

# Integrated Business Systems For Multiple Facilities

## Background

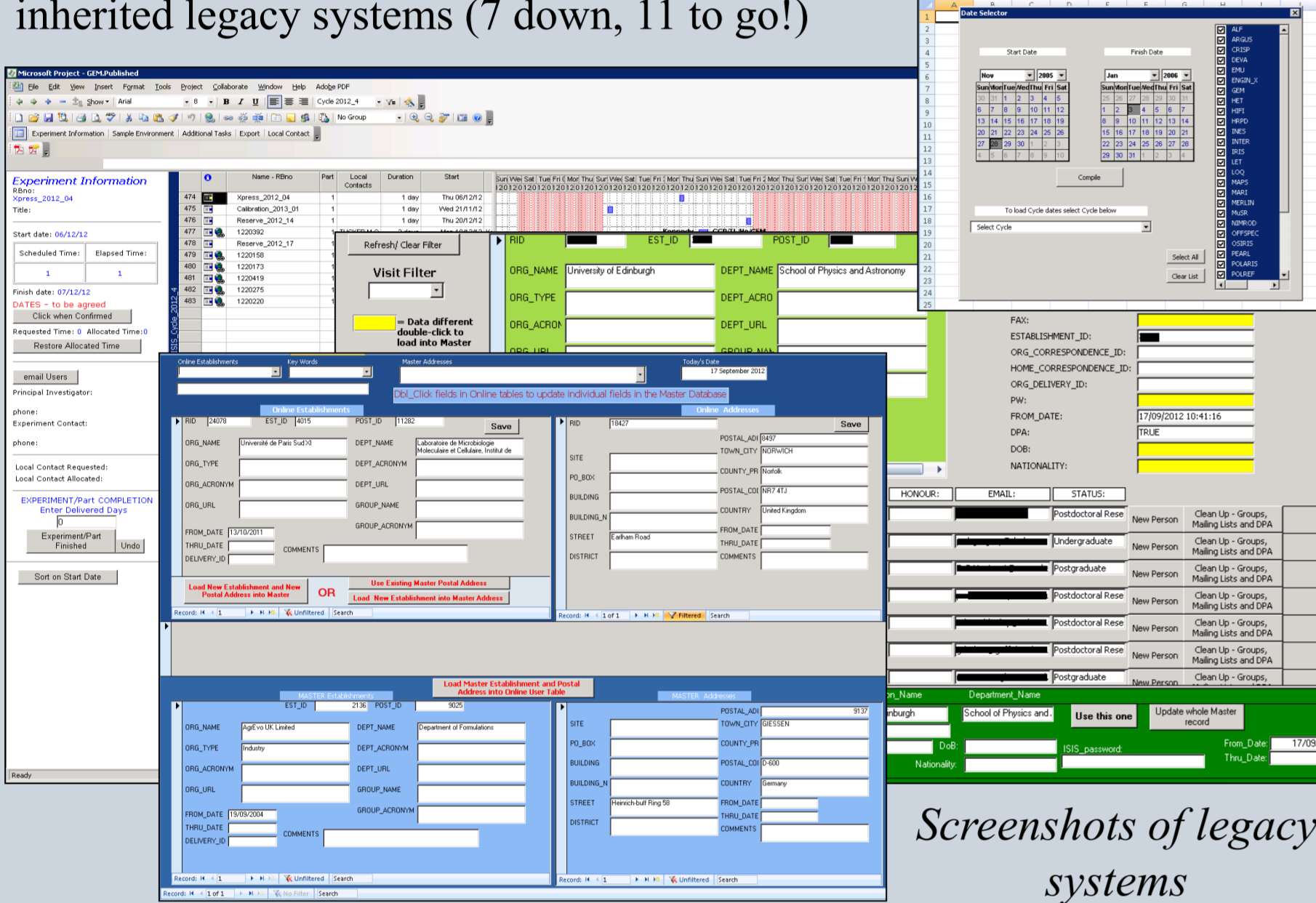
With business software dating back to the early 2000s, the ISIS Computing Business Applications team look after a collection of software ranging from legacy client tools we have inherited to web-based systems have architected and developed from scratch.

- We provide suitable software and support for facility users and staff.
- Our systems are used by multiple facilities including ISIS, Central Laser Facility (CLF), Research Complex at Harwell (RCaH) & MICE.
- The goal is to produce a fully integrated suite of coherent and extensible business systems that appear to users and staff as one unified system.

### Current challenge

In 2011 we inherited a lot of legacy programs. These loosely integrated, stand-alone programs have become outdated, difficult to manage and are simply unfit for the job. For example, the scheduler uses MS Project Server 2003, MS Access and MS Excel Add-ins to allow staff to schedule experiments.

Similarly to those systems we have already built we are using Java, EJB, SOAP web services and ASP.NET (C#) to move all systems to a tiered architecture with web-based GUIs gradually eradicating all inherited legacy systems (7 down, 11 to go!)



## Single Sign-On

Each system is a separate web application (for easy maintenance). Our ASP.NET web applications enable a single sign-on mechanism through form based authentication. To do this we set `enableCrossAppRedirects` attribute to true in the Web.config file of each application and put in an identical `machineKey` tag also in the system.web element.

```
<forms..... enableCrossAppRedirects="true" />
```

Setting this up means that behind-the-scenes if the user is authenticated a ticket is created which is stored by the client. When the user subsequently visits an additional .NET application it passes the ticket for validation to the new application. If all the keys and other criteria match then the user is directed to the URL intended without having to login for a second time.

We plan to introduce SSO cross technology too e.g. from our Java proposal system to our .NET safety test system and vice versa. In this case because both technologies use the same authentication module (consume the same web service) we will pass the Session ID between applications. Things like the application the user office staff use to manage user details will still require them to login again (added security).



## Looking Ahead

Although progress has been good we still have a lot to do replacing legacy systems and have ideas from staff coming in every day for brand new systems we've never had before. Our main focus over the coming months and year will be to:

- Continue to reduce the number of legacy systems
- Ensure our systems are ready for Umbrella

### The Plan

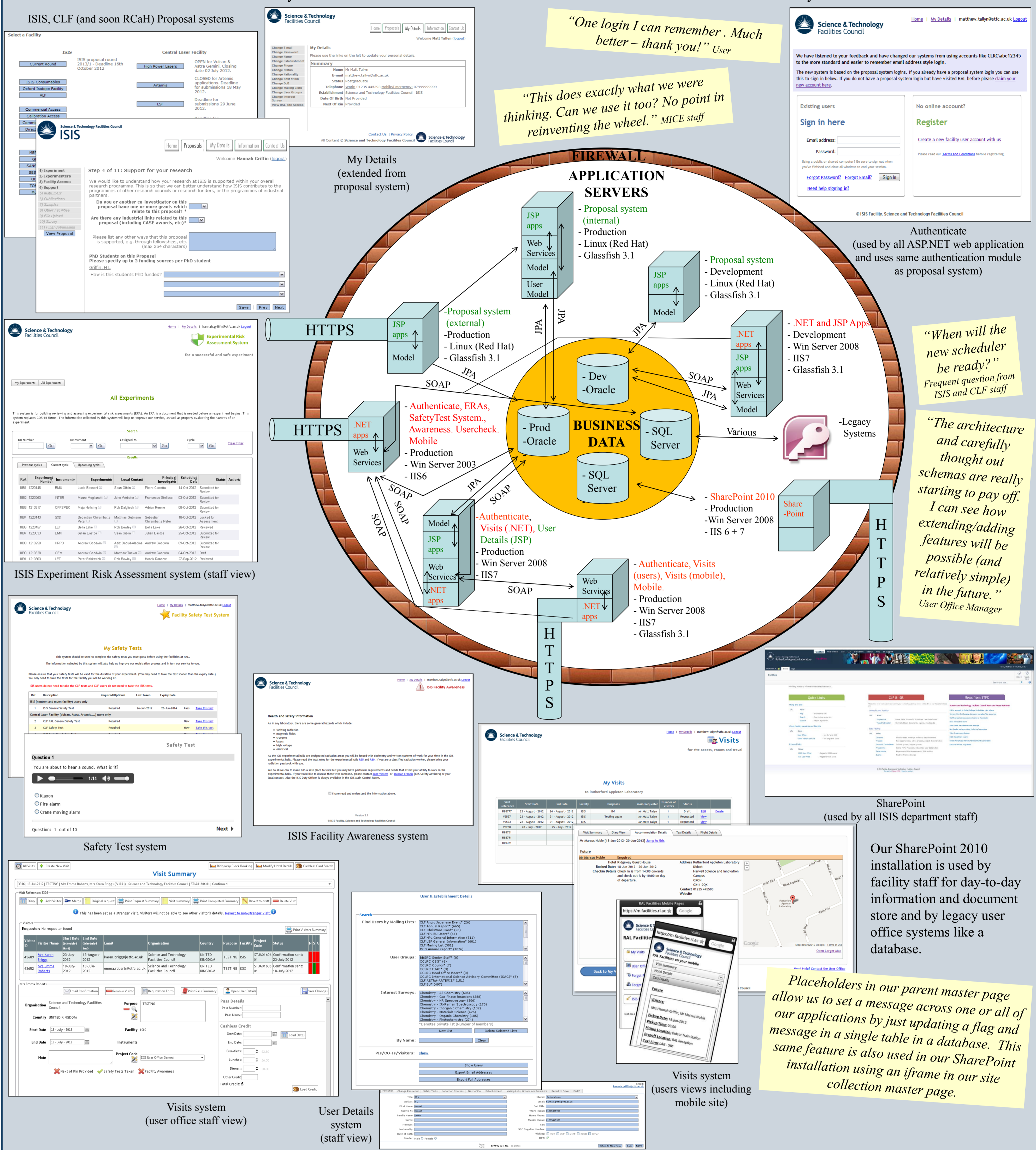
- Finish enabling **cross-platform SSO**
- Work will also begin (collaboration with University of Derby) on a proof of concept to replace parts of the **Facility Access Panel** process (system to replace multiple legacy MS Access tools)
- A **new experiment scheduling system** (to replace multiple legacy MS tools and add-ins) and we aim to release version 1 for at least ISIS and CLF. The architecture aims to allow for adoption by other facilities if required.
- Provide our users with the option of using **Umbrella** to identify themselves.
- Work with colleagues to facilitate the adoption of the **Affiliation Database**.
- Start using an installation of CERN's conference management application, **Indico** (to replace legacy MS FrontPage-reliant system).

### Longer Term Plan

- Management information systems, expert systems, claims...

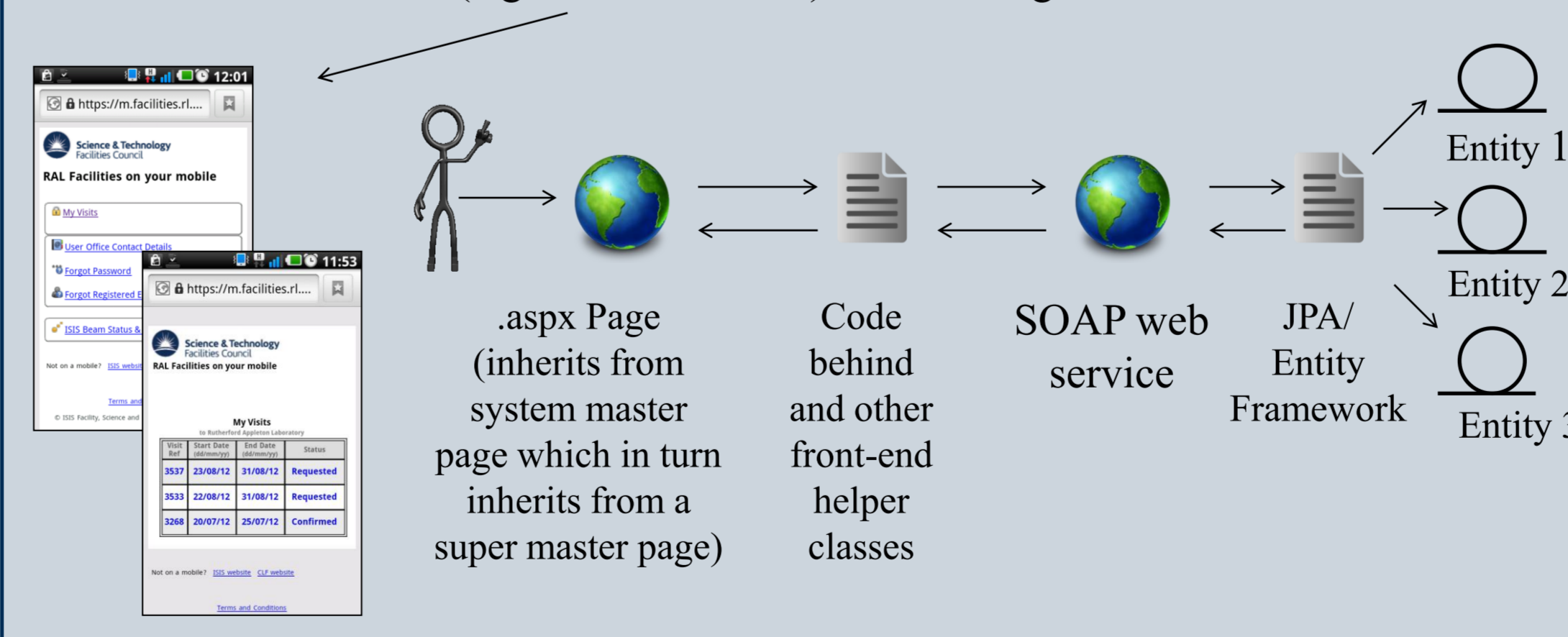
## World of Business Apps – System Architecture

We collect and make available in useful ways the information facilities staff and users need to deliver excellent science safely.

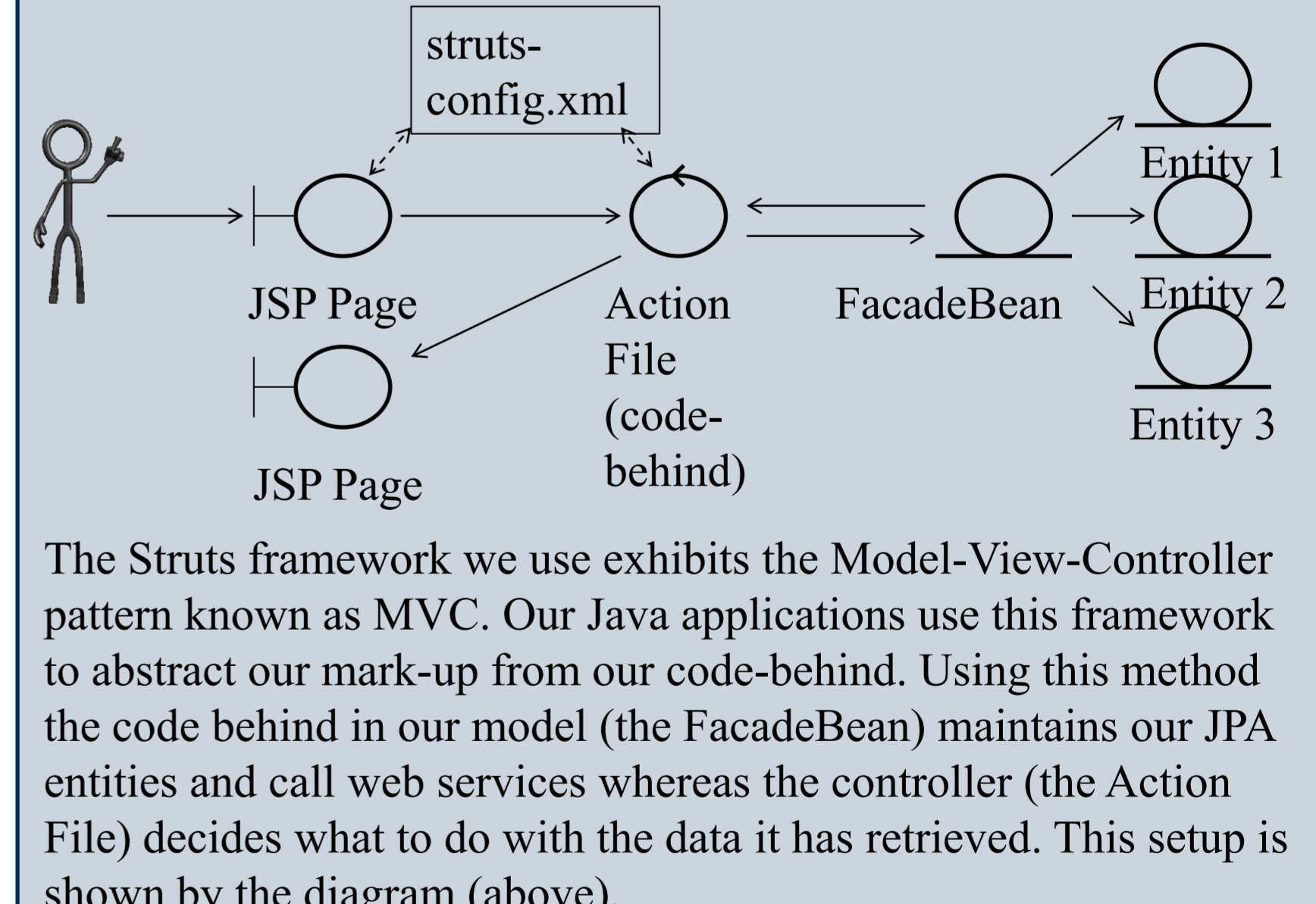


## ASP.NET Web Forms

Our front-end .NET apps are written using this structure. The markup (presentation layer) is what the client sees and interacts with. We can then place calls to web services in the code behind to happen when certain events are fired. This enables us to have different user interfaces (e.g. our mobile site) but all using one common back-end.

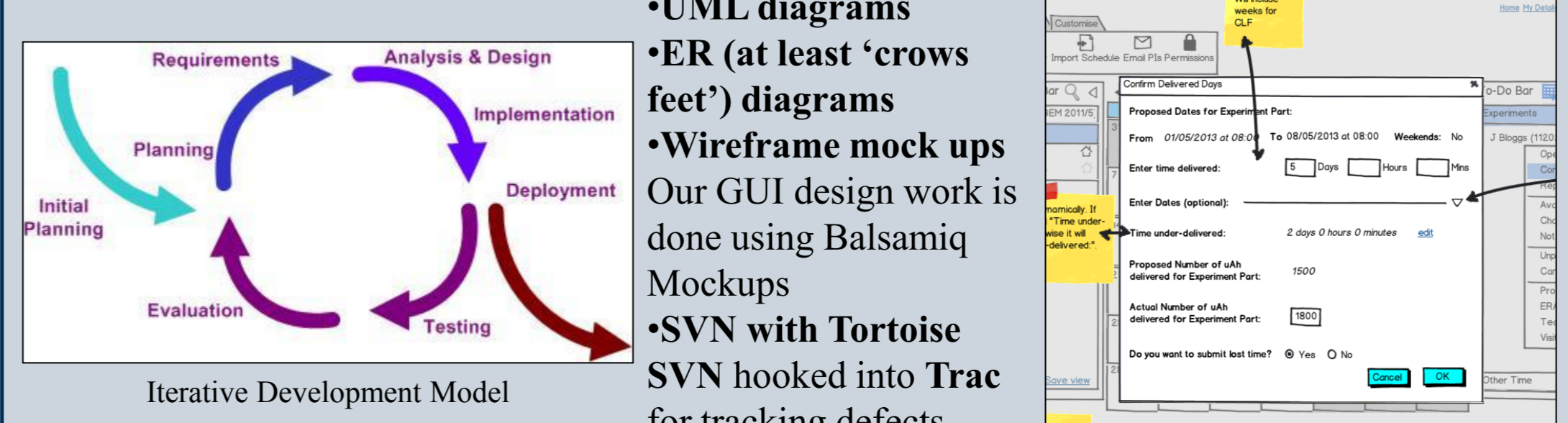


## Struts and MVC



## Development

Due to the small size of our team we follow a prototyping approach to gather requirements and refine designs. At the start of a project we try to get a **solid understanding of the ultimate full system in order to design a sound database schema and basic flexible architecture**. After that it is a very iterative process and we **design and deliver in chunks** based on priorities.



## Technologies Used



## Find out More

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