Mastering Systems Integration; Assignments

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Abstract

All assignments of the course Mastering Systems Integration.

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logo
TBD

Discuss the Case

Sketch the system-of-interest

What are the most relevant project goals?

Sketch the project master plan (the main milestones and their timing)

Determine KPPs

Determine 5 to 10 ***Key Performance Parameters*** (KPP) of the System

Quantify these KPPs

Define the KPPs roughly, using a ***Use Case***

VUCA Causes Risks

VUCA =

Volatility

Uncertainty

Complexity

Ambiguity

Assess Risks of KPPs

Assess the risk fo each KPP

Explain why this KPP may suffer from this risk

Select one KPP to work on in the remainder of the Face-to-Face workshop

- this KPP should be “hot” (lot of organizational buzz)
- you may also select two “conflicting” KPPs

Describe Typical Use

Define the typical use (by customer stakeholders) of the system in relation to the selected KPP.

This use case helps to define the KPP further

This use case will guide the verification and validation

Make Block Diagrams

Make block diagrams of the system, the software, and the hardware.

Block diagrams show parts, and interfaces or connections.

These block diagrams need tens of blocks.

Model Dynamic Behavior

Model the Dynamic Behavior of the System.

Focus on the Dynamic Behavior that relates to the KPP.

Visualize the Dynamic Behavior with various sketches, diagrams, or graphs (see Visualizing Dynamic Behavior for inspiration).

Make Budget

Map the Dynamic Behavior on the block diagrams.

Transform this into a budget:

Quantify contributions of parts and functions to the KPP.

Re-assess Risks

Re-assess the risks for the chosen KPP

using the insights gained so far

These risks are leading when defining the integration sequence

Determine an Incremental Integration Sequence

Determine an incremental ***integration sequence*** to build confidence in the KPP ASAP.

Strive for about 6 main increments.

Reason starting at the end result and then backward in time.

For each increment determine its prerequisites in terms of parts, interfaces, functions, and performance levels.

Assess Other Planning Perspectives

assess the planning from the perspectives:

- ***fitness for purpose*** in customer context
- ***integration configurations*** and ***testware***
- ***supplier*** and ***logistics*** status
- ***technology readiness***
- ***development*** and ***resource*** status

Transform into PERT plan

Transform the integration sequence and the planning from the other perspectives into a ***PERT-plan***.

A PERT-plan focuses on ***activities*** and their mutual ***relations***; the logic of the plan. Time and resources are secondary information.

Assess Robustness

Assess how well the PERT plan addresses the original risks in the KPPs.

Assess the robustness of the PERT-plan for changes.

All assumptions in the integration plan will probably change. A good integration PERT-plan shouldn’t change much.

Prepare Final Presentation

Prepare a presentation for the management

- to communicate the systems integration approach
- its rationale
- and its impact on the project, the test configurations, the schedule, the organization, and the suppliers

Add a slide on the course learnings and reflections

Content for Final Presentation

- Goal of this presentation, main message, desired outcome
- Mission/goal of end customer
- Master plan, milestones and dates
- Key performance parameters of the system
- Block diagrams (20..30 blocks), dynamic behavior (20..30 blocks), some supporting visualizations, budget
- Integration strategy and sequence
- PERT plan (proposal)
- Summary and specific actions, and recommendations (e.g. allocate these resources, order …, etc.)

Add a slide on the course learnings and reflections