

SIMULATION ENGINEERING TECHNOLOGIES





Production Scheduling and

FOOD

Capacity Planning Solution

Milling Facility



successful **150**+





a **4-sight** Group Company



WE ARE IN ALMOST EVERY SOUTH AFRICAN HOUSEHOLD, WITH MORE THAN 000 MUCH BRANDS SPANNING STAPLES TO TOP-END OFFERINGS

WE ARE 30 million CHICKENS ON THE GROUND AT ANY GIVEN TIME FROM OVER 200 FARMS COUNTRYWIDE



OF WHEAT & MAIZE MILLED EVERY YEAR











Complicated production scheduling Adapting to **changes in equipment status**

> Introduction of **new / priority orders** Cannot test various **scheduling rules**

Required a multi-purpose solution









accurate

capacity planning scheduling solution





to assist RCL with the advantages of

SIMO offered a robust solution

process simulation

and data analytics. Easy integration to their existing

data structures.

The **FLEXIBILITY** to test new scheduling approaches and

the fact that it will enable the to perform





scheduling and capacity planning were key advantages.









scope requirements

detail

milling operations packing lines bulk loading

output





key approaches

unique **aggregating** of batches order **prioritisation** continuous and discrete **parallel** batches





key approaches

simultaneously consider

product > bin > route > size > rate > machine

in relation to other orders





capacity model

use forecasted demand data

determine system capacity

Identify bottlenecks



periodical use





scheduling model

integrate with multiple systems

realistic production schedule

change scheduling approach







outcomes

- successfully change planning approach
- produce towards maintaining **appropriate**
- minimum stock
- based on **current** orders, product mix and stock in system
- minimise effect of emergency situation



outcomes

identified and validated various **behavioural**

and rule based areas of intervention

required change management

future opportunities identified





outputs example







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»	▲ Jan. 15-19, 2018						
Resource	Monday 0 03 06 09 12 15 18 21 0	Tuesday 0 03 06 09 12 15 18 21 0	Wednesday 0 03 06 09 12 15 18 21 0	Thursday 00 03 06 09 12 15 18 21 0	Friday 0 03 06 09 12 15 18 21		
+ Bulk Loading	e e	e e	e e e	e e	e		
+ Milling							
 Packing 							
+ Carousel 1	ent_P ent_Pac ent_ ent_ent_Pack_Batch.14 ent_	ent_ ent_Pack	ent ent ent ent_	ent_ ent_Pack ent_ ent ent	ent ent_Pac ent_ent_Pac		
+ Carousel 12.5	ent_ent_Pack en ent_Pack ent_Pack_Batc e		e ent_Pack	ent_Pack_Bato e e ent e	ent_Pac		
+ Carousel 2	ent_P e ent_Pa		ent en e	ent_ ent_Pack ent	ent_e_ent_Pa		
+ Carousel 50	en ent_Pack_Ba e ent_Pa ent_Pack_Bato ent_P e	e e e e e ent_	e e ente e e	e ent_Pack_B e e ent e	ent_P ent_Pa e		
+ Carousel 60	en ent_Pack_B e e ent_Pack ent_Pack_Batch.		ent_P ent_Pac	ent_P ent_Pa e ent_P	ent_P c		
+ Fawema 1	en e 📢 e 📢 e ent_Pack_Batch.1 ent_P en e e	e <mark>e</mark> e e <mark>e</mark> e	ent_Pack_ cent_ e cent_Pack_Bat e	ent_Pack_Bat e ent_P e	e e en e e e e		
+ Fawema 2	en e (e ent_Pack_Batch.1450 ent_ ent_P	e e e e e ent_Pack	e ent_Pa <mark>e ent_ en</mark> e e	e ent_P e e e ent_P	ent_Pa e e e		
+ Fawema Smalls 1	6 e e		e e	6 6	e		
+ Fawema Smalls 2.5	e e e e		eee	e e e e	ee		
+ Fawema Smalls 5	e e ent_P e	e	e e	e e e e	ee		
+ Packing_States							
Wait_Milling							
Wait_Packing							



outputs example



	WHEAT		(ING		DATE:	DATE:	<u>2019/(</u>	<u>05/15</u>	
Machine	Priority	Code	Product Description	Size (kg)	Quantity to be Packed Today	Quantity to be Packed Tomorrow	Actual	Short Stock	Priority
na 1		030150	Butterfield Brown	12.5	0				
		030143	Butterfield White	12.5	0				
		030419	Premix White	12.5	0	9000		9356	1
		030402	Premix Brown	12.5	6750			10230	3
		032604	Silky Soft White	12.5	7650			6928	
		032611	Silky Soft Brown	12.5	0			1082	
Jel		033106	Sweet & Light	12.5	0	8010		3203	
Faw		030525	Crispy Crust Ruto	12.5	0			6002	
		002256	Supreme W/B Flour	12.5	0			4928	2
		005059	Supreme B/B Meal	12.5	0			6440	
		001259	Supreme Cake Flour	12.5	24100	25020		7048	1
	Priority								
		001259	Supreme Cake Flour	12.5	24100	25020		7048	
		100253	Econo Cake Flour	12.5					
Fawema 2		002256	Supreme W/B Flour	12.5	0			4928	
		002300	Supreme W/B Flour	10	0				
		001303	Supreme Cake Flour	10	0			2996	
		104343	Econo Cake Flour	10					
		497794	Ritebrand C/F	10	0			5187	
		497817	Wheatfield C/F	10	0				

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outputs example



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		497794	Ritebrand C/F	10	0			5187	
		497817	Wheatfield C/F	10	0				

Similarion Eliseristic Line Clocks

WHEAT PACKING DATE1: (Roundup to Pallet Fill) DATE2: DATE3: DATE4: DATE5: 15/01/2018 16/01/2018 17/01/2018 18/01/2018 19/01/2018 Quantity to be Packed Machine Size (kg) Priority Priority Priority Priority Priority Total Actual Short Stock Code Product Description Today Tomorrow Day 3 Day 4 Day 5 Fawema 1 **Butterfield Brown** 12.5 030143 Butterfield White 12.5 030419 Premix White 12.5 Premix Brown 12.5 032604 Silky Soft White 12.5 -Fawema 032611 Silky Soft Brown 12.5 Sweet & Light 12.5 Crispy Crust Ruto 12.5 Supreme W/B Flour 12.5 Supreme B/B Meal 12.5 001259 Supreme Cake Flour 12.5 Fawema 2 Supreme Cake Flour 12.5 100253 Econo Cake Flour 12.5 N/A N/A N/A N/A N/A Supreme W/B Flour 12.5 Supreme W/B Flour Fawema Supreme Cake Flour N/A N/A N/A Econo Cake Flour N/A N/A Ritebrand C/F 497817 Wheatfield C/F



outputs example



	Monday	Tuesday	Wednesday	Thursday	Friday		
Resource	0 03 06 09 12 15 18 21 0	0 03 06 09 12 15 18 21 0	0 03 06 09 12 15 18 21 0	0 03 06 09 12 15 18 21 (0 03 06 09 12 15 18 21		
Bulk Loading ■	en ''	e	e	e	e e		
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÷ C	ent_Milling_Batch. 1509	ent_Milling_Batc	ent_Milling_Batch.11313	ent_Milling_Batch. 160730	ent_Milling_Batch.		
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+ E	ent_Milling_Batch. 17929 ent_Milling_Bat en	t_Milling_Batch.17930 e	ent_Milling_Batch ent_Milling_Batch.10812	ent_Milling_Batch ent_Milling_Batch.1607	ent_Milling_Batch.2171		
+ F	ent_Milling_Batch. 1510	ent_Milling_Batch.90626	ent_Milling_Batch. 108119		ent_Milling_Batch.217105		
+ G	e ent_Milling_Batch.1514	e ent_Milling	ent_Milling_B	e ent_Milling_Batch.160734 ent_M	alin e ent_Milling_Batch.217109		
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Packing							
+ Carousel 1	ent_P ent_Pack ent_ ent_ent_Pack_Batch.14 ent_	ent_ent_Pack_	ent ent ent ent_	ent_ ent_Pack ent_ ent ent ent	ent ent_Pac ent_ ent_Pac		
+ Carousel 12.5	ent_ent_Pack en ent_Pack ent_Pack_Batch. e		e ent_Pack	ent_Pack_Batch e e ent e	ent_Pac		
+ Carousel 2	ent_P e ent_Pa		ent en e	ent_ ent_Pack ent	ent e ent_Pa		
+ Carousel 50	en ent_Pack_Bat e ent_Pac ent_Pack_Batch ent_P e	e e e e e ent_	e e ent e e en e e	e ent_Pack_Ba e e ent e	ent_P ent_Pa e		
+ Carousel 60	en ent_Pack_B e ent_Pack ent_Pack_Batch.		ent_P ent_Pac	ent_P ent_Pa e ent_P	ent_P ¢		
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+ Fawema 2	en e f f e ent_Pack_Batch.1450 ent_ ent_P	e e e e ent_Pack	e ent_Pac e ent_ en e e	e ent_P e e e ent_P	ent_Pac e e e		
+ Fawema Smalls 1	6 e e		e e	ee	e		
+ Fawema Smalls 2.5	e e e e e		e e e e	e e e e e	e e		
+ Fawema Smalls 5	e e ent_P e	e	e e e	e e e e	e e		
r_Batch_Pack_11							
 Packing_States 							
 Wait_Milling 							
Wait_Packing							
			1	1			



Jan. 15-19, 2018

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Jan. 15-19, 2018

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Resource

Packing
 ① Carousel 1

+ Maize



Friday

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