

# Joint Working Group Woodworking Machinery

Ernst Esslinger, Chairman

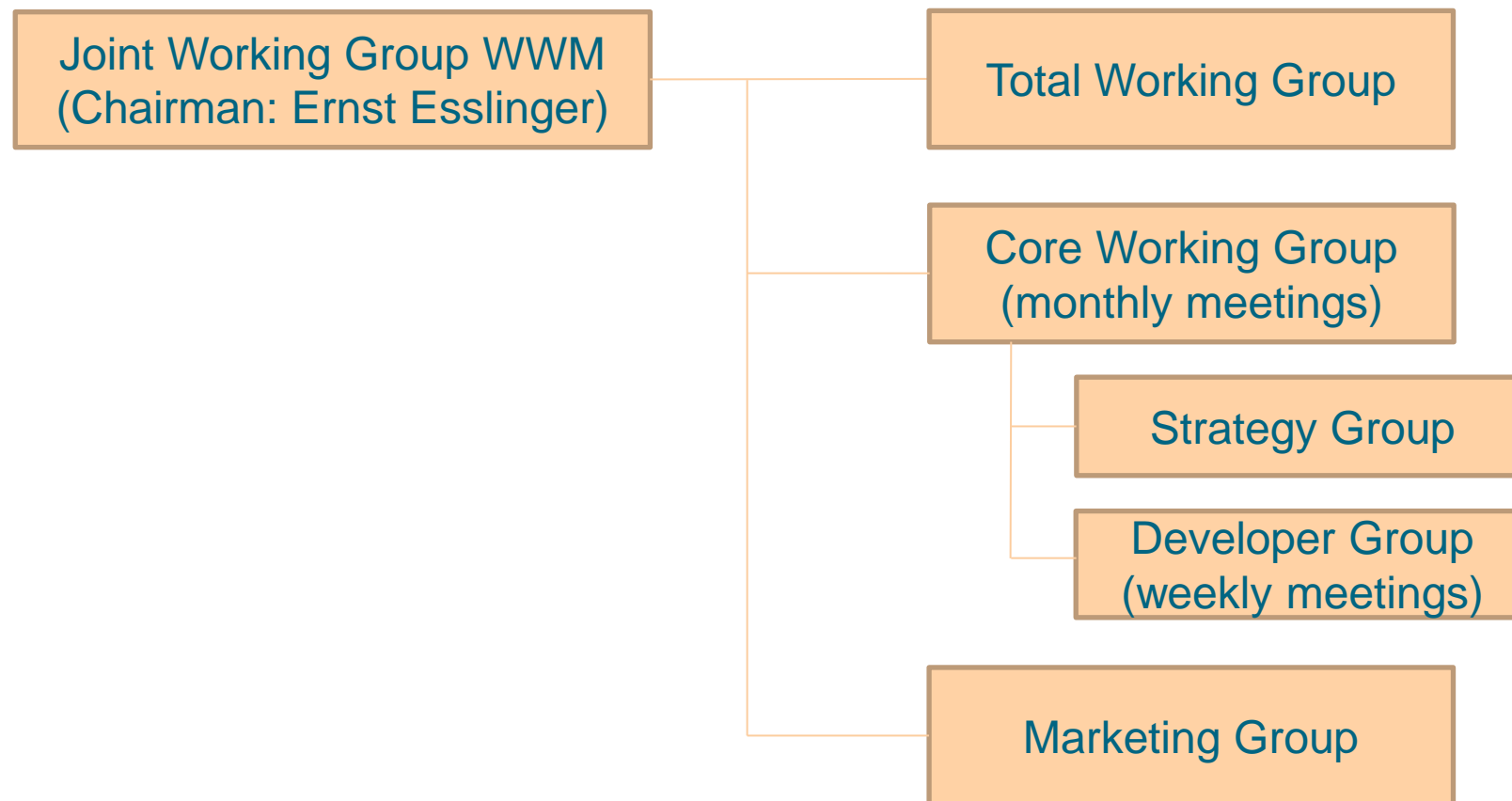
# Members of the core working group



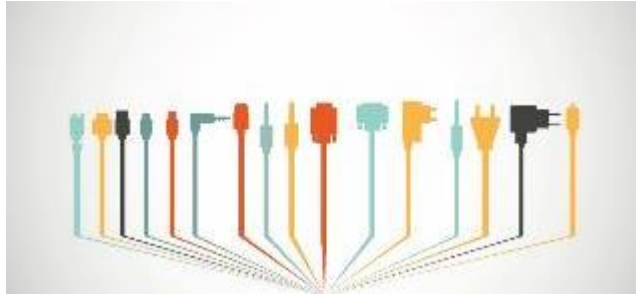
Supported by:



# Structure of the Joint Working Group WWM

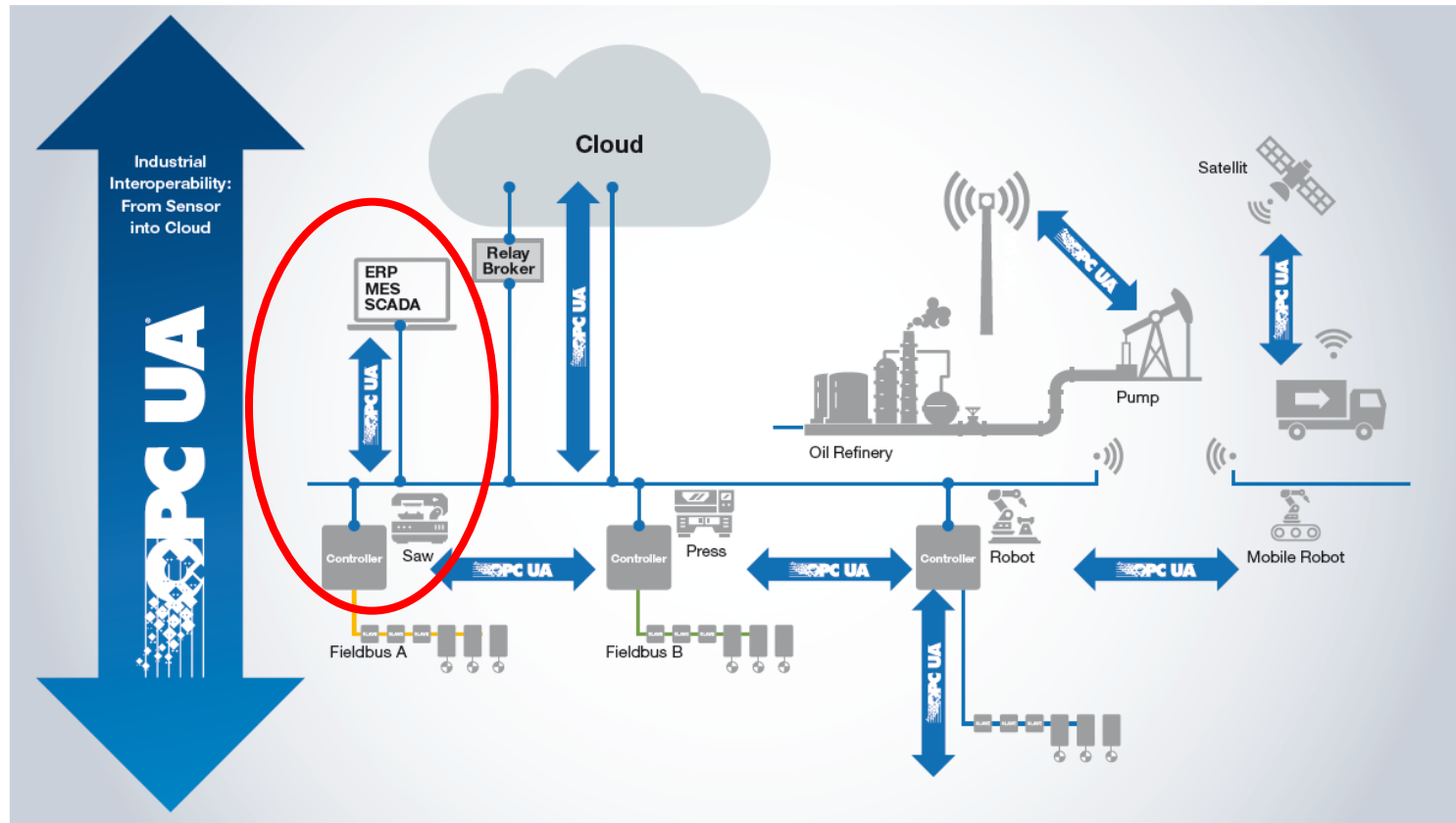


## Motivation for a standardized interface



In a modern production environment, our customers typically connect machines from different manufacturers into a production network. This allows the view on the actual state of the machine from everywhere. This data can be stored and analyzed to improve the machine availability. Currently, there is no standard for communication defined, and it is always necessary to define a new software communication interface. It would be helpful, save money and reduce efforts for customers, if a standard interface would be available for connecting all their machines to an ERP/MES system or a cloud. It should be as easy as connecting a printer to a PC.

# Focus on Machine – MES Coupling with OPC UA



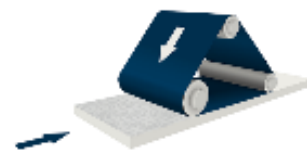
# What are woodworking machines doing?



Cutting



Collating/  
Feeding



Laminating /  
Sanding /  
Lacquering /  
Planning



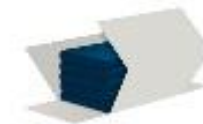
Sizing /  
Edge-  
banding



Drilling/ Fitting  
Insertion



Assembly



Packaging

# Content of the WWM companion specification



## Use Cases for Release 1.0

Use case 1: Identification of Machines of different Manufacturers

Use case 2: Overview of Machine States

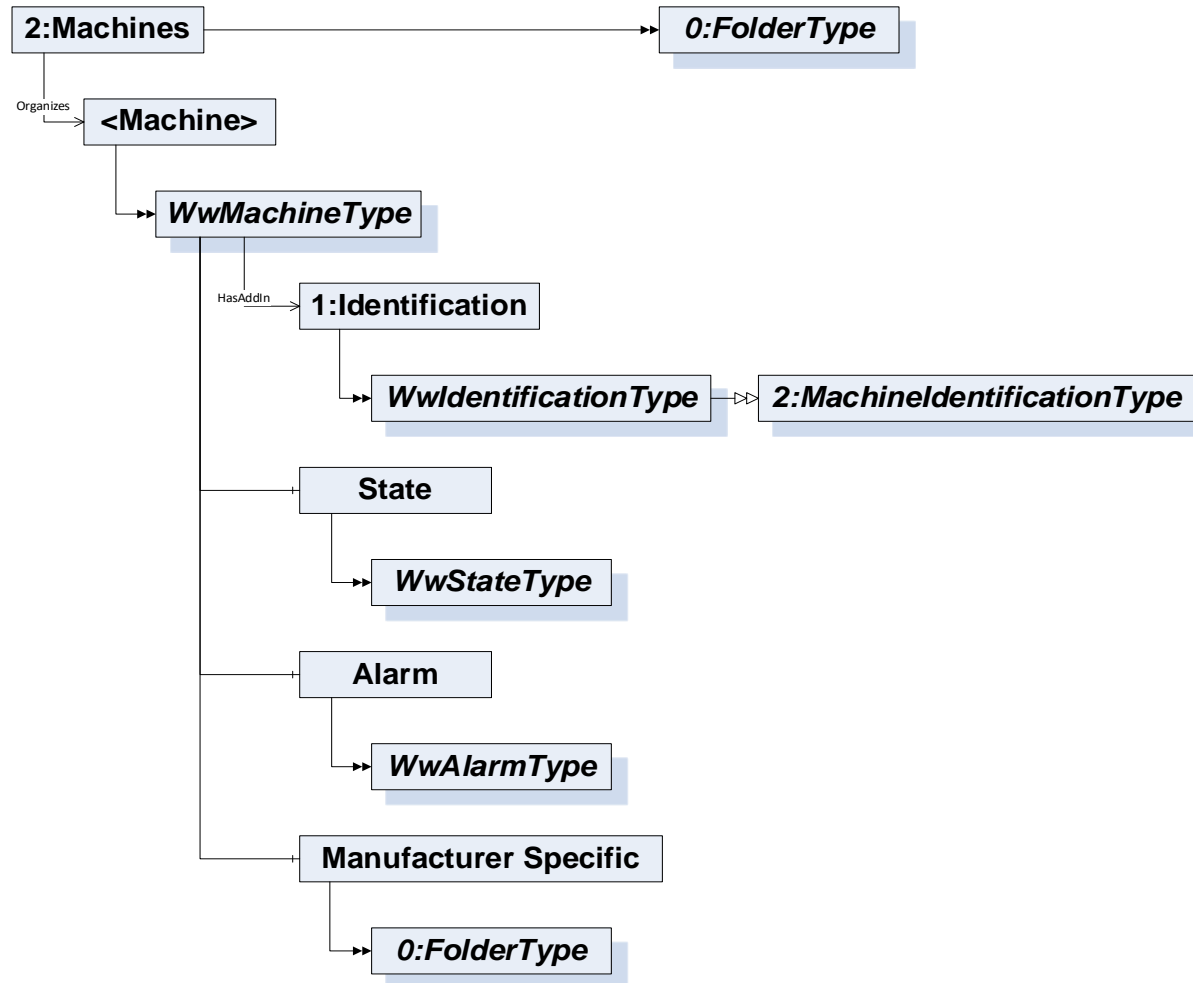
Use case 3: Overview of Errors and Warnings

Use case 4: Providing Information for KPI calculations

# Content of the WWM companion specification



## Woodworking Information Model overview





# Content of the WWM companion specification



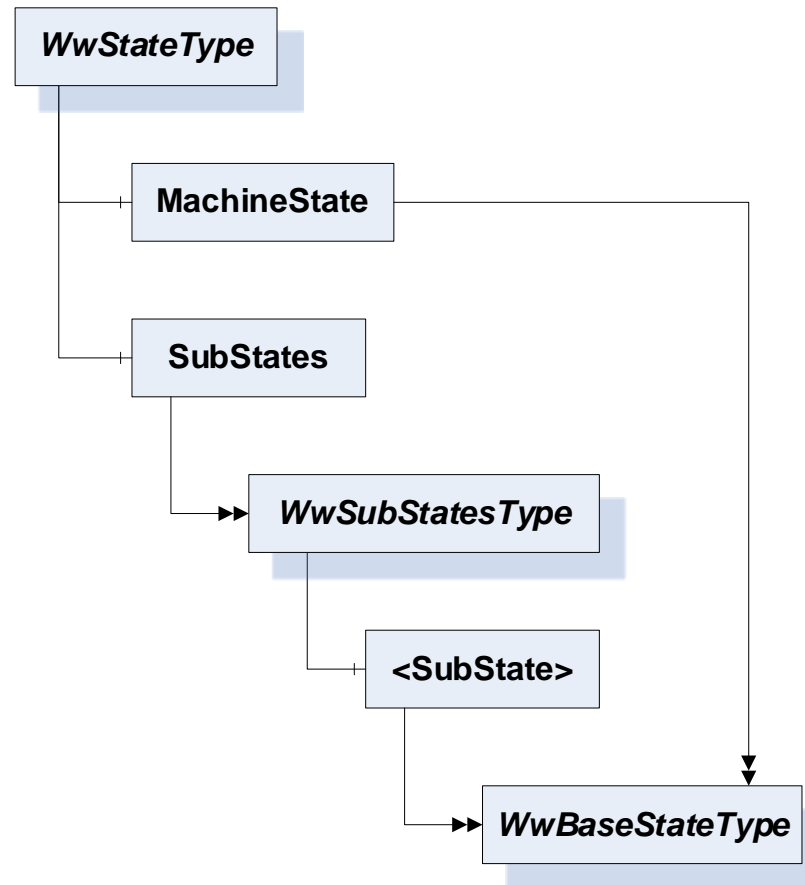
## WwIdentificationType Definition

BrowseName	WwIdentificationType				
IsAbstract	False				
References	Node Class	BrowseName	Data Type	Type Definition	Other
Subtype of the 2:MachinelIdentificationType defined in OPC UA for Machinery					
Applied from 2:MachinelIdentificationType (Note: Changes are marked bold)					
0:HasProperty	Variable	1:ProductInstanceUri	0:String	0:PropertyType	M, RO
0:HasProperty	Variable	1:Manufacturer	0:LocalizedText	0:PropertyType	M, RO
0:HasProperty	Variable	1:ManufacturerUri	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	1:Model	0:LocalizedText	0:PropertyType	M, RO
0:HasProperty	Variable	1:ProductCode	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	1:HardwareRevision	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	1:SoftwareRevision	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	1:DeviceClass	0:String	0:PropertyType	M, RO
0:HasProperty	Variable	1:SerialNumber	0:String	0:PropertyType	M, RO
0:HasProperty	Variable	2:YearOfConstruction	0:UInt16	0:PropertyType	M, RO
0:HasProperty	Variable	2:MonthOfConstruction	0:Byte	0:PropertyType	M, RO
0:HasProperty	Variable	2:InitialOperationDate	0:DateTime	0:PropertyType	O, RO
0:HasProperty	Variable	1:AssetId	0:String	0:PropertyType	O, RW
0:HasProperty	Variable	1:ComponentName	0:LocalizedText	0:PropertyType	O, RW
0:HasProperty	Variable	2:Location	0:String	0:PropertyType	O, RW
0:HasProperty	Variable	LocationPlant	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	LocationGPS	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	CustomerCompanyName	0:LocalizedText	0:PropertyType	O, RO

# Content of the WWM companion specification



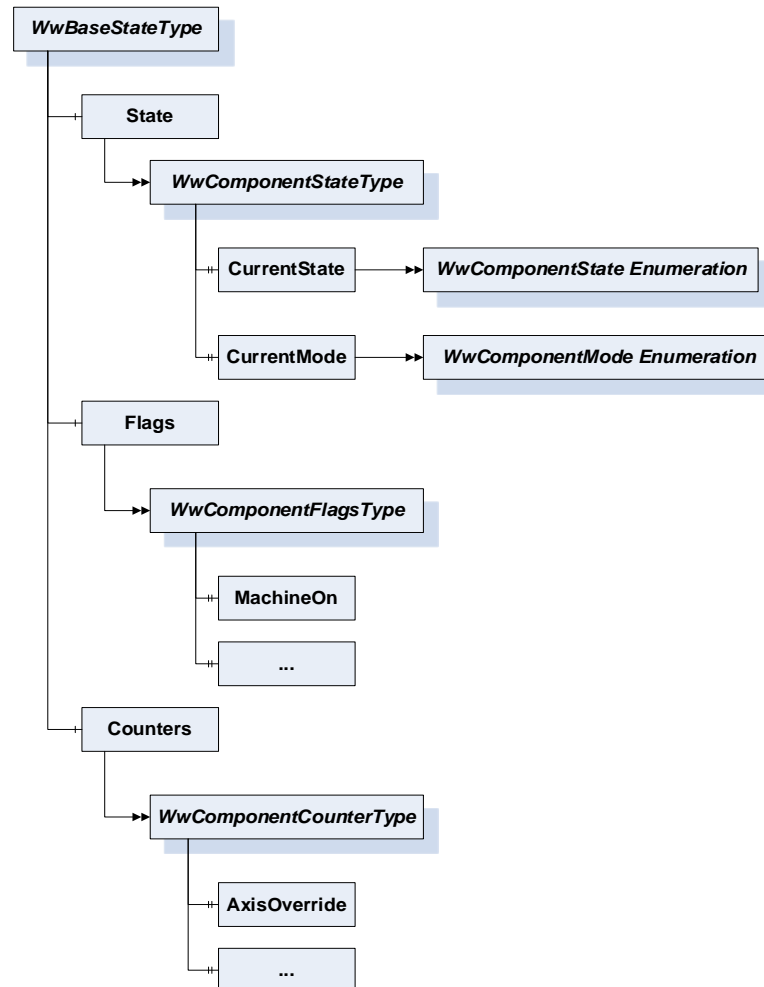
## Overview of the WwStateType



# Content of the WWM companion specification



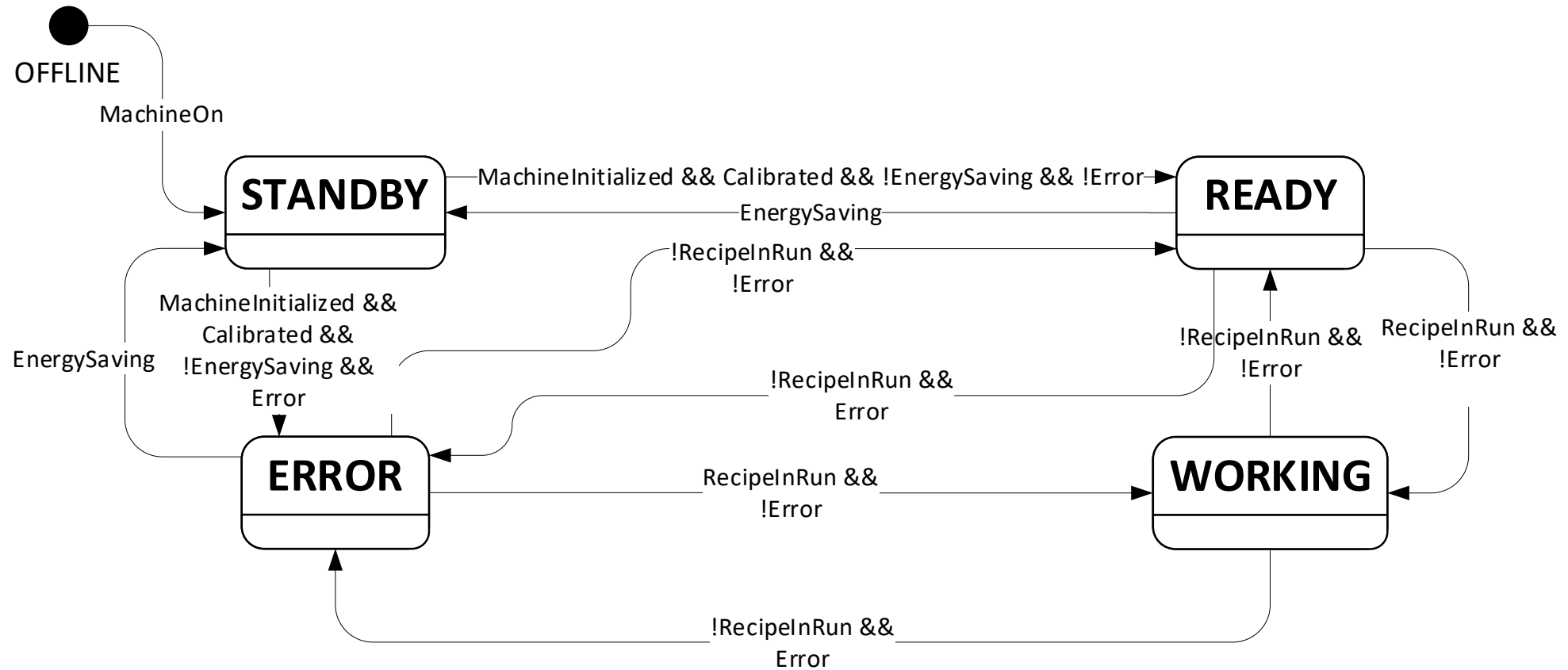
## State diagram of the ComponentState



# Content of the WWM companion specification



## State diagram of the ComponentState



# Content of the WWM companion specification



## WwComponentStateEnumeration Values

Name	Description
OFFLINE_0	The component is offline.
STANDBY_1	The component is in standby.
READY_2	The component is ready to start working.
WORKING_3	The component is working.
ERROR_4	The component is not able to start working because it has an error.

# Content of the WWM companion specification



## WwComponentModeEnumeration Values

Name	Description
OTHER_0	This state is used if none of the other states below applies.
AUTOMATIC_1	The component is in automatic mode.
SEMI_AUTOMATIC_2	The component is in semi-automatic mode.
MANUAL_3	The component is in manual mode.
SETUP_4	The component is in setup mode.
SLEEP_5	The component is in sleep mode. Component is still switched on, energy consumption reduced by e.g. reducing heating, switching drives off. Production is not possible.

# Content of the WWM companion specification



## WwComponentFlagsType Definition

Attribute	Value				
BrowseName	WwComponentFlagsType				
IsAbstract	False				
References	Node Class	BrowseName	Data Type	Type Definition	Other
Subtype of the 0:BaseObjectType defined in OPC UA Part 5					
0:HasComponent	Variable	MachineOn	0:Boolean	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	MachineInitialized	0:Boolean	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	PowerPresent	0:Boolean	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	AirPresent	0:Boolean	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	DustChipSuction	0:Boolean	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	Emergency	0:Boolean	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	Safety	0:Boolean	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	Calibrated	0:Boolean	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	Remote	0:Boolean	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	WorkpiecesPresent	0:Boolean	0:BaseDataVariableType	M, RO
...	...	...	...	...	...

# Content of the WWM companion specification



## WwComponentCountersType Definition

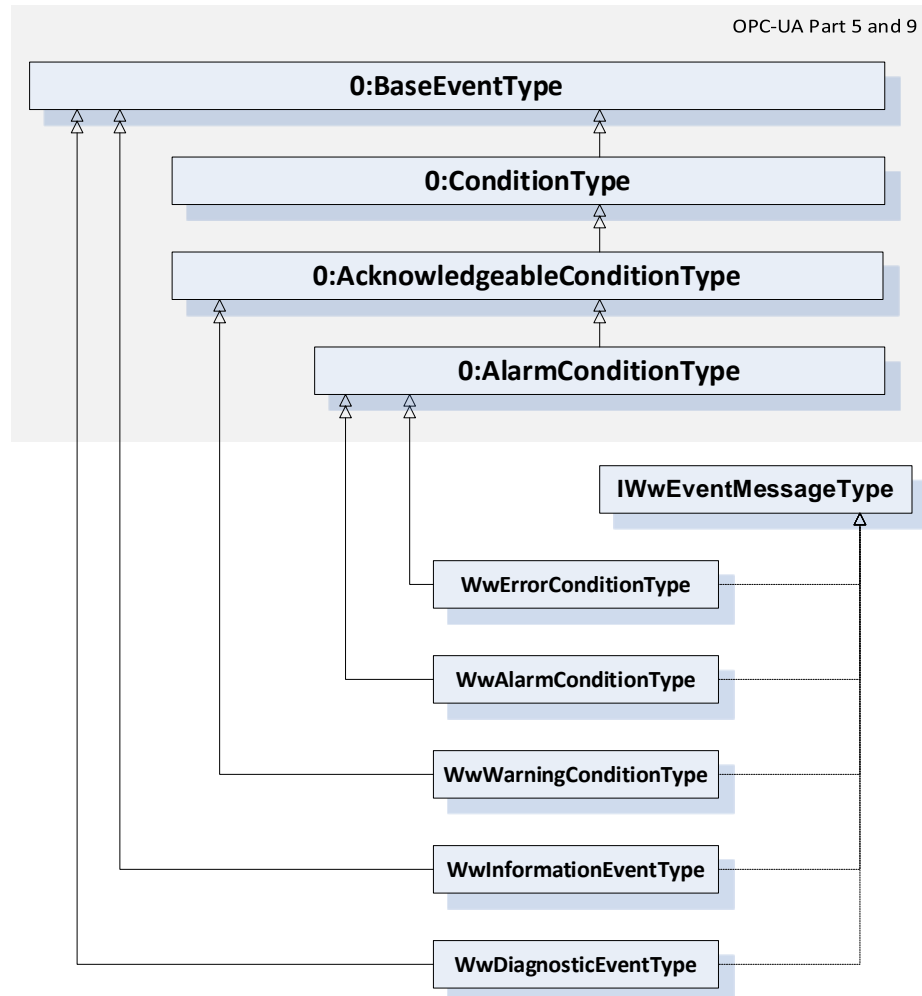
Attribute	Value				
BrowseName	WwComponentCountersType				
IsAbstract	False				
References	Node Class	BrowseName	Data Type	Type Definition	Other
Subtype of the 0:BaseObjectType defined in OPC UA Part 5					
0:HasComponent	Variable	AxisOverride	0:UInt32	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	SpindleOverride	0:UInt32	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	FeedSpeed	0:Double	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	LastStartedRecipe	0:String	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	AbsoluteOfflineTime	0:UInt64	0:BaseDataVariableType	O, RO
0:HasComponent	Variable	AbsoluteStandbyTime	0:UInt64	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	AbsoluteReadyTime	0:UInt64	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	AbsoluteWorkingTime	0:UInt64	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	AbsoluteErrorTime	0:UInt64	0:BaseDataVariableType	M, RO
0:HasComponent	Variable	AbsoluteMachineOnTime	0:UInt64	0:BaseDataVariableType	O, RO
...	...	...	...	...	...



# Content of the WWM companion specification



## WwAlarmType Definition



# Content of the WWM companion specification



## IWwEventMessageType Definition

Attribute	Value				
BrowserName	IWwEventMessageType				
IsAbstract	True				
References	Node Class	BrowserName	DataType	TypeDefinition	Other
Subtype of the 0:BaseInterfaceType defined in OPC 10001-7					
0:HasProperty	Variable	MessageId	0:String	0:PropertyType	M, RO
0:HasProperty	Variable	MessageName	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	PathParts	0:String[]	0:PropertyType	M, RO
0:HasProperty	Variable	Group	0:String	0:PropertyType	O, RO
0:HasProperty	Variable	LocalizedMessages	0:LocalizedText[]	0:PropertyType	O, RO
0:HasProperty	Variable	Arguments	WwMessageArgumentDataType[]	0:PropertyType	O, RO

# Harmonization with other Companion Specifications



- » From the beginning in July 2018 we work very close with the other JWGs in VDMA and VDW
  - We learned a lot specially from the persons creating the Machine Tools companion specification
- » We are part of the Machinery Group in VDMA
  - As soon as new definitions are available we use them directly in our companion specification
- » We get a very good support by the OPC UA department in VDMA

# Timetable



- » In July 2018 we started our activities
- » In January 2020 we presented the first draft version of our companion specification to the public
- » On December 2020 we plan to present our release candidate

**Thank you**  
**Thank you**  
for your attention!