Linking Inventories to Corporate MI Systems

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Overview

Introduction: Leeds Equipment Sharing and Management System

Developing a strategic overview of the inventory

- Improving internal networking
- Opportunities to realise savings
- Getting a handle on sustainability of research equipment base

Beyond Inventories: Booking, charging, user management

Conclusions

Leeds moved over to SAP as its single primary information store and platform in early 2000s

Asset register and equipment inventory already held in SAP

General principle, duplicating data sources without ensuring consistency not a good idea

Therefore, build the outside world facing inventory on top of SAP

MIS Wins and Losses

Wins

- Access to 'primary' data for all business processes

- Relationships between data maintained

  - Personnel records and estates information both link to organisational structure.

  - Purchase records link people and assets to organisational structure

  - Asset register links purcashe records, assets and estates locations

Losses

- Complexity !

  - Limited access due to training requirements

  - SAP operators not necessarily familiar with data they are working with

  - Those familiar with data find it difficult to check for accuracy

  - Overview of SAP and operational overview of the University held in different type of role

Implementation of ESMS

"Quick 'n' Dirty" solution was to use an existing off-the-shelf reporting tool – "Qlikview" – works fine, but not geared towards primary audience – research staff – ad licensing issues

Bespoke web application communicating with SAP via web-services

Initial design brief – make it look and feel a bit like web of science = structured searches, quite old fashioned, but familiar to research staff
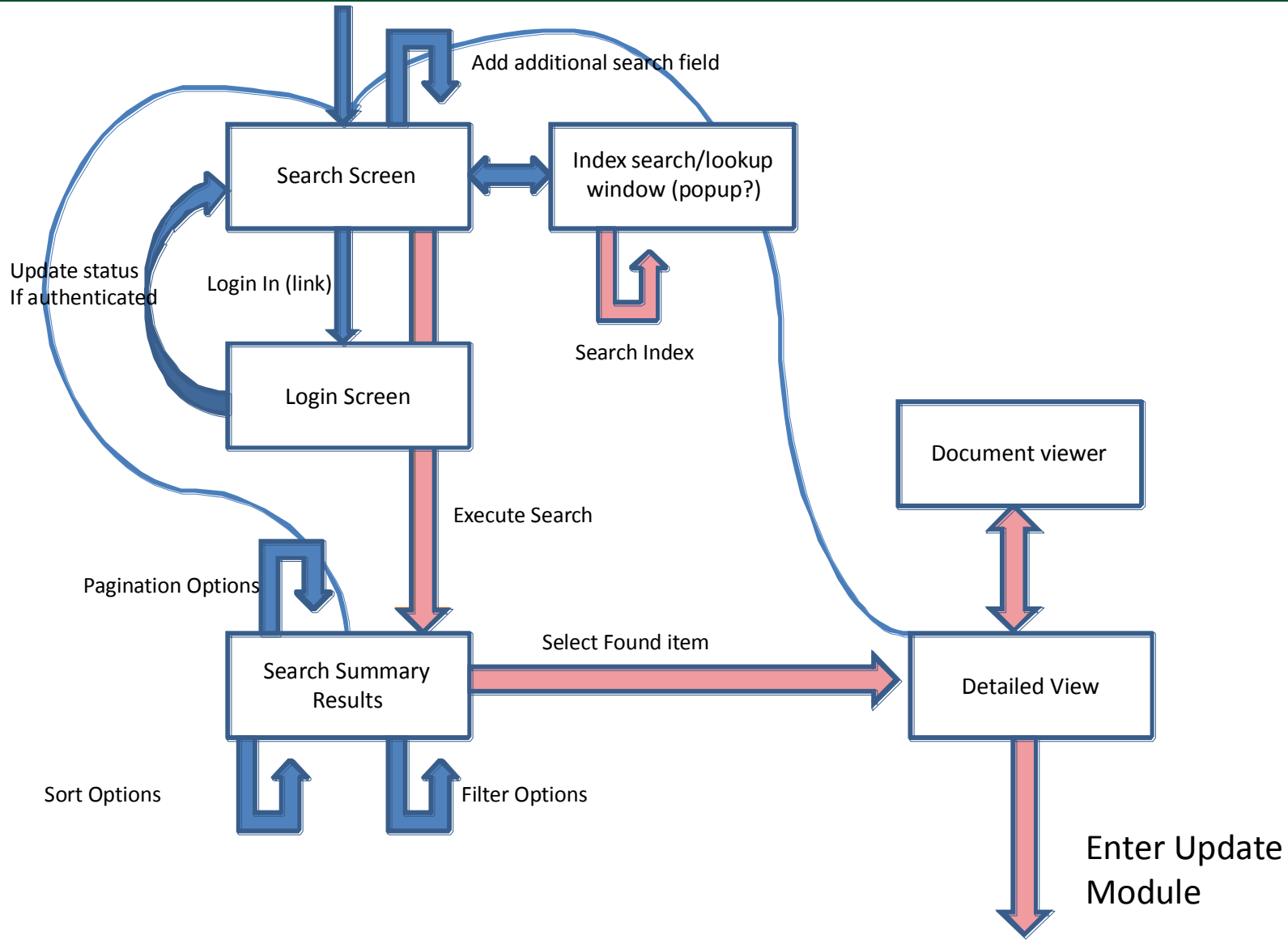
Make something that the owners of equipment could update and 'fix' up their own records

Enrich the inventory with additional data, pictures, files….

Design Schematics

Add additional search field

Search Screen ↔ **Index search/lookup window (popup?)**

Update status
If authenticated

Login In (link)

Search Index

Login Screen

Document viewer

Execute Search

Pagination Options

Search Summary Results → Select Found item → **Detailed View**

Sort Options   Filter Options

Enter Update Module

Things that are Easier

Lots of 'added value' data is already present in a suitable form for linking

- E.g. Academic manager (PI) and technical contact already exist in the HR tables – just need to link to their HR number and name, contact address, email, phone, organisational stricture already there

Consistency when associated data changes

- E.g. Rooms come and go (!) and people change name…

Integration with other processes

- E.g. now all purchases over £25k generate skeleton records in the inventory

Things that are not so easy

The system is inherently more complex = more prone to failure and requires two teams of developers to work on it

Potential performance bottlenecks

- Latency (total bandwidth should be easy)
- Do you really want to hit the University's main database on th whim of external users ?
- The unexpectedly slow operations…
- Can be mitigated with caching of search data or intermediate results

Security ?

- Need to design the interaction with the MIS carefully
- But separation of data and presentation can help – interactions mediated through a well defined and limited interface

A separate front end communicating with the back end database via a web standards based programming interface

Doesn't have to be the inventory website that is talking to the back end

- E.g. School and department websites can generate custom views of data – particularly with rich content added and managed by the equipment owners

- Services for business/ knowledge transfer/ marketing can all tap into the inventory – making use of components for corporate content management systems

Easy(ier) to hook up to make shared inventory systems.

Having imposed a classification system we can start to ask interesting questions…
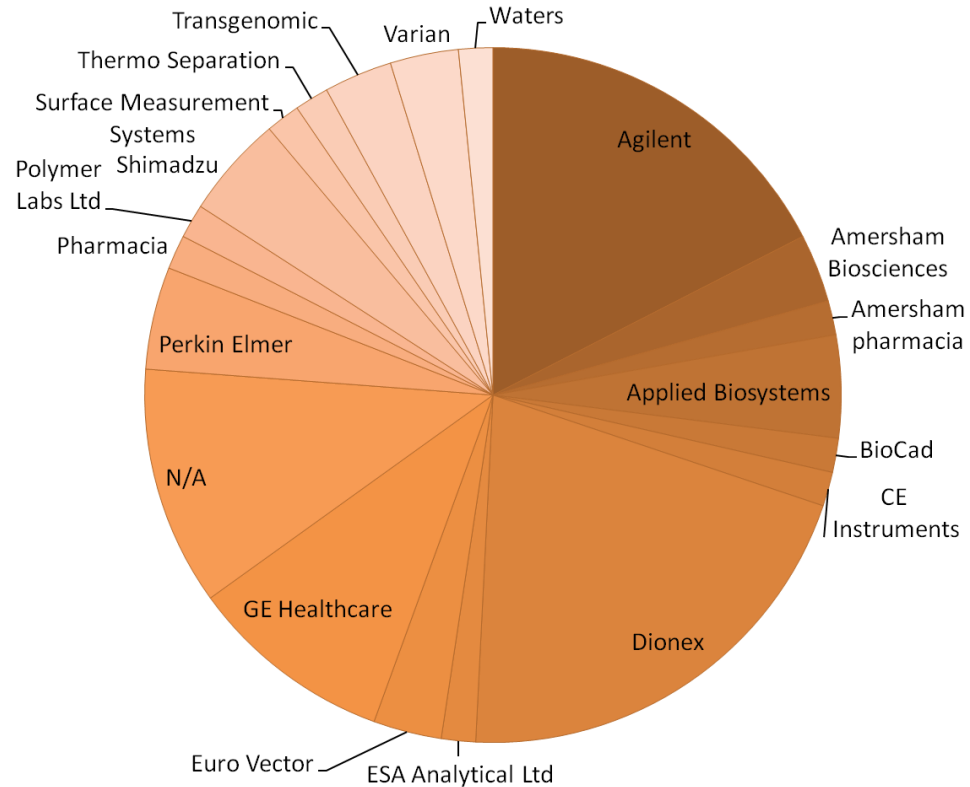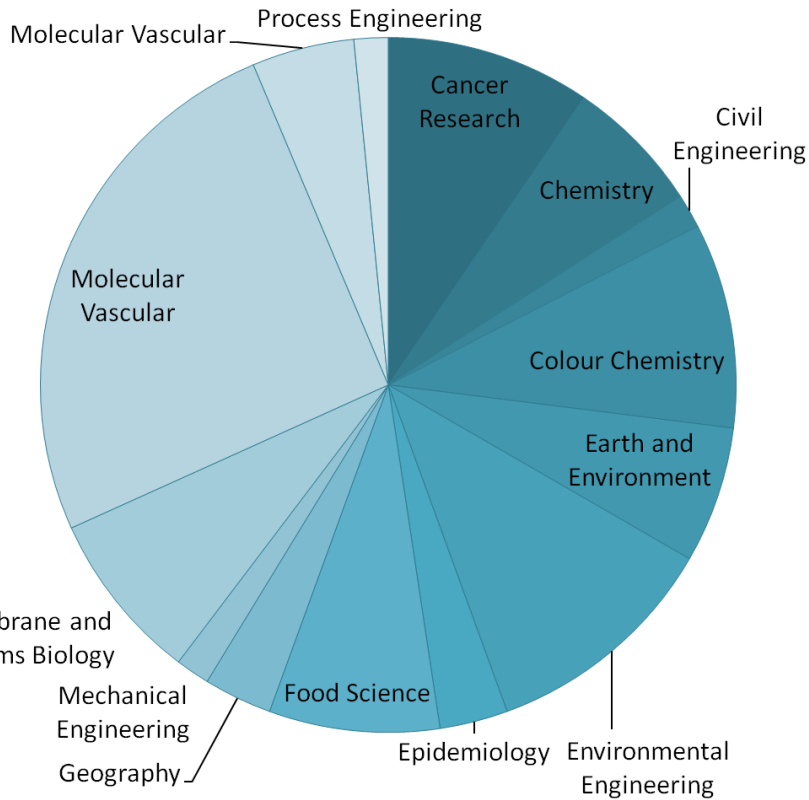
- Where do we own <type of equipment> ?

- Who has most of them, who has the most experience ?

- Is there spare capacity or do we have a shortage across the University ?

- Can we share service contracts/parts/service visits/technical expertise ?

Start off simply by looking a clusters of equipment and getting Academic managers and technical contacts talking in the same room…
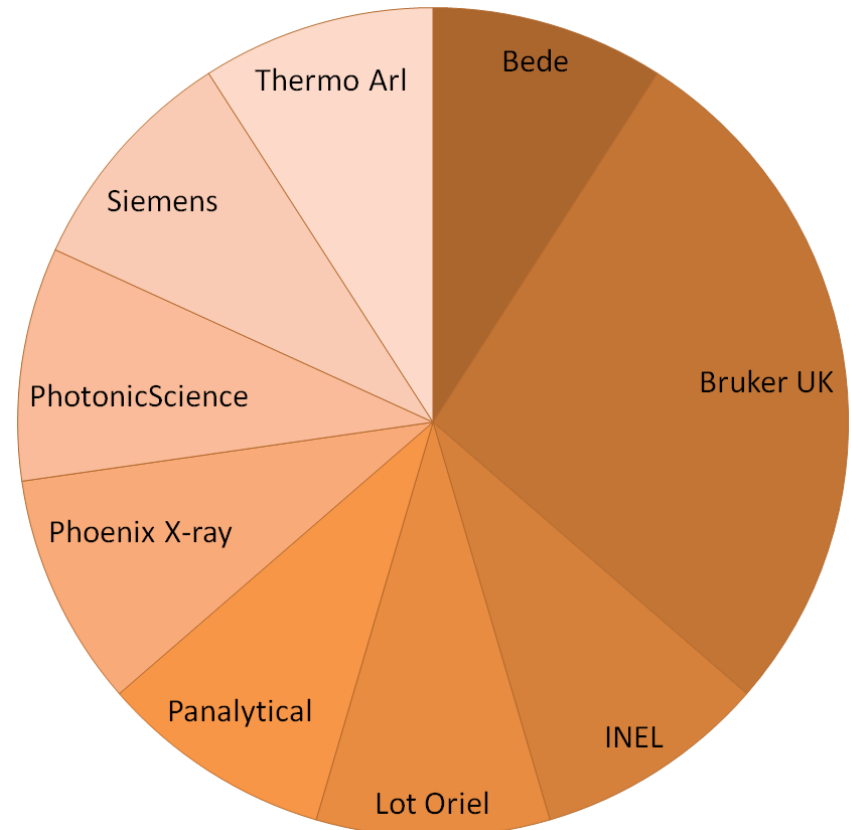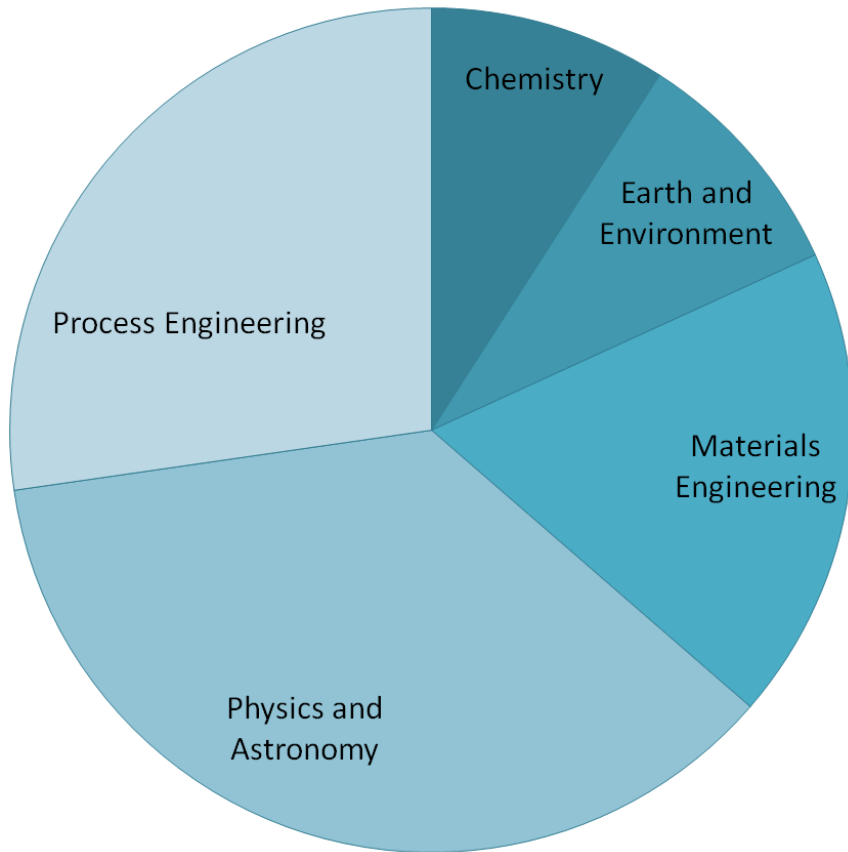
e.g. Chromatography (n=63)

e.g. X-ray Diffraction (n=11)

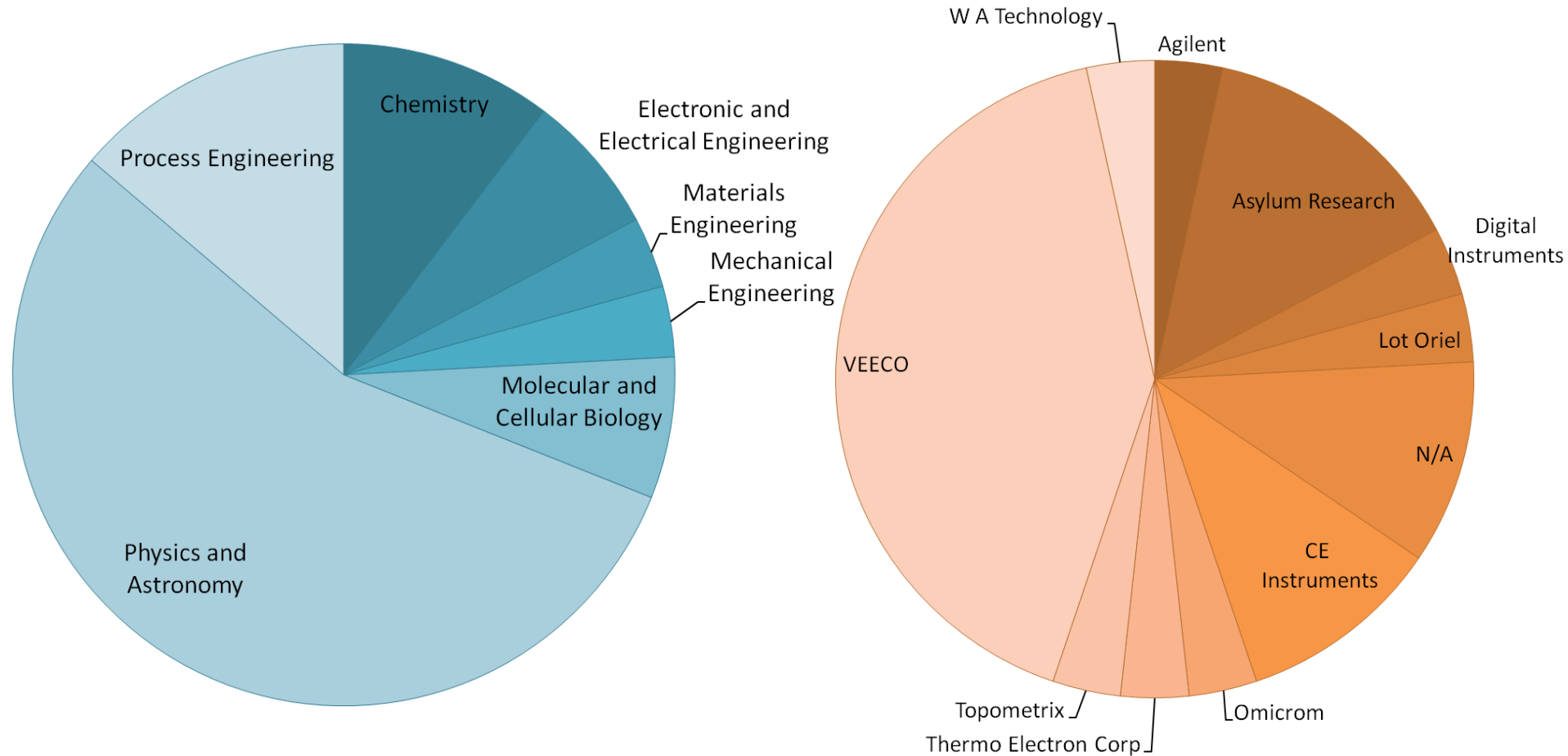# e.g. Scanning probe microscopy (n=29)

Outcomes from Cluster Meetings (1)

• There was clear lack of knowledge about facilities available elsewhere within the institution;

• There were issues with technical support, with instruments not being used to capacity owing to insufficient staffing;

• There were pieces of equipment not being used owing to lack of maintenance/funding for repairs;

• There were difficulties with finance: internal charging, non-FEC costed research (PhD students), sustainable management of SRFs/MRFs.

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• Central University web sites will be established, e.g. mass spectrometry @ Leeds, allowing visibility of the complete inventory, not just one Institute's;

• Opportunities identified for joint internal/external training courses, and industrial open days;

• Central Purchasing looking for ways to ensure more efficient service contracts are in place across campus (>£2M currently being spent!);

•Opportunities for recruitment of dedicated service enginesr for high value equipment (e.g. scanning electron microscopes).

Sustainability

The key question is "how long is this bit of equipment going to last"

Difficult question to answer !

- Is this a typical example of such equipment ? Who uses it, how often and to do what ?

- What do we mean by 'last' ? Produce 4* data, work within specification, produce data useful for a PhD student….?
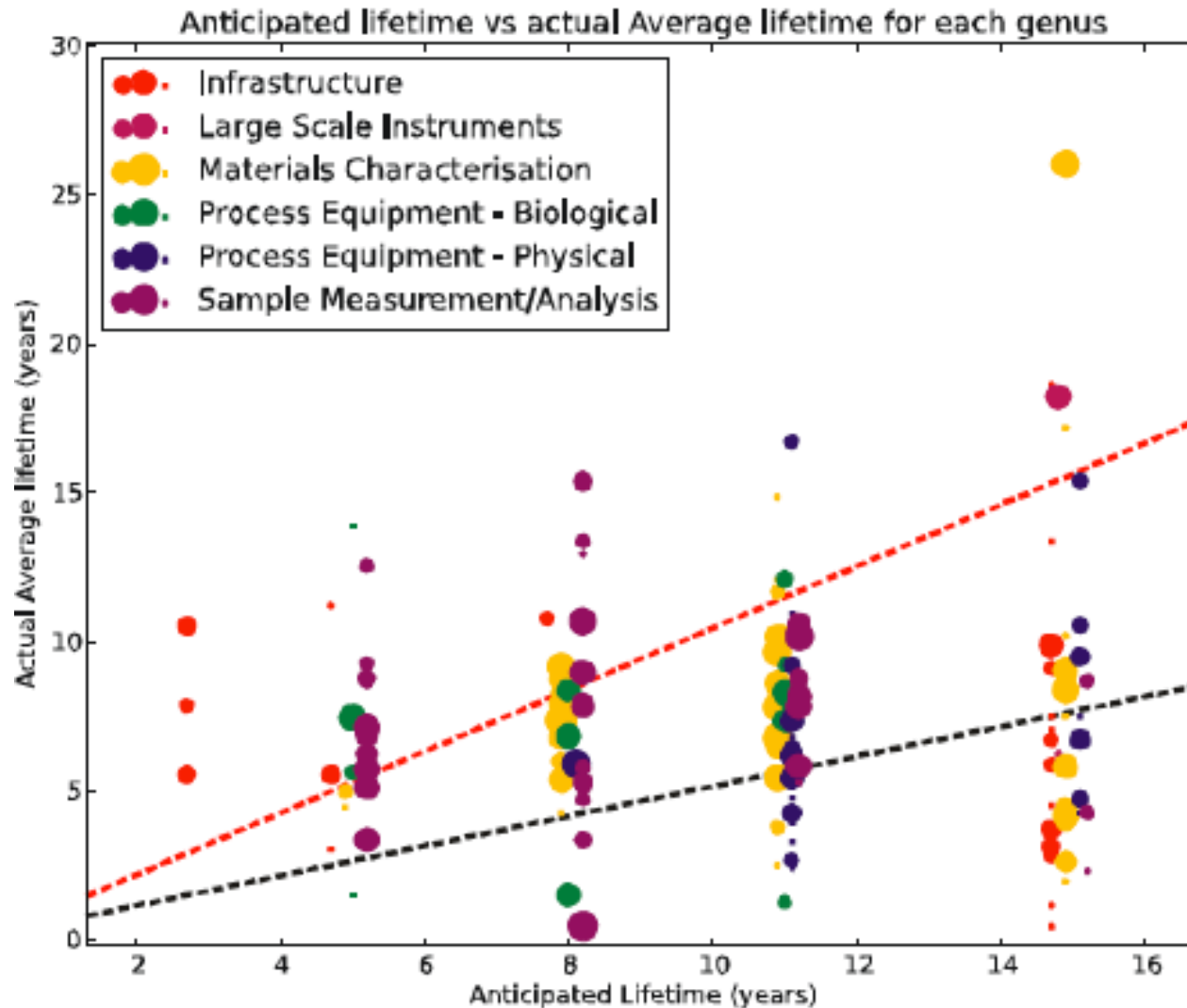
Taken a crude, pragmatic approach – assume one can assign an average lifetime based on genus (the lowest level of our taxonomy)

- Inspired MRC draft policy on depreciation lifetimes

- Definitely not a substitute for proper estimates when looking at single items

- Potentially useful to identify where there are emerging sustainability issues…

Anticipated lifetime vs actual Average lifetime for each genus
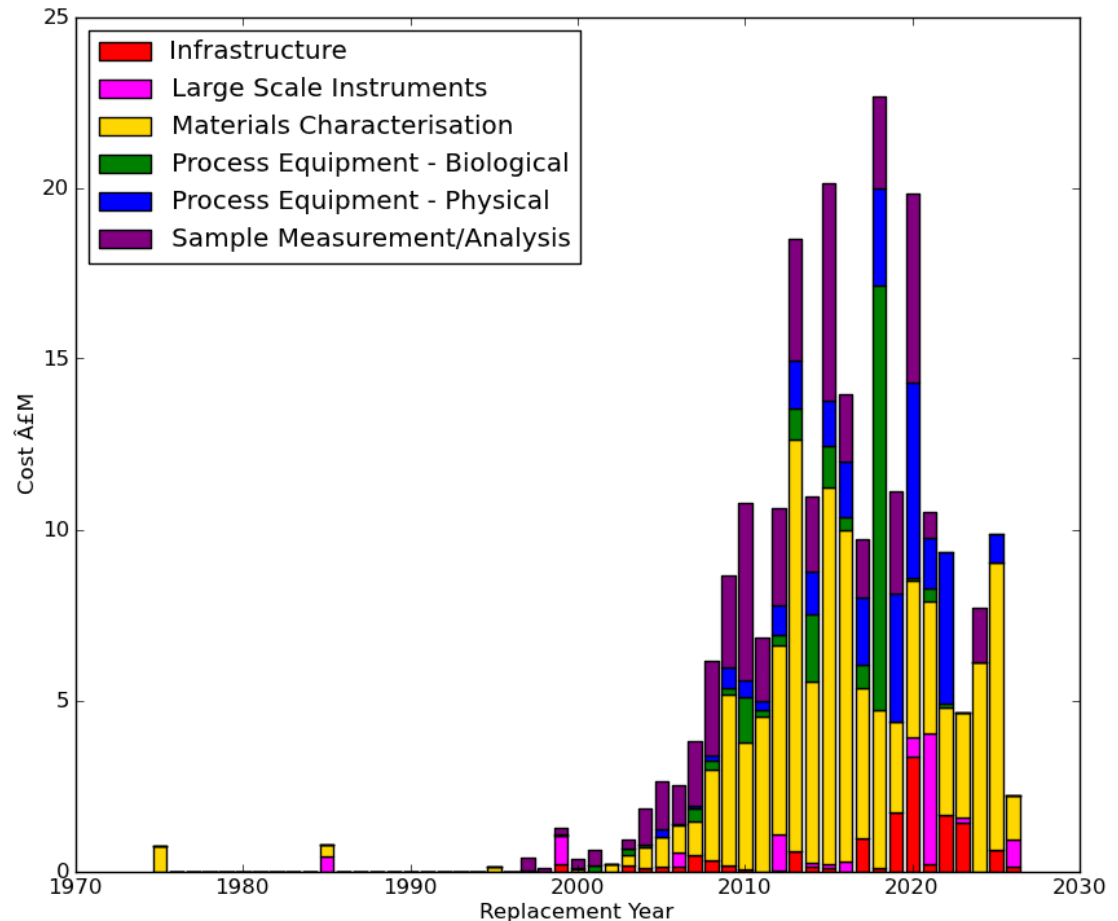
Combine inventory data with purchase records and can get a new picture of what we've been investing in…
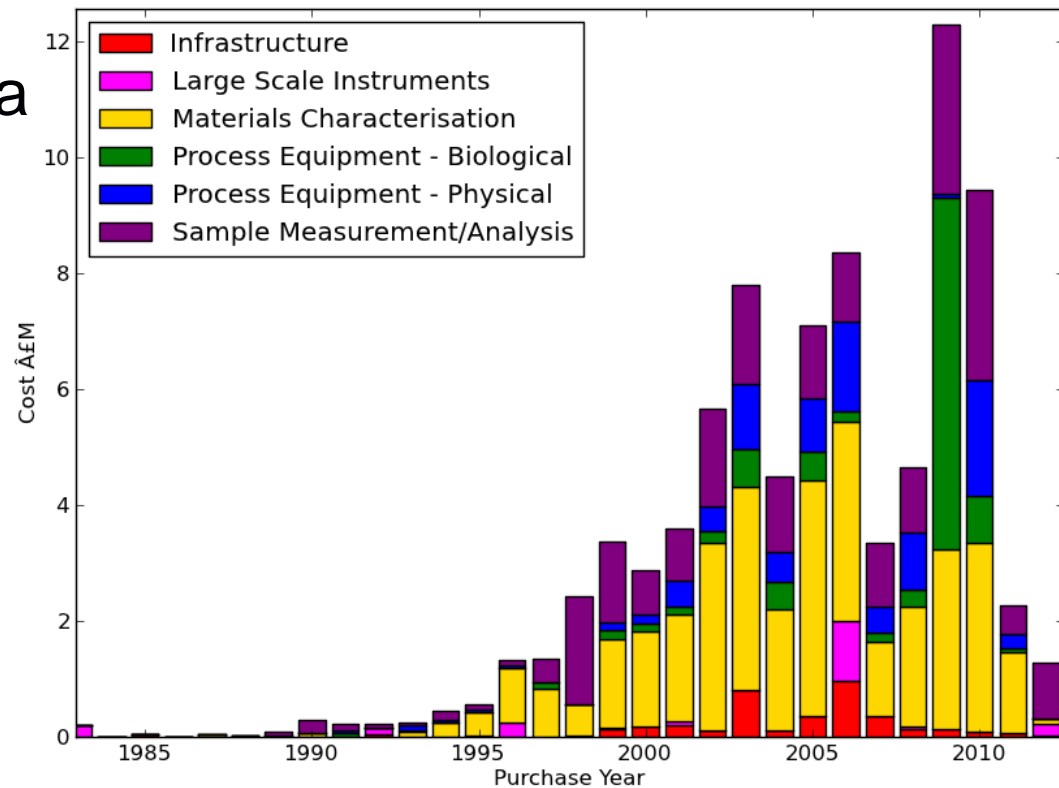
Add in our estimated lifetimes and get what we might have to spend…

These are very crude estimates, but would suggest that the UK overall should perhaps spend ~£500M to maintain the position of its research equipment base

Refining the picture

We need to validate whether our lifespans are realistic

…or indeed whether one can apply a single lifetime per classification

What is the correct value of inflation to apply ?Certainly not headline inflation…

Ideally we need a bigger data set to work with, but also need consensus as to how to do this sort of analysis

Beyond Inventories: Stages in Using Shared Equipment

Identify Suitable Equipment

Be Trained to use Equipment

Reserve Time to use Equipment

Use Equipment

(Teach others to use Equipment)

Calculate Usage of Equipment

Pay bills (!)

Background

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Nanotechnology Cleanroom

UNIVERSITY OF LEEDS

University of Leeds | Nanotechnolgy Cleanroom | General Information | About this website

General Information
- About this website
- New Users
- Getting Training

User and Equipment lists
- Available Equipment and Charges
- Cleaning Rota 🔒
- My Account 🔒
- Book Equipment 🔒
- Manuals and Instructions 🔒
- Find Users 🔒
- Find Equipment 🔒
- Management 🔒

Building Information

Safety Information

Contacts

Administration 🔒

Login/Logout

Introduction

Welcome to the nanotechnology cleanroom Intranet Website. Here you will find information about the day to day arrangements for the Wolfson Nanotechnology Cleanroom at the University of Leeds. The Wolfson Nanotechnology Cleanrooms are a £2.5 Million Suite of class 100 cleanrooms with facilities for photo- electron beam- and focussed ion beam lithography that are operated on behalf of the University of Leeds by the School. of Electronic and Electrical Engineering.

User List Management

Questions one finds oneself asking....

- Who is that ?

- Are they allowed to use that equipment ?

- Do they know what they are doing ?

- and well enough to train somebody else ?

- Where dp they live and who is in charge of them ?

Generic information about individuals (e.g. contact details)

Information specific to items of equipment (e.g. Experience level)

Basic user focussed questions

- Is X working and when is it available to use next week ?

- Who is using X before/after me ?

Management Policy

- Who can make bookings, who can edit/delete bookings ?

- What is the minimum/typical/maximum time that something can be booked for ?

- When can a sysem not to be used ?

- Can we stop uncooperative practices e.g. Speculative booking, over booking, short notice cancellations etc ?

Typical questions to be answered:

- How many hours/days has user A used equipment X ? *(and how much do they owe us now ?)*

- What fraction of time was the equipment in use/broken/free for ?

- What fraction of time was the equipment used by Engineers/Physicists/Postgraduates/Post docs/undergraduate projects

Safety Managent

Producing up to date user lists

Providing a central repository for risk assessments, instructions

Recording when users confirmed they had read Ras/instructions

Individual user training records

Summary

As with other UNIQUIP presentations – there is lots of added value to integrating inventories with other data sources

We can start to get more holistic pictures of an institution's research equipment assets

If we are to share equipment effectively, there are substantial management challenges that technology can help us with

(but also lots of other hard problems to solve)