

References

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- [5] http://www.umsl.edu/~sauterv/analysis/488_f01_papers/wang.htm
- [6] [http://msdn.microsoft.com/en-us/library/5t6z562c\(VS.80\).aspx](http://msdn.microsoft.com/en-us/library/5t6z562c(VS.80).aspx)
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Appendix A

Benchmark Productivity Percentages

Line Productivity Percentage	Bonus Amount Rs.
< 75	700.00
75<= and < 76	1000.00
76<= and < 77	1100.00
77<= and < 78	1200.00
78<= and < 79	1300.00
79<= and < 80	1400.00
80<= and < 81	1500.00
81<= and < 82	1700.00
82<= and < 83	1900.00
83<= and < 84	2100.00
84<= and < 85	2300.00
85<= and < 86	2500.00
86<= and < 87	2700.00
87<= and < 88	2900.00
88<= and < 89	3100.00
89<= and < 90	3300.00
90<= and < 91	3500.00
91<= and < 92	3700.00
92<= and < 93	3900.00
93<= and < 94	4100.00
94<= and < 95	4300.00
95<= and < 96	4500.00
96<= and < 97	4700.00
97<= and < 98	4900.00
98<= and < 99	5100.00
99<= and < 100	5300.00
100<= and < 101	5500.00
101<= and < 102	5700.00
102<= and < 103	5900.00
103<= and < 104	6100.00
104<= and < 105	6300.00
105<= and < 106	6500.00
106<= and < 107	6700.00
107<= and < 108	6900.00
108<= and < 109	7100.00
109<= and < 110	7300.00
110<= and < 111	7500.00
111<= and < 112	7700.00
112<= and < 113	7900.00
113<= and < 114	8100.00
114<= and < 115	8300.00
115<= and < 116	8500.00
116<= and < 117	8800.00
117<= and < 118	9100.00
118<= and < 119	9400.00
119<= and < 120	9700.00
120<=	10000.00

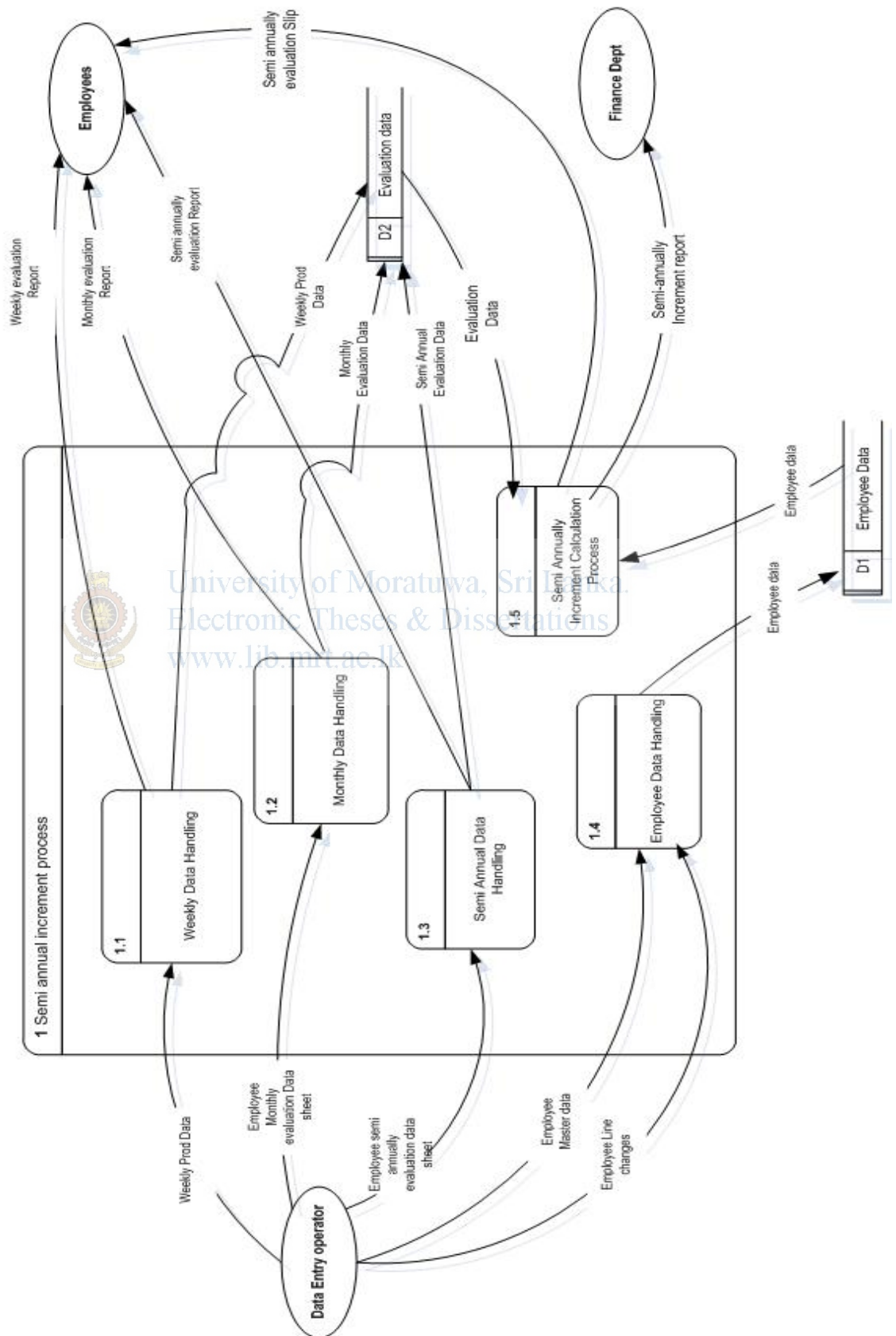
Appendix B

Weightings given for the Key Result Areas of the Performance Evaluation System (Winders/ Core Room Assistants/ Material Preparing Assistants).

	Key Result Area	Relevant No.	Weight Given		Total Weight		
Weekly	01.0 On time production with right quality	01.0	50	A=50 B=40 C=30 D=00	50		
	02. Special Contributions	02.1	16	A=16 B=07 C=02 D=00		24	
		Extra Achievement in production		A=08 B=05 C=02 D=00			
		02.2 Dedication and commitment	08				
	03.0 Quality Failures	03.1 No. of rejects by employee	-7	A= 00 B=-01 C=-03 D=-07	-7		
	03.2 No. of times not obeyed company rules/ sup.'s instructions	03.2	-7	A= 00 B=-02 C=-04 D=-07			
	Monthly	01. Attendance & Punctuality	01.1 Attendance	16		A=16 B=12 C=00	20
			01.2 Punctuality	04		A=04 B=03 C=02 D=00	
02.0 Suggestions & Innovations		02.0	03	A=03 B=02 C=01 D=00	03		
Semi-annually		01.0 No. of Appreciation Letters/ Employee of the month	01.0	03		A=03 B=02 C=01 D=00	
	02.0 No. of Warning Letters	02.0	-10	A=-10 B=-07 C=-05 D=-03 E= 00		-10	

Appendix D

Level 2 DFD of the Existing System



Appendix E

Comparison Report of BSO I and BSO II

BSOs Vs Functional Requirements

Functional Requirement	BSO I	BSO II
System shall provide facility to calculate the productivity ratio line wise weekly basis.	√	√
System shall provide facility to calculate the average productivity ratio line wise for a given week range (Monthly).	√	√
System shall provide facility to input adjustment parameter line wise to adjust the productivity value if necessary.	√	√
System shall provide facility to input the “setup factor” parameter line wise to adjust the productivity value if necessary.	√	√
Standard timing data for transformers should be able to add/modify/print.	√	√
Best operation should be able to mark and should be able to identify separately in the timing sheet.	√	√
Standard timing sheet of a transformer should be able to copy for another transformer	√	√
Standard timing sheet of a transformer should be able to copy for as for a job timing sheet.	√	√
Facility should be available to copy standard timing sheet for a given job range at once as a bulk. Option should be available to filter based on job start date too	√	√
System shall provide facility to add/modify job operations <ul style="list-style-type: none"> • New operations should be able to add for the job timing sheet • Timing of job operations should be able to change • Job operations should be able to remove if there is no any transactions for that operation 	√ √ √	√ √ √
The system shall provide facility to assign different machines to different production lines.	√	√
System shall provide facility to add/modify weekly labour	√	√

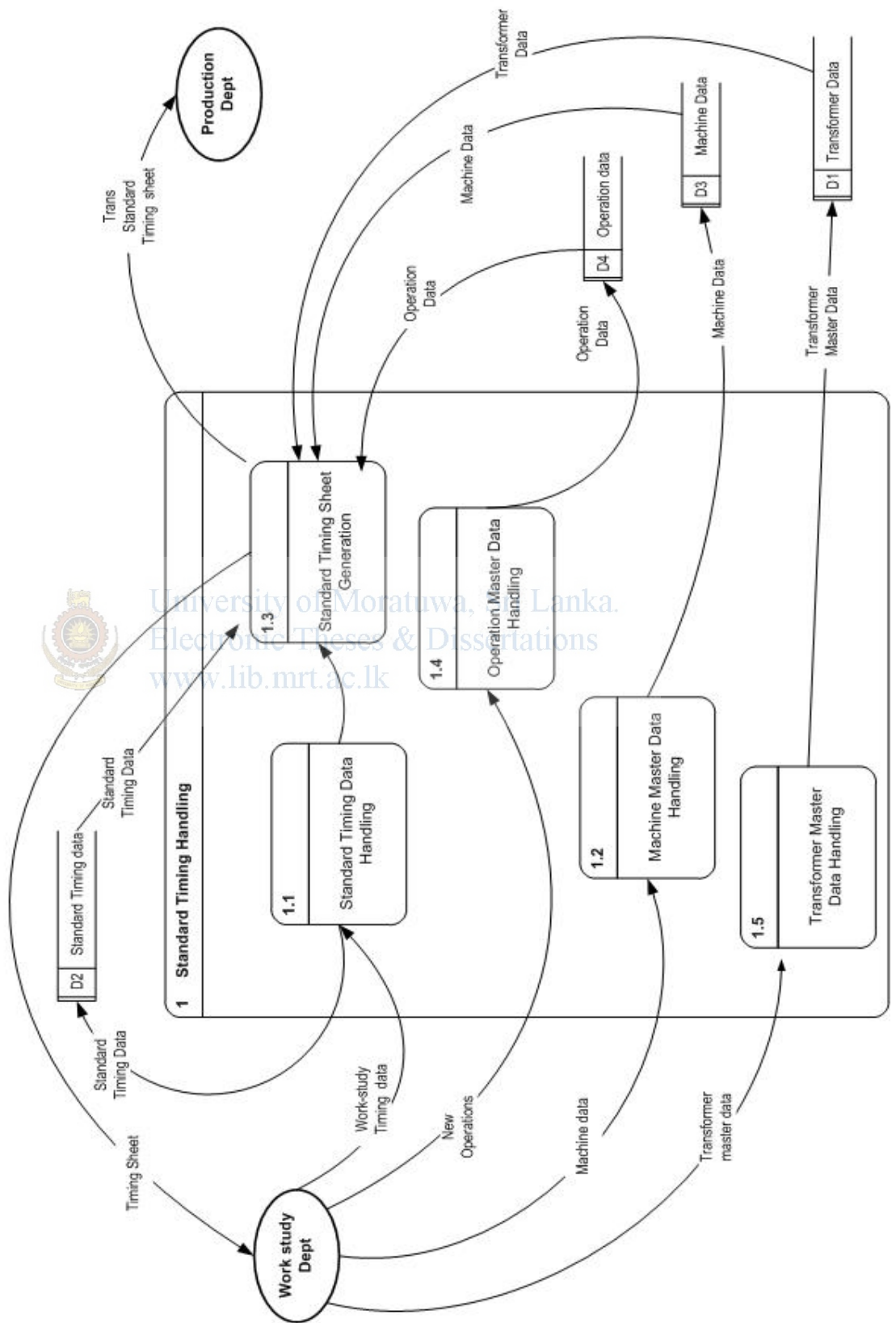
Appendix E

hours weekly wise		
System shall provide facility to query daily transaction data on Job wise.	√	√
System shall provide facility to generate validation reports for completed quantities operations based on operation order.	√	√
System should validate the production quantity at the time of entering the data with the job quantity based on the line set-up parameters.	√	√
System should automatically picks up the correct operation timing for the operation based on the available timing and the predefined priority criteria.	√	√
System should have the facility to graphically analyse trends of the productivity variations of lines.	√	√

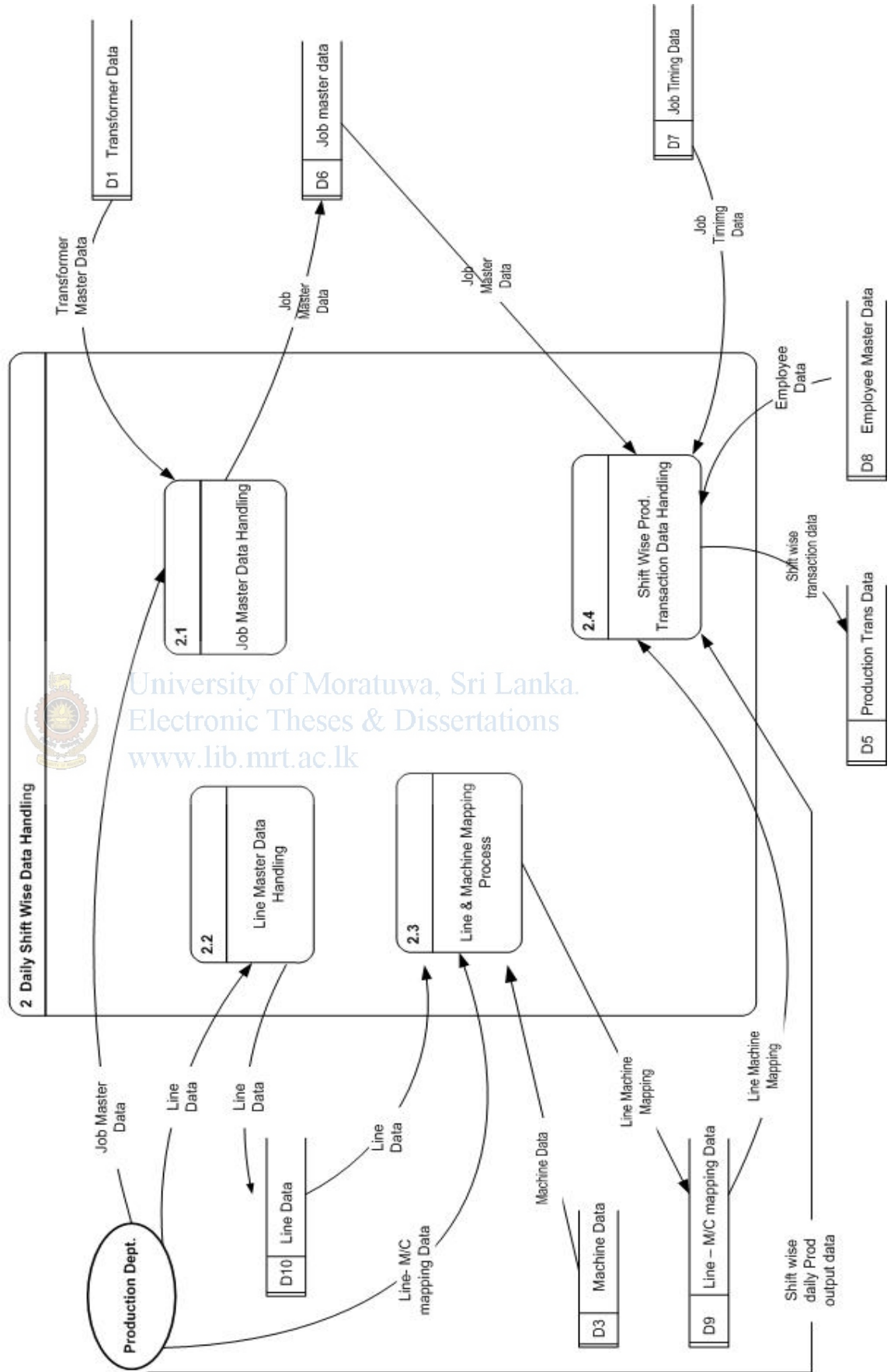
BSOs Vs Non Functional Requirements

Non Functional Requirement	BSO I	BSO II
Daily production output data sheets should be sent to data entry operators on time.	√	√
Database server should be kept on active always.	√	√
Uninterrupted power system should be available to supply power for the servers.	√	√
A reliable networking facility should be available as many users work in the system simultaneously online.	√	√
About 6 to 10 data entry operators should be available for huge data entering.	√	√
Proper procedure has to be implemented in order to collect the data sheets from production lines	√	√
HR department should provide line wise working hours weekly on time	√	√
System should be operationally feasible	√	X
System should be technically feasible	√	√
System should be financially feasible	√	√

Level 2 DFDs of the Proposed System

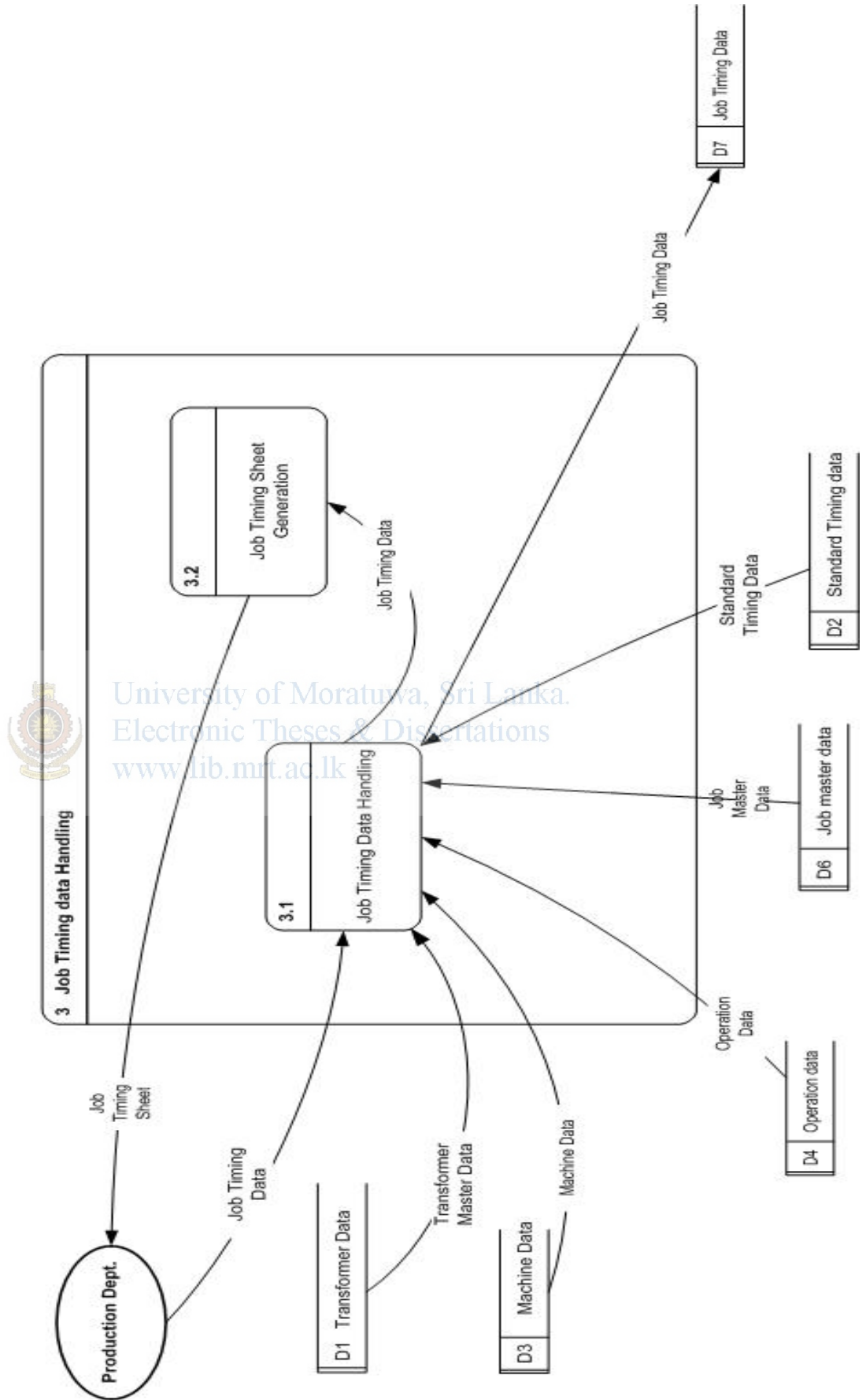


Level 2 DFD of the Process 1 of the Proposed System

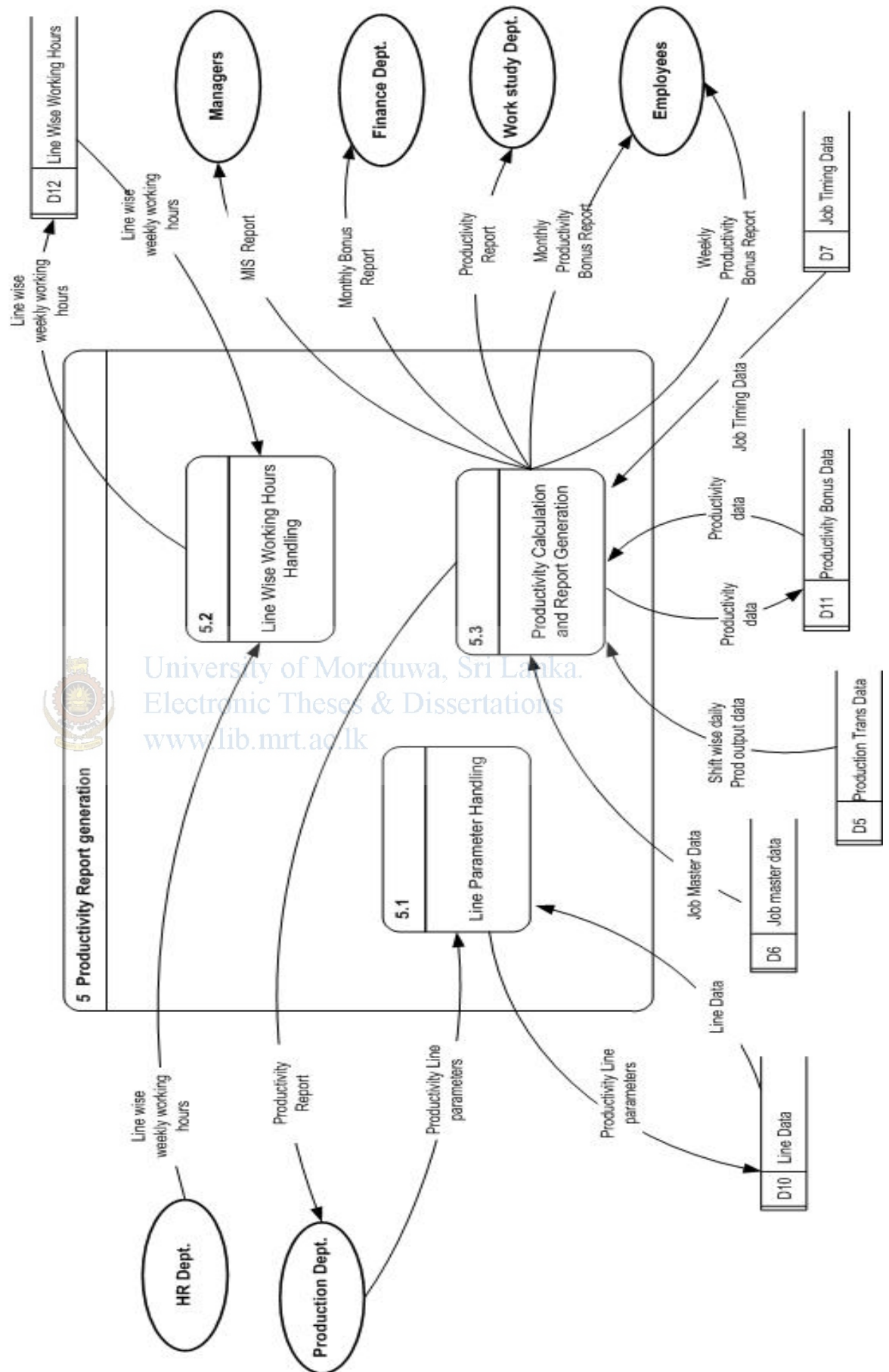


Level 2 DFD of the Process 2 of the Proposed System

Appendix F



Level 2 DFD of the Process 3 of the Proposed System

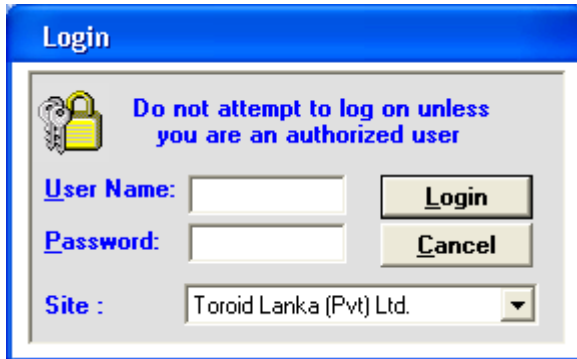


Level 2 DFD of the Process 5 of the Proposed System

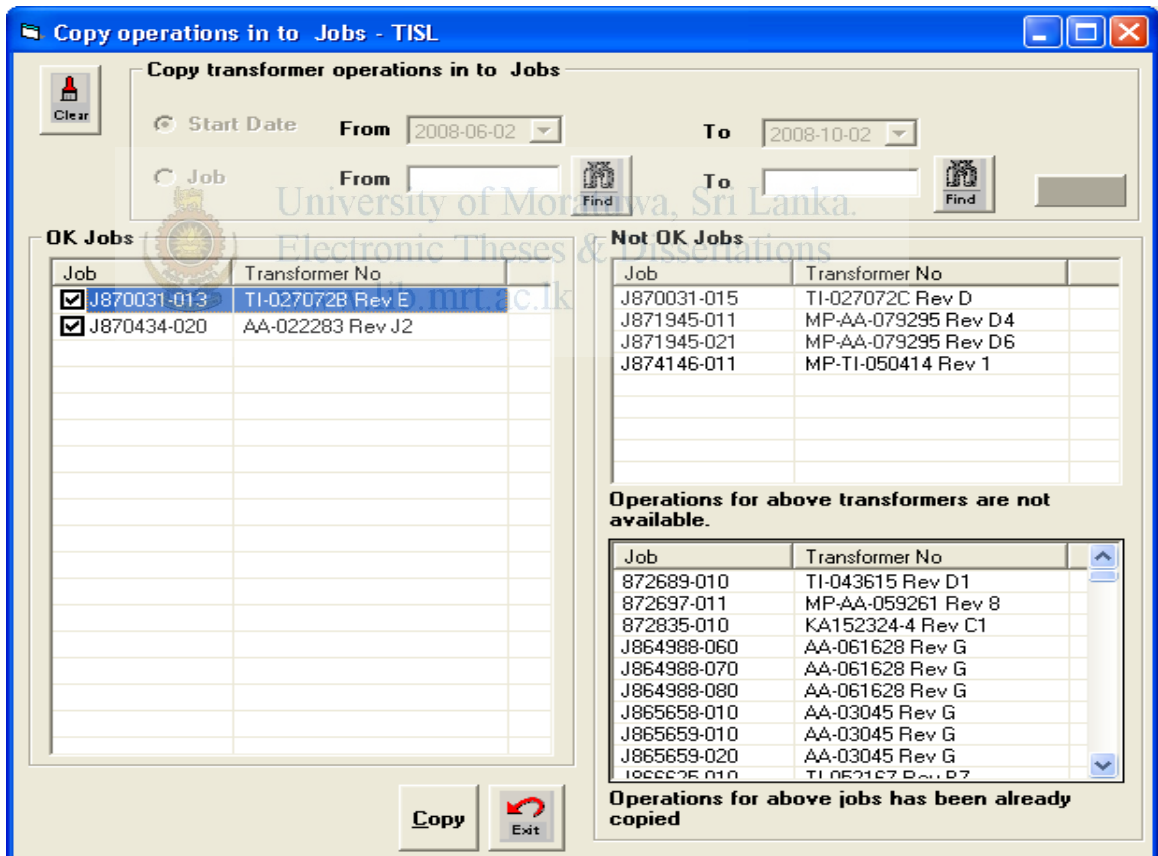
Appendix G

Some user interfaces of the developed application

User Interface of the Login Screen is shown below



User Interface of the “ Copy Standard Operation BOM to Jobs” is shown below



Appendix G

User Interface of the Weekly labours hours entering screen is shown below

Line	EMP Count	Labour Hrs
L-02	81	2704.64
TILK1-Assembling	44	1751.82
TILK2-Assembling	53	1996.8
TILK1-Core Winding	45	1434.79
TILK2-Core Winding	42	1977.86
TILK1-Core Insulation	18	675.39
TILK2-Core Insulation	13	429.84
L-08	44	1818.23
L-09	46	1766.46
L-10	38	1588.92
L-13	38	1713.98
L-244	45	1862.83
TILK1-Potting	20	719.74
TILK2-Potting	37	1291.4
TILK2-Testing	17	495.87
TILK1-Testing	17	685.02
TILK1-Visual	18	740.92
TILK2-Visual	15	571.74
TILK1-Carpentry	3	165.88
TILK1-Packino	12	584.03

User Interface of the Production Data Entering Screen is shown below

Job No.	Transformer	Oper...	MC type	Com...	Addi...	M/C Hrs	Man Hrs	Total Hrs	Emp 1
J862142-...		10	AU-125	50	0	0.0308	0.0165	0.0473	
J862142-...		10	MA-140	50	0	0.0427	0.0272	0.0699	
J862142-...		10	MA-400	50	0	0.0318	0.0165	0.0483	
J862142-...		10	MA-250	50	0	0.0353	0.0272	0.0625	
J862142-...		20	LA-750	50	0	0.034		0.034	
J862142-...		20	LA-1000	50	0	0.0311		0.0311	

Job No.	Transformer	Oper...	MC type	Com...	Addi...	M/C Hrs	Man Hrs	Total Hrs	Emp 1	Err
J866626-...	TI-052167 Rev B7	110		35	0		0.1513	0.1513		
J874056-...	TI-54582-F Rev C9	90		170	0		0.0637	0.0637		
J873457-...	TI-050701 Rev E2..	190		68	0		0.3388	0.3388		
J873500-...	AA-062521 Rev 3	110		25	0		0.0727	0.0727		
J873218-...	SA-TI-037061A Rev C6	80		28	0		0.1115	0.1115		
J873218-...	SA-TI-037061B Rev C7	80		28	0		0.1115	0.1115		
J873218-...	SA-TI-037061C Rev C6	80		28	0		0.1115	0.1115		
J873218-...	SA-TI-037061A Rev C6	85		6	0		0.2288	0.2288		
J873218-...	SA-TI-037061B Rev C7	85		6	0		0.2288	0.2288		
J873218-...	SA-TI-037061C Rev C6	85		6	0		0.2288	0.2288		

Appendix G

User Interface of Productivity Report Generation Screen is shown below

Production Efficiency - Weekly Efficiency Report - TISL

Week : 0839 International Lanka

Section :

Line	Setu
L-01	0
L-02	1
L-03	1
L-04	1
L-08	1
L-10	1
L-11	1
L-13	1
L-21	1
L-222	1
L-244	1
L-32	1
L-34	1
L-401	0
L-41	1
L-42	1
L-44	1.06
L-51	1
L-52	1
L-61	0.94
L-NEW	0
L-SAP 1B	1
L-SAP 2	1
TILK1-Assembling	1
TILK1-Core lathing	0
TILK1-Packing	1
TILK1-Potting	1

Selected lines for productivity calculations

Line	Productivity
L-07	
L-09	82.28
TILK1-Carpentry	74.46
TILK1-Core Insulation	123.13
TILK1-Core Winding	109.65

Archive Delete existing Records for the week and Archive Process Print Clear Exit

User Interface of analysis screen is shown below

Graphical Analysis

Production Line [Y - Axis] Week [X - Axis] Value Frequency

TILK1-Assembling 0848 Productivity % Weekly

TILK1-Carpentry 0847 Bonus Amount Paid Monthly

TILK1-Core Insulation 0846 0845 0837

TILK1-Core lathing

TILK1-Core Winding

TILK1-Packing

LINE PRODUCTIVITY

LINE PRODUCTIVITY

Productivity %

Week

0846 0847 0848

Draw Report Print Help Clear Cancel Send to Multiple Graph Page View Multiple Graph Page