

CHAPTER 6

CONCLUSION

6.1. Conclusion

According to the research which has been held in the PT. Samudera Luas Paramacitra by implementing Lean Six Sigma, the conclusions are below:

a. According to the relation of each waste in the waste relation matrix, the highest percentage of waste is defect which value is 18.99%. It means that the most waste in the RH Roll production is defect product.

b. There are 9 critical to quality (CTQ) in the production process of RH Roll, such as non-standardize hole (A1), cracked wheel (A2), chipped wheel (A3), cracked rubber (B1), rough surface (C1), non-standard height 19 (C2), non-standard height 18 (C3), perforated rubber (C4), mark on the surface (D1). According to the Pareto's principle, the focus of the problem is the 20% of the cumulative result. The first 20% of the cumulative result is D1 (mark on surface). Since the highest number of CTQ has been determined, then the root cause has to be analyzed by using Fishbone Diagram. According to the fishbone diagram, there are three problems which is affected the CTQ, such as:

- i. The rings have been worn
- ii. The position of the roll can be change easily inside the machine
- iii. The operators who are not careful in put the ring between the roll.

Each of the problems has different root cause.

c. The main priority of the problem solution is based on the highest value of the RPN. The highest value of the RPN is 490. The recommended action in order to avoid the failure based on the FMEA table is scrape the inner of the ring. Moreover, the preventive action is create form of check list control to continually inspection. The quality of PT. Samudra Luas Paramacitra for the RH Roll products before implementation is 4.0021 sigma (6382 per one million opportunities), and the quality after implementation is 4.1580 sigma (4119 per million opportunities). It means that the implementation of Lean Six Sigma in the production floor is success to reduce the waste.

6.2. Suggestion

Considering the result of Lean and Six Sigma implementation in PT. Samudera Luas Paramacitra, author recommends to implement these methods in others types of waste, in order to reduce the number of waste. Moreover the author also recommends to implement these methods for others products in PT. SLP.



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APPENDIX.1. Conversion of Sigma Level (Surjandari, Ph, & Muslim, n.d.)

Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO
0.00	933.193	0.51	839.913	1.02	684.386	1.53	488.033
0.01	931.888	0.52	836.457	1.03	680.822	1.54	484.047
0.02	930.563	0.53	833.977	1.04	677.242	1.55	480.061
0.03	929.219	0.54	831.472	1.05	673.645	1.56	476.078
0.04	927.855	0.55	828.944	1.06	670.031	1.57	472.097
0.05	926.471	0.56	826.391	1.07	666.402	1.58	468.119
0.06	925.066	0.57	823.814	1.08	662.757	1.59	464.144
0.07	923.641	0.58	821.214	1.09	659.097	1.60	460.172
0.08	922.196	0.59	818.589	1.10	655.422	1.61	456.205
0.09	920.730	0.60	815.940	1.11	651.732	1.62	452.242
0.10	919.243	0.61	813.267	1.12	648.027	1.63	448.283
0.11	917.736	0.62	810.570	1.13	644.309	1.64	444.330
0.12	916.207	0.63	807.850	1.14	640.576	1.65	440.382
0.13	914.656	0.64	805.106	1.15	636.831	1.66	436.441
0.14	913.085	0.65	802.338	1.16	633.072	1.67	432.505
0.15	911.492	0.66	799.546	1.17	629.300	1.68	428.576
0.16	909.877	0.67	796.731	1.18	625.516	1.69	424.655
0.17	908.241	0.68	793.892	1.19	621.719	1.70	420.740
0.18	906.582	0.69	791.030	1.20	617.911	1.71	416.834
0.19	904.902	0.70	788.145	1.21	614.092	1.72	412.936
0.20	903.199	0.71	785.236	1.22	610.261	1.73	409.046
0.21	901.475	0.72	782.305	1.23	606.420	1.74	405.165
0.22	899.727	0.73	779.350	1.24	602.568	1.75	401.294
0.23	897.958	0.74	776.373	1.25	598.706	1.76	397.432
0.24	896.165	0.75	773.373	1.26	594.835	1.77	393.580
0.25	894.350	0.76	770.350	1.27	590.954	1.78	389.739
0.26	892.512	0.77	767.305	1.28	587.064	1.79	385.908
0.27	890.651	0.78	764.238	1.29	583.166	1.80	382.089
0.28	888.767	0.79	761.148	1.30	579.260	1.81	378.281
0.29	886.860	0.80	758.036	1.31	575.345	1.82	374.484
0.30	884.930	0.81	754.903	1.32	571.424	1.83	370.700
0.31	882.977	0.82	751.748	1.33	567.495	1.84	366.928
0.32	881.000	0.83	748.571	1.34	563.559	1.85	363.169
0.33	878.999	0.84	745.373	1.35	559.618	1.86	359.424
0.34	876.976	0.85	742.154	1.36	555.670	1.87	355.691
0.35	874.928	0.86	738.914	1.37	551.717	1.88	351.973
0.36	872.857	0.87	735.653	1.38	547.758	1.89	348.268
0.37	870.762	0.88	732.371	1.39	543.795	1.90	344.578
0.38	868.643	0.89	729.069	1.40	539.828	1.91	340.903
0.39	866.500	0.90	725.747	1.41	535.856	1.92	337.243
0.40	864.334	0.91	722.405	1.42	531.881	1.93	333.598
0.41	862.143	0.92	719.043	1.43	527.903	1.94	329.969
0.42	859.929	0.93	715.661	1.44	523.922	1.95	326.355
0.43	857.690	0.94	712.260	1.45	519.938	1.96	322.758
0.44	855.428	0.95	708.840	1.46	515.953	1.97	319.178
0.45	853.141	0.96	705.402	1.47	511.967	1.98	315.614
0.46	850.830	0.97	701.944	1.48	507.978	1.99	312.067
0.47	848.495	0.98	698.468	1.49	503.989	2.00	308.538
0.48	846.136	0.99	694.974	1.50	500.000	2.01	305.026
0.49	843.752	1.00	691.462	1.51	496.011	2.02	301.532
0.50	841.345	1.01	687.933	1.52	492.022	2.03	298.056

Cont. APPENDIX.1. (Surjandari, Ph, & Muslim, n.d.)

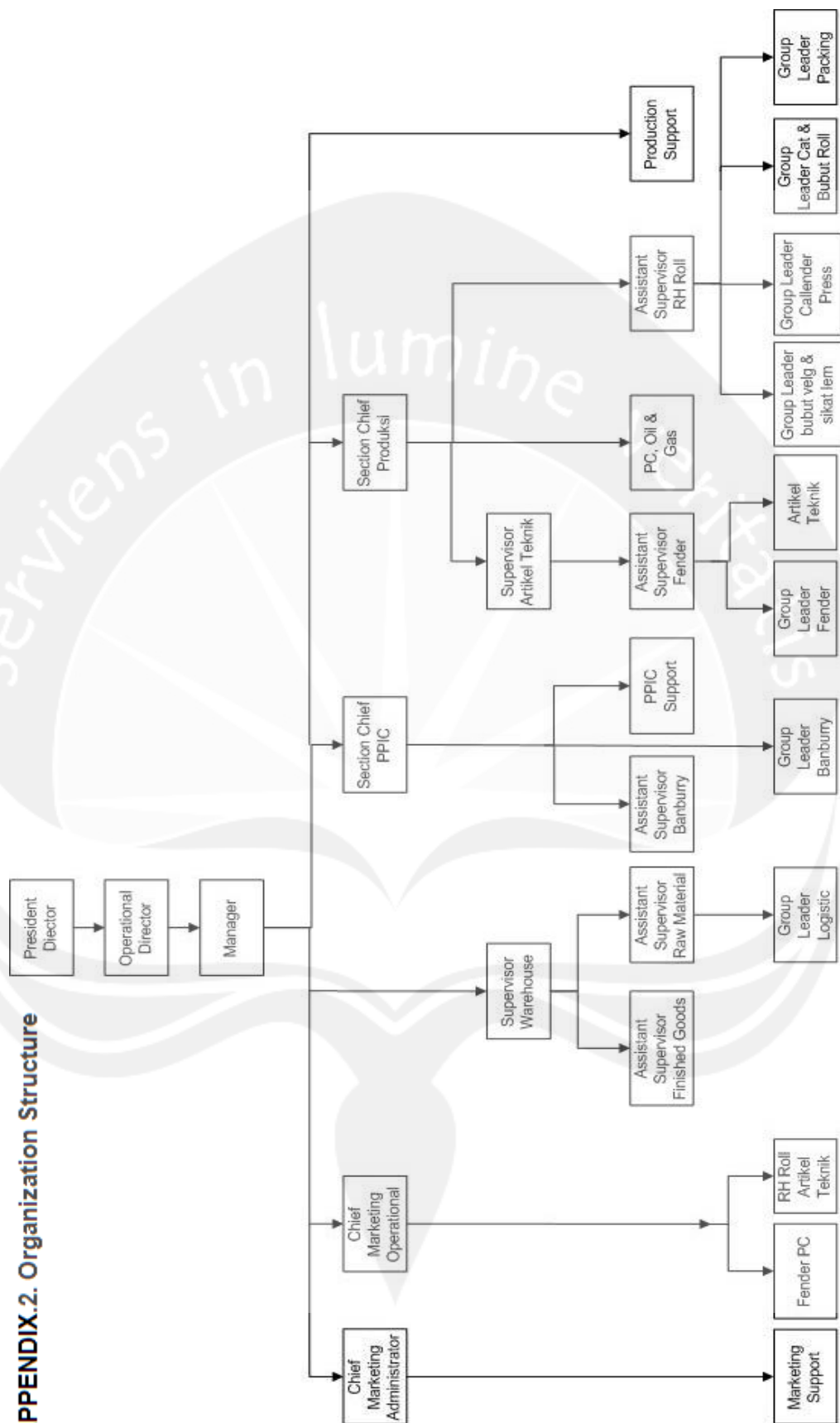
Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO
2.04	294.598	2.55	146.859	3.06	59.380	3.57	19.226
2.05	291.160	2.56	144.572	3.07	58.208	3.58	18.763
2.06	287.740	2.57	142.310	3.08	57.053	3.59	18.309
2.07	284.339	2.58	140.071	3.09	55.917	3.60	17.864
2.08	280.957	2.59	137.857	3.10	54.799	3.61	17.429
2.09	277.595	2.60	135.666	3.11	53.699	3.62	17.003
2.10	274.253	2.61	133.500	3.12	52.616	3.63	16.586
2.11	270.931	2.62	131.357	3.13	51.551	3.64	16.177
2.12	267.629	2.63	129.238	3.14	50.503	3.65	15.778
2.13	264.347	2.64	127.143	3.15	49.471	3.66	15.386
2.14	261.086	2.65	125.072	3.16	48.457	3.67	15.003
2.15	257.846	2.66	123.024	3.17	47.460	3.68	14.629
2.16	254.627	2.67	121.001	3.18	46.479	3.69	14.262
2.17	251.429	2.68	119.000	3.19	45.514	3.70	13.903
2.18	248.252	2.69	117.023	3.20	44.565	3.71	13.553
2.19	245.097	2.70	115.070	3.21	43.633	3.72	13.209
2.20	241.964	2.71	113.140	3.22	42.716	3.73	12.874
2.21	238.852	2.72	111.233	3.23	41.815	3.74	12.545
2.22	235.762	2.73	109.349	3.24	40.929	3.75	12.224
2.23	232.695	2.74	107.488	3.25	40.059	3.76	11.911
2.24	229.650	2.75	105.650	3.26	39.204	3.77	11.604
2.25	226.627	2.76	103.835	3.27	38.364	3.78	11.304
2.26	223.627	2.77	102.042	3.28	37.538	3.79	11.011
2.27	220.650	2.78	100.273	3.29	36.727	3.80	10.724
2.28	217.695	2.79	98.525	3.30	35.930	3.81	10.444
2.29	214.764	2.80	96.801	3.31	35.148	3.82	10.170
2.30	211.855	2.81	95.098	3.32	34.379	3.83	9.903
2.31	208.970	2.82	93.418	3.33	33.625	3.84	9.642
2.32	206.108	2.83	91.759	3.34	32.884	3.85	9.387
2.33	203.269	2.84	90.123	3.35	32.157	3.86	9.137
2.34	200.454	2.85	88.508	3.36	31.443	3.87	8.894
2.35	197.662	2.86	86.915	3.37	30.742	3.88	8.656
2.36	194.894	2.87	85.344	3.38	30.054	3.89	8.424
2.37	192.150	2.88	83.793	3.39	29.379	3.90	8.198
2.38	189.430	2.89	82.264	3.40	28.716	3.91	7.976
2.39	186.733	2.90	80.757	3.41	28.067	3.92	7.760
2.40	184.060	2.91	79.270	3.42	27.429	3.93	7.549
2.41	181.411	2.92	77.804	3.43	26.803	3.94	7.344
2.42	178.786	2.93	76.359	3.44	26.190	3.95	7.143
2.43	176.186	2.94	74.934	3.45	25.588	3.96	6.947
2.44	173.609	2.95	73.529	3.46	24.998	3.97	6.756
2.45	171.056	2.96	72.145	3.47	24.419	3.98	6.569
2.46	168.528	2.97	70.781	3.48	23.852	3.99	6.387
2.47	166.023	2.98	69.437	3.49	23.295	4.00	6.210
2.48	163.543	2.99	68.112	3.50	22.750	4.01	6.037
2.49	161.087	3.00	66.807	3.51	22.216	4.02	5.868
2.50	158.655	3.01	65.522	3.52	21.692	4.03	5.703
2.51	156.248	3.02	64.256	3.53	21.178	4.04	5.543
2.52	153.864	3.03	63.008	3.54	20.675	4.05	5.386
2.53	151.505	3.04	61.780	3.55	20.182	4.06	5.234
2.54	149.170	3.05	60.571	3.56	19.699	4.07	5.085

Cont. APPENDIX.1. (Surjandari, Ph, & Muslim, n.d.)

Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO
4.08	4.940	4.59	1.001	5.10	159	5.61	20
4.09	4.799	4.60	968	5.11	153	5.62	19
4.10	4.661	4.61	936	5.12	147	5.63	18
4.11	4.527	4.62	904	5.13	142	5.64	17
4.12	4.397	4.63	874	5.14	136	5.65	17
4.13	4.269	4.64	845	5.15	131	5.66	16
4.14	4.145	4.65	816	5.16	126	5.67	15
4.15	4.025	4.66	789	5.17	121	5.68	15
4.16	3.907	4.67	762	5.18	117	5.69	14
4.17	3.793	4.68	736	5.19	112	5.70	13
4.18	3.681	4.69	711	5.20	108	5.71	13
4.19	3.573	4.70	687	5.21	104	5.72	12
4.20	3.467	4.71	664	5.22	100	5.73	12
4.21	3.364	4.72	641	5.23	96	5.74	11
4.22	3.264	4.73	619	5.24	92	5.75	11
4.23	3.167	4.74	598	5.25	88	5.76	10
4.24	3.072	4.75	577	5.26	85	5.77	10
4.25	2.980	4.76	557	5.27	82	5.78	9
4.26	2.890	4.77	538	5.28	78	5.79	9
4.27	2.803	4.78	519	5.29	75	5.80	9
4.28	2.718	4.79	501	5.30	72	5.81	8
4.29	2.635	4.80	483	5.31	70	5.82	8
4.30	2.555	4.81	467	5.32	67	5.83	7
4.31	2.477	4.82	450	5.33	64	5.84	7
4.32	2.401	4.83	434	5.34	62	5.85	7
4.33	2.327	4.84	419	5.35	59	5.86	7
4.34	2.256	4.85	404	5.36	57	5.87	6
4.35	2.186	4.86	390	5.37	54	5.88	6
4.36	2.118	4.87	376	5.38	52	5.89	6
4.37	2.052	4.88	362	5.39	50	5.90	5
4.38	1.988	4.89	350	5.40	48	5.91	5
4.39	1.926	4.90	337	5.41	46	5.92	5
4.40	1.866	4.91	325	5.42	44	5.93	5
4.41	1.807	4.92	313	5.43	42	5.94	5
4.42	1.750	4.93	302	5.44	41	5.95	4
4.43	1.695	4.94	291	5.45	39	5.96	4
4.44	1.641	4.95	280	5.46	37	5.97	4
4.45	1.589	4.96	270	5.47	36	5.98	4
4.46	1.538	4.97	260	5.48	34	5.99	4
4.47	1.489	4.98	251	5.49	33	6.00	3
4.48	1.441	4.99	242	5.50	32		
4.49	1.395	5.00	233	5.51	30		
4.50	1.350	5.01	224	5.52	29		
4.51	1.306	5.02	216	5.53	28		
4.52	1.264	5.03	208	5.54	27		
4.53	1.223	5.04	200	5.55	26		
4.54	1.183	5.05	193	5.56	25		
4.55	1.144	5.06	185	5.57	24		
4.56	1.107	5.07	179	5.58	23		
4.57	1.070	5.08	172	5.59	22		
4.58	1.035	5.09	165	5.60	21		

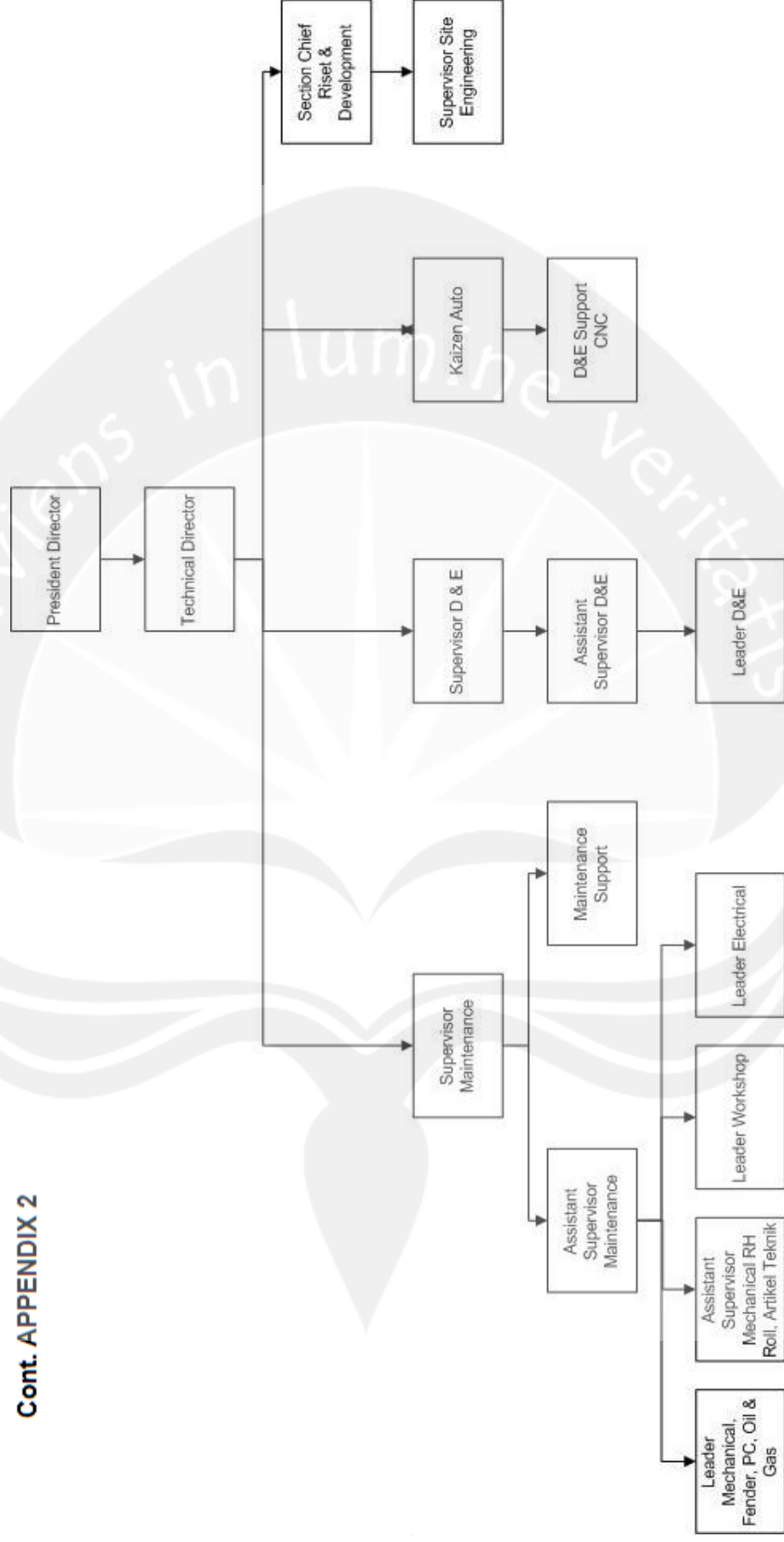
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APPENDIX.2. Organization Structure

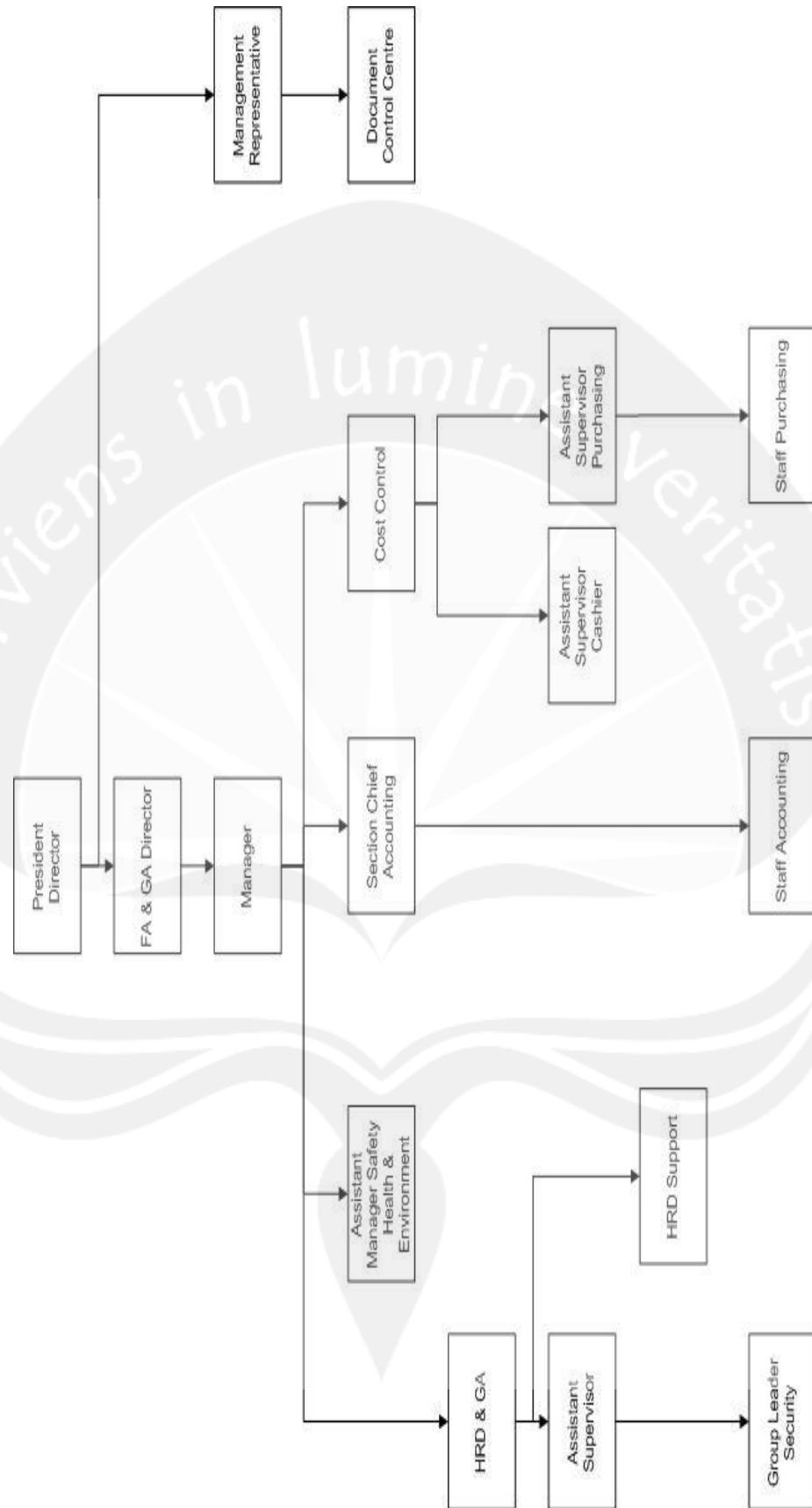




Cont. APPENDIX 2



Cont. APPENDIX 2



APPENDIX.3. Business Process

