

JORD
Training Report and Introduction
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1. Introduction

This document reports on the work undertaken under JORD C during Phase 2 of the project in the first half of 2014 and provides some information about the deliverables and remaining work. Roughly 165 hours were billed on this effort, though there have also been substantial in-kind hours from project sponsor representatives.

1.1 Executive Summary

Deliverables:

- First course module "Introduction to Templates" presentation.
- Training program design.

The first course module:

- Is usable, though could do with some minor work.
- Also, a practical component should likely be implemented.

The training program design includes:

- Second course module "Classes and Instances" defined with topic level descriptions, ready to be developed.
- The rest of the first course "Reference Data Readiness" defined and ready to be discussed, rounded out with topics and then developed (all classroom setting).
- A second course "Ontology and Cohesion" defined (classroom setting).
- A third course "Technical Deployment of ISO 15926" defined (self-service).
- Scoping for all of the above.
- List of existing public materials relevant to training.
- Identification and analysis of material gaps for specific audiences.

Approach:

- Serve most in-need audiences first.
- Do simplest and most concrete concepts and material first.
- Engage audience-appropriate stakeholders from the outset.

Remaining work:

- 560 hours to complete the first course.
- 2190 hours to complete the second and third courses and provide supporting material.

2. Engagement Process

JORD C (Training) launched in earnest at the beginning of 2014 with the search for a training advisor. Rosemary Koehler (CH2M Hill) was selected for that role. She advised to engage stakeholders early in the design process and to have them nominate representatives for the development of specific modules. Module development and coordination were by the author of this document.

Through to April 2014, the training analysis and design phases revealed that engineers were the most underserved audience for guidance relating to reference-data. The advisor and JORD management agreed that appropriate representatives for the development of training in this iteration should be managers of engineers.

In April 2014, stakeholders amongst the current JORD steering group were approached and four agreed to assign representatives: Dow with 2 representatives, and the remainder with one each: Bechtel, Emerson and CCC.

Stakeholder review of the design began in May 2014 with weekly iterations. That gave way to review of the development of the first module in June 2014.

2.1 Value of the Process

Two very valuable aspects were found to the process:

1. It greatly aided in setting the pacing and measuring the appropriateness of the material for the intended audience.
2. Keeping the stakeholders limited to just the target audience representatives ensured that their needs were met in an efficient way that did not delay the development schedule.

The author recommends that this process be followed for further development of training material in the future.

Note however: the appropriate stakeholder representatives should in theory change as the training development progresses and the intended audiences change.

3. Background to “Introduction to Templates”

The training program design process revealed that engineering audiences in particular were under-served by existing collateral. That posed a huge problem for creating strong reference data. We need the input of engineers on a very large scale in order to create reference data that is applicable to what they do.

The choice was made to invert the approach we've usually taken. We have tended to attack the problem from the theoretical detail upwards towards the workforce. Instead, the training program design starts with a customized training module for the workforce, and with each successive module building it from there towards the theoretical.

3.1 Fact-Based Modelling

So this first module "Introduction to Templates" takes a Fact-Based Modelling (FBM) approach to reference data requirements collection, and uses a derivation of Object-Role Modelling (ORM) for schematic representation. This seeds the ground for the growth of more material, with each successive training module approaching the theoretical in more strict terms.

We do not try to teach engineers ISO 15926 part 2, or part 7 because too much abstract reference data design and analysis would be required for them to meet that bar. Equally, the schematic representation from part 2 requires them to make complex decisions that bear little relation to how they think of their own data.

3.2 Module Goal is to Describe Existing Information Flows

Instead, the goal of this module is to train engineers and computer-aided engineering (CAE) technology support and solutions staff in how to record their understanding of their own data, in a consistent repeatable way that has a strong structural tie to both templates and spreadsheets.

Emphasis is placed on a repeatable process, reliant on proven data modelling analysis techniques and visual language. This first module will emphasize that real-world sample data is a necessary part of the process and of the result.

Important note: they are not creating proper ISO 15926 templates with this, nor are they doing quite proper ORM conceptual schema design process (CSDP). Even so the process can be a start to creating proper templates and/or following CSDP.

The outcome is that if this is applied in the field:

- The company gets a consistent and thorough record describing their data flow (immediately useful for workflow re-use and data re-purposing).
- The industry gets a consistent, comparable and sample-backed definition of that flow (creating solid use cases for reference data).

4. Future Modules and Courses

From the first module, further training modules could be implemented to develop the "Reference Data Readiness" course: the goal of this first course is to train subject matter experts in how to create discipline-specific reference data.

That gives way to a whole second course which ties all of that learning back to proper part 7 and part 2 (including part 2 schematic language). That second course will train true abstract reference data design experts (for mostly CAE, information technology and formal academic audiences).

A third course (online self-service, not classroom) is envisaged for stepping software developers through the technologies and techniques used to deal with reference data.

5. Remaining Work

The second and third courses are not necessary to establish the business, and could be funded through revenue, rather than provided from seed funding. So seed funding would be commensurate with the **560 hours** needed for the first course only.

Training requires a total investment of about 2750 hours to meet the full goals as described in the training program design. The training program design stages this work for maximum stakeholder value, so the expected rollout schedule would be over a period of years.

There is still un-scoped work relating to consulting collateral and management decision-making supports that fall under the consulting/training/instruction banner. Stakeholder engagement is required to better define, scope and prioritize those efforts.

The remainder of this chapter breaks down the known costs in courses and reference materials.

5.1 Course 1: Reference Data Readiness

The first course will require about 560 hours to complete – details are provided below.

5.1.1 Module 1: Introduction to Templates

The “Introduction to Templates” presentation component is complete, except for the need to base the content on real-world sample data acquired from stakeholders.

The practical component not build yet: it is also reliant on real-world sample data and cannot be started until that data has been acquired, discussed and analyzed. There is a management cost to acquiring that data which is not scoped.

Development scope for the remaining work on module 1 is about 70 hours, 10 hours for real-world data integration and 60 hours for the practical component.

5.1.2 Module 2: Classes and Instances

The “Classes and Instances” module has been fleshed out down to the level of topics in the training program design. It will require about 135 hours of development to properly implement module 2 from this description.

5.1.3 Remaining Modules

All of the remaining modules for the reference data readiness course need topic level description and stakeholder review (20 hours) and then implementation (335 hours).

5.2 Course 2: Ontology and Cohesion

The second course "Ontology and Cohesion" needs about 675 hours of development across all of its modules, and perhaps 30 hours of topic level description and stakeholder review.

5.3 Course 3: Technical Integration of ISO 15926

The third course, "Technical Integration of ISO 15926" requires about 1500 hours of effort. As noted in the training program design, it would be a good idea to split this course into two, given its size. Note also that the cost will be higher because this is a self-service course without the benefit of a trainer to ask questions of, so the quality level of the material needs to reflect that gap.

5.4 Material: Templates and the Need for iRING and ISO 15926

This material (to be made available on the business website in essence) can be constructed from the first topic of the first module, with some refinement. It is estimated to be about 6 hours' work to convert that part of the presentation into a printable and/or web document and to refine it for a public audience.

5.5 Material: Template Schematic Language

A reference document for the web site that describes exactly how ORM has been adapted to the concept of ISO 15926 part 7 templates will take about 40 hours to develop, based on existing sources.

There are several management costs here in the coordination and checking of that effort, plus some technical costs in showing proofs of the mapping from the diagrammatic representation to an acceptable data representation of part 7.

5.6 Material: Part2 Schematic Primer

For part 2 diagramming, a primer with examples that relate back to templates (and perhaps using ORM as corollary there) needs to be written, at a cost of probably 20 hours if we can safely work from existing materials.

This is probably only needed during the development of the second course (Ontology and Cohesion) when the audience for thorough part 2 will begin to expand.