EXPLORING THE FEASIBILITY OF A SOFTWARE ENGINEERING CENTRE IN SRI LANKA

By

Roshan Daluwakgoda

University of Moratuwa, Sri Lanka Electronic Theses & Dissertations www.lib.mrt.ac.lk

This dissertation was submitted to the Department of Computer Science and Engineering of the University of Moratuwa in partial fulfillment of the requirements for the Degree of Master of Business Administration.

Department of Computer Science Engineering

University of Moratuwa

January 2005



82566

82.566

681.3505" 004.41(5487)

II Thesis

ACKNOWLEDGEMENT

This research project thesis would not have come to light in the absence of guidance, support and encouragement received from various parties. I would like to give my earnest thanks to all of them that helped me on different occasions to complete this research project.

My special thanks go to my supervisor Dr. Ravi Corea for giving me the guidance and advice in completing this research project. My thanks extended to Dr. Vishaka Nanayakkara who agreed to be my academic supervisor.

I would like to thank all my lecturers, course coordinators and faculty members who supported me in numerous ways in completing the thesis on time.

My thanks goes to those who spent time in completing the questionnaires and sent me comments despite their busy schedules and special thanks goes to those who spent time with me discussing the facts and concepts in detail. I would like to thank my employer PricewaterhoseCoopers Lanka (Pvt.) Ltd. in supporting me to observe project information and current business practices to select the most relevant case study analysis for my thesis.

I earnestly thank those who published articles of the software industry in Sri Lanka and other web contents in relevant web sites, which helped me to extract information for my literature review.

Last but not least my thanks go to my wife and my little daughter for understanding, tolerating and encouraging me to complete this thesis on time.

DECLARATION

"I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any University to the best of my knowledge and belief it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for interlibrary loans, and for the title and summary to be made available to outside organizations"

Roshan Daluwakgoda

November 2004

4

University of Moratuwa, Sri Lanka. Electronic Theses & Dissertations www.lib.mrt.ac.lk

UOM Verified Signature

Dr. Ravi-Corea – Supervisor

ABSTRACT

The software industry is becoming more complex due to the rapid change of development tools and technology platforms. Most countries gain competitive advantage by adopting these technologies quickly and make their software industry competitive in the international market. Globally recognised software firms use state of the art technology tools and platforms to design, develop and test their software solutions to ensure the ultimate product is of high quality.

Sri Lanka has the potential to tap the software export market if the government can provide the required infrastructure and incentives to local software firms. Lack of government support and inadequate access to the state of the art technology tools are key barriers for the development of small and medium scale software firms.

This research project aims to analyse some of the current problems of the software industry in Sri Lanka as experienced by software firms. It further extends to estimate the demand for services, which may help small and medium software firms and individuals to use state of the art technology tools and platforms when offered at a reasonable price. Based on the demand estimate the researcher aims to explore the feasibility of a software engineering centre and conceptualise the service delivery model. The proposed centre aims to provide services to small and medium software firms and individuals who practice software development as a profession so that they may achieve the standards of world class software enterprises.

A proposal for a sustainable business model based on the conceptual model is an important part of this project.

Table o	of C	ont	ents
---------	------	-----	------

ACKNOWLEDEMENT	1
DECLARATION	_11
ABSTRACT	_ 111
CHAPTER 1	1
1. BACKGROUND	1
1.1 RESEARCH PROBLEM	_ 1
1.2 RESEARCH PROJECT OBJECTIVE	4
1.3 RESEARCH PROJECT SCOPE	_ 4
1.4 SIGNIFICANCE OF THE RESEARCH PROJECT	4
CHAPTER 2	6
2. LITERATURE SEARCH	6
2.1 ISSUES FACING THE SRI LANKAN SOFTWARE INDUSTRY	_ 6
2.2 MEASURES TAKEN BY OTHER COUNTRIES	10
2.3 SOFTWARE CENTRES AND LABORATORIES IN SRI LANKA	12
2.3.1 SUMMARY OF THE LITRATURE REVIEW:	_ 14
2.4 SOFTWARE CENTRE MODELS IN OTHER COUNTRIES	_ 16
2.4.1 SOFTWATE LABORATORY CONCEPTS TO SUPPORT R&D ACTIVITIES	18
2.4.2 SUMMARY OF THE LITRATURE REVIEW	_ 19
CHAPTER 3 University of Moratuwa, Sri Lanka.	20
3. METHODOLOGY	_ 20
3.1 QUESTIONNAIRE	_ 21
3.2 CASE STUDY	_ 23
3.3 CONCEPTUAL MODEL	_ 23
3.4 BUSINESS MODEL	_ 24
CHAPTER 4	25
4. OBSERVATIONS/RESULTS/DATA	_ 25
4.1 OBSERVATION AND RESULTS	_ 25
CHAPTER 5	32
5. ANALYSIS AND DISCUSSION OF RESULTS	_ 32
5.1 ANALYSIS OF SURVEY RESULTS	_ 32
5.2 CONCLUSION	_ 43
CHAPTER 5	44
6. CASE STUDY	_ 44
6.1 CASE STUDY APPROACH	_ 44

.

H

ير

	6.3	LIMITATIONS	49
	6.4	CASE STUDY DISCUSSION	50
CHA	PTE	R 7	51
	7. C	ONCEPTUALISATION	51
	7.1	CONCEPTUAL MODEL	52
	7.2	SUMMARY OF THE CONCEPTUAL MODEL	53
СНА	PTE	R 8	56
	8. B	USINESS MODEL	56
	8.1	TARGET CLIENT DEFINITION	56
	8.2	FINANCIAL MODEL AND STRATEGY	56
	8.3	RESOURCE REQUIREMENT	60
	8.4	PARTNERSHIP STRATEGY	61
	8.5	LIMITATION	61
СНи	арте	R 9	62
	9. EC	CONOMIC AND SOCIAL ANALYIS	62
	9.1	SUMMARY OF ECONOMIC AND SOCIAL ANALYIS	_ 6.5
СНА	PTEI	R 10	66
	10. CO	ONCLUSIONS AND RECOMMENDATION	_ 6.6
	10.1	SUMMARY OF RESEARCH FINDINGS AND RECOMMENDATIONS	67
NOT	'ES, R	REFERENCES AND BIBLIOGRAPHY	70
ANN	EXE	S	72
	ANN	EX A: SURVEY QUESTIONNAIRE RESULTS	
	ANN	EX B: CASE STUDY – PROJECT PLAN	
	ANN	EX C: CONCEPTUAL MODEL	
	ANN	EX D: CONCEPTUAL MODEL - SOFTWARE CENTRE UTILISATION	
	ANN	EX E: BUSINESS PLAN SOFTWARE ENGINEERING CENTRE DETAILED BUD	GET

ANNEX F: BUSINESS PLAN INFRASTRUCTURE REQUIREMENTS

ANNEX G: ECONOMIC AND SOCIAL ANALYIS ADJUSTED FINANCILA PROJECTION

4

Number	
TABLE1: THE SUMMARY OF THE RESPONDENTS PROFILE:	25
TABLE2: PROBLEMS IN SOFTWARE INDUSTRY IN SRI LANKA	27
TABLE 3: GOVERNMENT ROLE IN SOFTWARE INDUSTRY DEVELOPMENT	27
TABLE 4: USAGE OF SOFTWARE FOR COMMERCIAL PURPOSE	28
TABLE 5: SOFTWARE LOAD TESTING	28
TABLE 6: DEMAND FOR SOFTWARE TESTING TOOLS	29
TABLE 7: DEMAND FOR SERVICES OFFERED BY THE CENTRE	29
TABLE 8: DEMAND FOR SOFTWARE TOOLS AND HARDWARE PLATFORMS	31
TABLE 9: PRIORITIES OF SOFTWARE INDUSTRY	34
TABLE 10: DEMAND ESTIMATE FOR COMPONENTS	41
TABLE 11: ANALYSIS OF THE OPEN ENDED QUESTION	42
TABLE 12: RESOURCE COST TABLE	46
TABLE 13: SOFTWARE PROJECT COST AND SCHEDULE	47

LIST OF TABLES



Ť

T

4

University of Moratuwa, Sri Lanka. Electronic Theses & Dissertations www.lib.mrt.ac.lk

LIST OF FIGURES

Number	
FIGURE 1: THE SUMMARY OF THE RESPONDENTS PROFILE:	26
FIGURE 2: ANALYSIS OF THE PROBLEM IN THE SOFTWARE INDUSTRY	32
FIGURE 3: ANALYSIS OF THE GOVERNMENT ROLE FOR SOFTWARE INDUSTRY	34
FIGURE 3: ANALYSIS OF THE GOVERNMENT ROLE FOR SOFTWARE INDUSTRY	34
FIGURE 4: USAGE OF SOFTWARE FOR COMMERCIAL PURPOSE	36
FIGURE 5: SOFTWARE LOAD TESTING	37
FIGURE 6: DEMAND FOR SOFTWARE TESTING TOOLS	38
FIGURE 7: ANALYSIS OF THE PROBLEM IN THE SOFTWARE INDUSTRY	39

Į.



_ _ _ -

2

ł

1

¥

University of Moratuwa, Sri Lanka. Electronic Theses & Dissertations www.lib.mrt.ac.lk

.