# umati – Machine Tools Information Model

# OPC 40501-1 UA for Machine Tools

## Part 1: Machine Monitoring and Job Overview

Götz Görisch, German Machine Tool Builders Association (VDW)

# Preliminary Remark

umati
universal
machine technology
interface

≠

Standardization
**„OPC UA for Machine Tools“**

„Marketing Community“
Propagation of use of open standards

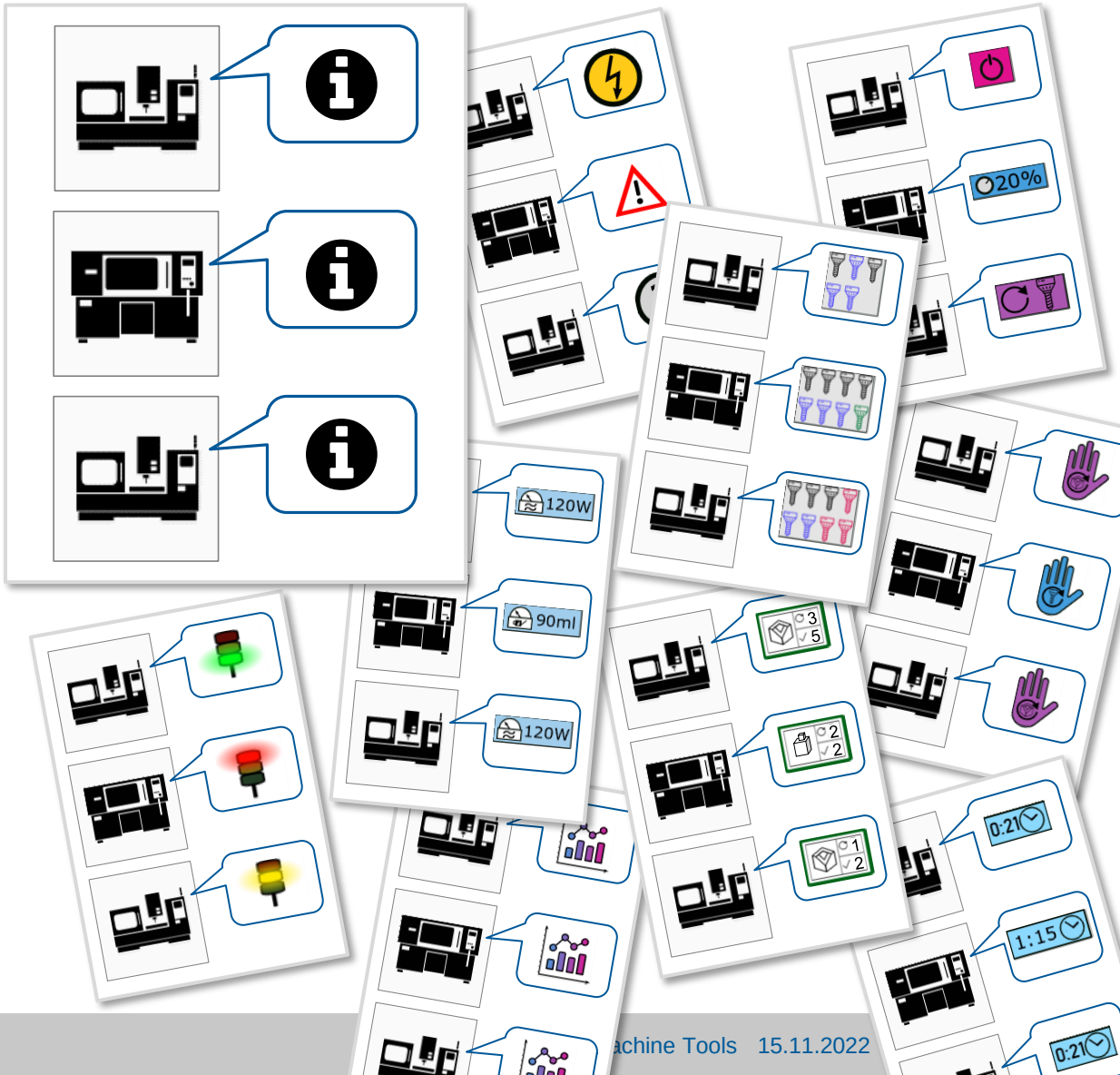
**currently sponsored by VDMA and VDW**

Joint Working group with OPC Foundation

**sponsored/hosted by VDW**

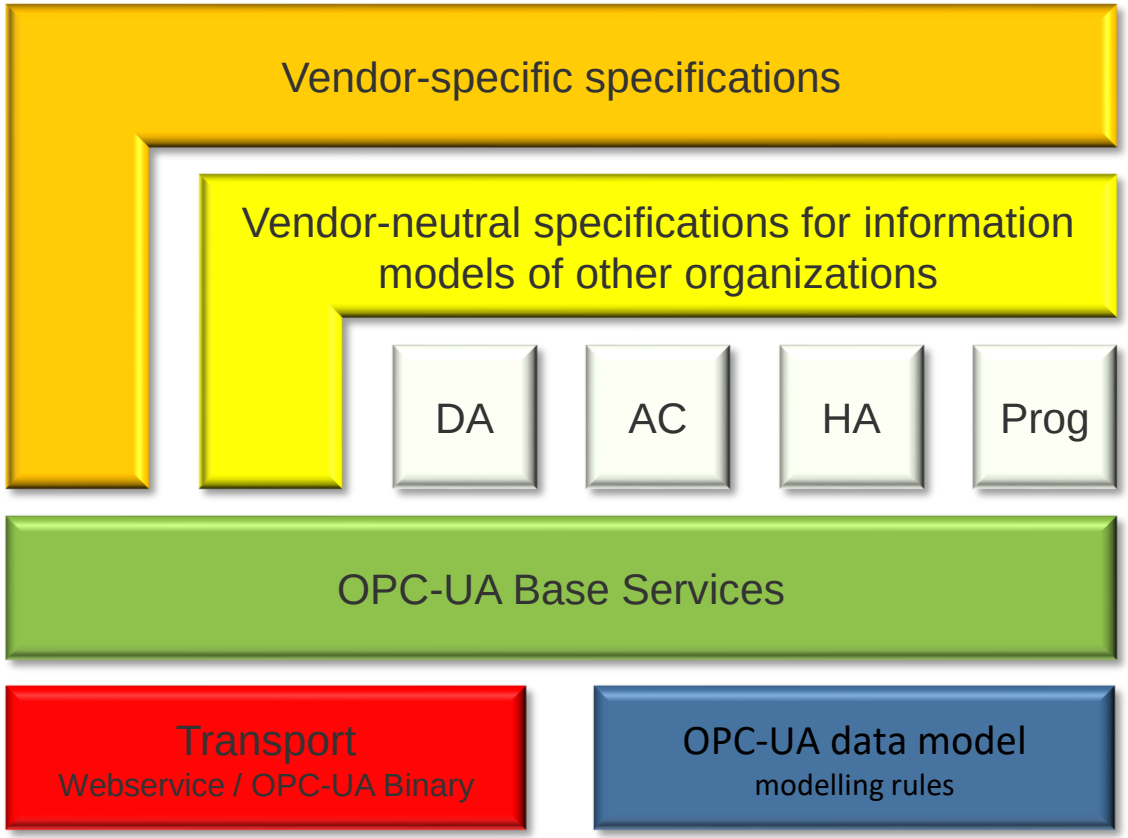
# Machine Tools Use Cases

1. Identify machines of different manufacturers
2. Overview if production is running
3. Overview of parts in a job
4. Overview of runtimes for a job
5. Overview of machine tool state
6. Overview of upcoming manual activities
7. Overview of errors and warnings
8. Providing information for KPI calculations
9. Providing an overview of tool data
10. Providing OPC UA for Machinery Use Cases



# OPC UA Architektur

IEC 62541



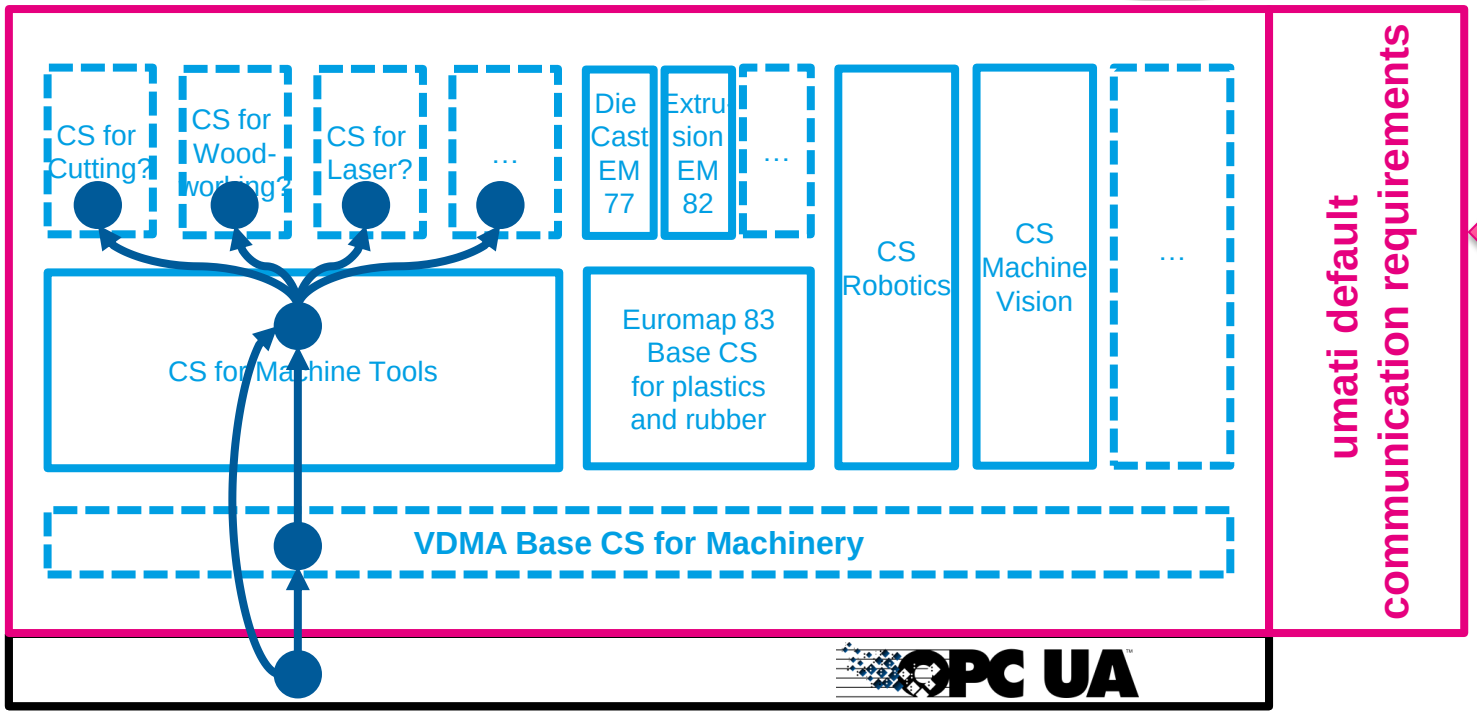

OPC UA for Machine Tools

nach: Wikipedia

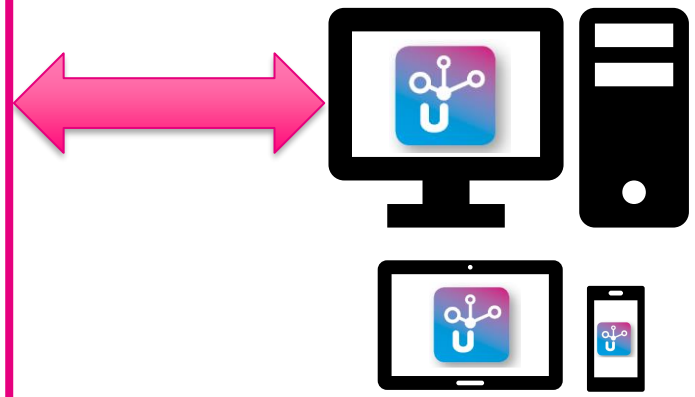
# Inheritance of Types and increasing specificity of specifications

- OPC UA Companion Specifications can be used world wide for free
- umati is a „marketing/quality assurance club“ independent of a single specification
- umati could integrate a wide variety of CSs

**Machinery: must use „umati endorsed“ OPC UA CSs**

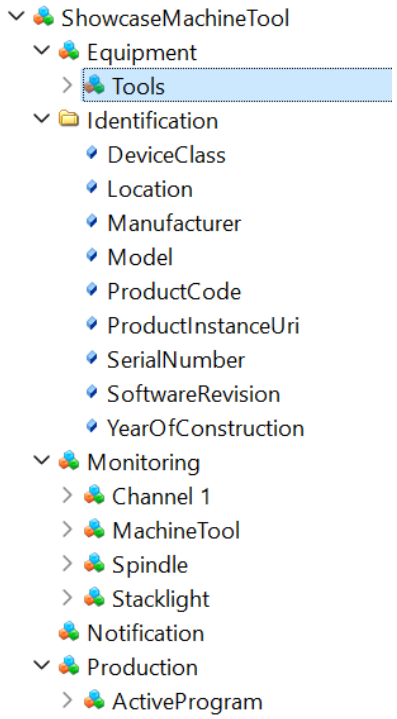


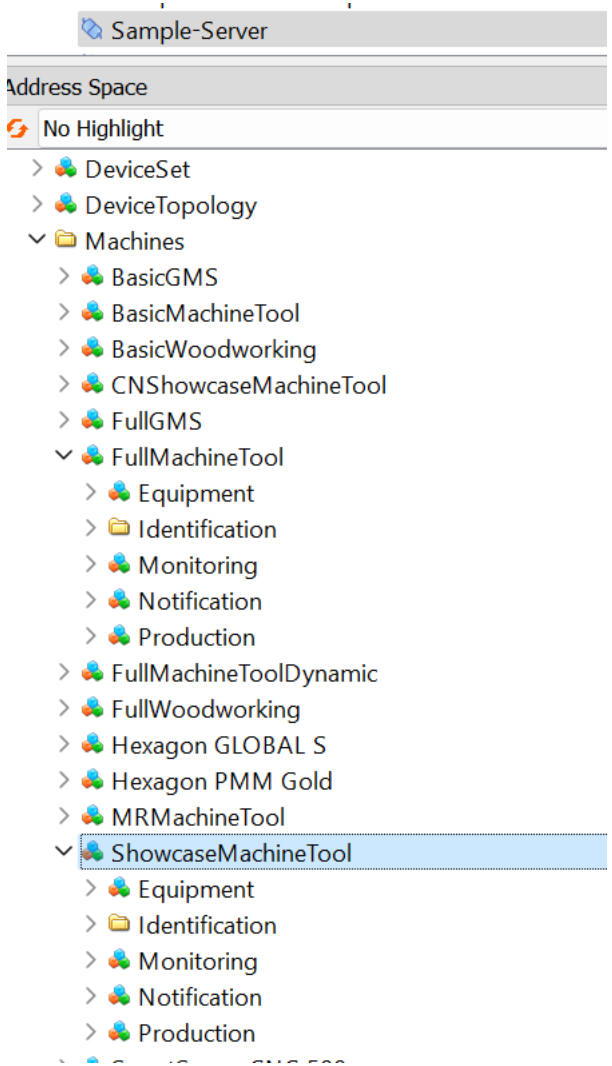

**Software: must be able to load „umati endorsed“ OPC UA CSs**



# SampleServer

- Public reachable instance: **opc.tcp://opcua.umati.app:4840** (none/anonymous)
  (Source: https://github.com/umati/Sample-Server)
- Backup: **opc.tcp://opcua3.umati.app:4840/UA**



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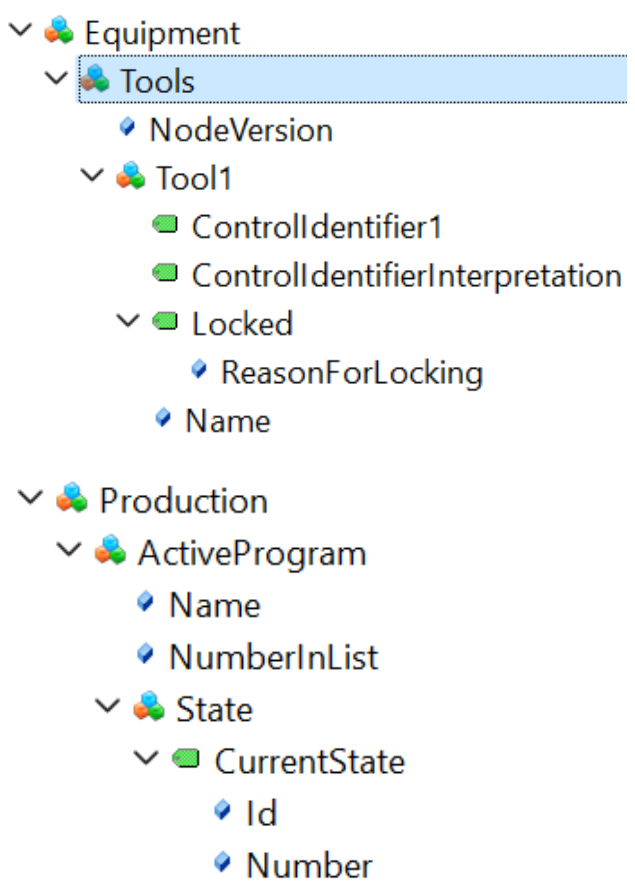
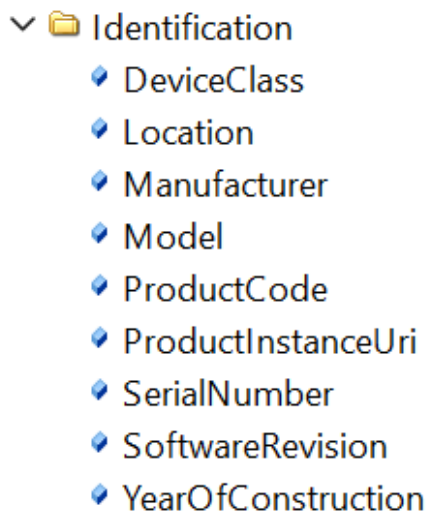
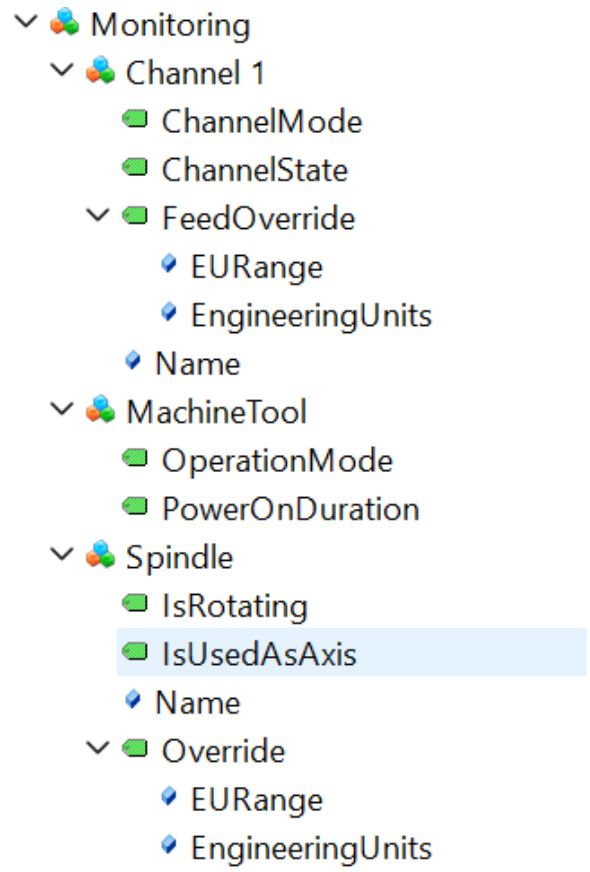
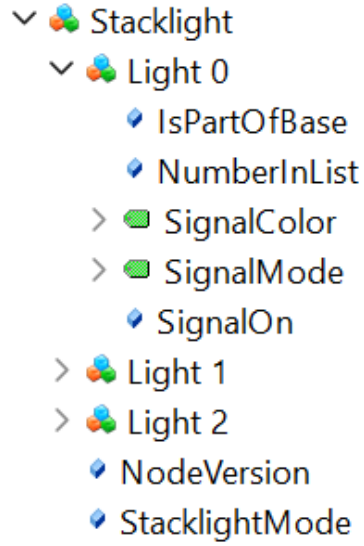
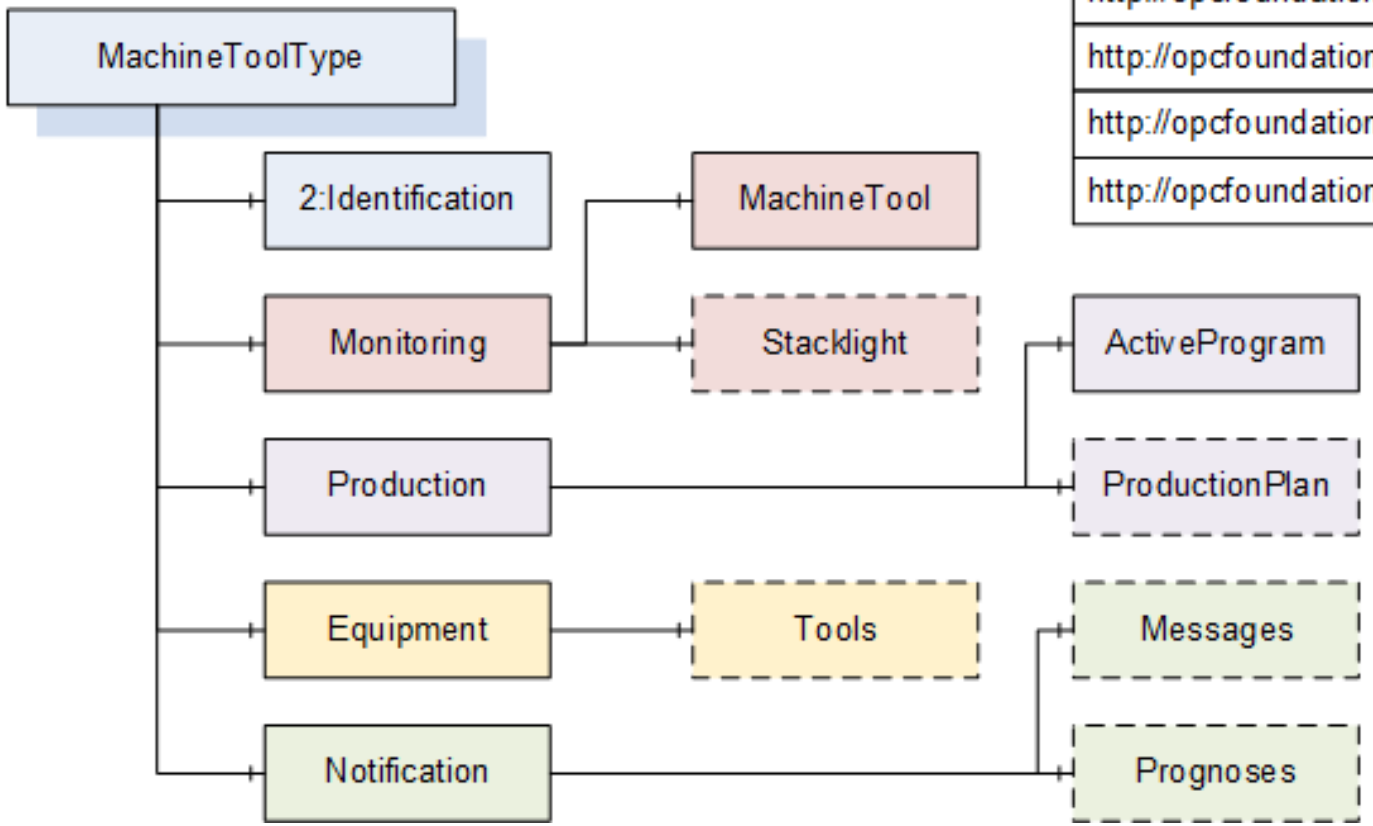


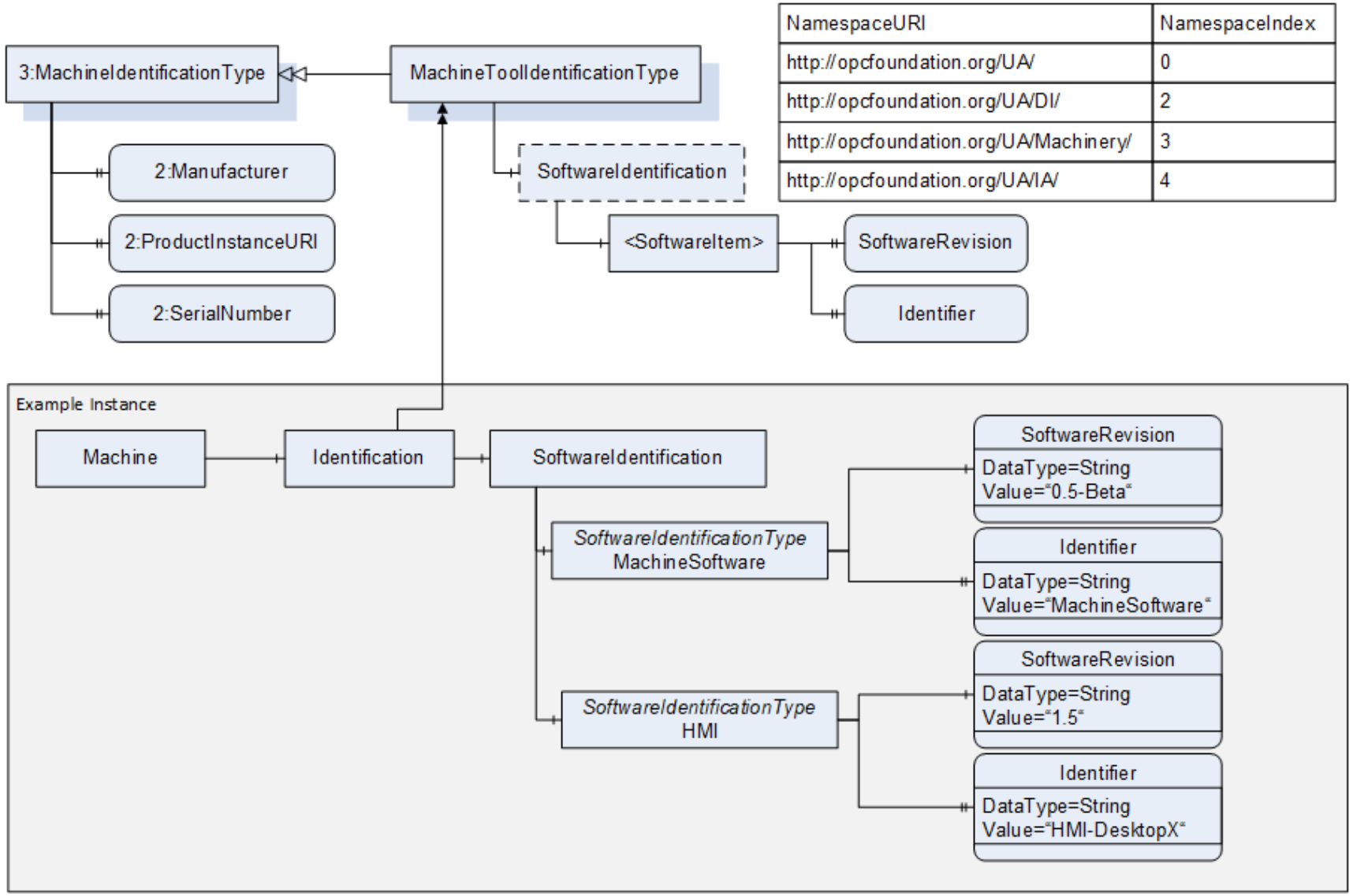



# Machine Tools Information Model




| NamespaceURI | NamespaceIndex |
|---|---|
| http://opcfoundation.org/UA/ | 0 |
| http://opcfoundation.org/UA/DI/ | 2 |
| http://opcfoundation.org/UA/Machinery/ | 3 |
| http://opcfoundation.org/UA/IA/ | 4 |

# Identification

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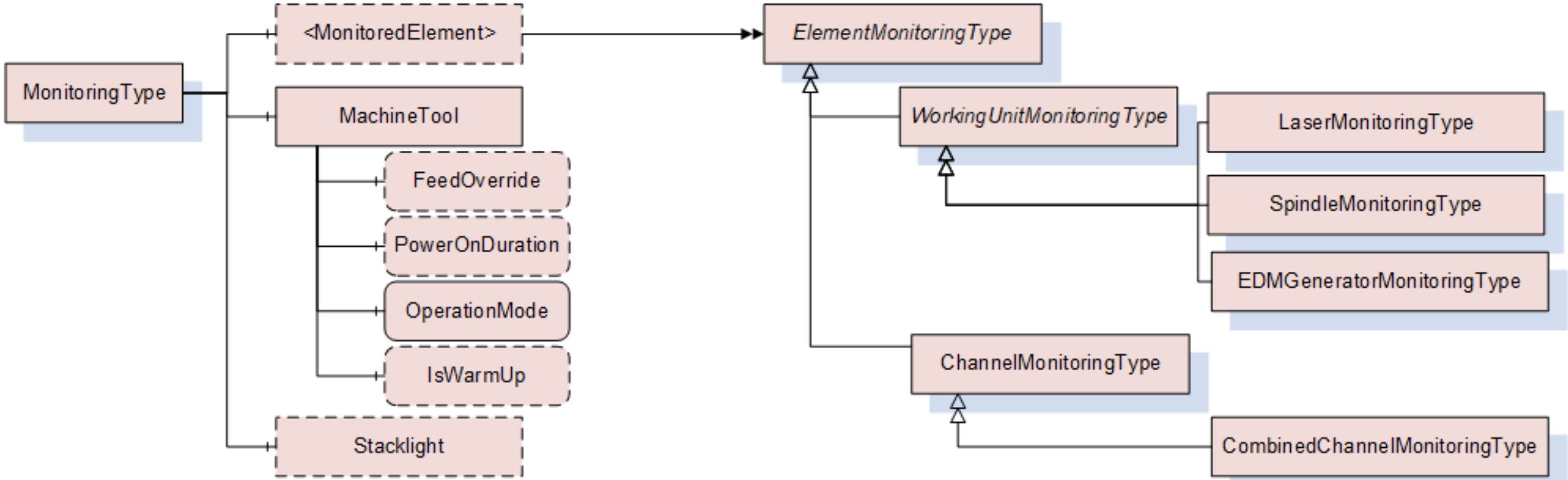
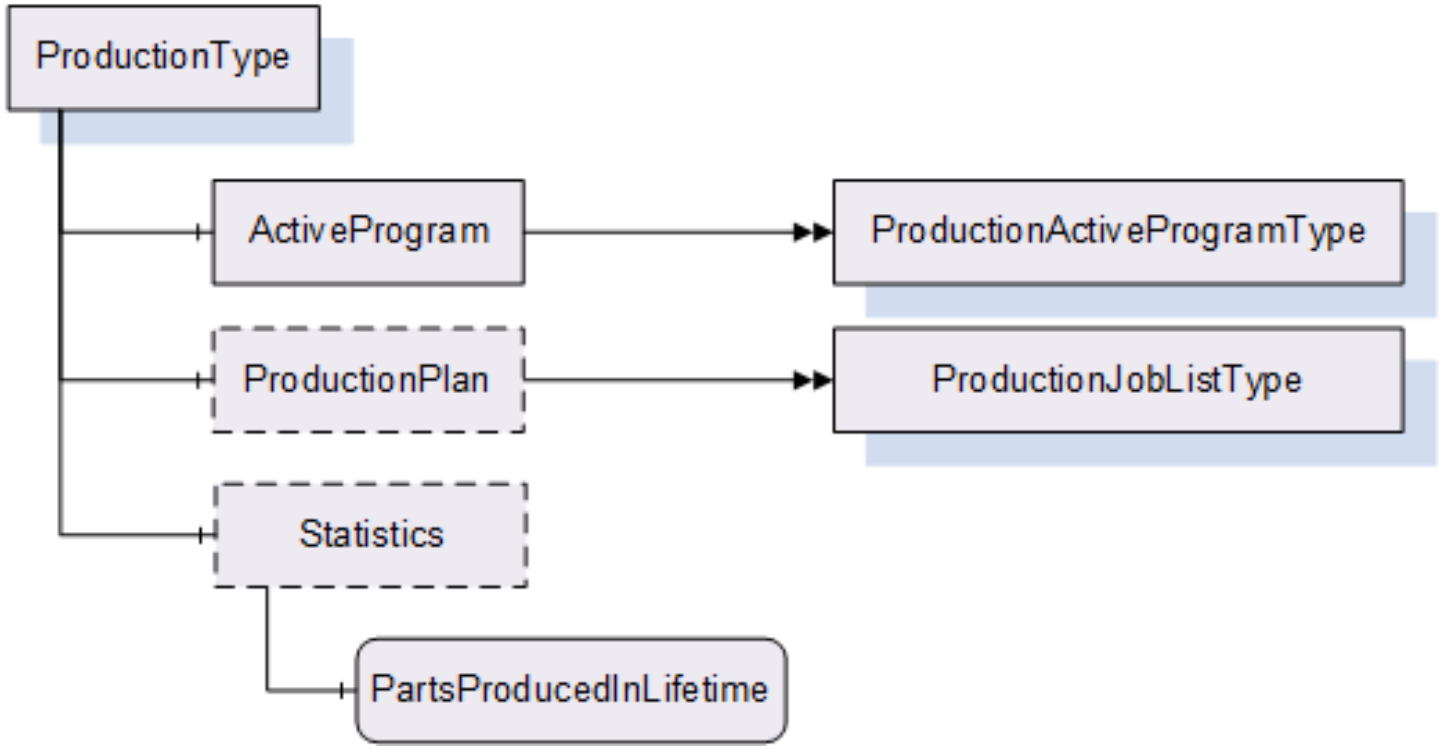
| http://opcfoundation.org/UA/IA/ | 4 |

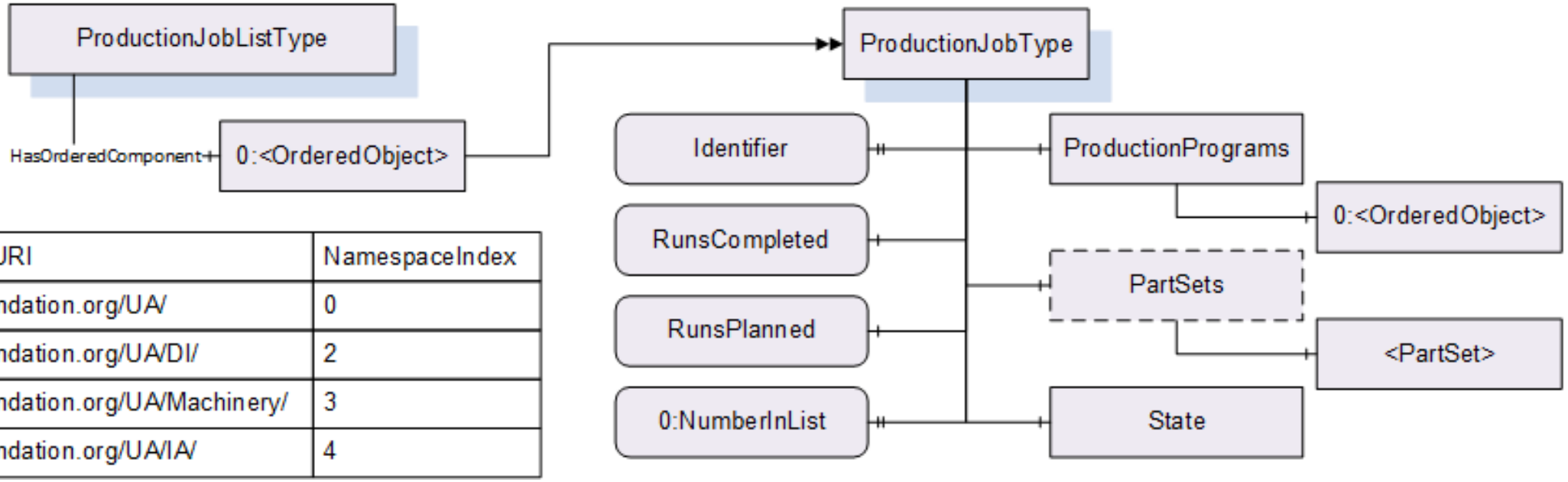
# Monitoring


<MonitoredElement>
ElementMonitoringType
MonitoringType
MachineTool
WorkingUnitMonitoringType
LaserMonitoringType
FeedOverride
SpindleMonitoringType
PowerOnDuration
EDMGeneratorMonitoringType
OperationMode
ChannelMonitoringType
IsWarmUp
Stacklight
CombinedChannelMonitoringType

# Production


ProductionType
ActiveProgram
ProductionActiveProgramType
ProductionPlan
ProductionJobListType
Statistics
PartsProducedInLifetime

# ProductionJobListType (ProductionPlan)

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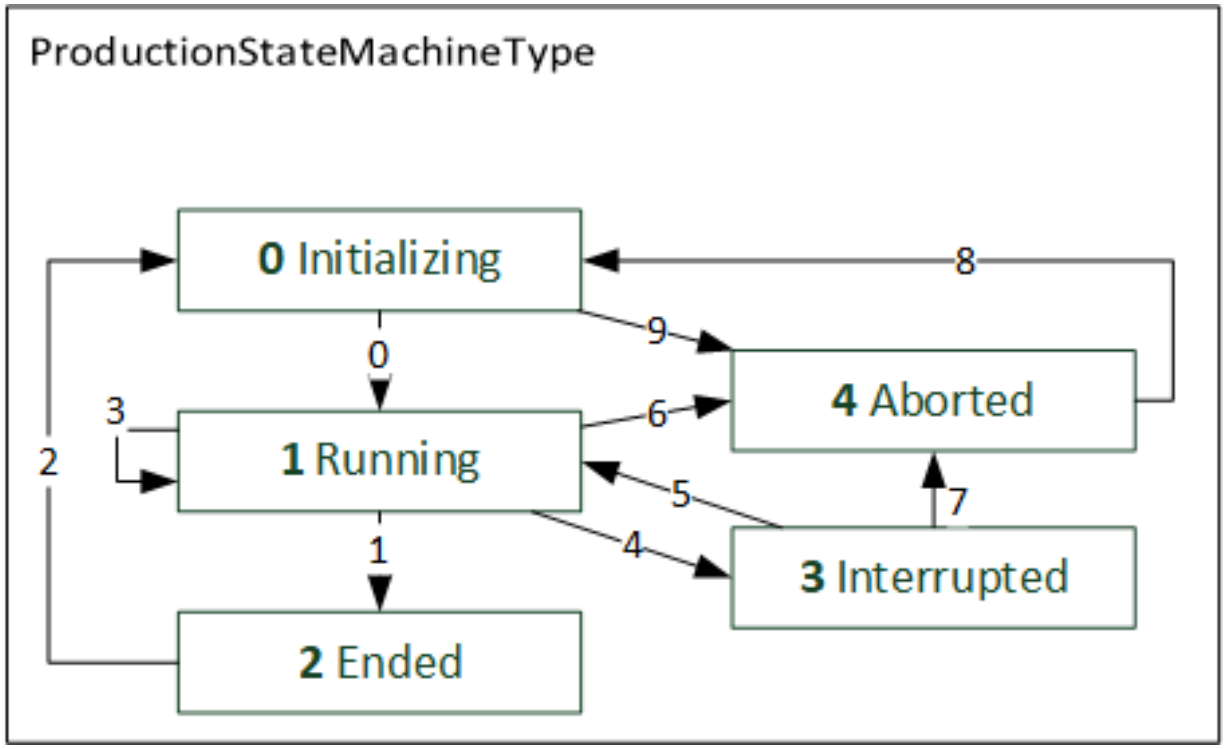
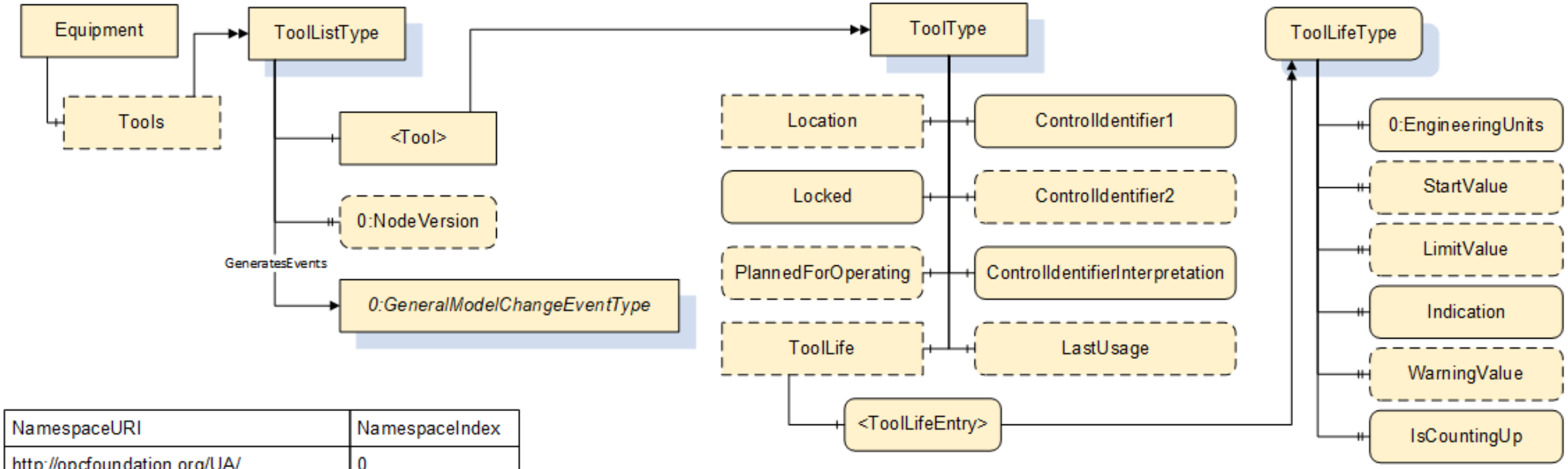
| http://opcfoundation.org/UA/Machinery/ | 3 |
| http://opcfoundation.org/UA/IA/ | 4 |

# ProductionStateMachineType



# Equipment

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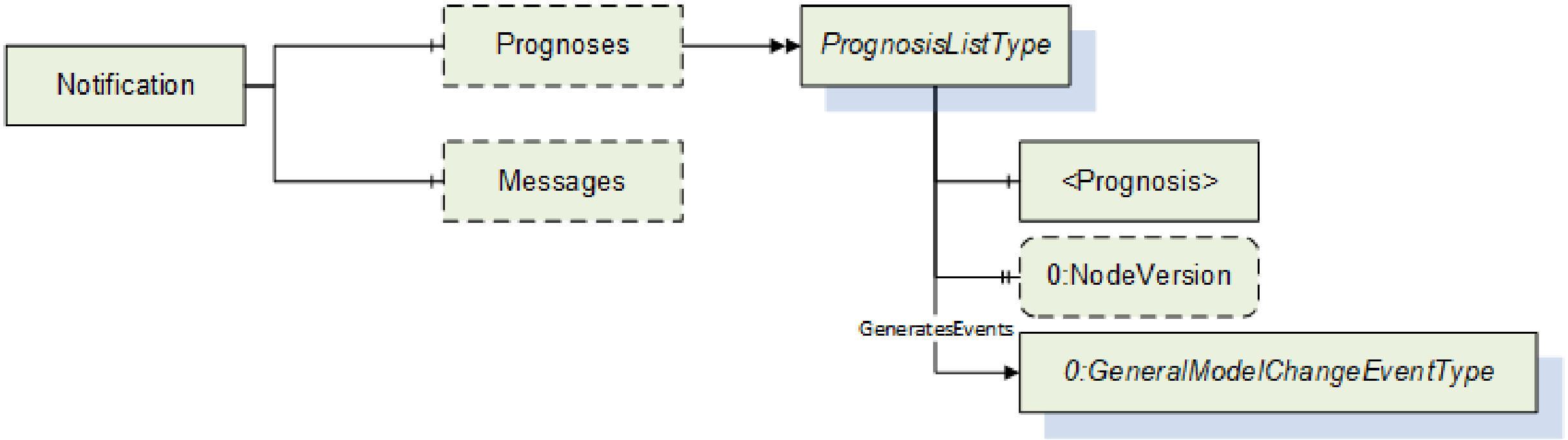
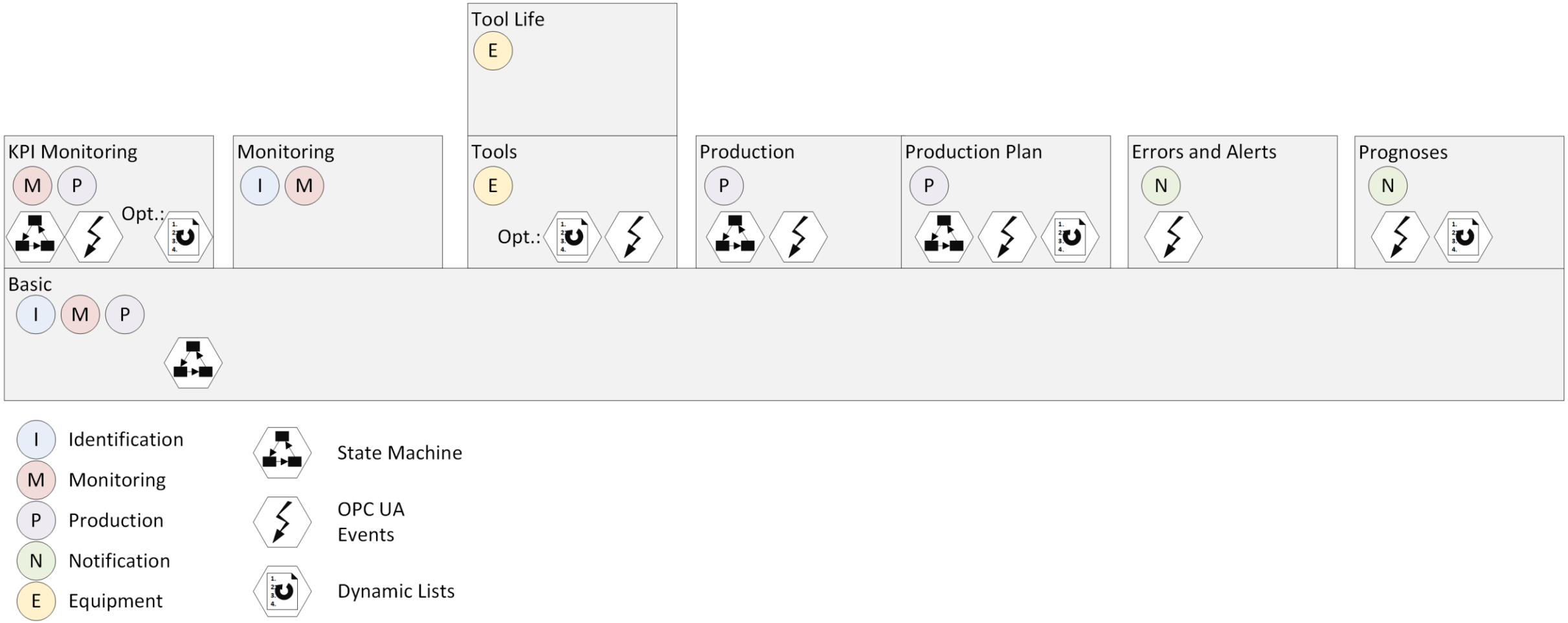
| http://opcfoundation.org/UA/Machinery/ | 3 |
| http://opcfoundation.org/UA/IA/ | 4 |

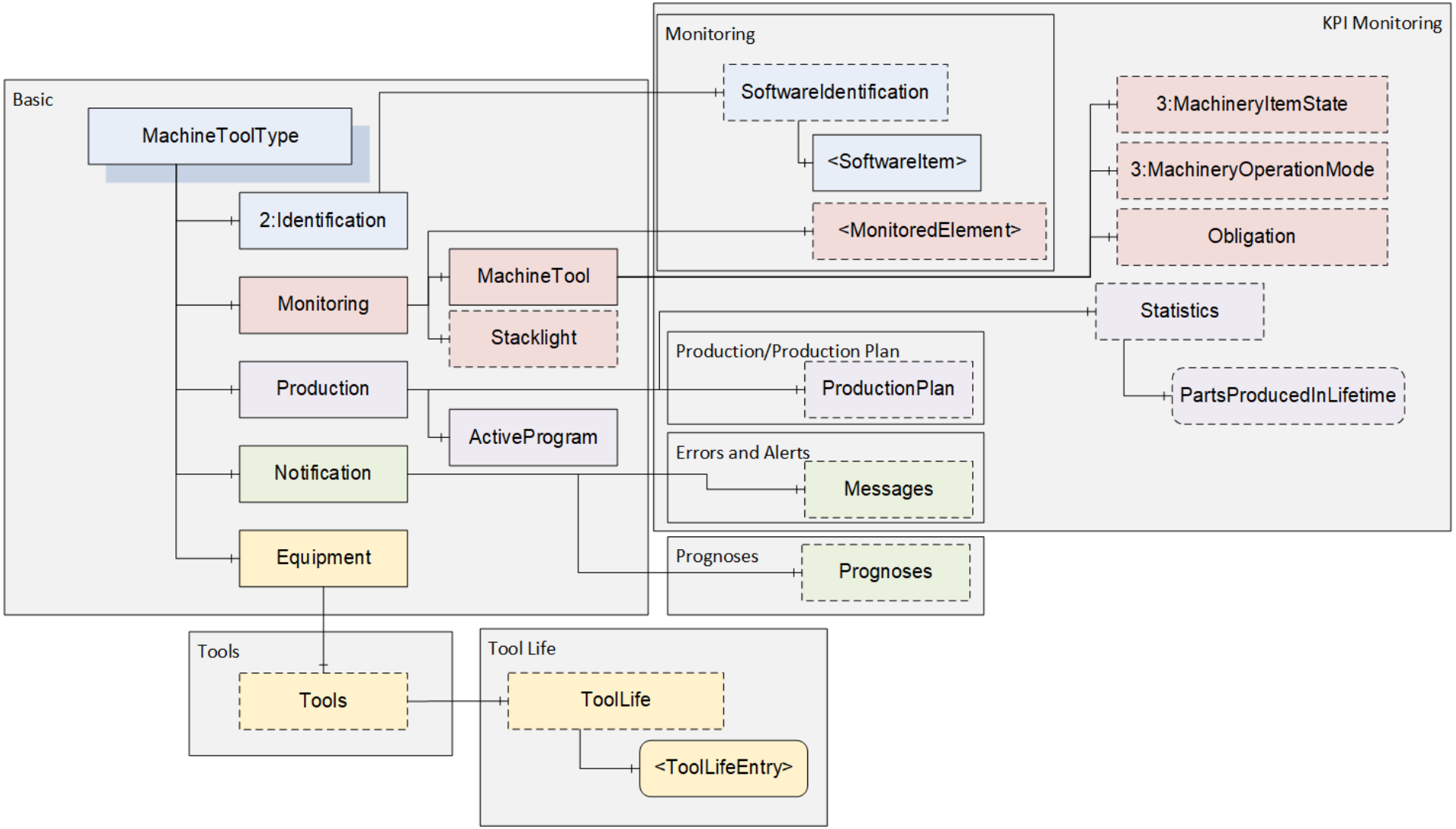
# Notification



# Facets


Tool Life
E
KPI Monitoring
M
P
Opt.:
Monitoring
I
M
Tools
E
Opt.:
Production
P
Production Plan
P
Errors and Alerts
N
Prognoses
N
Basic
I
M
P
I Identification
M Monitoring
P Production
N Notification
E Equipment
State Machine
OPC UA Events
Dynamic Lists

# Facets – AddressSpace View



# Datahub

- Opc.tcp://datahub.umati.app:4840
- Sign&Encrypt Basic256Sha256
- User: umati-user
- Password: https://umati.org/about/#vision

- OPC UA for Machine Tools Online Reference: https://reference.opcfoundation.org/MachineTool/docs/

**Thank you**
for your attention!

For further information please contact: Goetz Goerisch g.goerisch@vdw.de