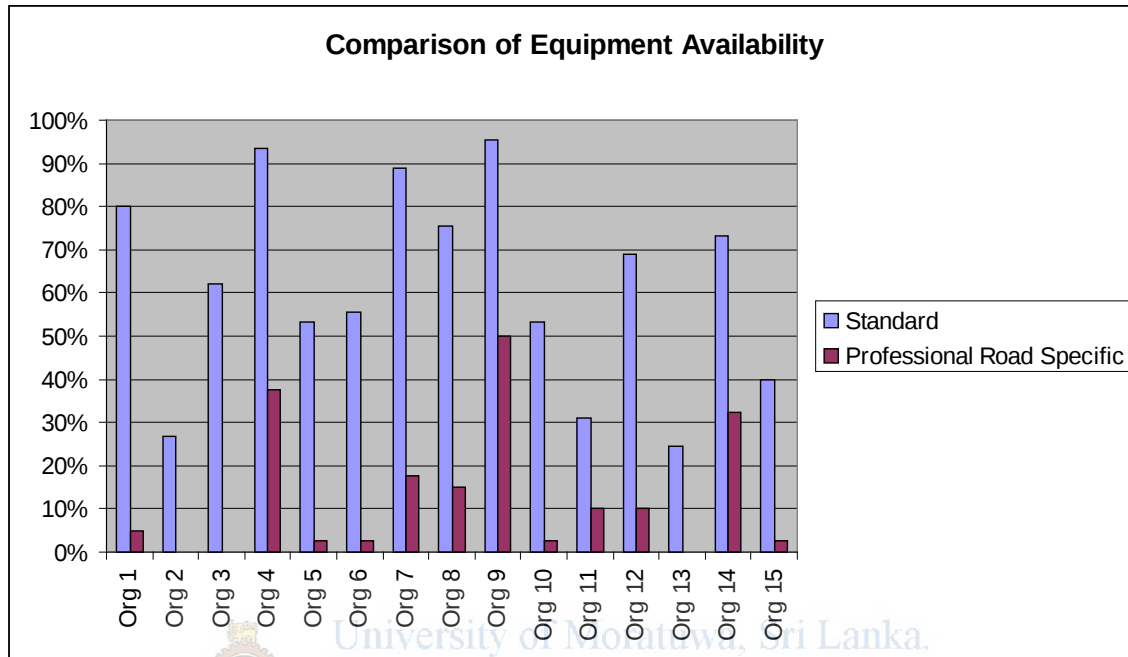


Figure 6.48: Variation of Management Instruments Indicator in Each organization

Table 6.7: Component values and the overall Indicator values

Organization Indicator	Component Indicator			Overall Indicator
	Enabling Environment	Institutional Role	Management Instruments	
Org 1	46%	57%	25%	43%
Org 2	6%	27%	8%	14%
Org 3	21%	25%	25%	24%
Org 4	16%	26%	27%	23%
Org 5	34%	47%	17%	33%
Org 6	26%	60%	20%	35%
Org 7	40%	60%	18%	40%
Org 8	56%	81%	18%	51%
Org 9	88%	90%	26%	68%
Org 10	34%	47%	16%	32%
Org 11	46%	56%	35%	46%
Org 12	87%	81%	29%	66%
Org 13	3%	23%	12%	13%
Org 14	60%	81%	30%	57%
Org 15	15%	18%	12%	15%
Average	39%	52%	21%	37%

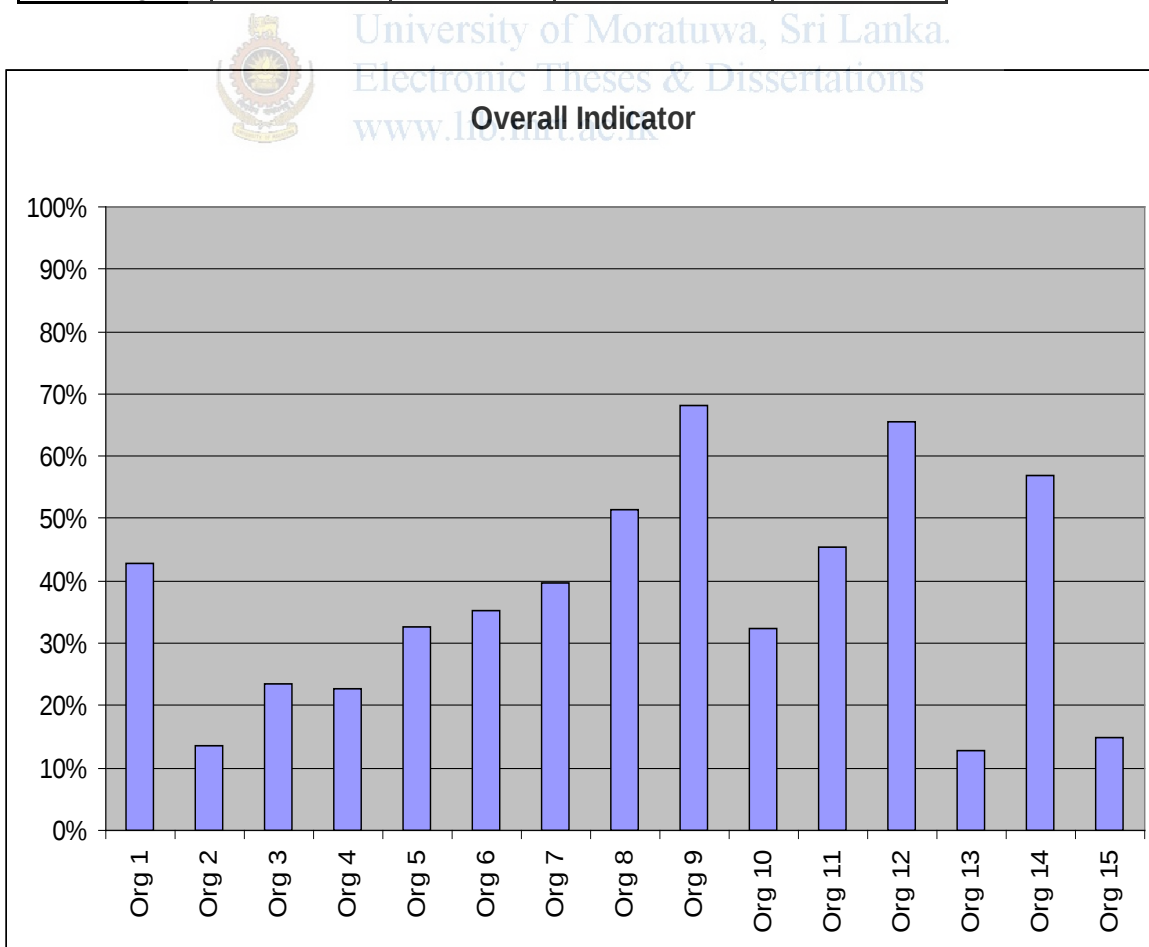


Figure: 6.49: Overall Indicator value of ICT usage in Organization

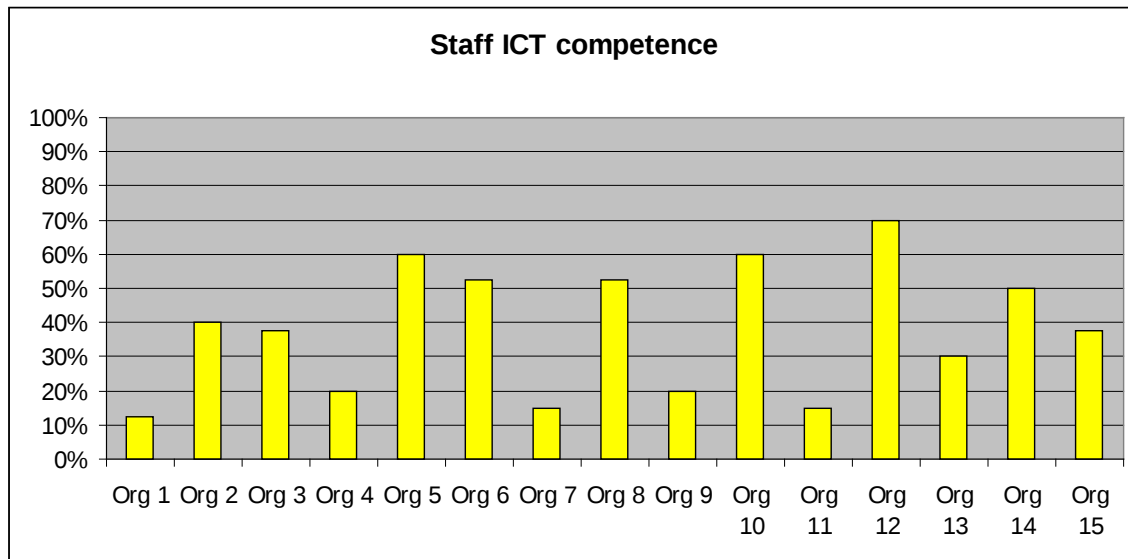


Figure 6.50: Level of Organizational competence with respect to each task



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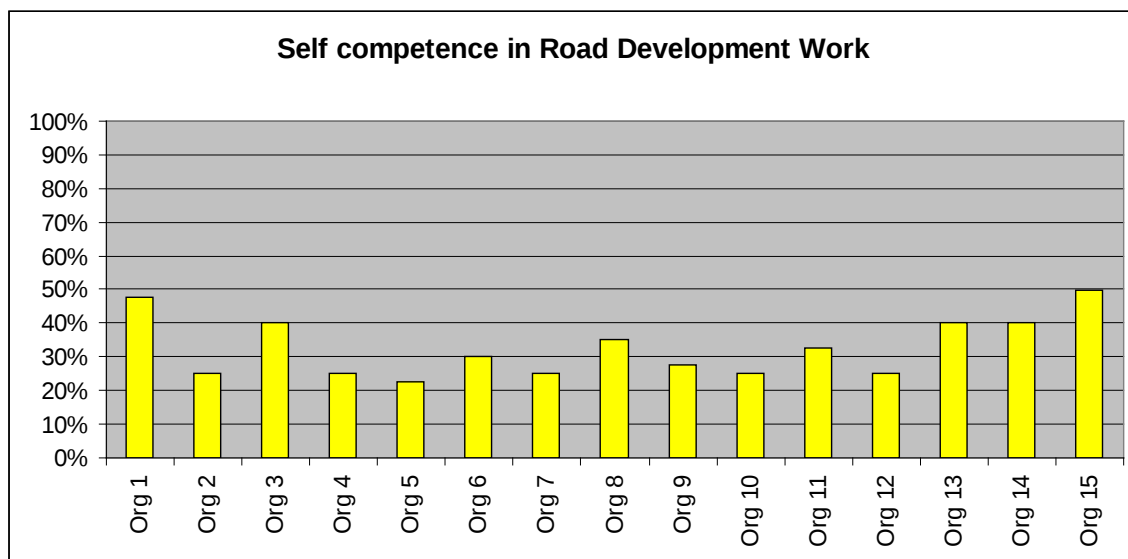


Figure 6.51: Individual Experience in road development

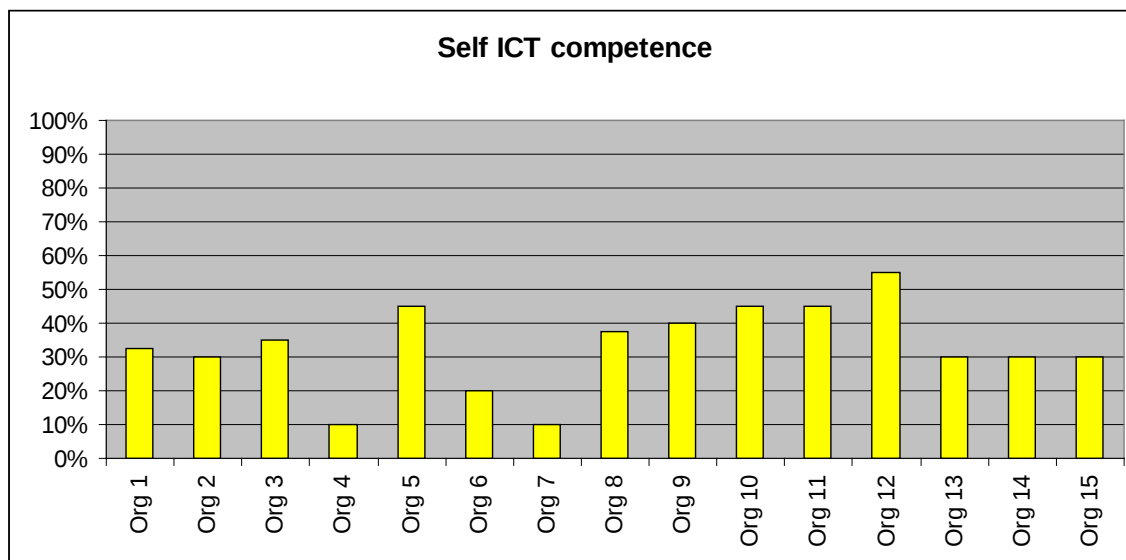


Figure 6.52: Expression of ICT capability



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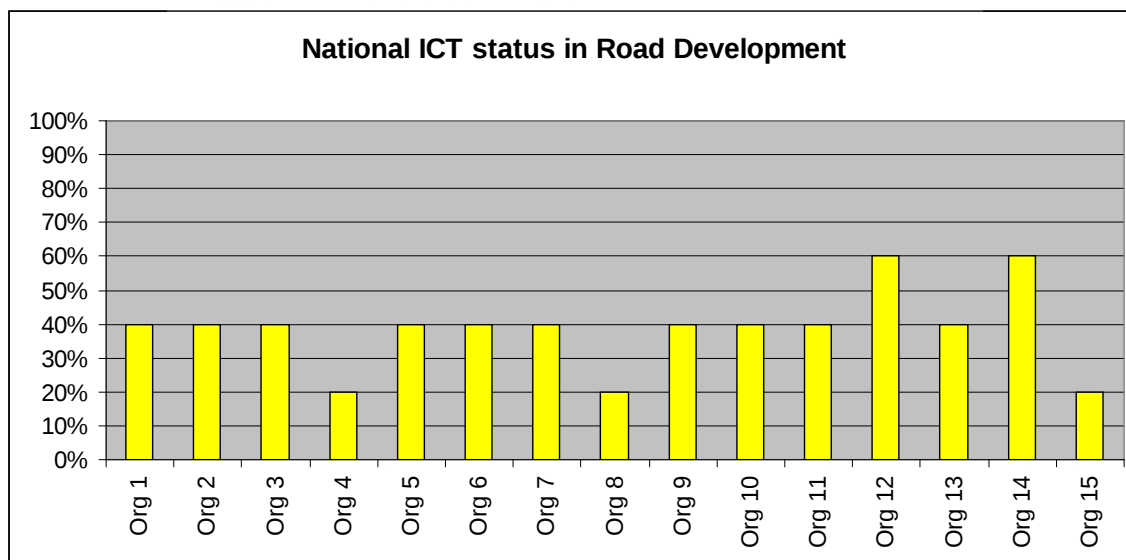


Figure 6.53: Assessment of the national level of ICT use in Road Sector

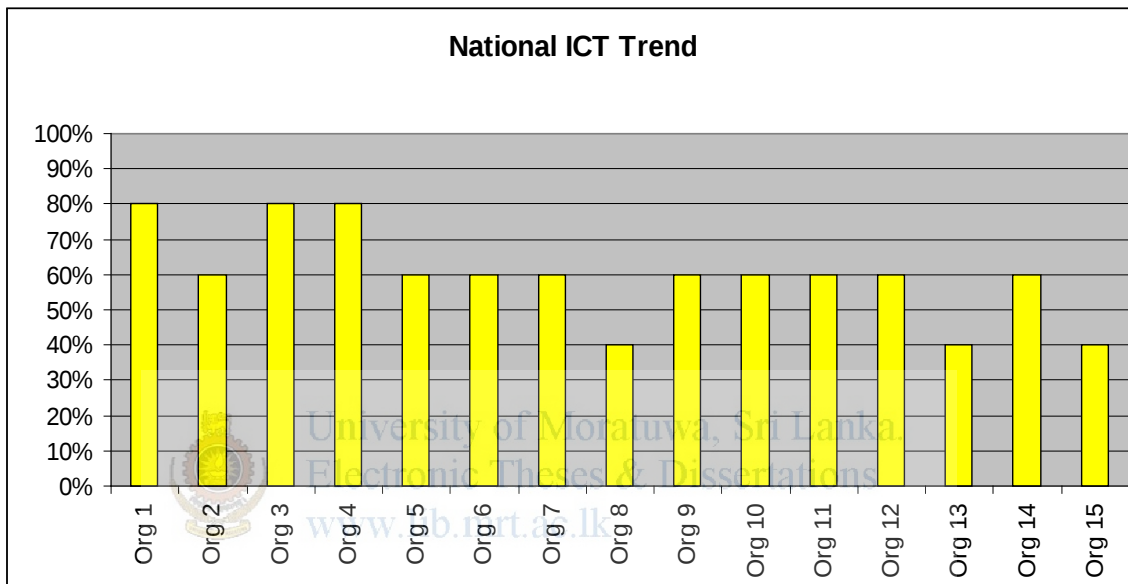


Figure 6.54: Assessment of National Trend of ICT use

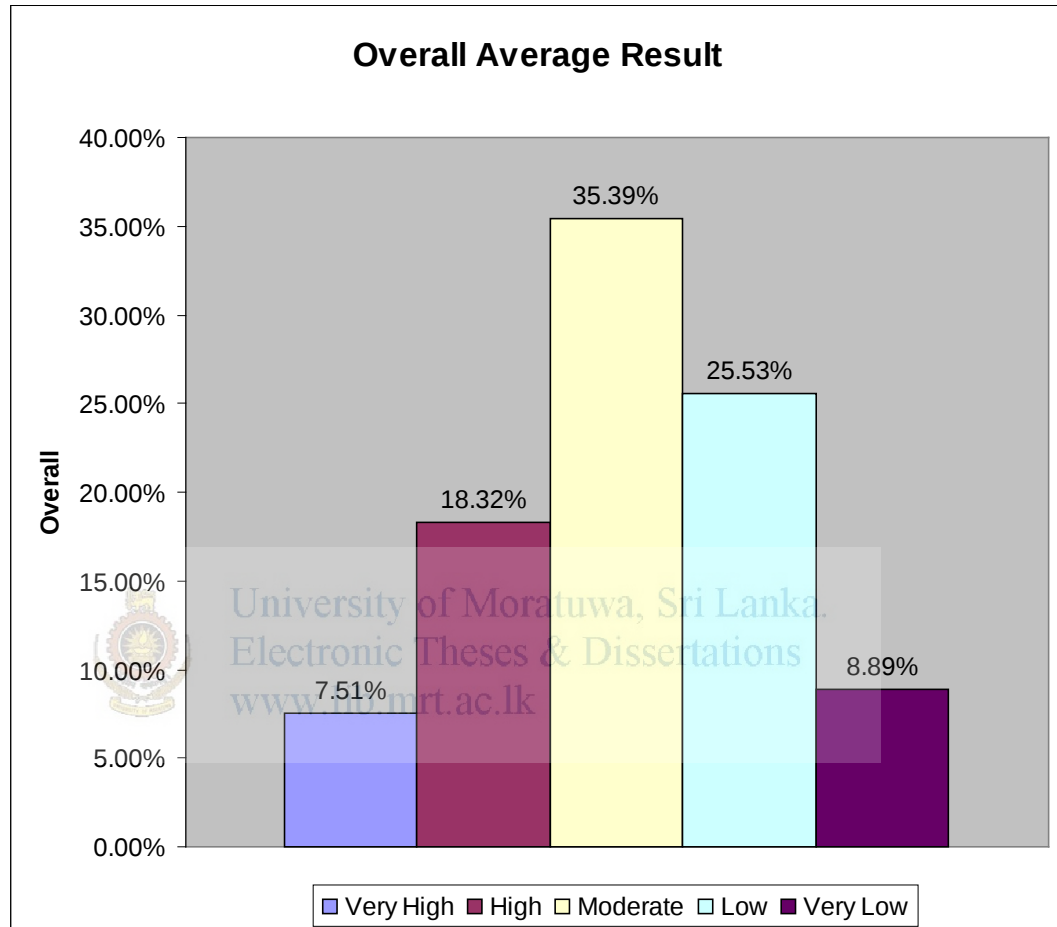


Figure 6.55: Overall Average Results in Major Components of Road Sector Infrastructure Development