Monthly Meeting

Knowledge Session on DIGITAL TRANSFORMATION JOURNEY – INDUSTRY 4.X – BUSINESS CASE MANUFACTURING
<table>
<thead>
<tr>
<th>Topics</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction : Brief about AEA : Delhi Chapter</td>
<td>6:15 to 6:35</td>
</tr>
<tr>
<td>2 Digital Transformation Journey  By Mr. Pankaj Dev</td>
<td>6:35 to 7:00</td>
</tr>
<tr>
<td>3 Feedback /Q&amp;A for Digital Transformation Journey</td>
<td>7:10 to 7:25</td>
</tr>
<tr>
<td>4 AEA Delhi Workshop Plan Content and Volunteer Finalization</td>
<td>7:25 to 7:40</td>
</tr>
<tr>
<td>5 Member Feedback /Discussions</td>
<td>7:40 to 7:45</td>
</tr>
</tbody>
</table>
Who We Are...

The Association of Enterprise Architects is the definitive professional organization for Enterprise Architects Delhi Chapter

- **President**
  - AEA India
  - Dr Pallab Saha

- **Board Member**
  - AEA India
  - Tarun Gupta

- **Advisory Board**
  - Prof Arpan Kar

- **Chair Delhi Chapter**
  - Chander Shekher

- **Vice Chair Delhi Chapter**
  - Aurobind Upadhyaya

- **Treasurer**
  - Sandeep Singh
• Aim
The AEA Delhi Chapter aims to advance the professional excellence and status of Enterprise Architecture and at the Delhi/NCR

• Mission
To enable and encourage the highest standard of enterprise architecture practice by members.
Presentation

Over 23 years of experience in Strategic Consulting, Digital Transformation, AI, ML, Data Strategy for Large and Medium Enterprises.
Mentor in startup India initiatives transforming city to safe city.

Contributor to Business Modeling, Business Analysis, Account-Based Marketing, Pre-sales activities & Solution Development, covering technical description, designing solutions, sizing offerings, Active role in making COE in Microsoft as well as Open Source Competency.
Mentoring team, Introduce standards and technology solutions necessary to support business-aligned IT strategies. A key player in enterprise-wide smooth transition of skills, technology, and people matrix. Managed and successfully achieved CMMI L5 Process Oriented Projects Project.
DIGITAL TRANSFORMATION JOURNEY – INDUSTRY 4.X – BUSINESS CASE MANUFACTURING
• Incubation of EA across unit.
• Leadership Coaching
• Transformation of HCM
• SMAC component evaluation
• Multiple Companies
• Multiple Plant
• Multi Vendor
• Time to Deliver
• Horizontal and vertical Integration
• Integrated Distribution Channel
• Smart Factory Maturity Model
• Additive Manufacturing
Value chain for OEM manufacturing industry

- **OEM**
  - Original Equipment manufacturer to produce parts, such as a company like Bosch

- **MANUFACTURER**
  - The actual car manufacturer like Toyota

- **CUSTOMS**
  - The customs and port officials

- **3PL**
  - A third party logistics company to organize the transit

- **TRUCKING COMPANY**
  - A trucking company to bring the cars from the ports to the dealers

- **CONSUMER**

- **DEALER**
  - The car dealer, perhaps Toyota of San Francisco, that sells cars to consumers

**EA Vision to**
- **build connected infrastructure**
- **build Forecast to Demand**
- **Integrate EXIM Process shorter compliance lifecycle**
- **SCM Automation**
- **Omni Channel Intelligence**
- **Provide real time information Market to Cash**
- **Customer Live Time Value, Identifying New Customer Segmentation**

Disclaimer: All product names, logos, and brands are property of their respective owners.
Business Overview

From Traditional ERP/Enterprise system to Intelligent ERP/Enterprise system.
As the Industrial Internet of Things (IIoT) takes shape, Smart Connected Assets enable Smart Connected Operations and have Smart Connected Products.

We focused on people, processes and technology that directly contribute to the bottom line of a manufacturing as its an asset intensive business. Business leaders having very limited EA skills majorly they have industry specific domain expertise, particularly about production and engineering systems. So we build the knowledge system first before mapping of As-IS and To-be process. Increasing the information flows and integration of systems within organizations, and along the supply chain is one of the main challenges that needs to be addressed via forming the EA building blocks.
### Key Partners
- Raw material suppliers
- Suppliers of sheet metal
- Plant and machinery suppliers
- Suppliers of electricity
- Suppliers of methane
- Packaging suppliers
- Suppliers of chemical/polishing additives
- Supplier of Trolley
- Supplier of cast iron
- IT Solution Providers
- Cloud Solution Provider
- IOT Provider
- Last mile connectivity Provider

### Key Activities
- CAD Designing
- Manufacturing of Parts
- MES Monitoring & Controlling
- Facilities operations & maintenance
- Sourcing
- Logistics planning
- Accounting & Control

### Value Propositions
- Provide best quality parts for primary and secondary market Asia pacific region.
- Value for money
- On-time delivery, zero assembly failure
- Apply techniques to the development of new products, using robotic process and reducing raw material wastage.
- Develop innovative solutions for our manufacturing processes for sustainable growth while respecting people and the environment around us.

### Customer Relationships
- Extensive sales network
- Real-time order processing status
- To-1 interaction with distributors
- On-demand product development

### Customer Segments
- End users
- Distributor
- Dealer
- Auto/Product Manufacturer
- Business customer
- Online Buyer's

### Key Resources
- Five manufacturing units
- Five logistics warehouses
- IT Infrastructure
- PaaS, SaaS and IaaS
- Human capital
- Robotic Operational know-how
- Financial assets
- Energy-efficient manufacturing system
- Resource-efficient manufacturing system

### Channels
- Large-scale retail
- Online B2B
- Manufacturing Organization
- Independent distributors
- Specialized stores
- Cloud-based interactive multi-channel

### Cost Structure
- Manufacturing costs
- Commercial costs
- Research & development costs
- General and administrative costs
- IOT enabler costs
- Financing cost

### Revenue Streams
- Volume of sales
- Value recovered from the use of recyclable materials
- Reduction in loss of goods and assets due to tracking enablement.

### Social & Environmental Cost

### Social & Environmental Benefit
“Reference Architecture Model Industries 4.0” (RAMI 4.0) [20] that propose a standardized communication between 3-dimension layers between IT, manufacturers/plants and the product life cycle. Integrating the Manufacturing execution system (MES), and an enterprise resource planning (ERP) layer. At device level, the production machines with their sensors and actuators are located. Furthermore, at control level the controllers for these machines are positioned. The MES level consists of the execution system that controls the execution of production in real-time.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Development</th>
<th>Architecture</th>
<th>Industry Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrate</td>
<td>Integrating the solution for the particular scenario with the industry domain</td>
<td>Act as a bridge between the solution and fits into a broader context.</td>
<td>Industry standards, best practices, and established patterns.</td>
</tr>
<tr>
<td>Abstract</td>
<td>Use of architectural viewpoints</td>
<td>To communicate the key details.</td>
<td>Information application and technology perspectives.</td>
</tr>
<tr>
<td>Communicate</td>
<td>Establish and formalize a solution.</td>
<td>The role of communicator.</td>
<td>Communicate its importance and value to stakeholders.</td>
</tr>
<tr>
<td>Inquire</td>
<td>Getting the core of the problem and soliciting requirements.</td>
<td>To solve specific problems.</td>
<td>Solicit specific requirements and goals of enterprise context.</td>
</tr>
<tr>
<td>Assist</td>
<td>An activity that makes their architecture real.</td>
<td>To actively assist as an enabler.</td>
<td>Virtual architecture aspect for strategic competitive.</td>
</tr>
<tr>
<td>Conceptualize</td>
<td>The form of a conceptual architecture diagram with logical functions.</td>
<td>To create a conceptual vision of the solution.</td>
<td>Establish the scope of the industry.</td>
</tr>
<tr>
<td>Formalize</td>
<td>The usual approach to formalization.</td>
<td>To be specific enough to unambiguously communicate the details.</td>
<td>Visualization in the form of an industry standard notation.</td>
</tr>
<tr>
<td>Analyze</td>
<td>The analysis consists of a driver.</td>
<td>To analyze the information that has been collected.</td>
<td>Proactive leading the key elements of the solution.</td>
</tr>
<tr>
<td>Enable</td>
<td>Achieving industry goal and enable the target strategy.</td>
<td>The equation for architecture value.</td>
<td>Key to achieving tactical operational as a supporter.</td>
</tr>
<tr>
<td>Visualize</td>
<td>An excellent way to represent the abstraction.</td>
<td>To create visual renditions of the abstractions.</td>
<td>Viewpoints as the reactive following for cost cutter.</td>
</tr>
</tbody>
</table>


Journey of an Enterprise Architecture Development Approach – Mallasang Jayakrishnan, Abdul Karim Mohamad, Abu Abdullah
Smart Factory Key Identifier

- Asset Performance Management (APM),
- Enterprise Quality Management Software (EQMS),
- Environnemental, Health & Safety Management (EHS),
- Industrial Energy Management (IEM) and
- Manufacturing Operations Management (MOM).

Vision to transform major process for 4.x
Key challenges to build the ecosystem for EA

• Making each business unit head understand the EA objective and goals
• Making them understand to identify the key business drivers, manufacturing operation are quite tightly coupled and dependencies between each business unit.
• Education for technical team to identify value out of each technical implementation.
• Operational complexity no single point of contact to understand end-to-end operation cycle.
• Week data capturing process, point of failure was unknown or no clear visibility.
• Legacy thoughts and evaluation of customer experience was missing.
• Buying cause evaluation process was week, most solution were bought as need of hour.
• Aligning stakeholder to lowest team member binding on data governance and responsibilities where missing.
• The transformation towards smart connected factories causes enormous changes in mechanical engineering industry starting from the development of cyber-physical production systems up to their application in production.
Incubation of EA across unit

- Making each business unit to think and progress like an EA practice.
- Cultivation of EA standard rules and reflection’s
  - **Business Before Technology** - The needs of the business should drive change.
  - **Control Technical Debt** - Control the age and variety of the technologies, products, process, supplier and platforms.
  - **Keep it simple.** Choose the simplest solution to maintain and deliver capability levels with the aim to reduce operational complexity.
  - **Data is an asset** - Use enterprise wide-policies to handle data creation, data modification and data use
  - **Customer Centric Approach** - Deliver the best experiences to customers with services and products.
  - **Learn fast, fail fast** - Do the hard and unknown stuff first.
  - **Reuse before buy, buy before build** - Maximize re-use of IT assets. If it is not possible to reuse, procure externally.

---

### Reference Strategic Ecosystem Architecture

<table>
<thead>
<tr>
<th>Business Drivers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Business vision</td>
<td>Integrated roadmaps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Capabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Modernization Capability Model</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data &amp; Applications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio Applications Landscape</td>
<td>Applications Development Standards</td>
</tr>
<tr>
<td>Data Architecture</td>
<td>Data Architecture Prescriptive Guidelines and Standards</td>
</tr>
<tr>
<td>Reusable IT Assets (APIs, SaaS, Tools, and Capabilities)</td>
<td></td>
</tr>
<tr>
<td>Data as a Service</td>
<td></td>
</tr>
<tr>
<td>Platform as a Service</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure and Technologies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure as a Service (Hosting)</td>
<td>Infrastructure as a Service (Network)</td>
</tr>
<tr>
<td>Technology Landscape</td>
<td>Data Centers as a Service</td>
</tr>
</tbody>
</table>

---

---
• Reference model where studied and was coached to leadership for EA implementation.
• Reference model as adapted by United Nations for sustainable EA.
• Leadership coaching played an important role since EA nearly always faces demands to cut costs, and a sustainable way to do so is to reduce the resource intensity of enterprise architecture through eco-efficiency.
• A well-defined leadership vision towards modernization of Smart Factory.
• Not everything can be smart as expected the governance and BPM process optimization play a vital role.
Primary groups of desired IT capabilities.

- Mashup capabilities
- Enterprise Information Integration capabilities
- Predictive and Real Time Analytics capabilities
- Cloud computing and Internet of Things capabilities.
### Recognizing Sources of Data

<table>
<thead>
<tr>
<th>Manufacturing</th>
<th>Business Administration</th>
<th>Sourcing and Sales</th>
<th>Logistics and Warehouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill of Materials management</td>
<td>General accounting</td>
<td>Supplier orders</td>
<td>Products anagaphic management</td>
</tr>
<tr>
<td>Productivity</td>
<td>Credits and finance</td>
<td>Customer orders</td>
<td>Warehouse movements</td>
</tr>
<tr>
<td>Consumption of resources</td>
<td>Planning and control</td>
<td>Sales Force Management</td>
<td>Order to delivery management</td>
</tr>
<tr>
<td>Emissions</td>
<td>Human resources</td>
<td>Marketing</td>
<td>Bar-code management</td>
</tr>
<tr>
<td>Scrap products</td>
<td>Information Technology</td>
<td>Quality Control</td>
<td>Financial recovery</td>
</tr>
<tr>
<td>Robotic Devices</td>
<td>Mobile/Field Service Management</td>
<td>Omni channel Integration</td>
<td>3PL Tracking</td>
</tr>
</tbody>
</table>
1. Architecture Principles, Vision, and Requirements:
• This layer describes the initial phase of an architecture development cycle. It includes information about defining the scope, identifying the stakeholders, creating the Architecture Vision, and obtaining approvals.

2. Business Architecture:
• This describes the development of a Business Architecture to support an agreed Architecture Vision.

Next session we will try to cover:

3. Information Systems Architecture:
• This layer describes the development of Information Systems Architectures for an architecture project including the development of Data and Application Architectures.

4. Technology Architecture
• This layer describes the development of the Technology Architecture for an architecture project.

5. Architecture Realization:
• This layer is the realization of the architectural components that are necessary for driving business value.
THANK YOU!

Pankaj Dev
Agelix Consulting
dev@agelixconsulting.com
Requested participants to volunteer for EA Workshop

*Enterprise Architecture for Startup*

*Enterprise Architects Road Map*

*Business Enterprise - Scenarios*
Questions?

THANK YOU!

AEA Delhi Chapter

https://www.linkedin.com/groups/10200780/

Email : chair.del@aeaindia.org
www.globalaea.org/groups/New Delhi