

SIMULATION MODELING OF A WAREHOUSE CONTAINERYARD OPERATION

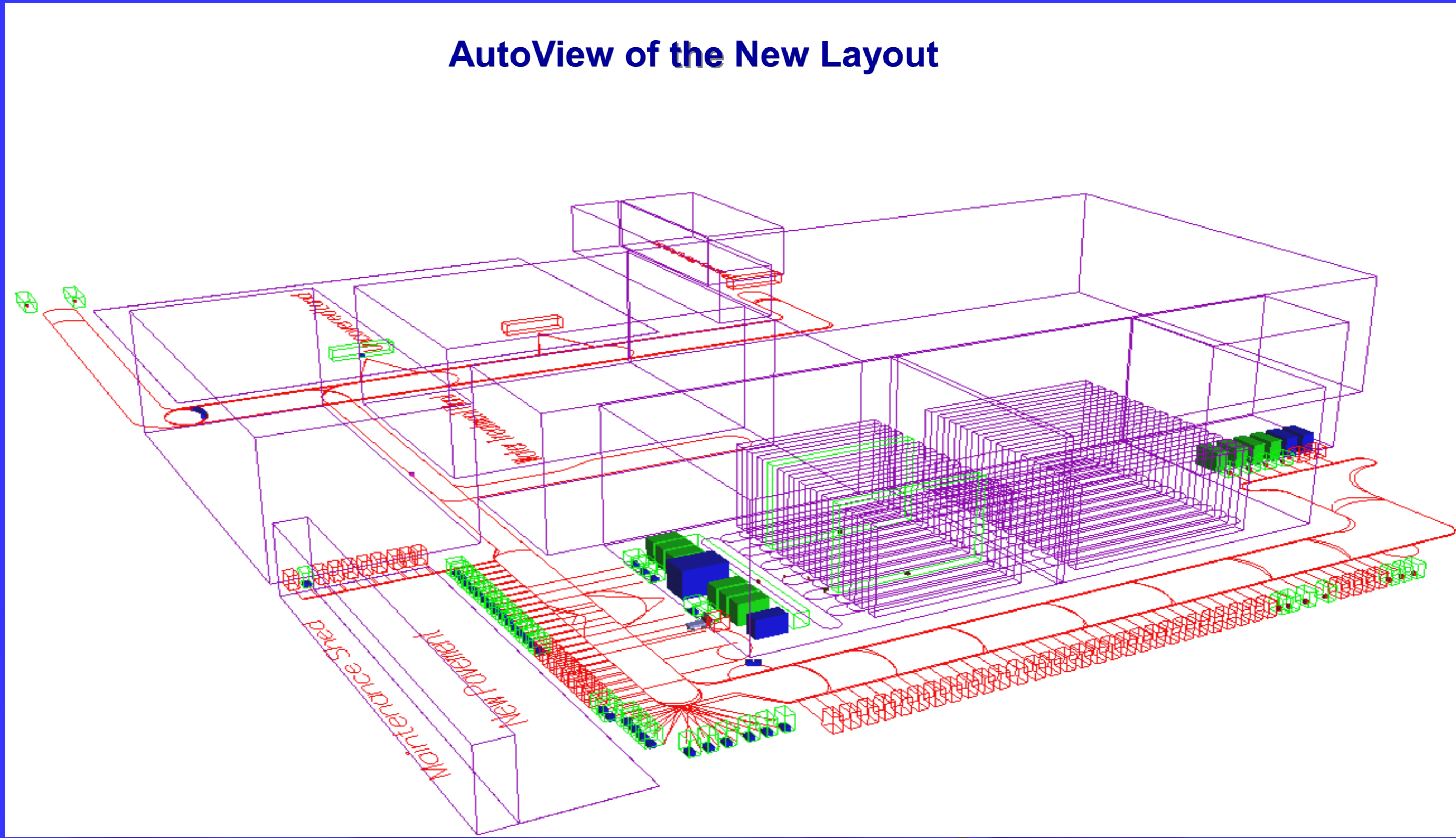
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1 Problem Definition



4 Model Building



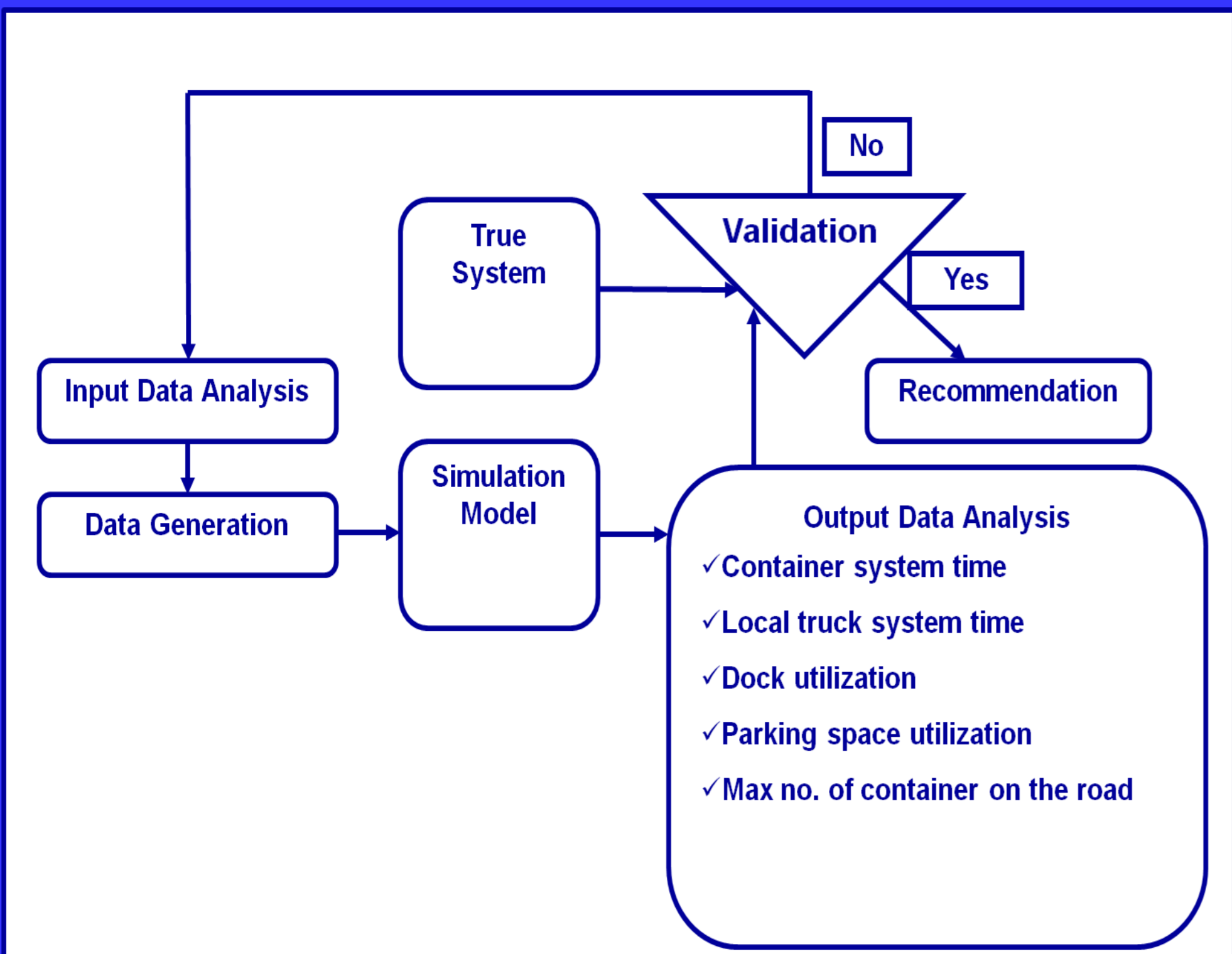
Wyeth Nutritional Singapore currently has an annual production capacity of 85 million pounds of infant milk powder, which is forecasted to reach a maximum of 140 million pounds in the future. The manager is concerned with the capability of the warehouse and the container yard. A previous study concludes that the current warehouse operation cannot cope with the increased production and offers recommendations. It remains to identify the potential problems of the container yard and its third party logistics partner, Sankyu.

2 Objectives



1. Review of the previous model
2. Simulation model of the current container yard at the production level of 85mlb, 95mlb, 105mlb, 115mlb, 125mlb and 140mlb.
3. Simulation model of the integrated warehouse and container yard operation with the new factory layout at the production level of 140mlb.
4. Study of the Sankyu warehouse capacity.

3 Methodology



5 Output Analysis



Production Level	Container Turn-around Time /day 5 th -50 th -95 th	Local Truck System Time /min 5 th -50 th -95 th	Receiving Dock Util. %	Shipping Dock Util. %	Container Space Util. % Region I, II, III	Max. No. of Containers parked on Road
85mlb	0.9 - 2.9 - 10.0	16 - 38 - 72	85.1	71.1	21 - 6 - 0.6	0
95mlb	0.8 - 2.8 - 7.0	17 - 37 - 107	85.4	74.1	29 - 13 - 6	3
105mlb	0.9 - 2.9 - 9.9	16 - 31 - 87	88.0	77.2	30 - 13 - 5	20
105mlb_OT	1.0 - 3.1 - 13.9	16 - 28 - 75	87.8	77.7	31 - 15 - 9	58
115mlb	1.0 - 3.9 - 15.9	17 - 45 - 117	89.3	82.0	43 - 30 - 25	53
115mlb_OT	0.9 - 3.1 - 9.8	16 - 35 - 93	90.0	82.3	39 - 19 - 10	16
125mlb_OT	1.0 - 8.9 - 31.0	18 - 47 - 109	95.2	86.8	75 - 62 - 50	209

6 Conclusions



Wyeth warehouse and container yard

1. Our group confirms the recommendation of the previous group that new docks should be opened when production capacity increases to 140mlb.
2. When production level increases to 125mlb, container turnaround time reaches 31 days, which imposes high penalty cost. High receiving dock utilization will cause congestion problems in container yard and warehouse.
3. With current layout, container yard space is insufficient to accommodate the production level at 140mlb. However, we justify that the new layout with increased parking space and docks can handle the augmented production.

Sankyu warehouse

We conclude that Sankyu has the ability to handle Wyeth's finished goods with forecasted 140mlb production level. However, it may encounter problems in some unexpected events which require Sankyu to be more flexible.