Building a PLM Skyscraper
Who are Schrader Electronics?

- The world’s number one supplier of Tire Pressure Monitoring Systems (TPMS)
- Over 50% market share
- Provide sensors and systems for automotive and industrial markets
- Broadest product offering with the largest customer base
- Annual Revenue exceeds $300 million
- Annual R&D expenditure exceeds 8% of sales
- 50 million sensors in 2013
- On course to ship 61 million sensors in 2014
Our Global Presence
**Company History**

- **1896**: August Schrader invents the original Schrader valve
- **1988**: Formed as supplier of innovative handheld digital tire pressure gauge
- **1994**: Won our first OE contract for RTPM on the 1997 C5 Corvette
- **2000**: TREAD Act announced, TPMS to become mandatory in all US cars
- **2009**: UNECE 64 legislation passed, mandating TPMS for Europe
- **2007**: Acquired SSSL to protect supply chain and exploit ASIC technology
- **2012**: Schrader shipped 200 millionth sensor in July 2012
Our Customers
Broad customer base and growing volume
Building a Skyscraper

Where do you begin?

- Form a project team
- Understand the starting point
- Define requirements
- Buy a “Dummies Guide to Skyscraper Construction”
- Shortlist Construction Companies
- Ask companies to propose solutions and submit tenders
- Select a company and start building!
PLM System Selection Team

- Formed in May 2012
- Key Managers (all part time) from:
  - Mechanical and Electronic Design
  - Project Management
  - Document Control
  - IT
- Weekly Meeting
- Executive Support
Schrader PLM Starting Point
Initial Requirements

Project Management / Product Lifecycle Management

Catia CAD

Altium CAD

CAD Data management

CAD Integration

Engineering BOMs

IFS ERP Manuf BOMs

IFS ERP Part Master

Document Management & Change Control

Electronic Approval

Electronic Access to all Docs

Control of sample builds

Matl Reqmts for samples
Increasing our PLM knowledge (June-Sept 2012)

- Introductory Workshop
- General Research
- Employees with PLM experience
- 3 Systems and 3 Partners Shortlisted
- Learning throughout the selection process
  - Detailed requirements gathering – led by Partners
  - Product demonstrations and workshops
Final System and Partner Selection (Nov 2012)

- System
  - Flexibility
  - Companywide usage
  - CAD Integration

- Partner
  - PLM Experience
  - Best Practice
  - Broader Perspective
Construction – Phase 1

Phase 1 ‘Floors’

Foundations (LIVE Sept 2013)
Mechanical and Electrical CAD Data Management

- Designs are created in specialist packages (CATIA, UG and Altium)
- Stored and controlled in Aras integration menus
- Eliminates uncontrolled data
- Fully traceable design and release process
Company – Wide Access to 3D Designs

- Viewable files in 3D PDF format generated from CAD
- Linked to the part record and accessible by anyone with PDF Reader
- Can be manipulated, sectioned and measured
- Encourages data re-use
Systematically Generated BOMs

- Integrations combine the electronic and mechanical BOMs into a complete digital BOM in Aras
- Design changes automatically reflected in the digital BOM
- Eliminates sources of error when the BOM is no longer manually created and updated
Change Tracking and Digital Signatures

- Paper-based change system replaced by digital signatures on an online workflow
- Progress towards release is fully visible
- Signatories and any comments are recorded against the change
Accessing Released Documentation

- Control maintained in Aras rather than sending copies
- Doc. search Application for easy access
- All sites and sister companies instantly pick up changes
Proposed ECR and ECO Processes

- Schrader only operates an ECN process
- Communication and consultation prior to change not always complete
- Proposed ECR system, followed by ECO
Project Management In PLM

- Timelines will be live and available to project team
- Documents and other deliverables uploaded directly into projects
- Improved collaboration between departments with visibility of data
Building a Skyscraper

Construction – Future Phases

- Resource Management
- Collaboration – ‘Secure Social’
- Secure File Distribution
- Quality Management
- Project Cost Management
- Replacing MS docs with system functionality
- Change Implementation
- Ideas capture and filtering

- Project Management
- Change Management
- Visualisation
- CAD Data Mgmt
- Product Doc Mgmt

- Part Master
- Basic ERP Integration
Implementation Scope

- IFS Integration
- Product Document Management
- Part and BOM Management
- Configuration Management
- Visualisation
- Mechanical CAD Data Management
- Altium Data Management
- Project Management
- Online Engineering Change Process
- Tie-In to Requirements Management
- Complete Document Management
- Resource Management
- Quality Management
- Project Cost Management

Grey
Blue
Red
Complete
In Development
Proposed Future Development

Timescale
2013
2014
Lessons Learned … so far!

- Aras was the right choice
- Flexible system and agile approach is critical
- BUT should have set a step by step roll out plan sooner
- It’s difficult to build several floors at once!
- Having internal Aras ‘development’ resource is essential
- We can always work harder at communicating with the business
- It is a challenge to keep focused on delivering priorities but have a way to capture ideas for the future
- ‘Feedback’ button was a good idea
Developing Aras – Outside Aras
Two main reasons:

1. To give users direct access to information which is stored/controlled in the PLM.
   - Reduces the need for training
   - Speeds up common tasks
   - Easier to get buy-in

2. Automating Aras Processes
   - A user friendly way of carrying out a process in Aras
   - E.g. creating a ‘Change’ item and adding affected items
Solving Problems

Controlling Documents

Before Aras

- Document Control Team manually controlling shared folders of latest Released Documents
- Several applications pulling files straight from folders
- Manual control, prone to errors

Many teams need access to Released documents, but aren’t involved in authoring or review

- Big overhead to train
- Users don’t care about Meta-Info, just want outputs
Aras Document Search App

- Allows user to browse folder structure, or search for Docs Directly
Related Solutions

- Implemented several small applications:
  - Pulling files and metadata into other company systems
  - Replacing pre-Aras solutions
- Storing and sending ‘read only’ links to Documents in Aras
Electronic CAD Change

Before Aras:
- Design files **not** controlled
- Documents managed manually by Doc Control
- Parts recorded manually on BOM Spreadsheets

Aras – Altium Integration:
- PCB Designs created in Altium
- “Integrate” connector saves Design into Aras producing:
  1. Parts
  2. Documents
  3. CAD Item
- Change difficult for a new User
Solving Problems

Electronic CAD Change App

- User launches from CAD design Item in Aras
- User selects what Parts of Design to revise
- User can choose to create new ECO or add to existing
- Populates ECO information
Solving Problems

Electronic CAD Change App

- Affected Items created
- New Revisions linked appropriately
Possible Future Integrations

Amount of information captured in Aras increasing

- Aras not everyone’s primary system, many users tied to ERP system
- Long term plan to give quick access to Aras information from every system

Example

- ERP user finds Part in IFS
- Right click action allows them to directly view drawings pulled from Aras
Questions?