



Automating the Digital Thread

Sept 2022

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Executive Vice President
Customer Engagements



Some of eQ Customers...

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Accelerating Digital Transformation

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Need for Digital Transformation

Substantial improvements in
Productivity & Efficiency



Substantial reduction in non value
added time and efforts



Innovative business models
NPI - First mover advantage



Ultimate benefits

Top and bottom line improvements
Sustained competitive advantages
High customer satisfaction & retention
Motivated & energized employees



a Data as a Service (DaaS) platform



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eQube® platform forms a Data Fabric of integrated data, applications, and devices that puts the power of analytics in the hands of end-users.

any data – at any speed, any application, any API, any format, any device ...

Digital Backbone – Actionable Insight



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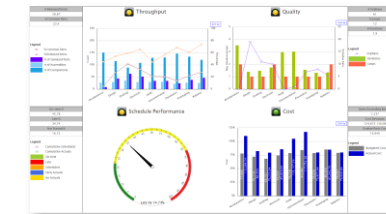
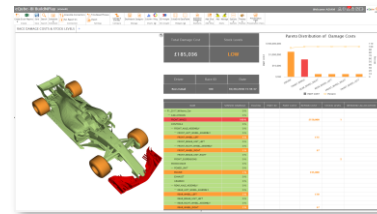
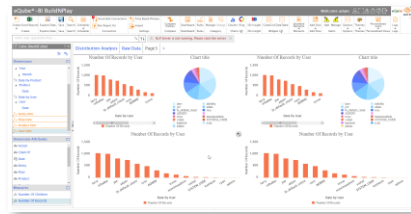
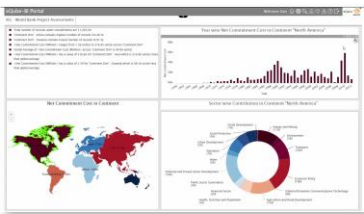
Throughput

Cycle Time

Cost

Quality

On Time Performance



Enterprise-wide BI

eQube BI

CAMEO
ENTERPRISE ARCHITECTURE
Teamwork Cloud



Bitbucket



Confluence

ANSYS

TEAMCENTER

ORACLE
JAGLE
PLM



ORACLE
E-BUSINESS SUITE



IBM
MAXIMO



Legacy
Systems / dB

Files

Sensors

Data
Warehouse



thingworx



eQube®-MI Digital Backbone

Jira Software



ANSYS
GRANTA



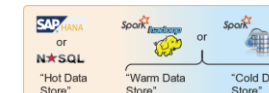
PTC® Windchill®



SOLUMINA



N*SQL
Databases



Enterprise Data Lake



Mentor
Graphics
DMS





Integration Suite

- eQube-MI: Low / No-code integration platform
 - Digital Backbone for the Enterprise
 - For application migration, synchronization, and integration (data federation & replication)
 - Catalog: Discover, reuse, or repurpose processing pipelines
- eQube-TM: Catalog & Metadata management for Models & Maps
 - Define solution models and map systems to the model
 - Catalog: Discover, reuse, or repurpose models and maps
- eQube-API Gateway: API Gateway for complete API Lifecycle management
 - Efficiently create, publish, monitor, maintain & secure APIs
 - Catalog: Discover, reuse, or repurpose APIs (OData, REST, Webservices)

Analytics Suite

- eQube-BI: Modern BI / Analytics platform
 - Actionable Insight
 - Data mash-ups: Analytics & BI for enterprise-wide visibility (COTS, legacy , IoT) honoring security of connected systems
 - Sentence based analytics
- eQube-ADA – Augmented data analytics
 - ML based automated data discovery and semantic modeling
- eQube-DP – Data curation, discovery and profiling
 - Understand quality and composition of data

eQube®-DaaS solutions

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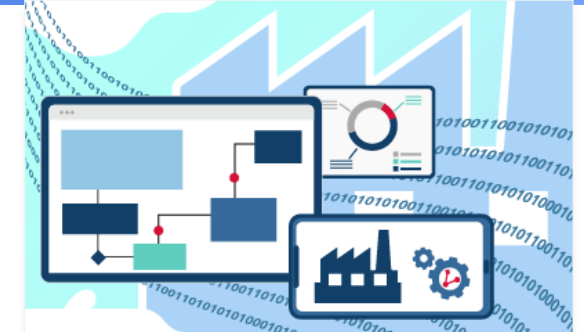
Digital Thread / MBE



Enterprise Search with security



Multi-PLM environment



Common Data Model and
API factory



Build 'For-purpose' apps fast



Secure Collaboration



Business process Orchestration



Application consolidation /
migration

Images hyperlinked for more information and video demonstrations

eQube®-DaaS solutions

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Smart Master data management



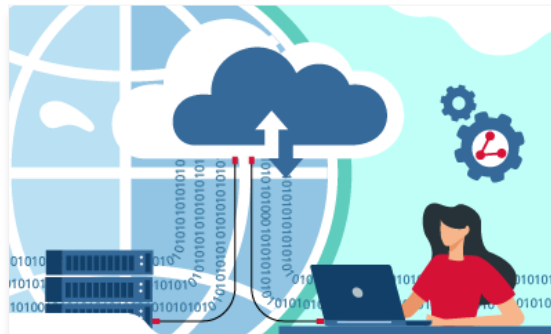
Real-time KPIs & Dashboards



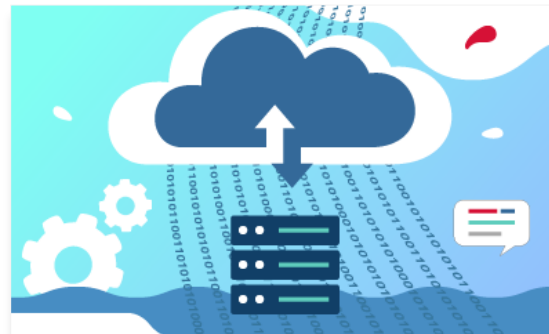
Augmented data analytics



IoT / Big Data solutions



Hybrid deployments



Create and manage a Data Lake

Available and in use Today
across the Industry

Select images for more information and Video Demonstrations

Building a Digital Fabric - Powered by eQube® - DaaS

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Actors

SysML Tool

ie: Cameo, AFSym, Confluence, Rational

JIRA

DOORS

Minerva

Windchill

Orchestration

Automated Digital Fabric

Navigable Links

Manual Delegated Links

Enterprise Search





- Data Fabric: establishes a robust, scalable, secure, & flexible data fabric
- Low/No-code integration platform: unique capability for rapid solutions implementation
- Heterogenous systems: agnostic to any application or data source – neutral platform
 - 65+ OOTB connectors released in the market (ALM, PLM, ERP, MES, MRO, CRM, databases – relational & No-SQL, streaming, files, data warehouse /lake,....)
 - Platform is upgrade tolerant
- Integrated data virtualization layer: effectively deals with any data, any format, any API, at any speed...
 - Provides OOTB capabilities of data mash-ups, data federation, replication, smart caching, migration
- Security: connected application level, authentication methods (NTLM, SAML, Kerberos, Certificate based..), secure collaboration
- Deployment flexibility: VMs, Containers – on-prem, multi-cloud, hybrid

2021 USAF DaaS and Integration Study -



ected Winner



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Headquarters U.S. Air Force

Integrity - Service - Excellence

Digital Engineering Partner
Interoperability



U.S. AIR FORCE



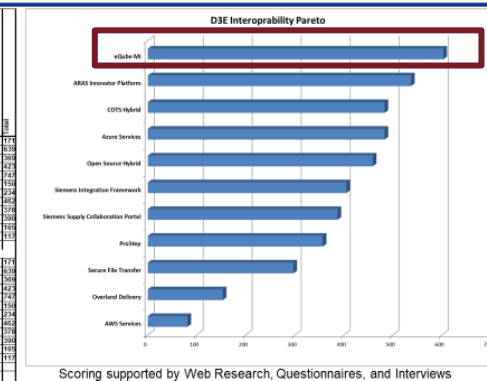
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Evaluation Results

Customer Expectation	Interoperability	API Alignment	Data Encryption	Ease and Time of Upgrade	Single and Bulk Data Load	Token Based	Capability Alignment	Ease and Time of Data Model Changes	Open Market/Train up Staff	Resilience	Supporting Infrastructure Alignment	API Library Depth and Breadth
API Alignment with AF needs	5	1	1	1	1	1	1	1	1	1	1	1
Data Encryption	5	1	1	1	1	1	1	1	1	1	1	1
Ease and Time of Upgrade	5	1	1	1	1	1	1	1	1	1	1	1
Single and Bulk Data Load	5	1	1	1	1	1	1	1	1	1	1	1
Token Based	5	1	1	1	1	1	1	1	1	1	1	1
Capability Alignment	5	1	1	1	1	1	1	1	1	1	1	1
Ease and Time of Data Model Changes	5	1	1	1	1	1	1	1	1	1	1	1
Open Market/Train up Staff	5	1	1	1	1	1	1	1	1	1	1	1
Resilience	5	1	1	1	1	1	1	1	1	1	1	1
Supporting Infrastructure Alignment	5	1	1	1	1	1	1	1	1	1	1	1
API Library Depth and Breadth	5	1	1	1	1	1	1	1	1	1	1	1



Scoring supported by Web Research, Questionnaires, and Interviews

Integrity - Service - Excellence



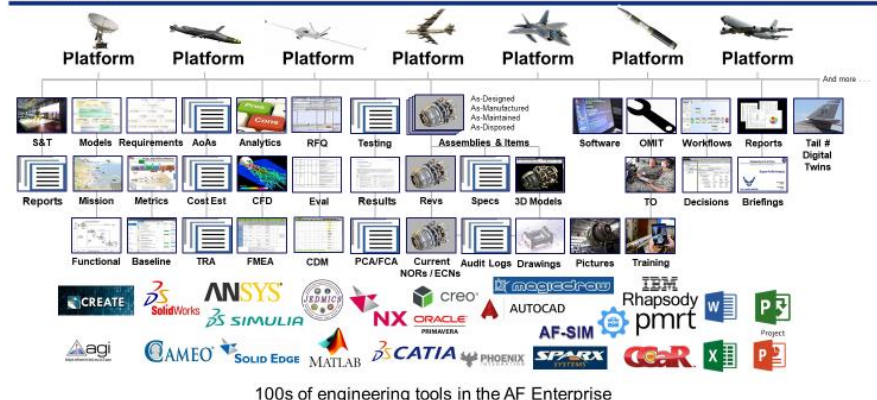
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Digital Engineering Products

Most are Decisions, Information, or Data



100s of engineering tools in the AF Enterprise

Integrity - Service - Excellence





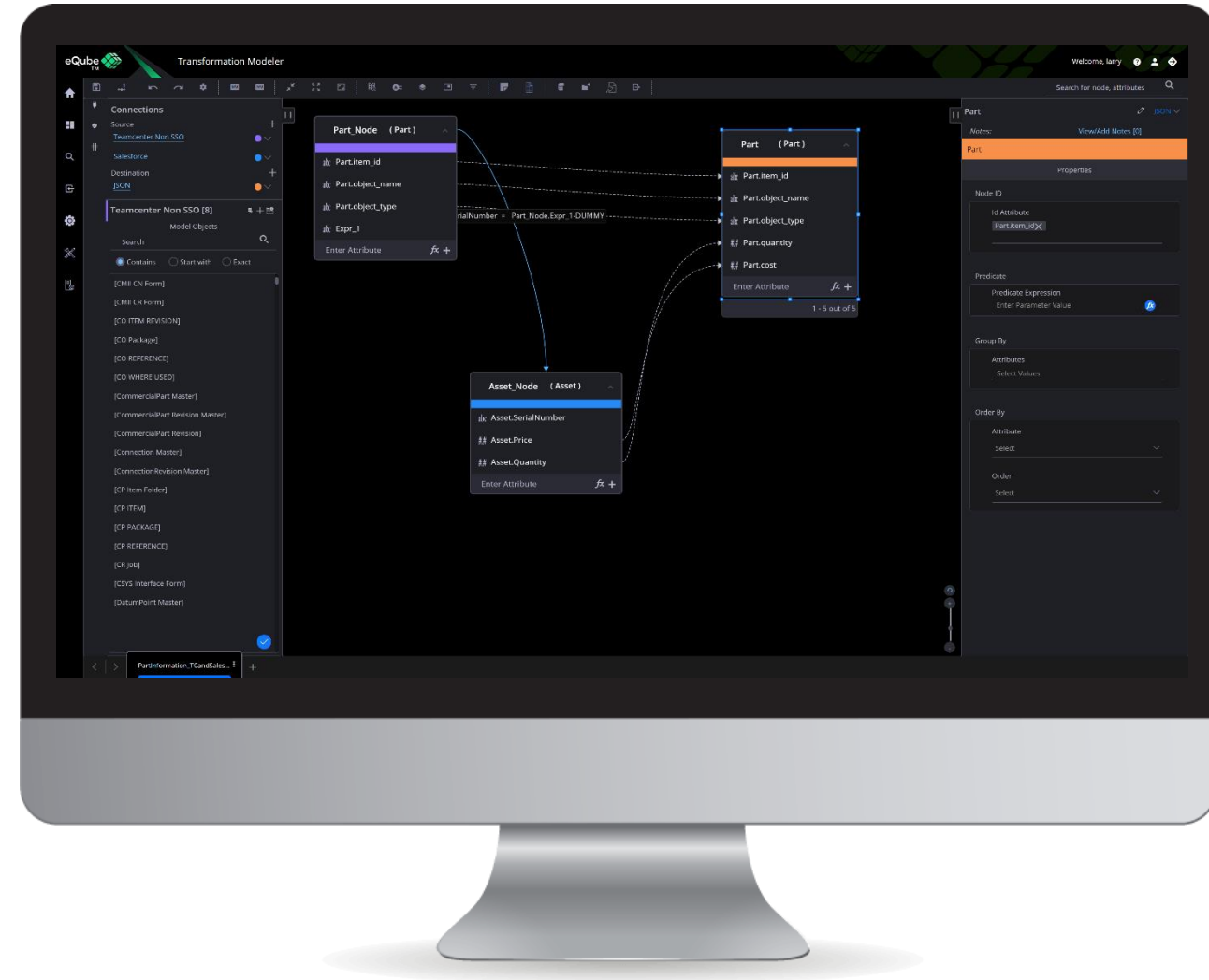
We Simply Deliver!

eQube®-TM: Catalog & Metadata management for Models & Maps



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- Define solution 'model'
 - OData or JSON Model for an Interface or 'For-Purpose' app
- Define solution 'maps'
 - Map source system (s) to solution model or destination systems (objects, tables, JSON, XML, files)
 - All objects, relationships & attributes available for each connected system (OOTB + Custom)
 - Capture transformation rules, annotations, & tags
 - Capture indices and cache objects with indices (for solutions such as: Enterprise Search, Digital Thread, etc.)
- Capability to handle simple to complex maps & models
 - BOPs, BOMs – EBOM / MBOM / LBOM / As-maintained ...
 - Composite keys to uniquely identify entities (Parts...)
- Catalog
 - Capture, Discover, Reuse, Repurpose models and maps with transformation rules
- Integrated with eQube offerings
 - eQube-AG – TM model & maps for API definition
 - eQube-MI – Directly consume TM maps in MI processing pipelines for an interface or service definition and execution



Source
Teamcenter Non SSO

Destination
JSON

Teamcenter Non SSO [8]

Model Objects

Search

Contains

Start with

Exact

[CMII CN Form]

[CMII CR Form]

[CO ITEM REVISION]

[CO Package]

[CO REFERENCE]

[CO WHERE USED]

[CommercialPart Master]

[CommercialPart Revision Master]

[CommercialPart Revision]

[Connection Master]

[ConnectionRevision Master]

[CP Item Folder]

[CP ITEM]

[CP PACKAGE]

[CP REFERENCE]

[CR Job]

[CSYS Interface Form]

[DatumPoint Master]

Part_Node (Part)

abc Part.item_id

abc Part.object_name

abc Part.object_type

abc Expr_1

Enter Attribute *fx* +

Part (Part)

abc Part.item_id

abc Part.object_name

abc Part.object_type

Part.quantity

Part.cost

Enter Attribute *fx* +

1 - 5 out of 5

Asset_Node (Asset)

abc Asset.SerialNumber

Asset.Price

Asset.Quantity

Enter Attribute *fx* +

Part

Notes: View/Add Notes [0]

Part

Properties

Node ID

Id Attribute

Part.item_idX

Predicate

Predicate Expression

Enter Parameter Value *fx*

Group By

Attributes

Select Values

Order By

Attribute

Select

Order

Select

PartInformation_TCandSales...

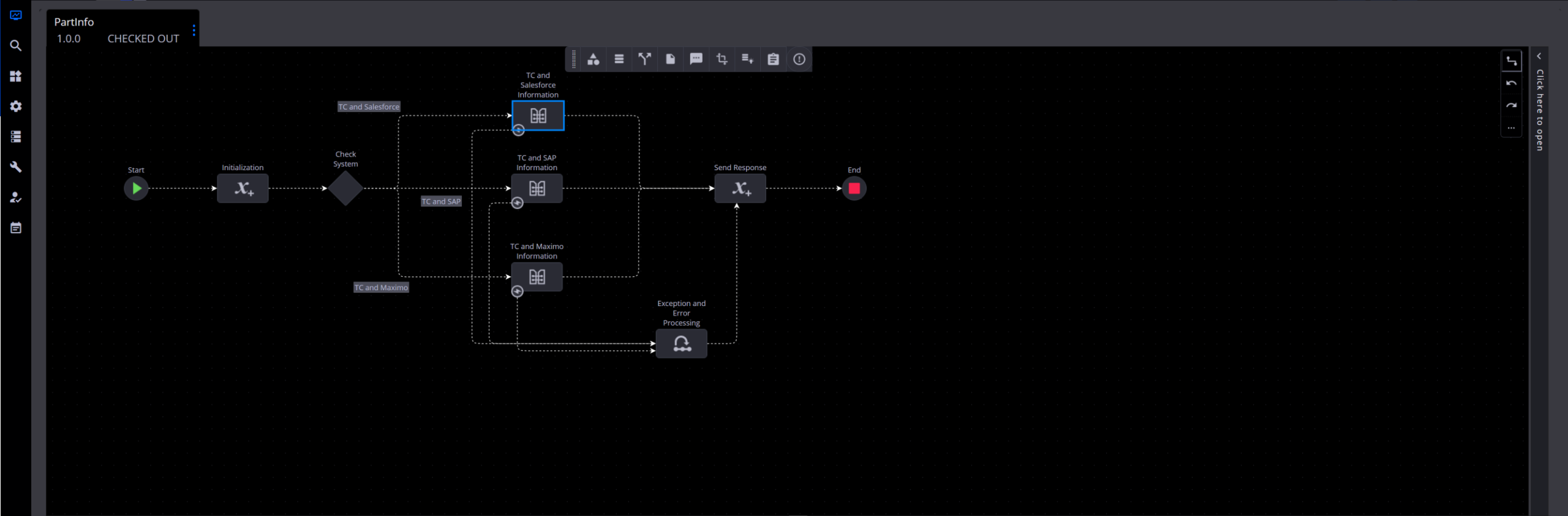
eQube®-MI: Low / No-code integration platform



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- Integrations made Easy!
 - Rapidly build Odata / REST services for any application (COTS or Legacy across any old / new version)
 - Efficiently integrate data, applications, and devices
- Rapidly build end-user centric low code 'For-Purpose' apps
 - Link data across the enterprise
 - Federate data – not replicate
- Establish a Digital Backbone for the Enterprise
 - Establish a robust, resilient, scalable, and secure application integration infrastructure
 - Efficiently integrate multiple systems (COTS & legacy)
 - Responsibly retire legacy systems without business disruption / black-outs
- Integrated with eQube offerings
 - eQube-AG – Define and publish APIs (OData, REST, Webservices)
 - eQube-TM – directly consume TM maps in MI processing pipelines for an interface or service definition & execution





Step

MDA

General

Connection

Pre Script

Configuration

Output

Post Script

Add

Throw

Retain

Map details

Parameters

* Map name

PartInformation_TCandSalesforce

Search

Refresh

Create

Open

* Source connections

Teamcenter Non SSO

tcConn

▼

Salesforce

sfConn

▼

eQube®-AG: API Gateway for complete API Lifecycle management



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- API Lifecycle management solution with Governance
 - Define APIs (OData, REST, Webservices)
 - Publish & execute APIs
 - Monitor API consumption metrics
 - Administer the APIs – define, secure, start, stop, deprecate
 - OpenAPI 3.x compatibility for complete API documentation
- Catalog
 - Capture, Discover, Reuse, Repurpose APIs
- Integrated with eQube offerings
 - eQube-TM – Model & maps for API definition
 - eQube-MI – Invoke MI pipeline for execution





Last 3000 hours

API Gateway

Last update 09/01/2020 14:50

