**Confidential**

**Draft for Discussion**

**Client**

**Specification of Laboratory Approach**

**Relating to an Integrated Financial Solution**

**Comprising**

**A Financial Suite and Data Warehouse,**

**including**

**Data Sharing, Implementation and**

**Project Management Services**

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Specification of the Business Simulation Laboratory

This document sets out the Laboratory approach that is to be applied.

The Laboratory approach that is set out in this document has been developed by James Robertson over several decades and is geared to minimizing commissioning risk and maximizing reliability in the final commissioned Business Information Systems solution.

# Laboratory Definitions

The following terms are applied:

## Laboratory

A laboratory is a facility that provides controlled conditions in which scientific research, experiments, and measurement may be performed. (Wikipedia)

In the context of this document a System Configuration Laboratory is a room equipped with computers, visual aids, etc in which the configuration of a system is developed, refined and tested until it is stable and suitable for commissioning. The Laboratory is also used to develop and test reports, training material, etc. The goal of the Laboratory is that when the Laboratory work is completed the system is ready for deployment with a high certainty of a robust, reliable and sustainable outcome.

## Engineering

Engineering is the discipline, art, skill and profession of acquiring and applying scientific, mathematical, economic, social, and practical knowledge, in order to design and build structures, machines, devices, systems, materials and processes that safely realize improvements to the lives of people.

The American Engineers' Council for Professional Development has defined "engineering" as “The creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design; or to forecast their behavior under specific operating conditions; all as respects an intended function, economics of operation and safety to life and property.” (Wikipedia)

## Prototype

A prototype is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from. (Wikipedia)

A prototype is a carefully and professionally constructed test sample of a system that in final form is intended to be put into economic operation by the developers (Robertson)

In the context of this document the entire configuration of all systems will be developed in Prototype form in the Laboratory until it reaches a point where it can be deployed in the business with a high level of certainty of a reliable and sustainable outcome.

## Implementation

Implementation is the realization of an application, or execution of a plan, idea, model, design, specification, standard, algorithm, or policy. (Wikipedia)

In the context of this document the Laboratory is a central component of the Implementation of the designated systems in the business. The main characteristic of a Laboratory based implementation is that every aspect of the configuration is comprehensively tested in the Laboratory such that the deployment of the software in the business is a Commissioning rather than an implementation with the bulk of the Implementation undertaken in the Laboratory.

## Test

A test can be considered as a technical operation that consists of determination of one or more characteristics of a given product, process or service according to a specified procedure. (Wikipedia)

In the Laboratory approach every component of the configuration will be comprehensively tested using statistically representative data such that the configuration is proven to be reliable and dependable. This is fundamentally different from “User Acceptance Testing” insofar as it requires a much higher level of rigour and reproducibility. Automated testing software may be used to run repetitive testing cycles.

## Walkthrough

In software engineering, a walkthrough or walk-through is a form of software peer review "in which a designer or programmer leads members of the development team and other interested parties through a software product, and the participants ask questions and make comments about possible errors, violation of development standards, and other problems".

A walkthrough differs from software technical reviews in its openness of structure and its objective of familiarization. It differs from software inspection in its ability to suggest direct alterations to the product reviewed, its lack of a direct focus on training and process improvement, and its omission of process and product measurement. (Wikipedia)

## Software Walkthrough

In the context of the Laboratory approach a software walkthrough is a systematic step by step practical demonstration of a piece of software directed at ensuring that the people present in the session gain a solid insight into the software and how it works directed at ensuring that the design work that follows is grounded in a solid understanding of how the software “machine” works.

## Configuration Walkthrough

A configuration walkthrough is a systematic step by step practical demonstration of a piece of software configured to fit a particular element of the business using real data directed at ensuring that the configuration accurately fits the understanding of the people present in the walkthrough with a view to ensuring a tight fit to the business.

# Laboratory Principles

The following principles are applicable to the Configuration Engineering Laboratory:



## Prototyping environment

The laboratory is a rigorous, carefully controlled prototyping and testing environment managed by a very senior and very practical manager who has a clear high level holistic view of how the entire solution fits together and who clearly understands the critical role of the laboratory. This manager is to be supplied by the Implementer.

## Representative data

The laboratory is populated with comprehensive, carefully selected representative data – perhaps 0.1% of the data that is in the live system but representative of all possible scenarios.

There are very specific principles to be applied in the selection of this data. Selection of this data will be guided by the Project Facilitator.

## Fully equipped

The laboratory is situated in room with sufficient workstations, a server, backup device (to permit rapid roll-back to previous test states), data projector, flip chart, white board, etc.

## Life of project

The laboratory is established at the very start of the project and runs until the Data Warehouse and Business Intelligence environment are fully operational and the system has been fully commissioned.

## Accurately model the real world

All configuration settings are tested in the laboratory until they accurately model the precise desired operation of the business and all required customization and custom development has been comprehensively and rigorously tested and accepted.

Executives and managers must be able to undertake structured facilitated walkthroughs of the laboratory configuration and see their business at all times – if it does not make sense to the executives and / or managers the process stops until the configuration has been modified so that it does make sense to them.

## Break it till it breaks no more

The primary initial goal of the laboratory is to break the configuration and once it cannot be broken to optimize it, document it, develop training material and computer based training material (CBT) in it, use it as a training environment, use it for the testing of reports and establish the Data Warehouse operating against it.

## Business Intelligence Development

A full set of management reports, dashboards, etc are to be developed and tested in the laboratory BEFORE production operation commences.

## Standards, Policies and Procedures

A full set of operational standards, policies and procedures must be developed during the project and embedded in the training given in the laboratory and thereafter.

## Computer Based Training Material

A full set of Computer Based Training material with regard to standard operating practices for all primary areas of business operation that uses the software must be developed in the laboratory and deployed as part of the final deliverable.

## Basis of go-live certificate

The configuration does NOT go-live until it has been comprehensively tested in the laboratory and accepted by all senior project team members.

The go-live certificate will be issued at the end of a structured walkthrough of the entire configuration by the entire top management of the project – this walkthrough may take several days and may have to be suspended several times for adjustments.

If the top team are not satisfied with the results of the walkthrough further walkthroughs, will be held until all members of the top team are willing to accept the configuration.

## Basis of live instance

The laboratory configuration forms the basis of the live instance of the software – the entire configuration is to be copied onto the production server and all transaction data files cleared and all counters reset.

The final empty configuration will be reviewed and tested during a trial run of the start-up process in the Laboratory.

## Goal of the Laboratory

The goal of the Laboratory is to ensure that the final live installation is an excellent fit to the business, that all staff are properly trained at go-live, that there are no surprises and that there is minimal well managed risk to the business on go-live.

## Bill of Services

More details of the Laboratory are set out in the Bill of Services.

# Laboratory Specification

The Laboratory is a well-equipped room with a full installation of all software components in which all aspects of the installation can be effectively tested.

The set-up of the Laboratory must be designed in such a way that all realistic scenarios and operational conditions can be simulated. This may require additional workstations and child Laboratory installations at remote sites in order to fully test the performance of communication, etc at practical levels.

It is important that the workstations, server/s, network operate at peak efficiency so that testing can proceed quickly. Testing relating to workstation, network and server performance must take place as a distinctly separate activity, maximum performance in the Laboratory is vital in order to ensure that testing proceeds as efficiently as possible and takes as little time of business and contractor personnel.

The room must be sufficiently large for an audience to be able to attend walkthroughs and there must be a data projector so that groups of people can participate in walkthroughs.

Other presentation aids such as flip charts and white boards must also be provided.

# Laboratory Stages

The following Laboratory Stages are to be followed – see also the Bill of Services:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | | | | |
| **1** |  |  |  |  |  | **Establishment of Laboratory** | | | |
|  | **1** |  |  |  |  |  | **Detailed planning of integrated laboratory simulation programme** | | |
|  |  |  |  |  |  |  |  | -- goal of the laboratory is to BREAK IT until IT cannot be broken | |
|  | **2** |  |  |  |  |  | **Specify laboratory facility** | | |
|  | **3** |  |  |  |  |  | **Procure equipment and establish laboratory facility** | | |
|  | **4** |  |  |  |  |  | **Collate and consolidate detailed statistically significant test packs for each**  **module into one integrated test pack** | | |
|  |  |  |  |  |  |  |  |  |  |
| **2** |  |  |  |  |  | **Testing of individual modules** | | | |
|  | **1** |  |  |  |  |  | **Commission and test individual modules in the laboratory as they become**  **available** | | |
|  |  |  |  |  |  |  |  |  |  |
| **3** |  |  |  |  |  | **Test Integration** | | | |
|  | **1** |  |  |  |  |  | **Test integration of modules as they become available** | | |
|  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  | **Testing and acceptance of the integrated solution** | | |
|  |  | **1** |  |  |  |  |  | **Technical integration** | |
|  |  |  | 1 |  |  |  |  |  | Technical testing of integrated solution until the entire solution works technically  -- 3 iterations |
|  |  |  | 2 |  |  |  |  |  | Other activities necessary to get the integrated solution to a point where it can be  utilized by the business team -- 3 iterations |
|  |  |  |  |  |  |  |  |  |  |
|  |  | **2** |  |  |  |  |  | **Business operational integration** | |
|  |  |  | 1 |  |  |  |  |  | Operational testing of the integrated solution until the entire solution works at a  business operational level -- 3 iterations |
|  |  |  | 2 |  |  |  |  |  | Other activities necessary to get the integrated solution to a point where it can be  presented to executives -- 3 iterations |
|  |  |  |  |  |  |  |  |  |  |
|  |  | **3** |  |  |  |  |  | **Simulation and review of the integrated solution -- first iteration** | |
|  |  |  | 1 |  |  |  |  |  | Comprehensive simulation of live operation with a small but statistically significant  test data pack |
|  |  |  | 2 |  |  |  |  |  | Systematic presentation and walkthrough of entire solution with executives |
|  |  |  | 3 |  |  |  |  |  | Other activities relative to first iteration |
|  |  |  |  |  |  |  |  |  |  |
|  |  | **4** |  |  |  |  |  | **Simulation and review of integrated solution -- second iteration** | |
|  |  |  | 1 |  |  |  |  |  | Revise, refine and optimize solution |
|  |  |  | 2 |  |  |  |  |  | Comprehensive simulation of live operation with small but statistically significant  test data pack until ready to present to execs |
|  |  |  | 3 |  |  |  |  |  | Systematic presentation and walkthrough of entire solution with executives |
|  |  |  | 4 |  |  |  |  |  | Other activities relative to second iteration |
|  |  |  |  |  |  |  |  |  |  |
|  |  | **5** |  |  |  |  |  | **Simulation and review of integrated solution -- third iteration** | |
|  |  |  | 1 |  |  |  |  |  | Revise, refine and optimize solution |
|  |  |  | 2 |  |  |  |  |  | Comprehensive simulation of live operation with small but statistically significant  test data pack until ready to present to execs |
|  |  |  | 3 |  |  |  |  |  | Systematic presentation and walkthrough of entire solution with executives |
|  |  |  | 4 |  |  |  |  |  | Other activities relative to third iteration |
|  |  |  |  |  |  |  |  |  |  |
| **4** |  |  |  |  |  | **Development and testing of integrated reports and BI models, etc** | | | |
|  | **1** |  |  |  |  |  | Development of integrated reports -- 3 iterations with Executive review | | |
|  | **2** |  |  |  |  |  | Development of integrated BI reports, models and dashboards -- 3 iterations  with executive review | | |
|  | **3** |  |  |  |  |  | Development of executive level strategic BI reports, models and dashboards  -- 3 iterations with executive review | | |
|  |  |  |  |  |  |  |  |  |  |
| **5** |  |  |  |  |  | **Specification, configuration, testing, refinement and documentation of integrated**  **workflows / operating procedures -- 3 iterations** | | | |
|  | **1** |  |  |  |  |  | **Specify and configure workflows -- iteration 1** | | |
|  |  | **1** |  |  |  |  |  | Define workflows from executive level and document | |
|  |  | **2** |  |  |  |  |  | Review and refine with management | |
|  |  | **3** |  |  |  |  |  | Review and refine with operational personnel | |
|  |  | **4** |  |  |  |  |  | Configure in the system | |
|  |  | **5** |  |  |  |  |  | Walkthrough | |
|  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  | **Specify and configure workflows -- iteration 2** | | |
|  |  | **1** |  |  |  |  |  | Define workflows from executive level and document | |
|  |  | **2** |  |  |  |  |  | Review and refine with management | |
|  |  | **3** |  |  |  |  |  | Review and refine with operational personnel | |
|  |  | **4** |  |  |  |  |  | Configure in the system | |
|  |  | **5** |  |  |  |  |  | Walkthrough | |
|  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  | **Specify and configure workflows -- iteration 3** | | |
|  |  | **1** |  |  |  |  |  | Define workflows from executive level and document | |
|  |  | **2** |  |  |  |  |  | Review and refine with management | |
|  |  | **3** |  |  |  |  |  | Review and refine with operational personnel | |
|  |  | **4** |  |  |  |  |  | Configure in the system | |
|  |  | **5** |  |  |  |  |  | Walkthrough | |
|  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  | **Finalize and accept workflows** | | |
|  |  | **1** |  |  |  |  |  | Management review | |
|  |  | **2** |  |  |  |  |  | Executive review | |
|  |  | **3** |  |  |  |  |  | Acceptance | |
|  |  |  |  |  |  |  |  |  |  |
| **6** |  |  |  |  |  | **Development of training materials** | | | |
|  | **1** |  |  |  |  |  | Documentation of policies and standards -- 3 iterations | | |
|  | **2** |  |  |  |  |  | Development of user manuals -- 3 iterations | | |
|  | **3** |  |  |  |  |  | Development of Computer Based Training material with tests and performance  measures with executive review -- 3 iterations | | |
|  | **4** |  |  |  |  |  | Other activities necessary to develop a comprehensive training environment for  the enterprise | | |
|  |  |  |  |  |  |  |  |  |  |
| **7** |  |  |  |  |  | **Training** | | | |
|  | **1** |  |  |  |  |  | **Training of Operational Personnel** | | |
|  |  | **1** |  |  |  |  |  | Overall system operation, integration impacts -- who is affected by what I do  -- how the whole system fits together | |
|  |  | **2** |  |  |  |  |  | Policies, standards, protocols, escalation, authorities, etc | |
|  |  |  |  |  |  |  |  |  | -- includes speed and accuracy of data capture for all personnel with significant  keyboard input requirements |
|  |  | **3** |  |  |  |  |  | Touch typing test for all personnel responsible for significant keyboard input | |
|  |  |  |  |  |  |  |  |  | -- touch typing classes for those who do not achieve a minimum standard of 20  words per minute at 99% accuracy |
|  |  |  |  |  |  |  |  |  | -- team must include an instructor |
|  |  | **4** |  |  |  |  |  | Training on CBT until reach required standard -- multiple repetitive cycles | |
|  |  | **5** |  |  |  |  |  | Comprehensive operational simulation until all staff are trained to a level where they can  migrate to new system easily -- at least 3 iterations | |
|  |  | **6** |  |  |  |  |  | Other training related activities for operational personnel | |
|  |  | **7** |  |  |  |  |  | Declaration of operational readiness | |
|  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  | **Training of supervisory personnel** | | |
|  |  | **1** |  |  |  |  |  | Overall system operation, integration impacts -- who is affected by what I do  -- how the whole system fits together | |
|  |  | **2** |  |  |  |  |  | Policies, standards, protocols, escalation, authorities, etc | |
|  |  |  |  |  |  |  |  |  | -- includes speed and accuracy of data capture for all personnel with significant  keyboard input requirements where applicable |
|  |  | **3** |  |  |  |  |  | Touch typing test for all personnel responsible for significant keyboard input | |
|  |  |  |  |  |  |  |  |  | -- touch typing classes for those who do not achieve a minimum standard of 20  words per minute at 99% accuracy |
|  |  | **4** |  |  |  |  |  | Training on CBT until reach required standard where applicable -- multiple repetitive  cycles | |
|  |  | **5** |  |  |  |  |  | Comprehensive training in conjunction with operational simulation until all supervisory  staff are trained to a level where they can migrate to the new system easily | |
|  |  |  |  |  |  |  |  |  | -- at least 3 iterations |
|  |  | **6** |  |  |  |  |  | Other training related activities for supervisory personnel | |
|  |  | **7** |  |  |  |  |  | Declaration of supervisory readiness | |
|  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  | **Training of Managers** | | |
|  |  | **1** |  |  |  |  |  | Overall system operation, integration impacts -- who is affected by what I do  -- how the whole system fits together | |
|  |  | **2** |  |  |  |  |  | Policies, standards, protocols, escalation, authorities, etc | |
|  |  |  |  |  |  |  |  |  | -- includes speed and accuracy of data capture for all personnel with significant  keyboard input requirements where applicable |
|  |  | **3** |  |  |  |  |  | Touch typing test for all personnel responsible for significant keyboard input | |
|  |  |  |  |  |  |  |  |  | -- touch typing classes for those who do not achieve a minimum standard of 20 words  per minute at 99% accuracy |
|  |  | **4** |  |  |  |  |  | Comprehensive training in conjunction with operational simulation until all managers  are trained to a level where they can migrate to the new system easily | |
|  |  |  |  |  |  |  |  |  | -- at least 3 iterations |
|  |  | **5** |  |  |  |  |  | Other training related activities for managers | |
|  |  | **6** |  |  |  |  |  | Declaration of management readiness | |
|  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  | **Training of Executives** | | |
|  |  | **1** |  |  |  |  |  | Overall system operation, integration impacts -- who is affected by what others do  -- how the whole system fits together | |
|  |  | **2** |  |  |  |  |  | Policies, standards, protocols, escalation, authorities, etc | |
|  |  | **3** |  |  |  |  |  | Comprehensive training in conjunction with operational simulation until all executives  are trained to a level where they can migrate to the new system easily | |
|  |  |  |  |  |  |  |  |  | -- at least 3 iterations |
|  |  | **4** |  |  |  |  |  | Other training related activities for executives | |
|  |  | **5** |  |  |  |  |  | Declaration of executive readiness | |
|  |  |  |  |  |  |  |  |  |  |
| **8** |  |  |  |  |  | **Formal declaration of readiness to commence live operation -- issue certificate**  **of readiness** | | | |
|  | **1** |  |  |  |  |  | Declaration by each Implementer Team Leader | | |
|  | **2** |  |  |  |  |  | Declaration by each Business Team Leader | | |
|  | **3** |  |  |  |  |  | Declaration by Implementer Project Leader | | |
|  | **4** |  |  |  |  |  | Declaration by Implementer Project Director | | |
|  | **5** |  |  |  |  |  | Declarations by Client Heads of Departments | | |
|  | **6** |  |  |  |  |  | Declaration by Client Project Facilitator | | |
|  | **7** |  |  |  |  |  | Declaration by Client Contract Manager | | |
|  | **8** |  |  |  |  |  | Declarations by Client Divisional Heads | | |
|  | **9** |  |  |  |  |  | Declaration by Client Executive Sponsor | | |
|  | **10** |  |  |  |  |  | Approval by EXCO | | |
|  | **11** |  |  |  |  |  | Shareholder approval | | |

1. **Laboratory Completion – Certificate of Readiness to Commence Live Operation**

As noted above the final stage of any aspect of Laboratory operation is the issue of a Certificate of Readiness to Commence Live Operation.

This certificate must be progressively signed by all team members and includes a clear statement that the persons signing the Certificate are fully satisfied that the system is ready to be deployed in the business.

The goal of this certificate is to create a context in which no-one will sign the certificate until they are fully satisfied that the configuration is ready to be commissioned.

1. **Ongoing Laboratory Operation**

Once the entire system is operational throughout the entire business the laboratory as a dedicated facility may be closed down.