Architecture Development Process

**Context**

**Do the right thing**

**Plan**
- Idea Creation & Verification

**Do the thing right**

**Build**
- Inception
- Elaboration
- Construction
- Transition

**Run it right**

**Operate**

**Retire it right**

**Retire**

```
Initiation #1 #2 #3 #4 \(\#N\) \(\#n\) Transition & Operation
```

**Define Enterprise Architecture Context**

- Determine Context
- Develop Understanding of Problem
- Brainstorm on alternative Solution approaches
- Develop Black-Box Perspective of Solution
- Not forget to communicate («Marketecture»)
- Create the Architecture’s core views
- Create the Architecture’s cross-cutting views
- Document key assumptions / decisions
- Review and assess the Architecture
Architecture View Model

**Context**

Enterprise Architecture Landscapes & Views

- **Requirements**
  - Principles & Constraints
  - Functional Requirements
  - Non-Functional Requirements

- **Application Architecture**
  - Data Architecture
  - Technology Architecture
  - Application Infrastructure
  - IT-Infrastructure

- **Perspectives**
  - Security Perspective
  - Availability & Reliability Perspective
  - Performance & Scalability Perspective
  - Extensibility Perspective

- **External Viewpoint**
  - Architecture Alternatives
  - System Context
  - Architecture Vision

(C) by Ingo Arnold | IT Architecture | e-Vaccine-Card
**Define Enterprise Architecture Context**

*Context*

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**Step 1: Enterprise Architecture Context**

<table>
<thead>
<tr>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand project and envisioned solution within a company’s broader Enterprise and Domain Architecture context</td>
</tr>
<tr>
<td>Analyse impacts and changes to the As-Is Enterprise architecture landscapes based on envisioned solution’s future shape</td>
</tr>
<tr>
<td>Understand gaps, overlaps, deficiencies, strengths of As-Is Enterprise architecture context regarding ▪ Capabilities ▪ Services ▪ Processes ▪ Information ▪ Applications ▪ Technologies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Solution Architect, Business Analyst, Enterprise Architect</td>
</tr>
</tbody>
</table>
Architecture Knowledge Framework

**Context**

**WHAT**
(Introductions, Definitions, Disciplines)

**WHERE**
(Architecture Perspectives)

**WITH WHAT**
(Architecture Techniques & Means)

**WHY**
(Architecture Requirements)

**WHO**
(Organizations & Roles)

**HOW**
(Methods & Process Models)

**Architecture Methodology Frameworks**
- TOGAF
Define Enterprise Architecture Context

Context

- Very early in the project the «eVaccine Card» Solution Architect has to
  - Understand the anticipated solution’s broader enterprise architecture context
  - Understand an organization’s standards, policies, and constraints

- The enterprise architecture assessment is based on the EA viewpoints
  - Business Architecture (Capabilities and Processes)
  - Information Architecture (Information and Data Structures)
  - Application Architecture (Applications and their functionality)
  - Technology Architecture (Technology platforms hosting applications)

- Outcomes of such an assessment could for example be
  - Something is missing and not existing today (gap)
  - Something is available but not perfectly fitting (extension, adjustment)
  - Something is available and perfectly fitting (reuse)
  - Several solutions already exist (overlap – potential for decomission)

(1) «Enterprise Architecture» may refer to the architecture of an entire enterprise, the architecture of an entire sub-organization, the architecture of a selected domain (e.g. Network, CRM)
During the capabilities assessment (1) the Solution Architect detects:
- «Patient Tracking» capability is not available, yet
- «Physician Tracking», and «Vaccination Reporting» capabilities already exist

During the application assessment the Solution Architect detects:
- «Vaccination System», «Vaccine Reporting & Analysis System», as well as «Vaccination Marketing Material System» already exists
- «Patient Register», «Physician Register», or «Vaccine Card System» do not exist yet

The Solution Architect performs similar assessments for:
- Information Architecture
- Technology Architecture

(1) Results of the EA assessments are outlined on the following slides
Define Enterprise Architecture Context

Result

- Business Capabilities Context

- Patient Centric Capabilities
  - Patient Tracking
  - Patient Outcome Monitoring
  - Vaccination Card Management
  - Patient-centric Marketing
  - e-Health

- Vaccines Centric Capabilities
  - Vaccination Reporting
  - Vaccines Studies Management
  - Vaccine Incident Management
  - Vaccination

- Physician Centric Capabilities
  - Physician Tracking
  - Physician Registration Management
  - Physician Diary
  - Event Planning

<table>
<thead>
<tr>
<th>Business Capability / Process</th>
<th>In Scope</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Tracking</td>
<td>Yes</td>
<td>Patient tracking capability is required as new business capability. It shall complement today’s patient centric capabilities. Patient outcome will be measured for drug-success in future. Patient behaviour will be tracked to drive better patient outcomes (e.g. adherence to drug application, etc.)</td>
</tr>
<tr>
<td>Vaccination Reporting</td>
<td>Yes</td>
<td>Capability exists already. Extensions may be required as part of this project.</td>
</tr>
<tr>
<td>Physician Tracking</td>
<td>Yes</td>
<td>Capability exists already. Extensions may be required as part of this project.</td>
</tr>
</tbody>
</table>
Define Enterprise Architecture Context

**Result**

- **Application Architecture Context**

### Application Architecture Context

<table>
<thead>
<tr>
<th>Application</th>
<th>Description</th>
<th>Purpose</th>
<th>Forseen changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Register System</td>
<td>Application to manage patient information</td>
<td>Provides the functionality to centrally manage a register of patients.</td>
<td>Application does not yet exist and needs to be added to today’s application landscape.</td>
</tr>
<tr>
<td>Physician Register System</td>
<td>Application to manage physician information</td>
<td>Provides the functionality to centrally manage a register of physicians.</td>
<td>Application does not yet exist and needs to be added to today’s application landscape.</td>
</tr>
<tr>
<td>ImproveHealth Vaccination System</td>
<td>Application to manage vaccination information</td>
<td>Handles today’s vaccination business processes.</td>
<td>Application exists in today’s landscape. Extensions may be required.</td>
</tr>
<tr>
<td>Vaccine Card System</td>
<td>Application to manage vaccine card information</td>
<td>Provides the functionality to centrally manage all vaccine cards and associate these to registered patients.</td>
<td>Application does not yet exists and needs to be added to today’s application landscape.</td>
</tr>
<tr>
<td>Vaccine Reporting &amp; Analysis System</td>
<td>Application to analyze vaccination information and create reports</td>
<td>Handles today’s analytics and reporting functionality required for the vaccination business processes.</td>
<td>Application exists in today’s landscape. Extensions needed to include analysis and reporting for patient and physician tracking information.</td>
</tr>
<tr>
<td>Vaccination Marketing Material System</td>
<td>Application to manage vaccination marketing material</td>
<td>Supports today’s marketing campaign business processes to produce marketing material.</td>
<td>Application exists in today’s landscape. Extensions needed to include e-vaccination information in marketing materials.</td>
</tr>
</tbody>
</table>
Define Enterprise Architecture Context

**Result**

- **Data Architecture Context**

<table>
<thead>
<tr>
<th>Business Object</th>
<th>Description (pulled from EA / context-agnostic)</th>
<th>Purpose (context-specific)</th>
<th>Forseen changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Primary business object which covers patient related information</td>
<td>Selection of context-specific attributes: - diagnose related information/data - address - gender - age - ...</td>
<td>Data Domain does not yet exist and needs to be added to today’s data landscape.</td>
</tr>
<tr>
<td>Physician</td>
<td>Data Domain for physician information</td>
<td>Covers all data that describe a registered physician. - only those physicians who actively medicate Novartis patients</td>
<td>Data Domain does not yet exist and needs to be added to today’s data landscape.</td>
</tr>
<tr>
<td>Vaccine Card</td>
<td>Data Domain for vaccine card information</td>
<td>Covers all data contained in a vaccine card.</td>
<td>Data Domain does not yet exist and needs to be added to today’s data landscape.</td>
</tr>
<tr>
<td>Vaccination</td>
<td>Data Domain for vaccination information</td>
<td>Covers all data that describe a vaccination. -</td>
<td>Data Domain exists. An extension to reference physicians, patients and vaccine cards may be required.</td>
</tr>
<tr>
<td>Marketing Material</td>
<td>Data Domain for marketing material</td>
<td>Covers all data that describe marketing material.</td>
<td>Data Domain exists. Structural extensions are not yet identified. Changes to existing content (data entities) may be required to update existing marketing material.</td>
</tr>
</tbody>
</table>
Define Enterprise Architecture Context

Result

- Technology Architecture Context

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Purpose</th>
<th>Forseen changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Device</td>
<td>Smartphone, HTML-5 supporting http-UA</td>
<td>UI rendition host for mobile users</td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td>Wintel/x86, MS Office x</td>
<td>UI rendition host for desktop users</td>
<td></td>
</tr>
<tr>
<td>Web Server</td>
<td>Apache, http/s</td>
<td>Presentation logic host</td>
<td></td>
</tr>
<tr>
<td>Application Server</td>
<td>Tx-, concurrency, session-management, and messaging support</td>
<td>Business &amp; integration logic host, Tx-, concurrency, session-management, and messaging support</td>
<td></td>
</tr>
<tr>
<td>Relational DBMS</td>
<td>Oracle, MS SQL Server</td>
<td>Persistence structures host</td>
<td></td>
</tr>
<tr>
<td>Directory Server</td>
<td>Distributed AD (read-optimized, not Tx-aware)</td>
<td>Physician and Patient register related user information</td>
<td></td>
</tr>
<tr>
<td>Cloud Services</td>
<td>Look at ADAM-based integration with Novartis AD</td>
<td>Not well understood yet but maybe a Physical Register exists as a SaaS solution, already</td>
<td></td>
</tr>
<tr>
<td>Message oriented Middleware (MOM)</td>
<td>Reliable messaging between remote application components (potentially crossing company perimeters)</td>
<td>Enable IPC on an application level</td>
<td></td>
</tr>
</tbody>
</table>