
Article:
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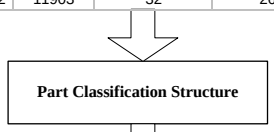
Customer Order No	Part No	Routing No	Net Requirement	Release Date (Mins)	Due Date (Mins)
19546	19	11901	32	261600	262080
19546	19001	11902	64	261120	261600
19546	19002	11903	32	261120	261600



Customer Order No	Part No	Routing No	Net Requirement	Release Date (Mins)	Due Date (Mins)	Part Tag	Parent Tag	Child Count	Holding No
19546	19	11901	32	261600	262080	1954619	195460	7	19
19546	19001	11902	64	261120	261600	1954619001	1954619	4	19
19546	19002	11903	32	261120	261600	1954619002	1954619	3	19

Figure 1. An example work-to-list (partial) with part classification structure

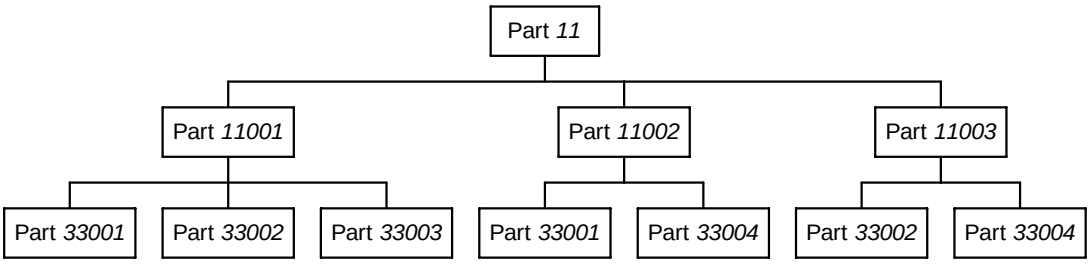


Figure 2. BOM for product number 11

MRP data	
MPS	2 years
Order size	Min(50), Max(2500)
Order interval	Min(Daily), Max(Yearly)
Product type	Stranger(3), Repeater(4), Runner(3)
BOM levels	Min(3), Max(5)
Lead-time	$\mu \pm 3\sigma$, Max(7 days)
Part mix	60% purchased, 40% manufactured
Part variety	434
Work-to-list	50000
Manufacturing system data	
Types of resources	Machines(10), Labour(6)
Machines capacity	*Guillotine(1)*
	Break press(1)
	Drill(1)
	Coiler(4)
	Finishing coiler(1)
	Turret punch press(2)
	Weld(3)
	Sub-assembly coiler(1)
	Mixer(5)
	Settings(1)
Labour capacity	*Assembly class 1(12)*
	Assembly class 2(1)
	Assembly class 3(1)
	Assembly class 4(2)
	Deburr(1)
	Inspector(1)
Queuing rule	EDD

Table 1. Parameters used for the implementation of the part recognition and classification structure

Part tag	Part number	Start	Operation number	End
111100133001	33001	0	1	5000
111100133002	33002	0	1	2500
111100133003	33003	0	1	2500
111100233001	33001	10	1	5010
111100333002	33002	10	1	2510
111100333004	33004	10	1	5010
111100233004	33004	20	1	5020
111100133002	33002	2500	2	3500
111100133003	33003	2500	2	3500
111100333002	33002	2510	2	3510

Child completion

Part tag	Part number	Due date	End
111100133002	33002	28800	3500
111100133003	33003	28800	3500
111100333002	33002	14400	3510

Part tag	Part number	Start	Operation number	End
111100133001	33001	5000	2	6000
111100233001	33001	5010	2	6010
111100333004	33004	5010	2	6010
111100233004	33004	5020	2	6020

Child completion

Part tag	Part number	Due date	End
111100133001	33001	28800	6000

Plausible parent release

Part number	Release date	TNOW
11001	28800	6000

Child completion

Part tag	Part number	Due date	End
111100233001	33001	24000	6010
111100333004	33004	14400	6010

Plausible parent release

Part number	Release date	TNOW
11003	14400	6010

Child completion

Part tag	Part number	Due date	End
111100233004	33004	24000	6020

Plausible parent release

Part number	Release date	TNOW
11002	24000	6020

Part tag	Part number	Start	Operation number	End
1111003	11003	14400	1	16400
1111003	11003	16400	2	17400

Child completion

Part tag	Part number	Due date	End
1111003	11003	33600	17400

Part tag	Part number	Start	Operation number	End

1111002	11002	24000	1	26000
1111002	11002	26000	2	27000

Child completion			
Part tag	**Part number**	**Due date**	**End**
1111002	11002	33600	27000

Part tag	**Part number**	**Start**	**Operation number**	**End**
1111001	11001	28800	1	30800
1111001	11001	30800	2	35800

Child completion			
Part tag	**Part number**	**Due date**	**End**
1111001	11001	33600	35800

Plausible parent release		
Part number	**Release date**	**TNOW**
11	33600	35800

Part tag	**Part number**	**Start**	**Operation number**	**End**
1111	11	35800	1	37300
1111	11	37300	2	38300
1111	11	38300	3	39300

Finished product completion			
Part tag	**Part number**	**Due date**	**End**
1111	11	40500	39300

Table 2. Simulation results for product number *11*

Performance measures	**Multi-level dependent demand manufacturing simulation model**	**Alliance Manufacturing MRP system**
Part delivery performance		
% of part late delivery	3	0
% of part on time delivery	97	100
% of part early delivery	0	0
Part release performance		
% of part late release	1	0
% of part on time release	99	100
% of part early release	0	0
Average resource unitisation (%)		
Guillotine	15.674	16
Break press	83.998	84
Drill	11.547	11
Coiler	80.452	80
Finishing coiler	23.563	24
Turret punch press	45.055	45
Weld	78.306	78
Sub-assembly coiler	2.5106	2.4
Mixer	48.620	49
Settings	51.280	51
Assembly class one	37.895	38
Assembly class two	33.439	33
Assembly class three	24.667	25
Assembly class four	82.640	82
Deburr	48.686	49
Inspector	71.159	71

Table 3. Results of the mapping analysis