

Job Dispatch & Tracking System For Porterage & Transport Department



IE3100R: Systems Design Project Department of Industrial & Systems Engineering

Supervisors: Prof Tang Loon Ching | Dr Ng Kien Ming

Project Manager from KTPH: Miss Jolia Low

Chua Jiajun Anthony | Ethan Wu Ying Tang | Low Ching Wing | Lui Lok Yiu



Background

The Porterage Department in Khoo Teck Puat Hospital (KTPH) is responsible for serving the needs of various departments by transporting patients, medical equipment and other items such as lab specimens. The service is supported by a total of **55 porters**. The department operates round the clock to support the continuous demand. Each year, the office receives about **160** movement requests per weekday and about **120** on weekends, totalling about **55,000** trips per year.

Objectives

1. Improve the efficiency of the Porterage Department by reducing cycle and response time thus raising customer satisfaction
2. Reduce non value added processes in the work flow

Methodology

Problem Definition

Job shadowing & interviews → Process mapping → Waste identification

Input Modeling

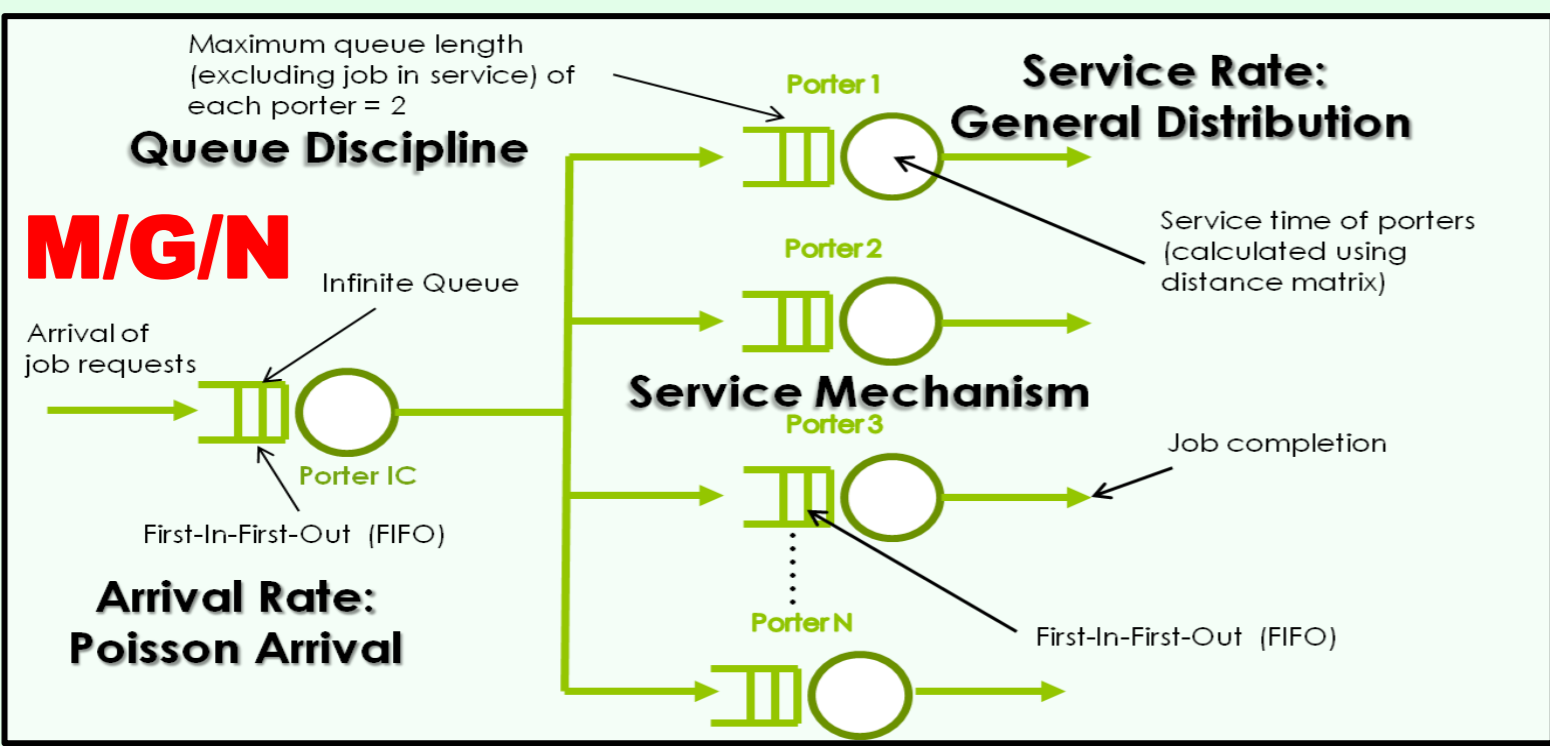
Data collection → Pareto analysis of jobs → Distance matrix mapping

Formulation

Queueing model → Simulation analysis → Process improvement

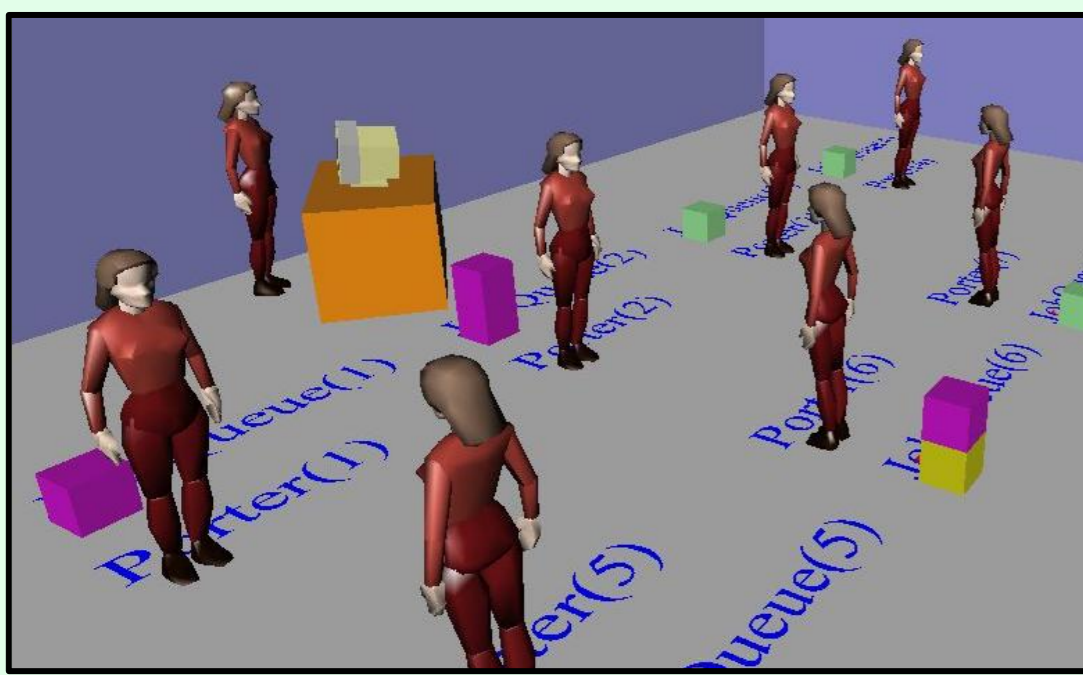
Simulation Study

Queueing Model



Simulation Model

Simulation Snapshot



Distance Matrix

From To	IC	A&E	Pharm	IC	A&E	Pharm	IC	A&E	Pharm	IC	A&E	Pharm	IC	A&E	Pharm	IC	A&E	Pharm	IC	A&E	Pharm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
IC	0	120	150	100	130	160	110	140	170	120	150	180	130	160	190	140	170	200	150	180	210	160	190	220	170	200	230	180	210	240	190	220	250	200	230	260	210	240	270	220	250	280	230	260	290	240	270	300	250	280	310	260	290	320	270	300	330	280	310	340	290	320	350	300	330	360	310	340	370	320	350	380	330	360	390	340	370	400	350	380	410	360	390	420	370	400	430	380	410	440	390	420	450	400	430	460	410	440	470	420	450	480	430	460	490	440	470	500	450	480	510	460	490	520	470	500	530	480	510	540	490	520	550	500	530	560	510	540	570	520	550	580	530	560	590	540	570	600	550	580	610	560	590	620	570	600	630	580	610	640	590	620	650	600	630	660	610	640	670	620	650	680	630	660	690	640	670	700	650	680	710	660	690	720	670	700	730	680	710	740	690	720	750	700	730	760	710	740	770	720	750	780	730	760	790	740	770	800	750	780	810	760	790	820	770	800	830	780	810	840	790	820	850	800	830	860	810	840	870	820	850	880	830	860	890	840	870	900	850	880	910	860	890	920	870	900	930	880	910	940	890	920	950	900	930	960	910	940	970	920	950	980	930	960	990	940	970	1000	950	980	1010	960	990	1020	970	1000	1030	980	1010	1040	990	1020	1050	1000	1030	1060	1010	1040	1070	1020	1050	1080	1030	1060	1090	1040	1070	1100	1050	1080	1110	1060	1090	1120	1070	1100	1130	1080	1110	1140	1090	1120	1150	1100	1130	1160	1110	1140	1170	1120	1150	1180	1130	1160	1190	1140	1170	1200	1150	1180	1210	1160	1190	1220	1170	1200	1230	1180	1210	1240	1190	1220	1250	1200	1230	1260	1210	1240	1270	1220	1250	1280	1230	1260	1290	1240	1270	1300	1250	1280	1310	1260	1290	1320	1270	1300	1330	1280	1310	1340	1290	1320	1350	1300	1330	1360	1310	1340	1370	1320	1350	1380	1330	1360	1390	1340	1370	1400	1350	1380	1410	1360	1390	1420	1370	1400	1430	1380	1410	1440	1390	1420	1450	1400	1430	1460	1410	1440	1470	1420	1450	1480	1430	1460	1490	1440	1470	1500	1450	1480	1510	1460	1490	1520	1470	1500	1530	1480	1510	1540	1490	1520	1550	1500	1530	1560	1510	1540	1570	1520	1550	1580	1530	1560	1590	1540	1570	1600	1550	1580	1610	1560	1590	1620	1570	1600	1630	1580	1610	1640	1590	1620	1650	1600	1630	1660	1610	1640	1670	1620	1650	1680	1630	1660	1690	1640	1670	1700	1650	1680	1710	1660	1690	1720	1670	1700	1730	1680	1710	1740	1690	1720	1750	1700	1730	1760	1710	1740	1770	1720	1750	1780	1730	1760	1790	1740	1770	1800	1750	1780	1810	1760	1790	1820	1770	1800	1830	1780	1810	1840	1790	1820	1850	1800	1830	1860	1810	1840	1870	1820	1850	1880	1830	1860	1890	1840	1870	1900	1850	1880	1910	1860	1890	1920	1870	1900	1930	1880	1910	1940	1890	1920	1950	1900	1930	1960	1910	1940	1970	1920	1950	1980	1930	1960	1990	1940	1970	2000	1950	1980	2010	1960	1990	2020	1970	2000	2030	1980	2010	2040	1990	2020	2050	2000	2030	2060	2010	2040	2070	2020	2050	2080	2030	2060	2090	2040	2070	2100	2050	2080	2110	2060	2090	2120	2070	2100	2130	2080	2110	2140	2090	2120	2150	2100	2130	2160	2110	2140	2170	2120	2150	2180	2130	2160	2190	2140	2170	2200	2150	2180	2210	2160	2190	2220	2170	2200	2230	2180	2210	2240	2190	2220	2250	2200	2230	2260	2210	2240	2270	2220	2250	2280	2230	2260	2290	2240	2270	2300	2250	2280	2310	2260	2290	2320	2270	2300	2330	2280	2310	2340	2290	2320	2350	2300	2330	2360	2310	2340	2370	2320	2350	2380	2330	2360	2390	2340	2370	2400	2350	2380	2410	2360	2390	2420	2370	2400	2430	2380	2410	2440	2390	2420	2450	2400	2430	2460	2410	2440	2470	2420	2450	2480	2430	2460	2490	2440	2470	2500	2450	2480	2510	2460	2490	2520	2470	2500	2530	2480	2510	2540	2490	2520	2550	2500	2530	2560	2510	2540	2570	2520	2550	2580	2530	2560	2590	2540	2570	2600	2550	2580	2610	2560	2590	2620	2570	2600	2630	2580	2610	2640	2590	2620	2650	2600	2630	2660	2610	2640	2670	2620	2650	2680	2630	2660	2690	2640	2670	2700	2650	2680	2710	2660	2690	2720	2670	2700	2730	2680	2710	2740	2690	2720	2750	2700	2730	2760	2710	2740	2770	2720	2750	2780	2730	2760	2790	2740	2770	2800	2750	2780	2810	2760	2790	2820	2770	2800	2830	2780	2810	2840	2790	2820	2850	2800	2830	2860	2810	2840	2870	2820	2850	2880	2830	2860	2890	2840	2870	2900	2850	2880	2910	2860	2890	2920	2870	2900	2930	2880	2910	2940	2890	2920	2950	2900	2930	2960	2910	2940	2970	2920	2950	2980	2930	2960	2990	2940	2970	3000	2950	2980	3010	2960	2990	3020	2970	3000	3030	2980	3010	3040	2990	3020	3050	3000	3030	3060	3010	3040	3070	3020	3050	3080	3030	3060	3090	3040	3070	3100	3050	3080	3110	3060	3090	3120	3070	3100	3130	3080	3110	3140	3090	3120	3150	3100	3130	3160	3110	3140	3170	3120	3150	3180	3130	3160	3190	3140	3170	3200	3150	3180	3210	3160	3190	3220	3170	3200	3230	3180	3210	3240	3190	3220	3250	3200	3230	3260	3210	3240	3270	3220	3250	3280	3230	3260	3290	3240	3270	3300	3250	3280	3310	3260	3290	3320	3270	3300	3330	3280	3310	3340	3290	3320	3350	3300	3330	3360	3310	3340	3370	3320	3350	3380	3330	3360	3390	3340	3370	3400	3350	3380	3410	3360	3390	3420	3370	3400	3430	3380	3410	3440	3390	3420	3450	3400	3430	3460	3410	3440	3470	3420	3450	3480	3430	3460	3490	3440	3470	3500	3450	3480	3510	3460	3490	3520	3470	3500	3530	3480	3510	3540	3490	3520	3550	3500	3530	3560	3510	3540	3570	3520	3550	3580	3530	3560	3590	3540	3570	3600	3550	3580	3610	3560	3590	3620	3570	3600	3630	3580	3610	3640	3590	3620	3650	3600	3630	3660	3610	3640	3670	3620	3650	3680	3630	3660	3690	3640	3670	3700	3650	3680	3710	3660	3690	3720	3670	3700	3730	3680	3710	3740	3690	3720	3750	3700	3730	3760	3710	3740	3770	3720	3750	3780	3730	3760	3790	3740	3770	3800	3750	3780	3810	3760	3790	3820	3770	3800	3830