Another division needs your help for a six-month project. Who will do my work here?

You'll keep doing this job too, but only the things that matter.

How long have I been doing things that don't matter?

Oops.
So How Proficient IS LabWare?

Jules Marsh
System Analyst / Programme Leader
and now….LIMS Administrator/Developer

Nicky Rusk
Programme Leader
and now….LIMS Project Support

LabWare Consultant: Petrus Van Aardt
With thanks to: Mark Chen
About Us...

Global Proficiency is a laboratory service provider with offices in Hamilton, NZ, and Tullamarine, VIC. We currently offer Inter-laboratory Proficiency Programmes (ILCPs) to 600+ customers in 75+ countries. These programmes cover the food and agrichemical industries, and include;

- WaterChek
- DairyChek
- MilkChek
- FertChek
- LipidChek
- WineChek
- HoneyChek
- SoilChek & PlantChek (ASPAC)
- Timber
- Beverages (Fruit Juice, Carbonated Drinks)
- Pathogens
- VeriTest
- VeriCal
- Meat
Background – Business Case Drivers

1) After a merger in 2011, we were left with 3 proprietary legacy systems, 2 of which were antiquated, virtually unsupported and were built using now obsolete programming language. We also had numerous (100’s?) spreadsheets, workbooks and lists

2) One integrated database application to support our business process while allowing for each programme’s unique design - varying samples, tests, stats models, data volume, and reporting requirements

3) Continuously changing and improving approach to international standards for both proficiency testing and reference material production

4) Improved workflows and efficiencies

5) If not internally developed and configured for the unique requirements of proficiency testing, then internally managed and maintained
...and so began a quest to find a suitable, flexible, internally managed, replacement...

3 options were considered;

• Update 1 or more of the existing applications
• Sub-contract the build of a single, new application compatible with current operating systems
• Purchase a licence for an application offered by another proficiency provider
Background – Cont.

The disadvantages with each were significant;

- Updating would only allow us to continue operating the same applications without improving functionality or consolidating workflows

- Sub-contracting the build of a new application would be expensive, place configuration and maintenance outside of the business (further increasing costs) and the developer was unlikely to be familiar with the proficiency business

- Purchasing pre-existing licenses from other providers meant not having the customised statistical capability we required for certain programmes, and confined us to predetermined functionality
Our parent company suggested we try LabWare...we were unconvinced...it was unlikely that a LIMS system would meet our specific requirements

**HOWEVER...**

After an evaluation process, LIMS 1 training, and a gap analysis study, we gained confidence that LabWare could indeed be configured to suit our needs as a proficiency provider...LIMS ⇒ PIMS?

Under the guidance of an extremely clever and creative LabWare consultant we began to develop a prototype application
While ALL businesses have specific and unique requirements, configuring a LIMS to suit the needs of a proficiency provider presented a number of areas that would require a rather different approach...
Challenges – Cont.

WebLIMS

Result Entry
User friendly interface for in-house and WebLIMS data entry

Product Inventory
Manufacture, subsampling, storage, irradiation, dispatch

Reference Materials
Generation and statistical processing

Customer Information Management

Data Volume
1000’s or results per programme per round

Statistics
Outlier identification, test models, normality

Charting
Neither Labware or Crystal could cover charting requirements

Resources
Specialist service provider - limited IT resources

Reporting
Multi-layered reporting in multiple reporting formats
From the bottom up...database configuration

**User added tables**

- **Method Information**
  - Method groups
  - Method lists
  - Customer default methods

- **ILCP Information**
  - Participants
  - ILCP planning
  - Test List planning

- **Data Processing**
  - Homogeneity/stability
  - Result processing
  - Reference materials
  - Customer summary data
  - Sample summary data
  - Critical value tables

**User added columns to LabWare tables**

- **Test List / Analysis Info**
  - Statistical model for processing
  - Number of samples in a set
  - Performance limits
  - Transformations
  - Method groups

- **Customer / Contact Info**
  - Customer codes
  - Dispatch details
  - Programme contacts

**Sample / Test Info**

- Product and micro matrix info
- Invoicing
- Transformations and limits
- Method groups

**Product Information**

- Material types
- Product types
- Product planning
From the bottom up...server configuration

**Citrix**

- **Citrix Server**
  - LabWare for concurrent users
  - Server directories

**Background**

**Virtual Machine 1**
- SQL Server
- Database
- Server directories
- Background server clients

**Virtual Machine 2**
- JEE Server
- JRE Installed

**Virtual Machine 3**
- Cluster Manager
- WebLIMS users 1-25

**Virtual Machine 4**
- Cluster Manager
- WebLIMS users 25-50

**WebLIMS**

- SQL Server
- Database
- Server directories
- Background server clients
Access Routines, Query Tags and Subroutines

Access Routines and Query Tags – nothing out of the ordinary

- Reports
- Certificates
- Summaries

Subroutines – forming the basis of our data processing and stats models for programmes, reference materials, homogeneity and stability

- Statistics – 2 way-ANOVA, F-test, Levene’s Test, T-test, KS Test
- Calculations – Z-score, UQ, LQ, IQR, SEM, Coefficient of Variance, Reproducibility
- Outlier Determination – Huber Score, Normalised Difference
  ...also
- Labels
- Setting database files for product related documents eg irradiation forms, formulations, reference certificates
Visual Workflows and User Grids

A visual workflow home page directs users to specific tailored workflows
Visual Workflows and User Grids – Example 1
Visual Workflows and User Grids

A visual workflow home page directs users to specific tailored workflows.
Selection criteria for in-house data entry

In-house an WebLIMS data entry grid

Shameless plug...
WishTrack item: W1543
Allow user configuration of textID format, and hide options
Implementation Timing

- Sep ‘12 –> Feb ‘13........Database configured
- Mar –> Present..............Tailoring for GP + Stats
- April..................................Client Web LIMS
- May –> Jul.........................Workflows
- Aug....................................Programme Delivery
- Aug –> Sep........................Reports Developed
- Sep.................................WebLIMS/Client Data Entry
- Sep.................................Historic Data Migration
- Sep -> Oct.......................Full & Parallel User Testing
- Oct.................................Change comms to clients
- ??.................................Go Live
Achievements...

One achievement sums up all the others...

| Global Proficiency and LabWare have collaborated to develop the world's first ILCP application from a base level LIMS product |

SO...

Is LabWare Proficient?
Thank You