Building a highly-integrated management system in Fusion Lifecycle

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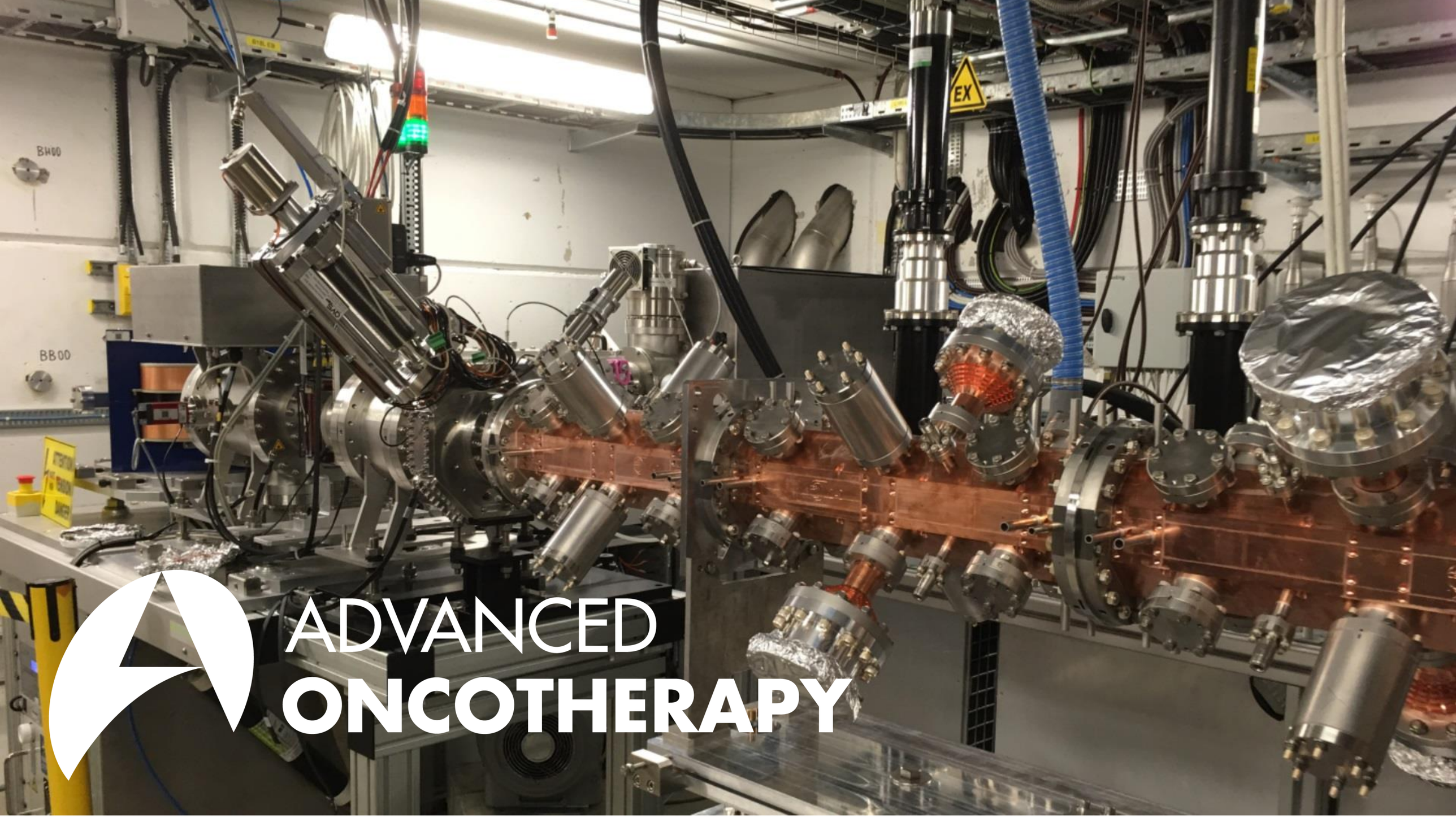
INTEGRATION

Integrated Management System

- An **Integrated Management System** (IMS) integrates all of an organization's **systems** and processes in to one complete framework, enabling an organization to work as a single unit with unified objectives.

Company overview


ADVANCED
ONCOTHERAPY

Overview of Advanced Oncotherapy plc

Advanced Oncotherapy is developing a 24m long, 230MeV, proton therapy system for the treatment of radio-sensitive tumours

- **Listed on AIM**
- **HQ in London with operations in UK, Switzerland and the US**
- **>90 employees, including 60 based in Geneva**
- **A distinctive collaboration with CERN…**
  - Operates the largest particle physics laboratory in the world
  - Created the world's most powerful accelerator (LHC)
- **… following the acquisition of ADAM in 2013**
  - A CERN spin off
  - Designed and built the first linear proton accelerator
  - Technology validated at 72 MeV

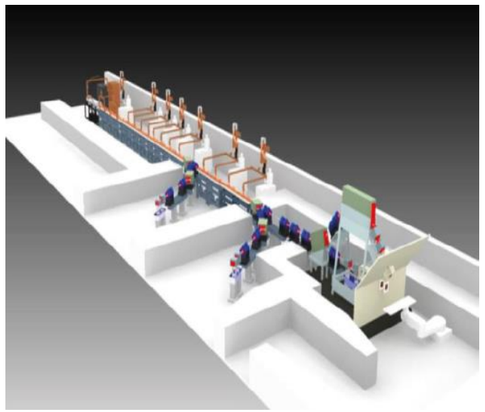
LHC (Large Hadron Collider)

27 km

14,000,000 MeV

99.9999% speed of light

LIGHT (LINAC for Image Guided Hadron Therapy)



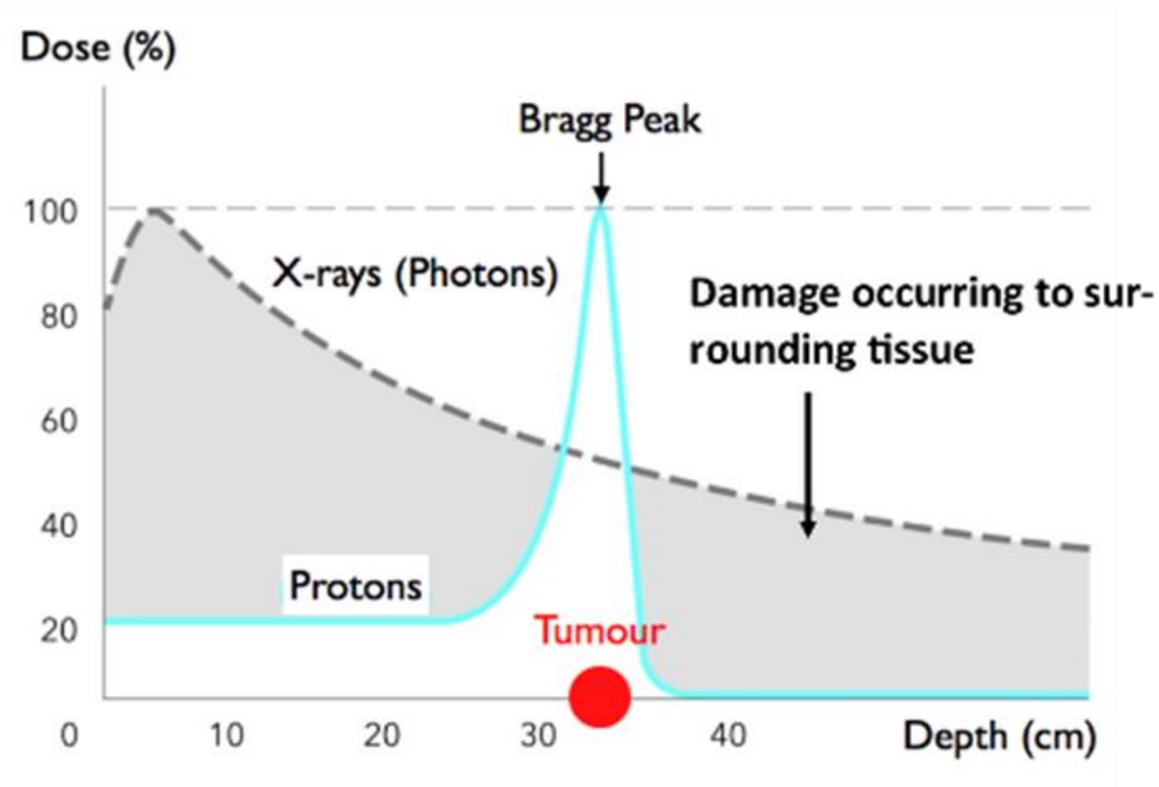
24 metres

230 MeV

60% speed of light

Proton Therapy –
a More Effective Type of Radiation Therapy

- **Energy released by protons destroys cancer cells in the same way as x-rays**
- **Validated technology**
  - First clinical use in 1954
  - More than 130,000 patients treated to date
- **Less healthy tissue damaged during treatment**
  - Bragg-peak effect

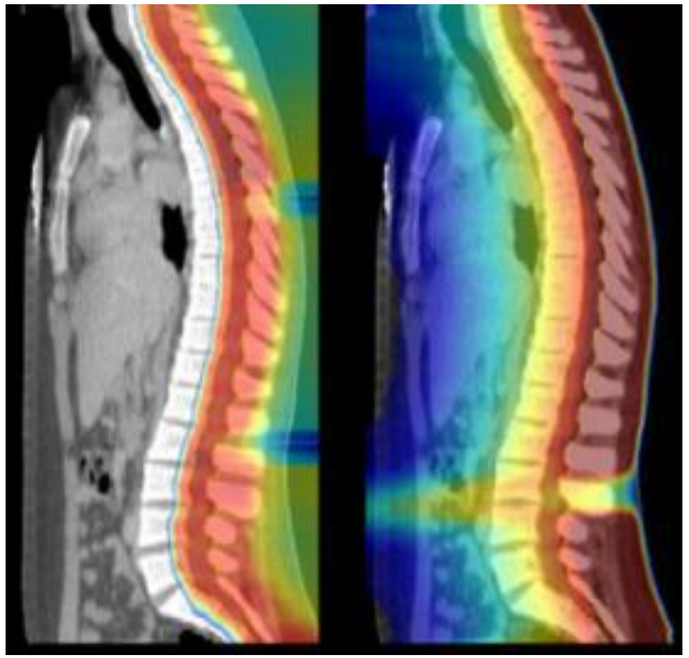


Proton Therapy – Illustration and Key Benefits

“The beauty is that you can use higher doses of radiation and therefore increase cure rates, while avoiding tissues that are exquisitely sensitive to radiotherapy and therefore at high risk of side effects.” *(Dr Adrian Crellin, Dean, Faculty of Oncology, Royal College of Radiologists))*

- **Non-invasive**
- **Better targeting to the tumour and not surrounding organs**
- **Reduced side effects and better quality of life**
- **Can reduce length of treatment and thus cost**
- **Particularly beneficial**
  - When tumours are located near critical organs or structures (e.g. brain, heart or spinal cord)
  - For children with cancers

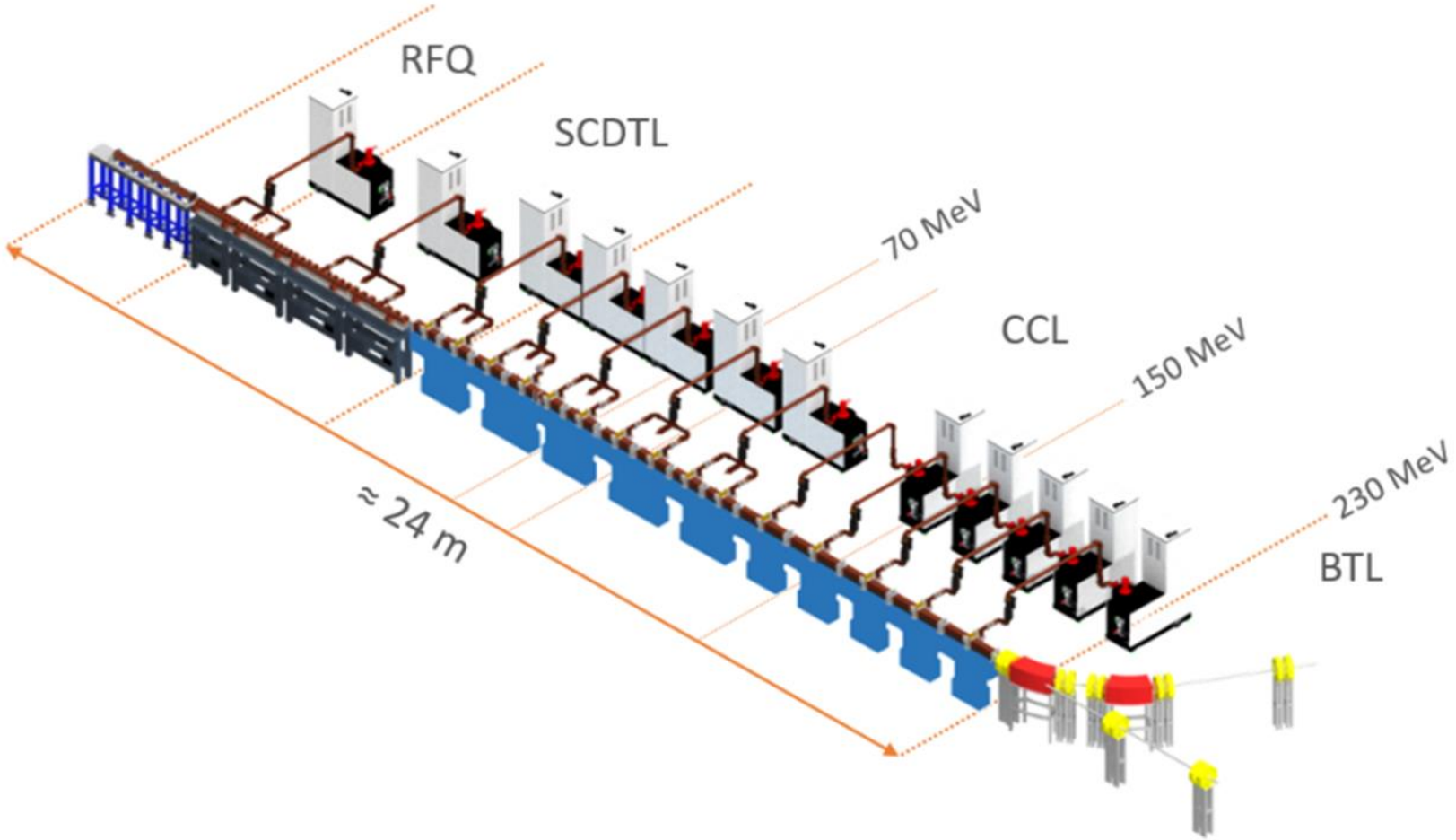
Teenage girl treated for medulloblastoma



Protons	X-rays
Restrictive Lung Disease	
0%	60%
Growth Abnormality	
20%	100%
IQ Drop of 10pts at 6yrs	
2%	29%

Product overview

Overview of the LIGHT System

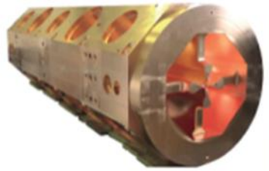
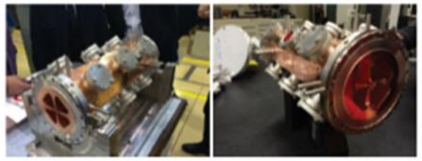
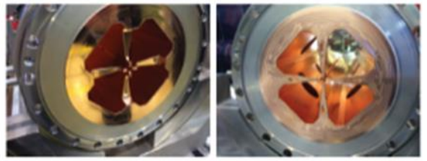


- **Technology already validated**
- **First linear accelerator for proton therapy**
- **Same frequency as conventional radiotherapy linacs**

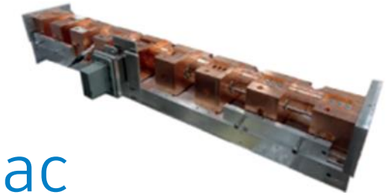
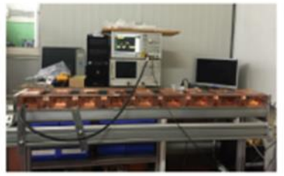
1. Proton Injection System



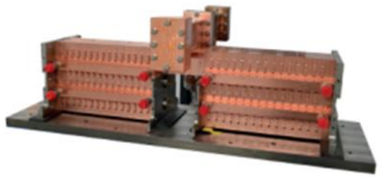

2. RF Quadrupole

3. SCDTL (x4)
Side-Coupled Drift Tube Linac

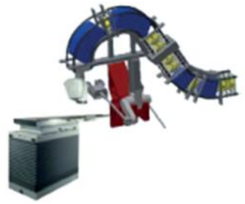
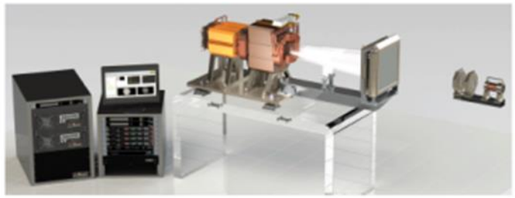



4. CCL (x15)
Coupled Cavity Linac



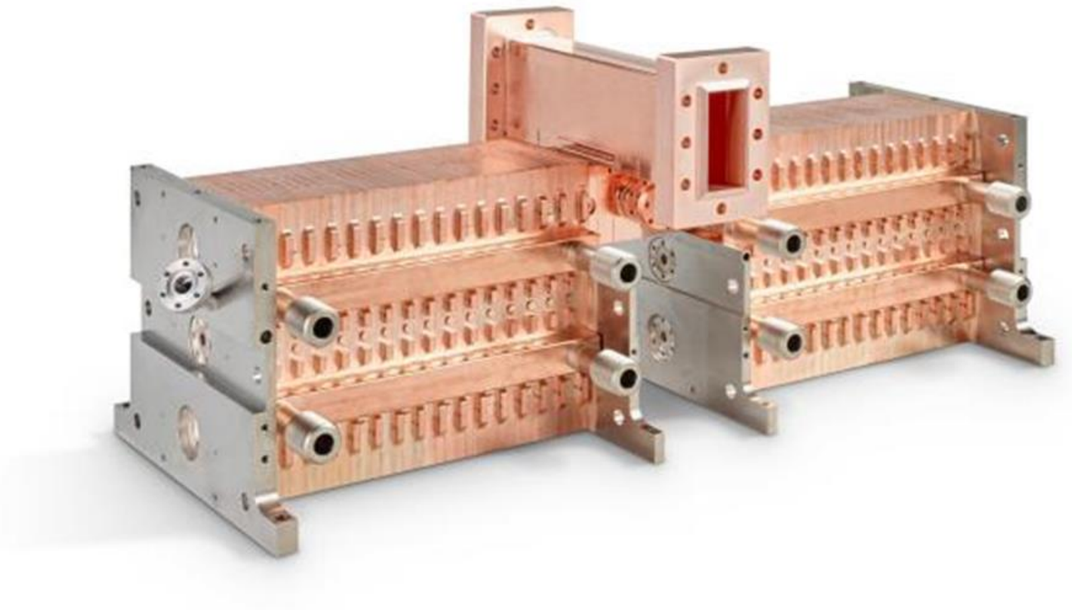


5. Beam Transfer Line
Nozzle System
Treatment Room

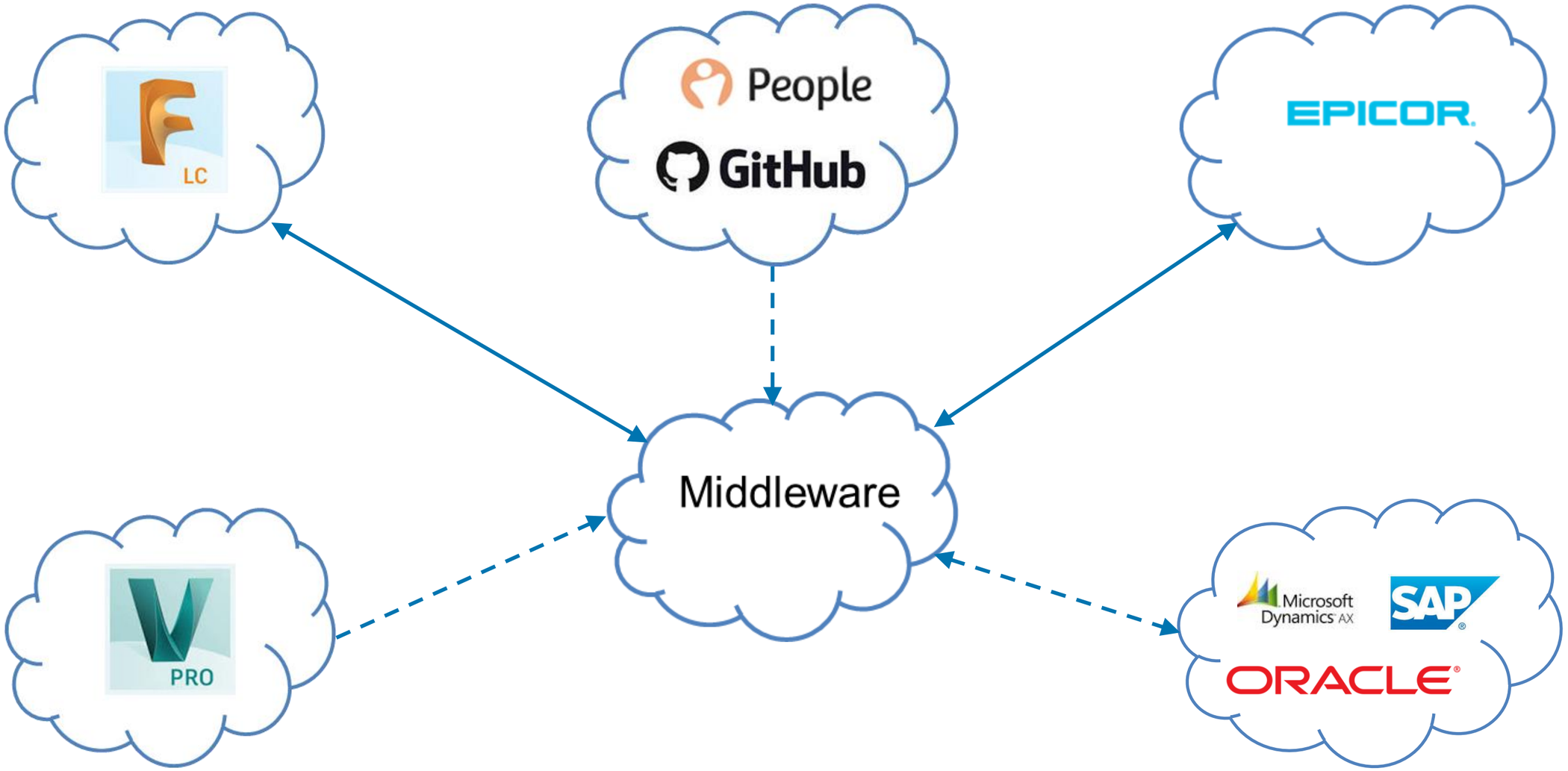

An example of one accelerator element

- Precision-machined oxygen-free high-purity copper plates
- Each set of plates is different
- Over 1000 copper components in the accelerating structures

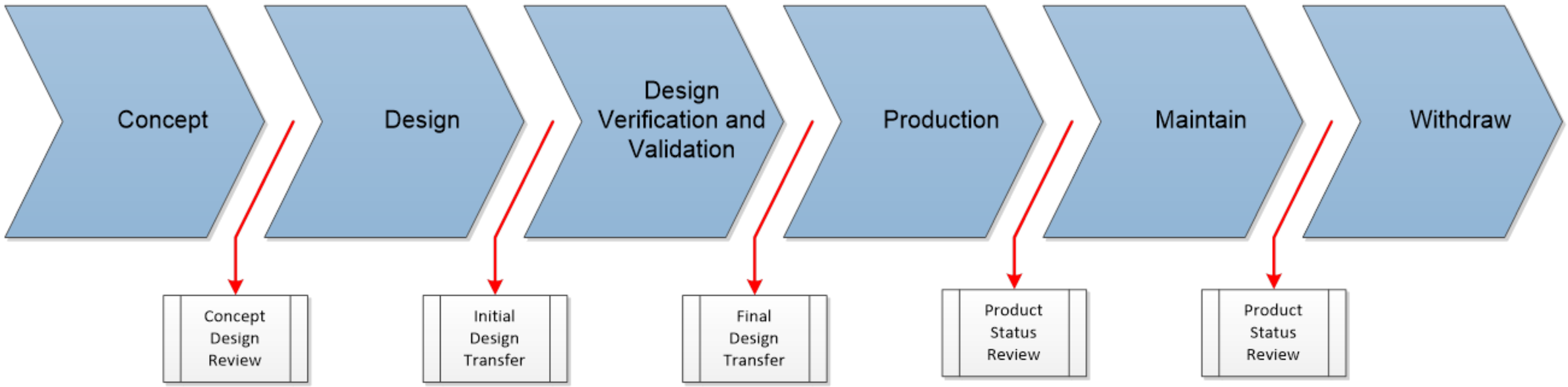


IT System Architecture and Product Lifecycle

How our IT systems integrate

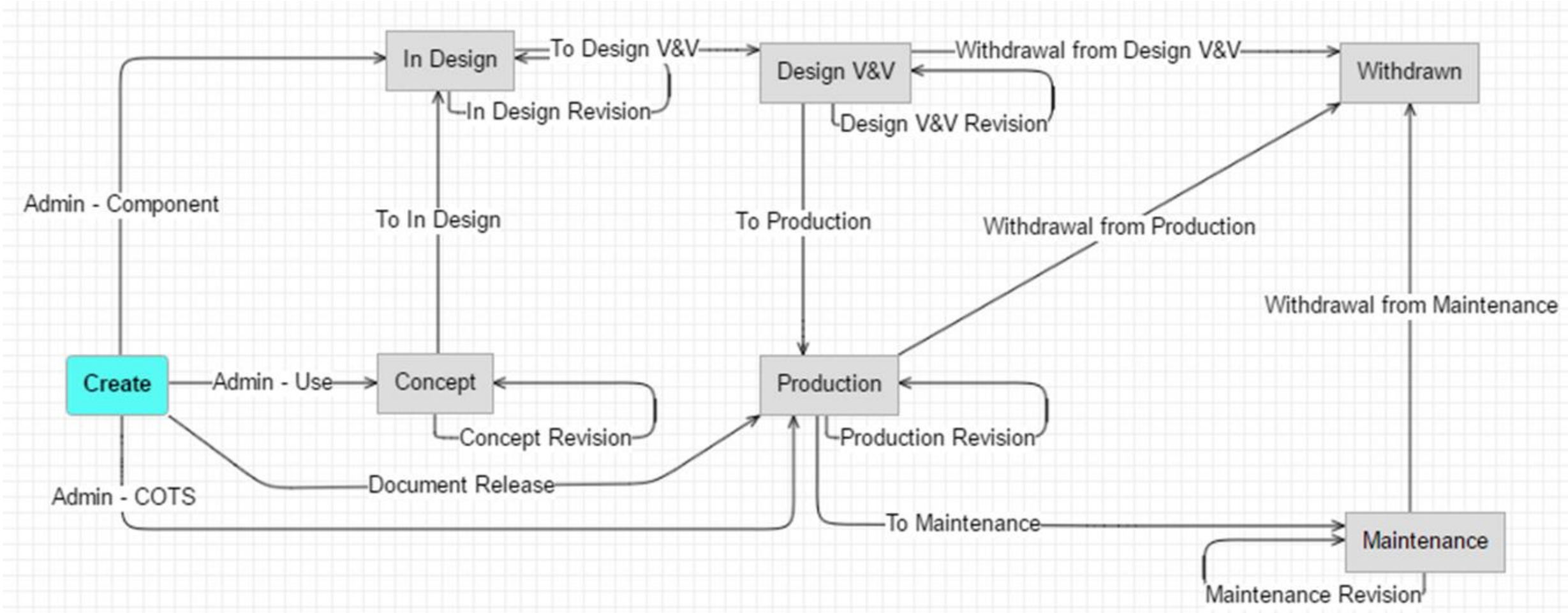


Product Lifecycle



- Distinct lifecycle phases with defined scope
- Gate reviews to pass from one phase to the next
- Review records are captured in PLM and linked to Items/Products
- Deliverables for each review can be defined
- Future development will consider embedding reviews in workflow

How this looks in Fusion Lifecycle



Business processes and business objects

Traceability

Business processes managed in Fusion Lifecycle

- Product management
- Document management
- Change and Configuration management
- Audit management
- Equipment management
  - Calibration and Maintenance
- Customer management
- Supplier management
- Problem and incident management
  - CAPA
  - Deviations
  - Non-conformity
  - Complaints
  - Returns
  - Vigilance
  - Regulatory informs
- Intellectual Property management

- Each of these processes involves one or more business objects.
- Each class of business objects represents a workspace in Fusion Lifecycle

The Fusion Lifecycle Workspaces

Items & BoMs

ICR/ICO

Audits

Non-conformities

Complaints

Vigilance

Return Materials

Documents

DCR/DCO

Issues

Materials

Suppliers

Customers

Deviations

Tasks

CAPA

Equipment

Calibration

Maintenance

Regulatory Informs

People

Invention disclosures

Patents

Legacy Items & BOMs

Legacy ECR/ECO

Legacy ECR responses

Licences In/Out

Trade Marks

Design Rights/ disclosures

Database Rights/ disclosures

Let’s look at some business processes….

- Supplier Audit

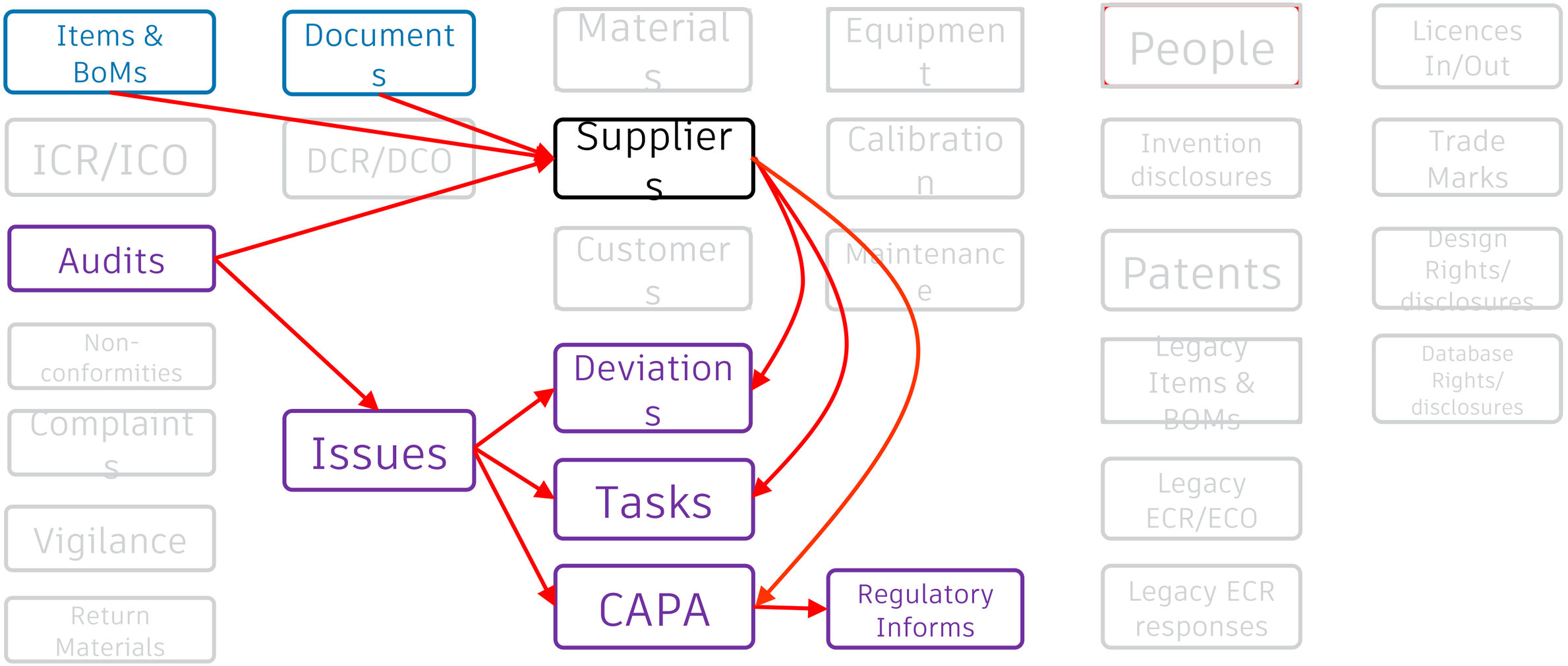
- Incoming inspection

- Customer complaints

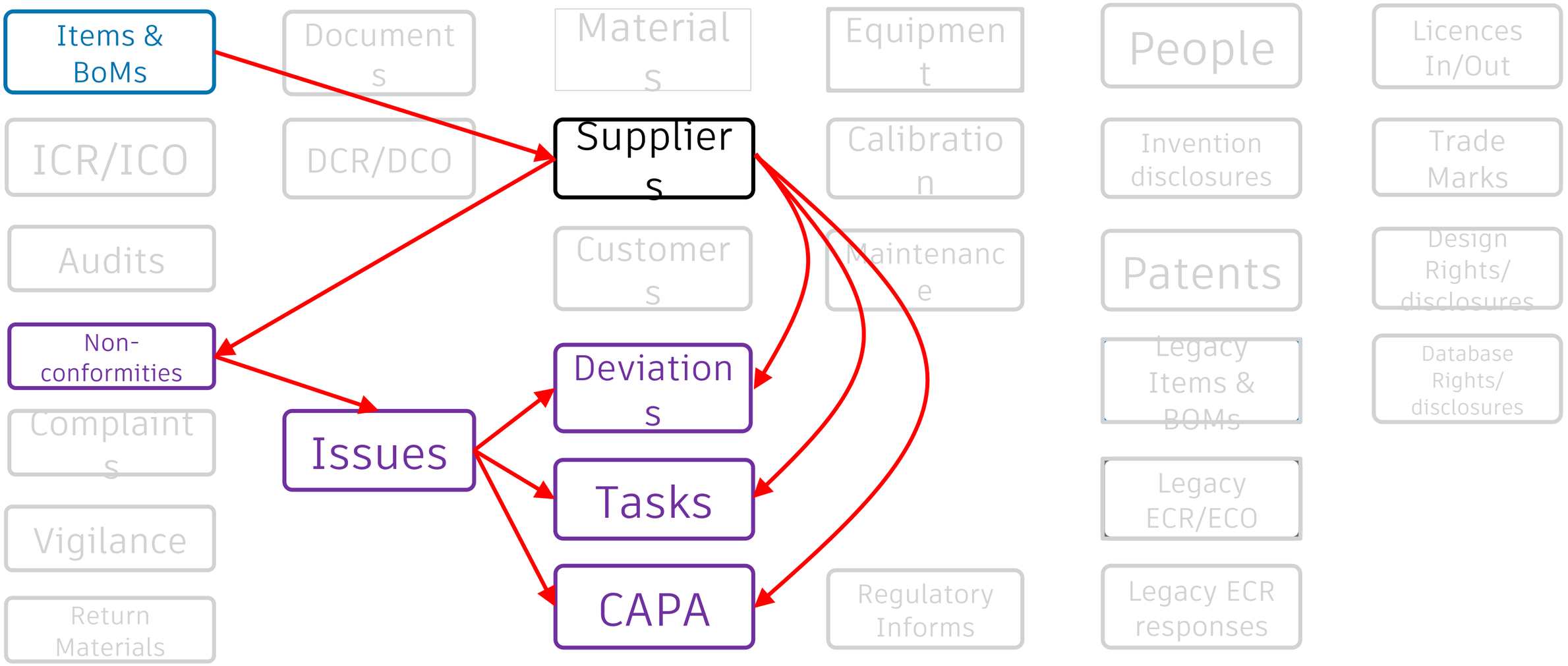
- Change control

- Intellectual Property management

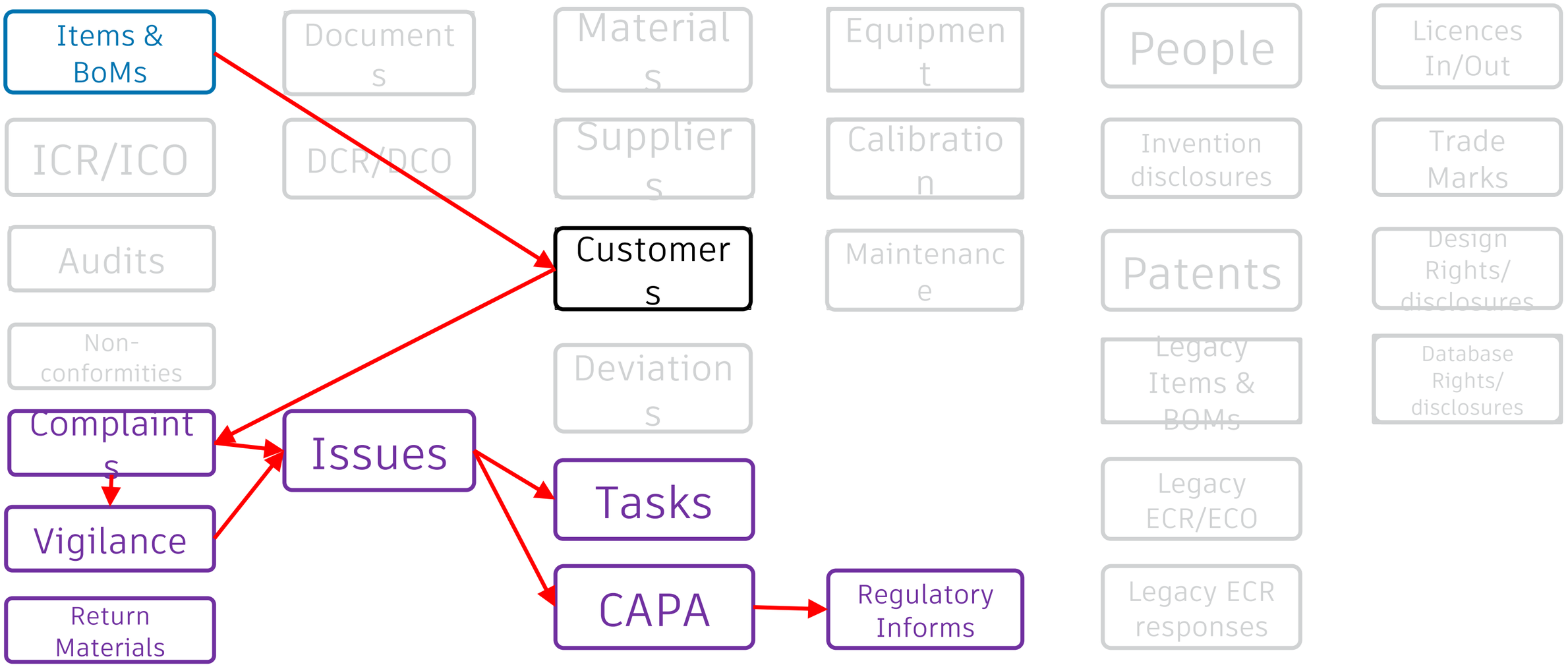
Supplier Audit



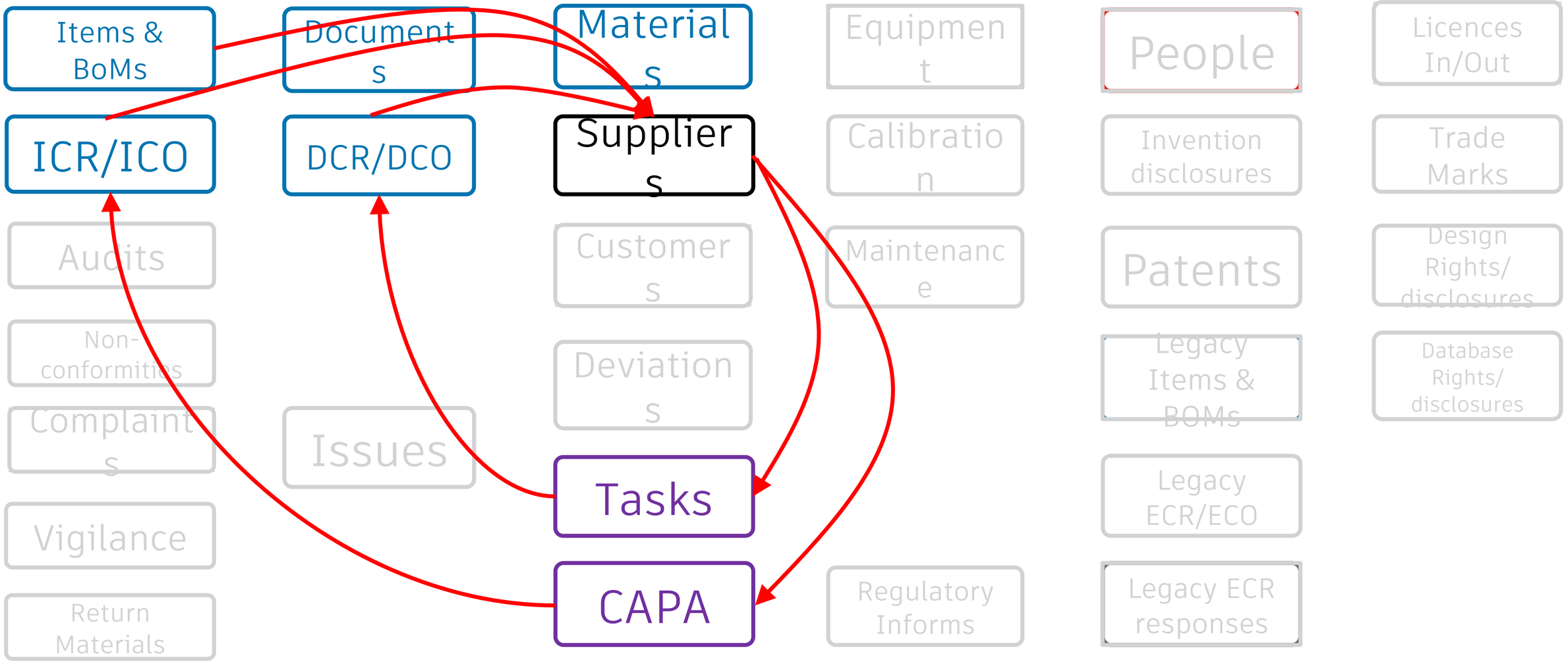
Incoming Inspection



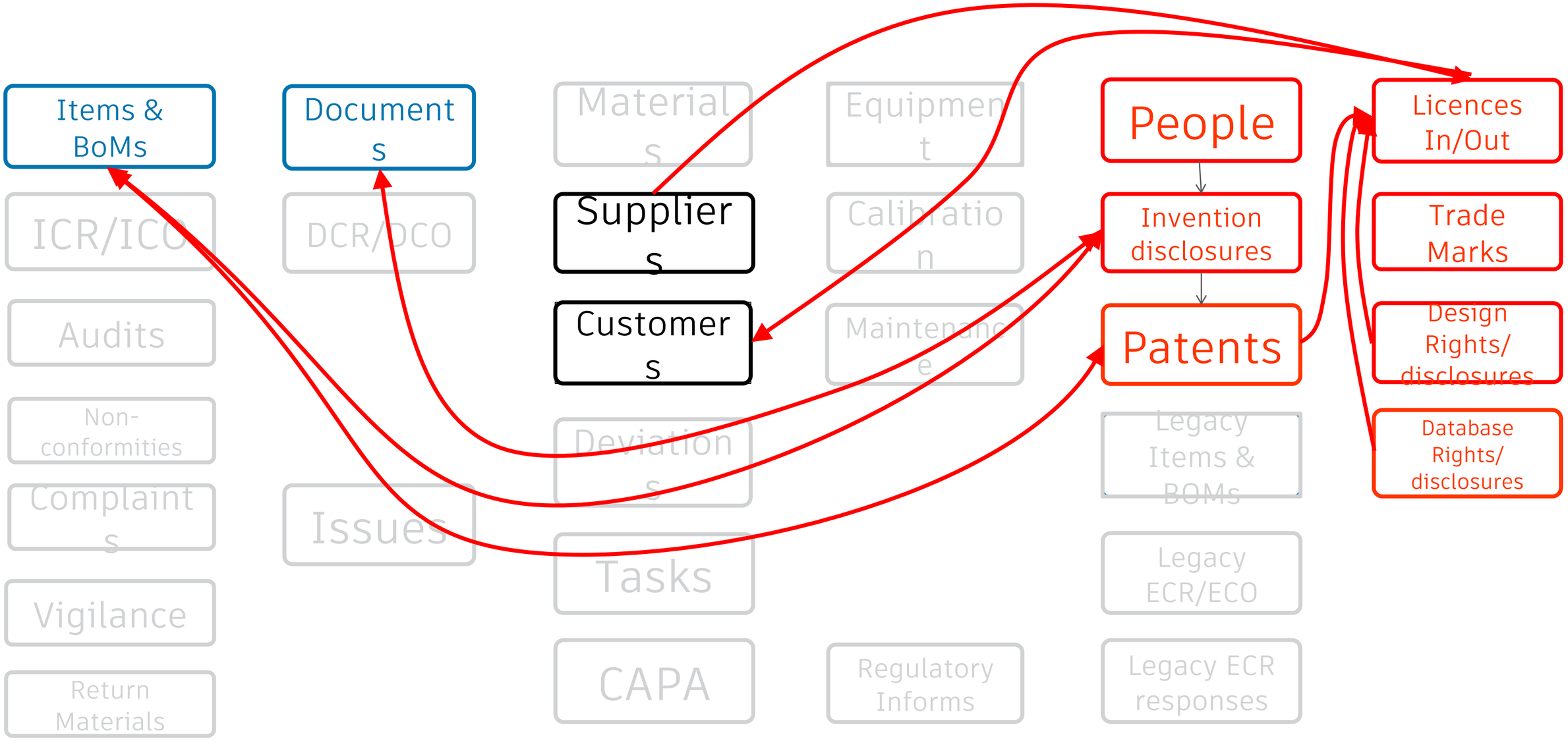
Customer Complaints



Change Control



Intellectual Property Management



What’s next….

- Work towards complete integration of PDM, PLM and ERP activities to minimise administration and reduce the risk of errors
- Create a highly integrated management system with embedded workflows to force adherence to process and thus reduce risk.
- Have all master data and related ‘objects’ in one place for ease of audit.
- Make PLM our one-stop shop for evidence of business processes and reporting.
- Seek further opportunities for integration with other platforms such as HR management, requirements management and test management.

Our flagship installation - 141 Harley Street

Acknowledgements

- Visualisations created using –

- Thanks to P-Cure Ltd. for the visualisation of patient positioning, imaging and treatment

Thank you from

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