Business Excellence in Digital Era – Paradigms of Configuration Management - CM

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The challenging asks of Industry and Business dynamics on CM capability across Product Definition – Order Fulfillment – Installed base maintenance is overwhelming.

**CM transformation for new smart architectures** of Autonomous vehicles

An car could have $6 \times 10^{10}$ buildable combinations, 150 million software lines of code... to manage

An IMC firm ensures uptime for installed base of ~3 million automated machines in ~27,000 plants~4000 customers

An auto OEM has to source 2 billion parts per year to 40 plants

With average value of large recall claims at €12.4m, How can OEMs prevent or otherwise quickly investigate..

An OEM has scores of legacy IT systems in OTD process not adaptable to change in configuration attributes

OTD: Order to Delivery

**Configuration Methodology commonisation** challenges for a successful merger

An IMC product may need high flexibility of default values for configurable features

Research Sources: Refer appendix
Future forward - Possibilities are many for digital transformation of business. Regardless of CM capability would be a core competency to ensure sustainability.

**CLM**: Configuration Lifecycle Management

**Paths to Digital Transformation**

- **Business Model A**: Continuous Product Refresh, Security and Privacy
- **Business Model B**: Feature Rich Products, Multi-Dimensional Products
- **Business Model C**: Connected Products, Social Active Collaboration
- **Business Model D**: Distributed Innovation, Security and Privacy

**Current Business Problems**

- CLM solutions
- Integrated sales configurators
- Traceability for Quality

**Business Dynamics**

- Competition landscape is changing! From ‘made to sell’ to ‘made to serve’
- The battle at Installed Base: Product usage data monetization
- Profitability: Operating Margins under pressure
- New Partnerships: Alliances with strangers!

**Current Business Problems**

- **Configuration Management Capability**
- **Configuration Lifecycle Management (CLM)**

**Future Business Problems**

- Feature Rich Products
- Multi-Dimensional Products
- Continuous Product Refresh
- Distributed Innovation
- Social Active Collaboration
- Security and Privacy
TCS’s Business 4.0 reference framework which ties together Technology Investments and Business Shifts - to steer CM strategy for digital transformation of business

**Embrace Risk**
An elastic cloud infrastructure democratizing computing access at scale

**Tailor/Mass Customize**
Technologies that bring intelligence to personalize every interaction, at scale and in real-time

**Create Exponential Value**
Automation that brings hyper efficiencies and exponential value

**Leverage Ecosystems**
Methodologies to make configuration and Change Management nimble, fast and error-free

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**BUSINESS 4.0**
intelligent, Agile, Automated, and on the Cloud

**ABUNDANCE**

**CLOUD**

**AUTOMATED**

**AGILE**

**INTELLIGENT**
While CM strategy would vary across companies, these would implement the core new dimensions, as digitalization and intelligence in the Products matures.

A continuous feedback loop making the product a complex adaptive system.

- **Product Journey**
  - Modular and Common Arch.
  - Multidisciplinary products

- **Sensing Capability**
  - Communication
  - Multidisciplinary products
  - Multidisciplinary products

- **Coordinated Operations**
  - Remote services
  - Multidisciplinary products
  - Multidisciplinary products

**Cooperative Operations**
- E2E Automated Enterprise Configuration: definitions and transactions
- Integrated configurators — Sales, CPQ, Engineer, Install Base
- ALM-PLM Integration
- Model based Enterprise
- Methodology for self-reconfiguring products

**Social Active Collaboration**

**Installed Base**

**Security and Safety Layers**

**TCS CoE Research and Documentation**
Compelling Reference Business Architecture emerging for new age **CM** strategy

**Self reconfiguring products**

- **Digital layer**
- **Connectivity Layer**
- **Physical Layer**

**Digital Configuration thread**

- Interfaces
- SLM
- MOM

**Business Benefits**

- **Customer Value Proposition**
  - Mass customization - transforming customer engagement, ensuring top line growth

- **Efficiency in Core operations**
  - Digital configuration thread - Error free, faster, simpler and transparent transactions - ensuring bottom line buoyancy

- **Sustainability**
  - Delivering new services - To be in the saddle for a not so far data driven economy!

**Processes**

- **Customers**
- **CPQ**
- **CRM**

**Products**

- **CPQ**
- **CRM**
- **MOM**

**People**

- **Customers**
- **Employees**
- **Partners**
- **Skills & mindset**

**Mass Customization**

**Seamless Collaboration**
A glance at key markers of **CM** led business transformation towards Business 4.0 & few **CM** Initiatives across Manufacturing firms

### KEY MARKERS OF **CM** LED BUSINESS TRANSFORMATION

<table>
<thead>
<tr>
<th>Profitability</th>
<th>Customer Integration</th>
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| P & L: Support operating margins | P&L & Balance Sheet: CM to **improve RoCE**

<table>
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<tr>
<th>Modular Architecture</th>
<th>Product Architecture</th>
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| Modular Architecture: Configure to Order | Platform Architecture: **Modify to Order**

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<th>Installed Base Management</th>
<th>Service Offerings</th>
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<td>Trigger based isolated events</td>
<td>Catalogue-driven, no customer integration</td>
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<tr>
<td>Self reconfiguring installed base</td>
<td>Data driven with customer integration</td>
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<th>Supply Chain Flexibility</th>
<th>Data Protection and Security</th>
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<td>Slow response to market changes</td>
<td>Manage confidentiality</td>
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<td>Agile response to market changes</td>
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#### Modular Architecture
- Simplifies variant configuration
- Common spare parts
- Ease of maintenance

#### Single Source of Configuration Truth
Simpler – fast – flawless transactions without Media or Data Breaks

#### Dynamic Configuration
Methodology for OTA reconfiguration of installed base - Based on product usage - customer preference-environment

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**TCS CoE Research and Documentation**

#lpXCox#18
A Comprehensive multi-dimensional **CM** Capability Maturity Assessment would be necessary to define roadmap and evaluate progress.

**CM Maturity Index**

\[ CM \text{ Maturity Index} = \text{Minimum} \left\{ \sum_{i=1}^{n} M_{d1,i}, \sum_{i=1}^{n} M_{d2,i}, \sum_{i=1}^{n} M_{d3,i} \right\} \]

**Digital Products & Services- Attributes(i)**
- What is the level of product data usage to enable self-reconfiguration
- To what extent can products be ‘modified to order’

**Strategic Initiatives- Attributes(j)**
- Are there business models defined to monetize configuration capabilities
- Is the Configuration Management linked to Profitability & Sustainability matrix

**Smart Business Processes- Attributes(k)**
- Is there a digital configuration thread across all business functions
- Are changes to configuration error-free, fast and simple
Thank You
## Data point (clockwise from top)

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