4. Functional Requirements

1. It must be possible to select a day, time span (hours within a day) or a supplier batch as input for the machine performance figures calculation.
2. The selected time span must be divided in parts (between the scheduled) breaks to calculate the machine efficiency for those parts. This is used to get an idea if the efficiency was getting better or worse during the selected timespan. If the selected timespan contains more than 5 breaks (i.e. the time span holds more than one day) then the time span is evenly divided into 5 sections.
3. Behind each error category there must be a timeline with spikes denoting the particular error occurrence(s)
4. In the timelines it must also be visible when the manual stops took place (orange areas)

Appendix A - Machine database tables and -codes

Table HstMachineError

Column	Description	SQL-Type	C#-Type	Allow NULL
MerType		tinyint	E_ErrorQueueType	
MerDate		datetime	DateTime	x
MerNumber		int	int	
MerSubNumber		int	int	x
MerData1		tinyint	byte?	x
MerData2		tinyint	byte?	x
MerData3		tinyint	byte?	x
MerData4		tinyint	byte?	x
MerData5		tinyint	byte?	x
MerMinId		int	-	x
MerText		varchar(33)	string	x

Enumeration type E_ErrorQueueType

This enumeration encodes the type of event

Identifier	Value	Description	MerNumber	MerSubNumber	MerData1	MerData2	MerData3	MerData4	MerData5
EQT_ERROR_QUEUED	1	Error raise	error number	sub-number					
EQT_WARNING_QUEUED	2	Warning raised							
EQT_WARNING_OR_ERROR_REMOVED	3	Warning/Error lowered							

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Identifier	Value	Description	MerNumber	MerSubNumber	MerData1	MerData2	MerData3	MerData4	MerData5
EQT_LAST_WARNING_OR_ERROR_REMOVED	4	All Errors/Warnings/errors lowered							
EQT_REQUEST_FOR_DATE_AND_TIME	5	Request for date and time handled							
EQT_COUNT_DATA_AVAILABLE	6	Data available for zone event	zone number 1..3						
EQT_INFO_MESSAGE	7	Periodic (each minute) Info event	timestamp hour	timestamp minute	set speed% x2	actual speed% x2	infeed eff% x2		
EQT_SPEED_MESSAGE	8	Start / Stop event	0=STOP, 1=START	E_ErrorCategory					
EQT_EGGSORT_ACTIVATED_MESSAGE	9								
EQT_EGGSORT_DEACTIVATED_MESSAGE	10								
EQT_LANE_COUNT_RESULTS_AVAILABLE	11								
EQT_NEW_SUPPLIER_REQUEST	12								
EQT_GRADER_POWERED_UP	13								
EQT_EGGSWITCH_NEW_SUPPLIER_REQUEST	14								
EQT_GRADER_DATA_CHANGED	15	Process data changed event	E_DataChangedMessages	detail					
EQT_TAG_DATA_AVAILABLE	16	EGG-it Switch Tag data changed							
EQT_LANE_ACTUAL_DATA_CHANGED	17	Lane count data changed event	lane nr	zone index					
EQT_MACHINE_AND_LANE_COUNTER_EVENT	18								
EQT_SUPPLIER_BATCH_RESULTS_TRANSMITTED	19								
EQT_ERROR_QUEUED_XP	21	Error raised XP	error number	sub nr 1	sub nr 2	text nr 1	text nr 2		
EQT_WARNING_QUEUED_XP	22	Warning raised XP	error number	sub nr 1	sub nr 2	text nr 1	text nr 2		
EQT_WARNING_OR_ERROR_REMOVED_XP	23	Error/Warning XP removed	error number	sub nr 1					
EQT_LAST_WARNING_OR_ERROR_REMOVED_XP	24	All Errors/Warnings XP lowered							

Enumeration type E_ErrorCategory

Identifier	Value	Description
EC_EVERYTHING_ELSE	0	
EC_SCHEDULED_DOWN_TIME	1	
EC_LANE_PRESSURE_CONTROL	2	
EC_FOREIGN_OBJECT_DETECTION	3	
EC_INKJET_ERROR	4	
EC_CRACK_DETECTOR_ERROR	5	
EC_DIRT_DETECTOR_ERROR	6	
EC_LEAKER_DETECTOR_ERROR	7	
EC_EGG_CHECK_ERROR	8	
EC_LOADCELL_ERROR	9	
EC_SAFETY_STOP	10	
EC_INCLINE_CONVEYOR_FULL	11	
EC_GRADERPRO_SPECIFIC	12	Grader stopped by basket check or inspection

Enumeration type E_DataChangedMessages

Identifier	Value	Description
ZONE_1_ES_BATCH_DATA_CHANGED	1	
ZONE_2_ES_BATCH_DATA_CHANGED	2	
ZONE_3_ES_BATCH_DATA_CHANGED	3	
ZONE_1_ES_SHIFT_DATA_CHANGED	11	
ZONE_2_ES_SHIFT_DATA_CHANGED	12	
ZONE_3_ES_SHIFT_DATA_CHANGED	13	
SORT_PROGRAM_CHANGED	241	
MACHINE_PARM_CHANGED	242	
ZONE_1_DATA_CHANGED	243	
ZONE_2_DATA_CHANGED	244	
ZONE_3_DATA_CHANGED	245	
INFEED_SORT_PROGRAM_CHANGED	246	
STAT_DATA_CHANGED	250	
ETHERCAT_CONFIG_DATA_CHANGED	251	

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Identifier	Value	Description
ETHERCAT_SCANNED_DATA_CHANGED	252	
ETHERCAT_STATE_DATA_CHANGED	253	