

System Supported Engineering: An Integrated Approach to Performance Based Contracting

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Performance Based Contracting

- According to the Department of the Environment, Water, Heritage and the Arts
 - Utilised in the energy industry with great potential for water, transport, waste, chemicals, etc.
 - Under PBC, a third party contractor takes responsibility and risks for the management of a specific part of the business.
 - Efficiency gains are shared between the contractor and the owner of the business.

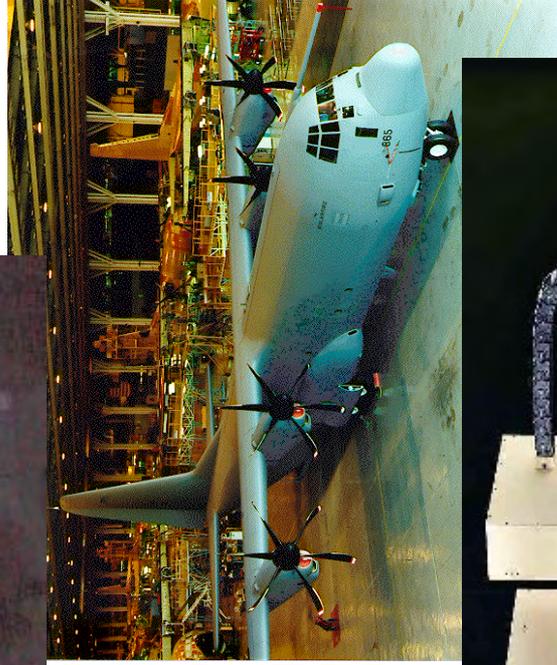
An Example of PBC

- In the energy industry, a PB contractor can manage supplies and operations of an asset with an aim to improve energy efficiency.
- Energy efficiency improvements are used to pay the contractor and also are returned to the firm.
- PBC is particularly suitable for firms that do not have ready access to capital, or the necessary expertise to implement cleaner production.
- Capital management can be part of PBC.

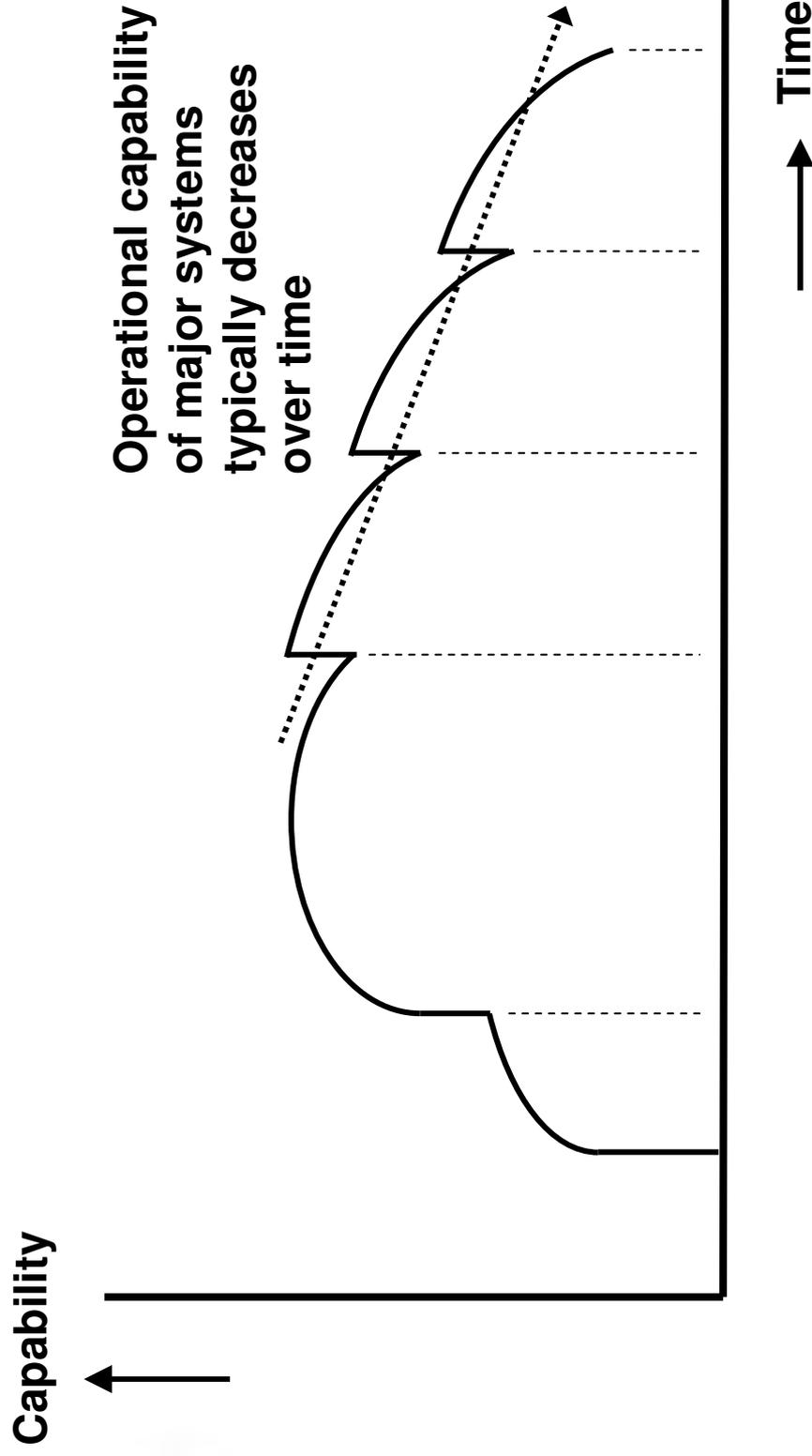
Key Features of PBC

- Identifying and setting up of the right Key Performance Indicators
- System for measurement and monitoring of performance
- Efficient management and administration of the contract, whilst ensuring continuing improvement
- Demonstrating value for money
- Multi-disciplinary collaboration

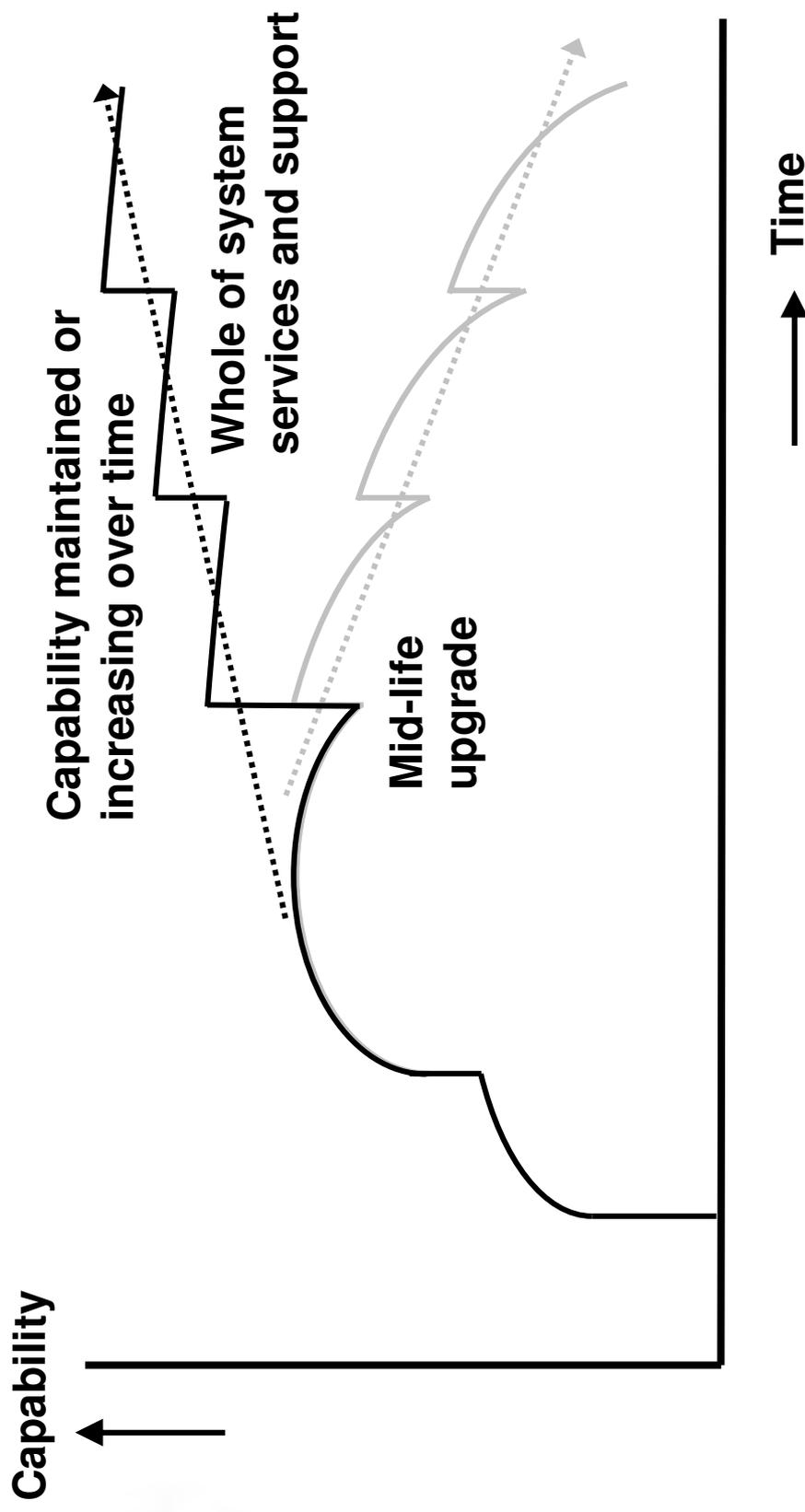
PBC for Assets



Capability Degradation Through Life



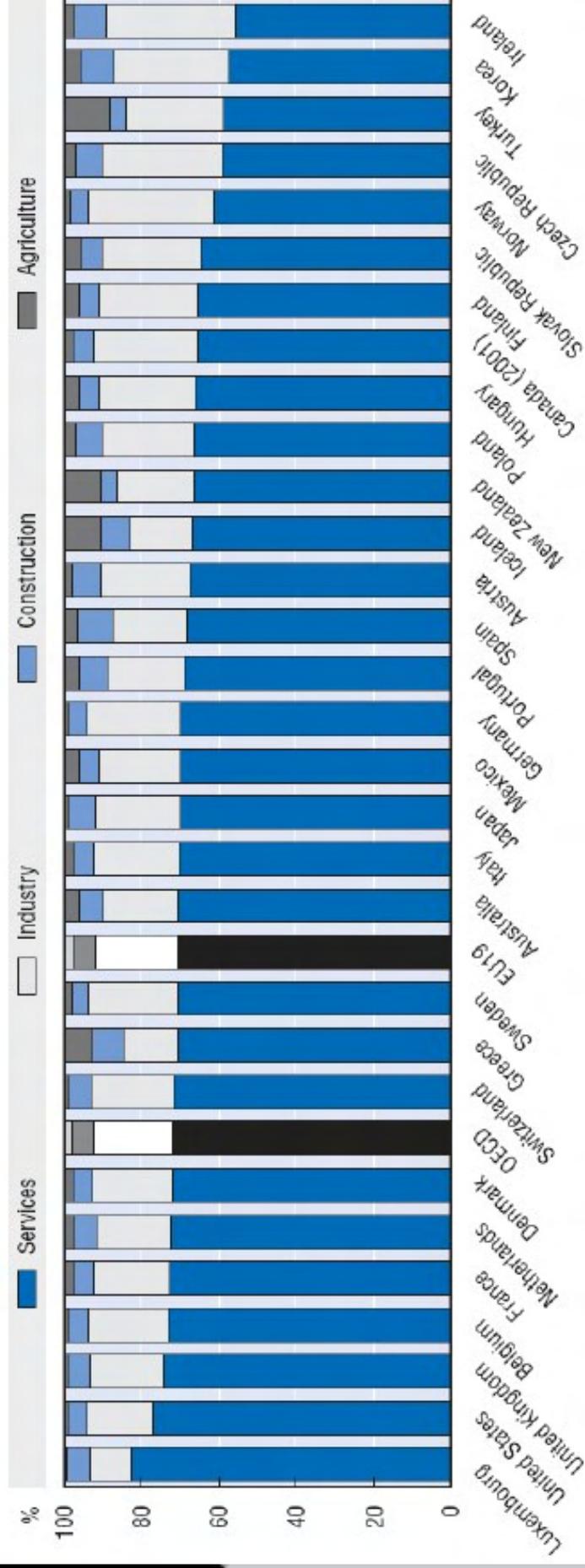
System Support Engineering: Improving Capability Through Life



System Support Engineering

- Initiated by BAE Systems in partnership with University of Cambridge in 2002
- The focus is on designing complete support solutions for complex systems that could involve contractors owning, operating and supporting those assets
- An informal definition:
 - The integration of industry domain knowledge and logistic engineering, supply chain management and maintenance engineering competencies, to create and deliver support solutions for in-service assets

Share of total gross value added by sector

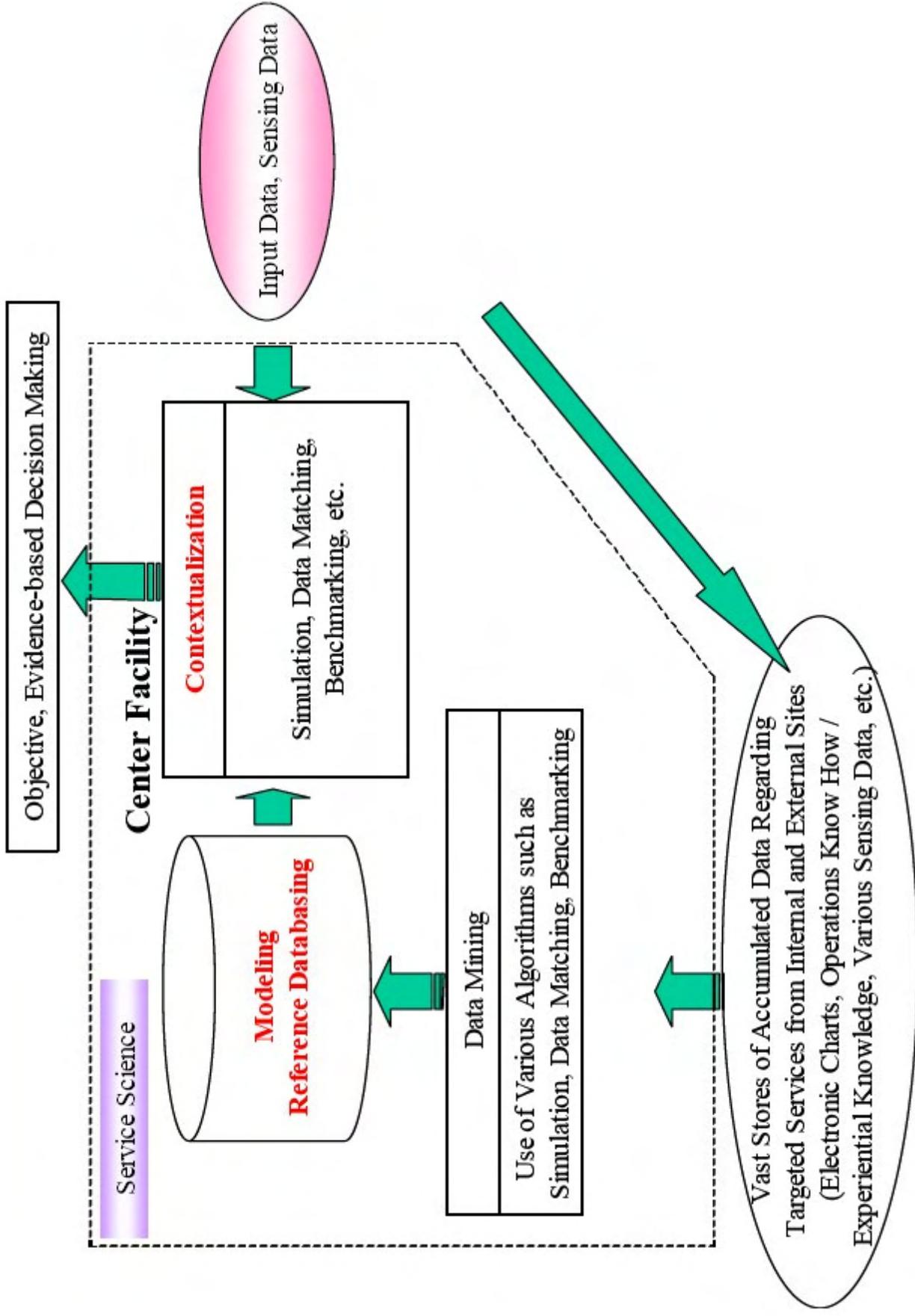


OECD Science, Technology and Industry Scoreboard 2005, Towards a Knowledge based Economy, pp.168-169

Complementary Concept in IT Sector

- Initiated by IBM in 2002
- Responded to the evolving business model for the IT industry, moving from entirely product to product + services
- Definition:
 - A service system is a dynamic, co-creating configuration of resources, including, people, technology organisations and shared information (language, laws, measures and methods), all connected by value propositions, with the aim to consistently and profitably meet the customer's needs better than competing alternatives.

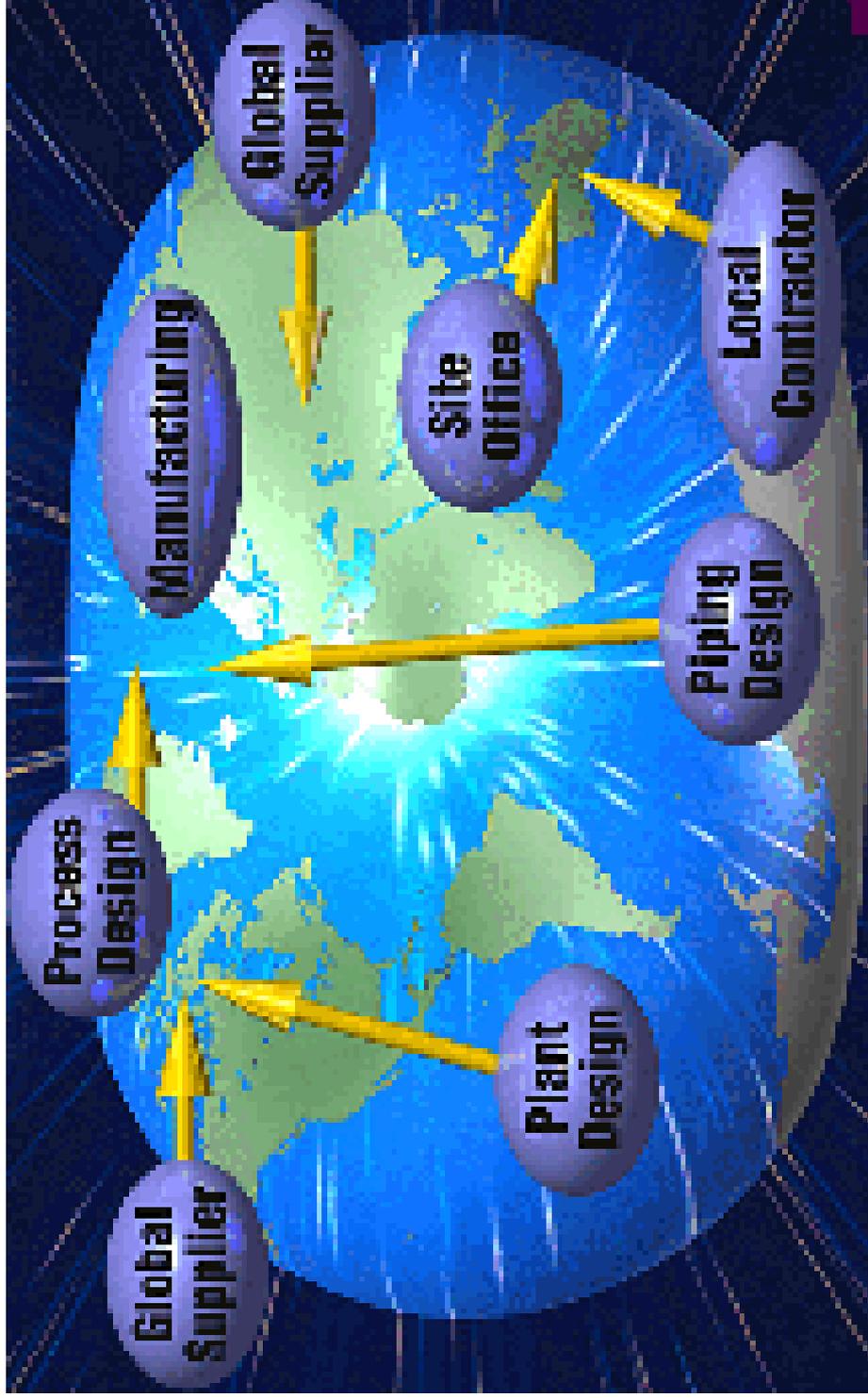
Service Science



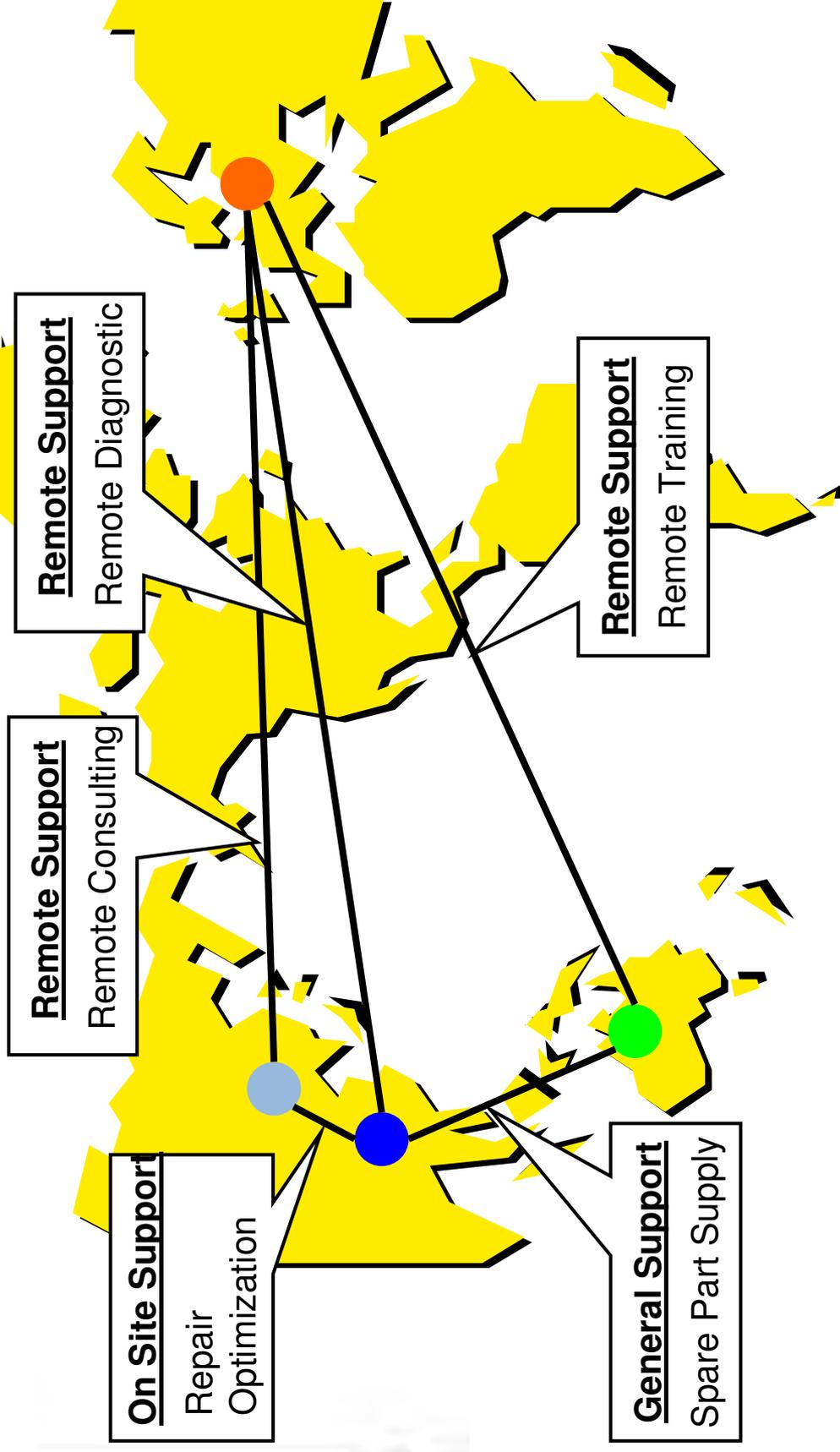
The Nature of Services

- Services are co-produced with consumers
- No one PB contract is the same
- To achieve growth through services, we need to:
 - Customize as a source of value creation
 - Treat consumers as co-innovators
 - Rely on professional knowledge for judgment-based work
- Have a lot of risks
- Professional and technical skills are central
- Need thorough analysis of the future prior to commitment

Globalisation



Collaborative Service Fulfillment



● Customer

● Service company

● Supplier

● System producer

Products vs Services

Products

- Tangible artifacts
- Storable
- Production precedes consumption
- Standardized processes
- High capital intensity through automation

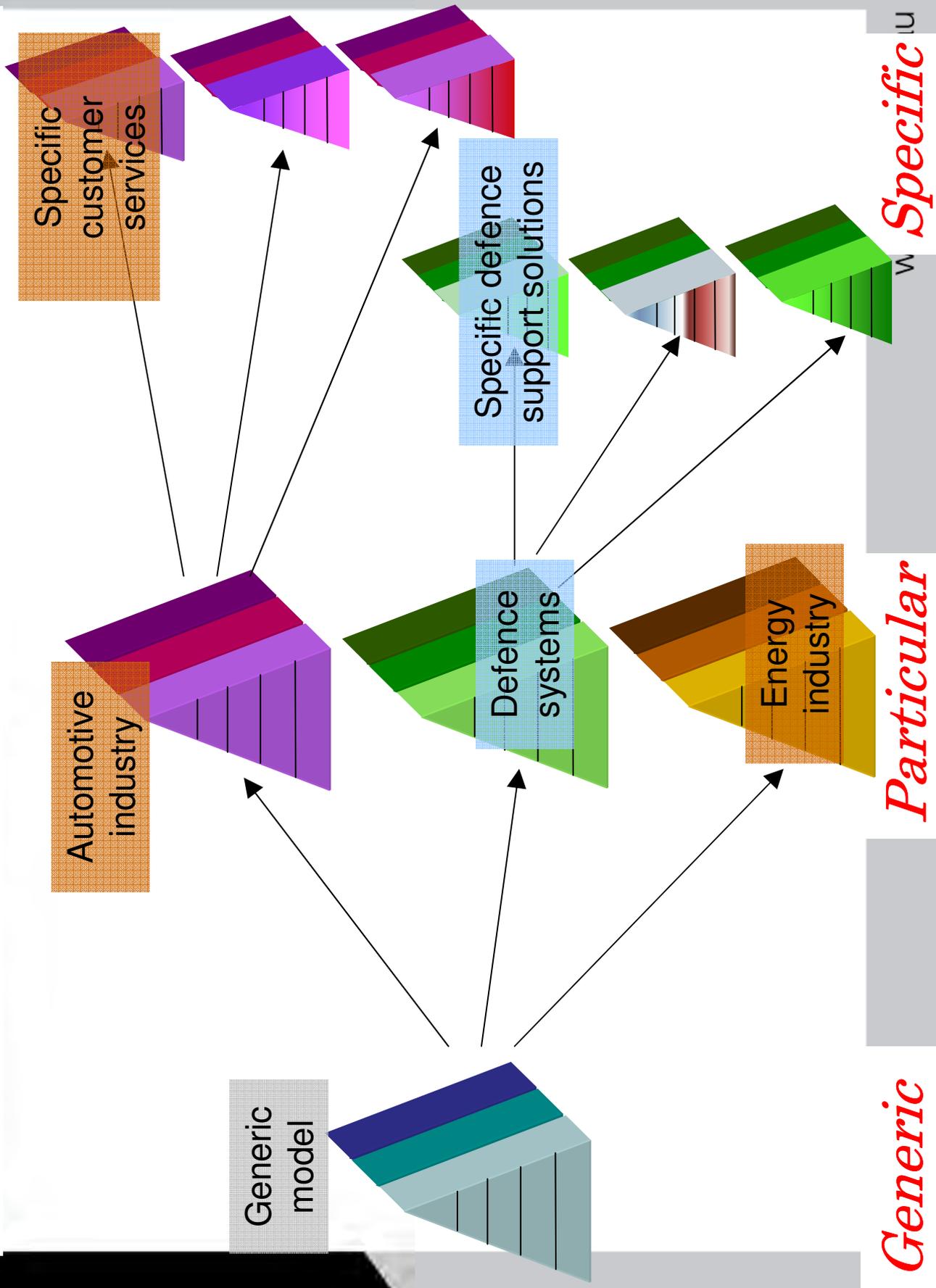
Services

- Intangible
- Non-storable
- Consumption proximate to point of production
- Customization
- Labour-intensive/ knowledge work

‘Productising’ Services

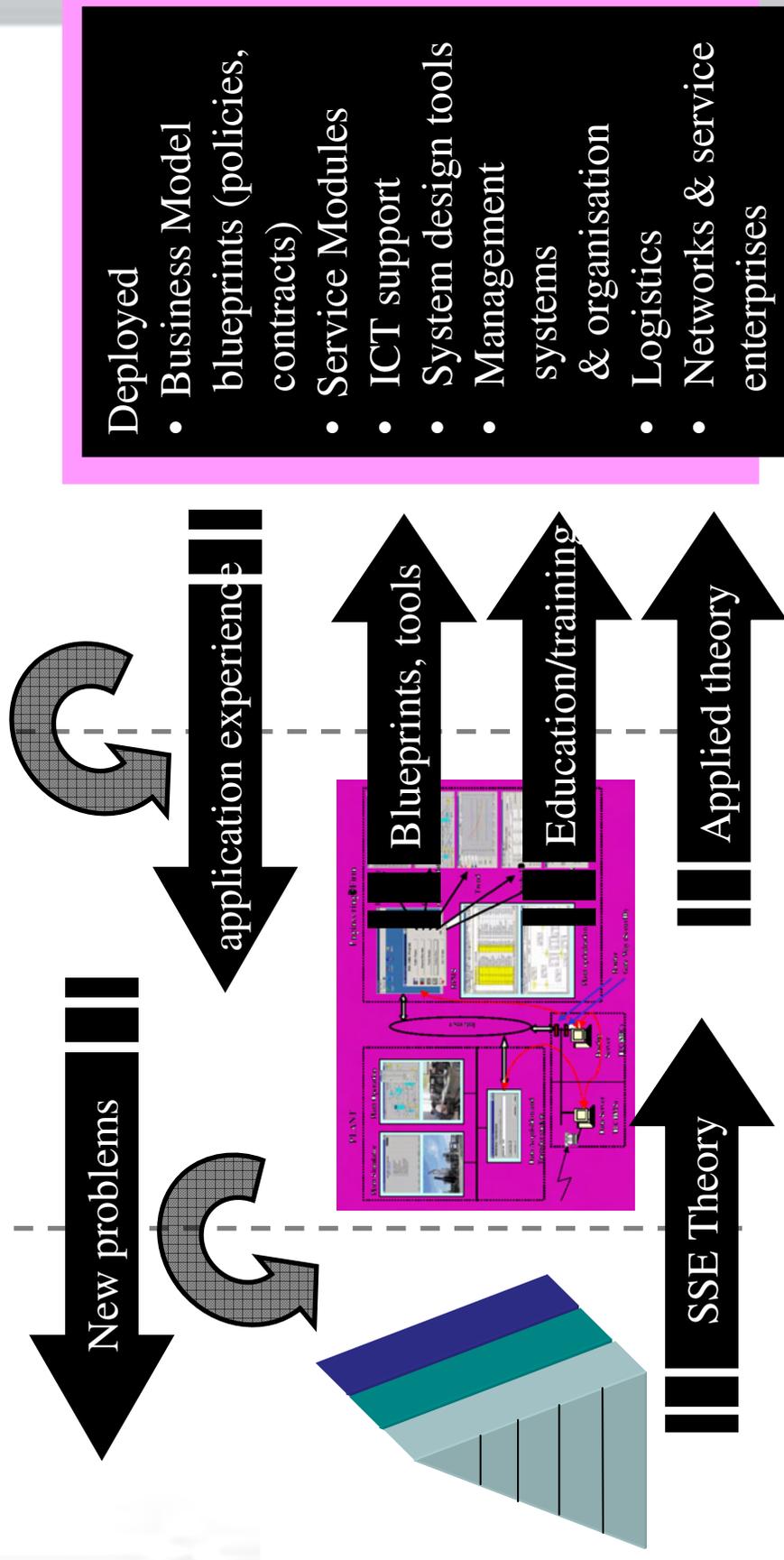
- Services are inherently complex systems with noise (significant variations between cases)
- To improve services efficiency, we need to:
 - Standardize and integrate processes
 - Adopt labour-saving technology
 - Mix-and-match repeatable services and solutions
- Make service delivery more like manufacturing process, so that human skill needs are minimised

System Support Architecture



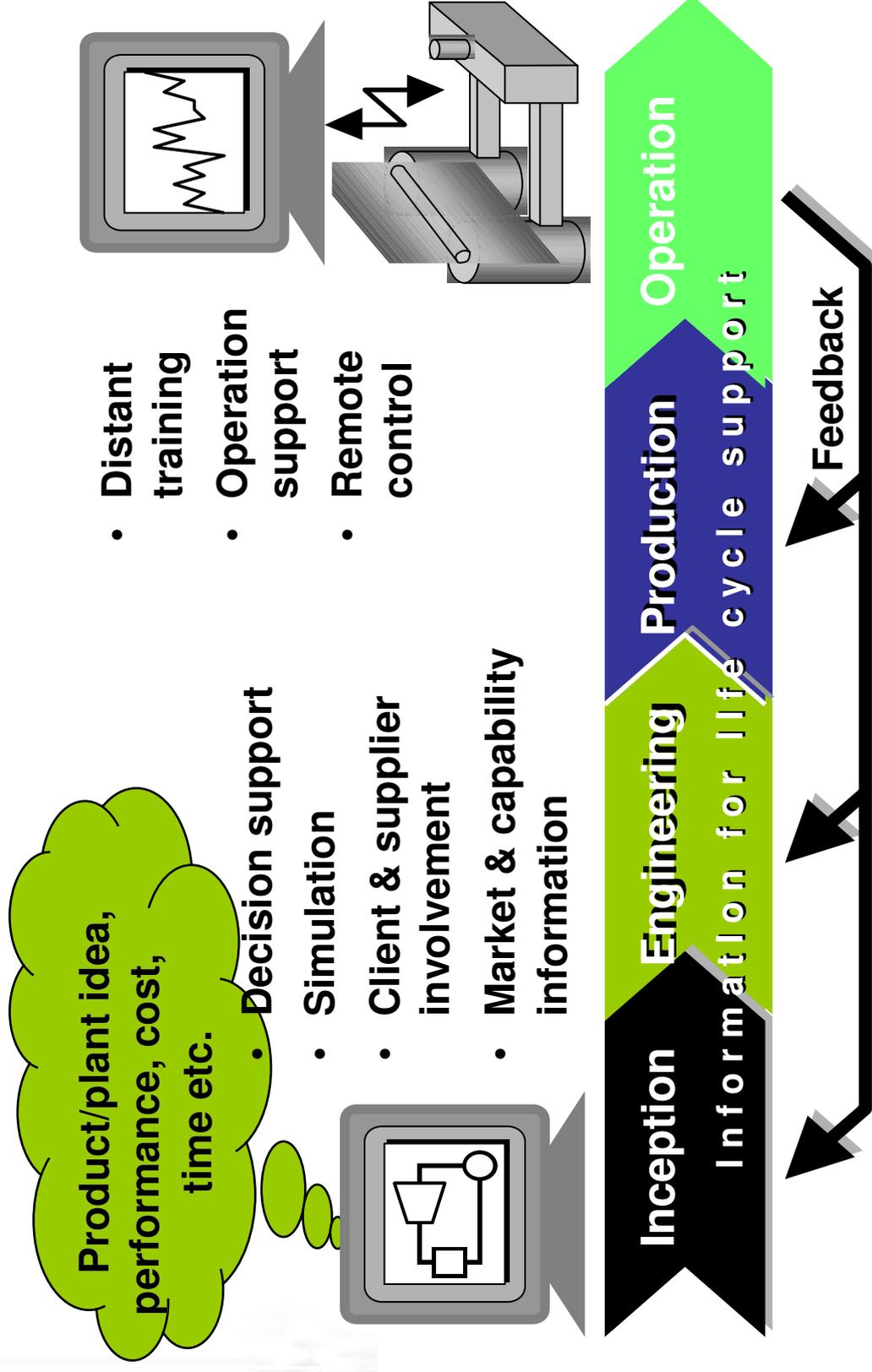
Industry – Research integrated effort

Follow through until new products and services are delivered, create feedback to R&D, Research, Education

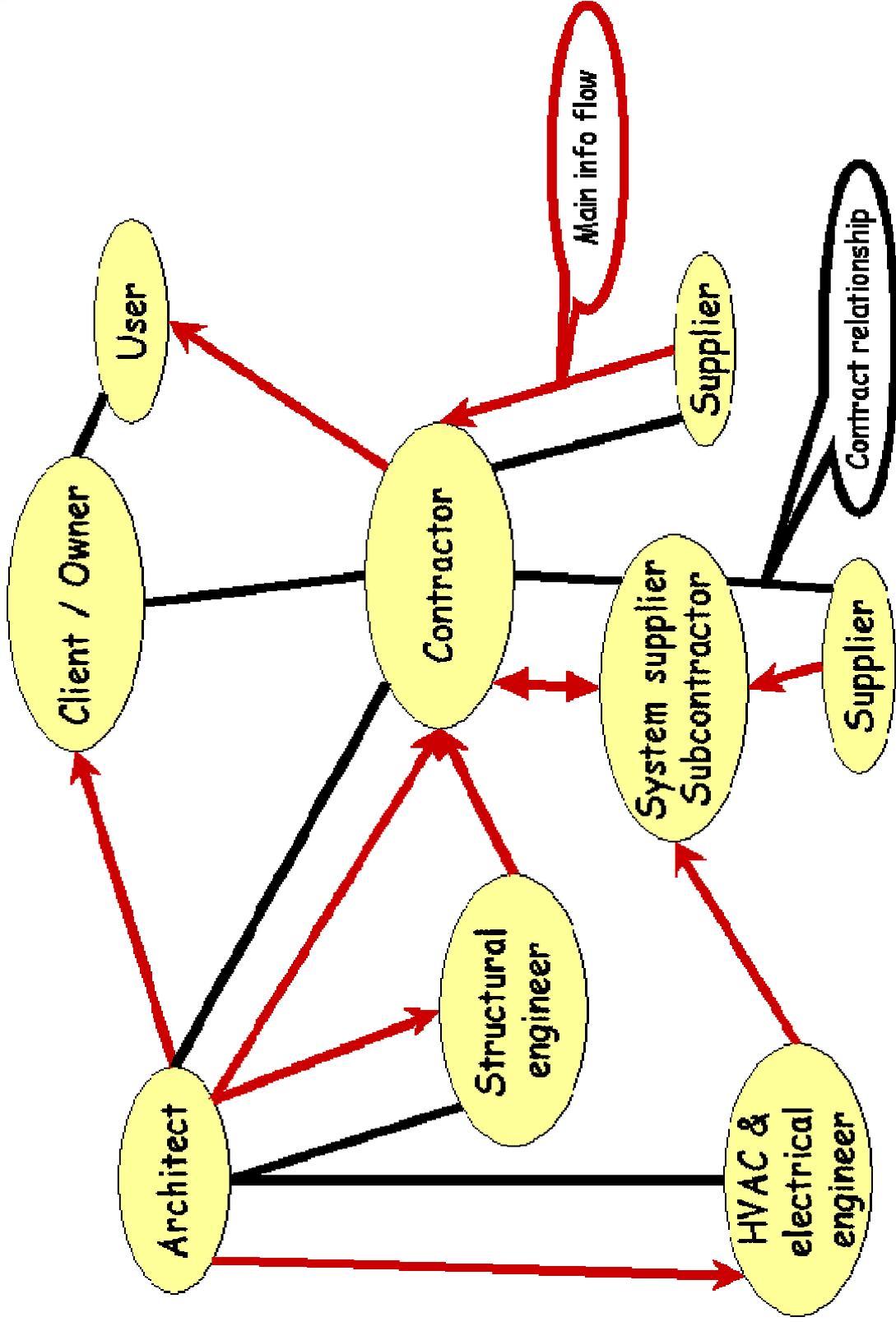


- Deployed**
- Business Model blueprints (policies, contracts)
 - Service Modules
 - ICT support
 - System design tools
 - Management systems & organisation
 - Logistics
 - Networks & service enterprises

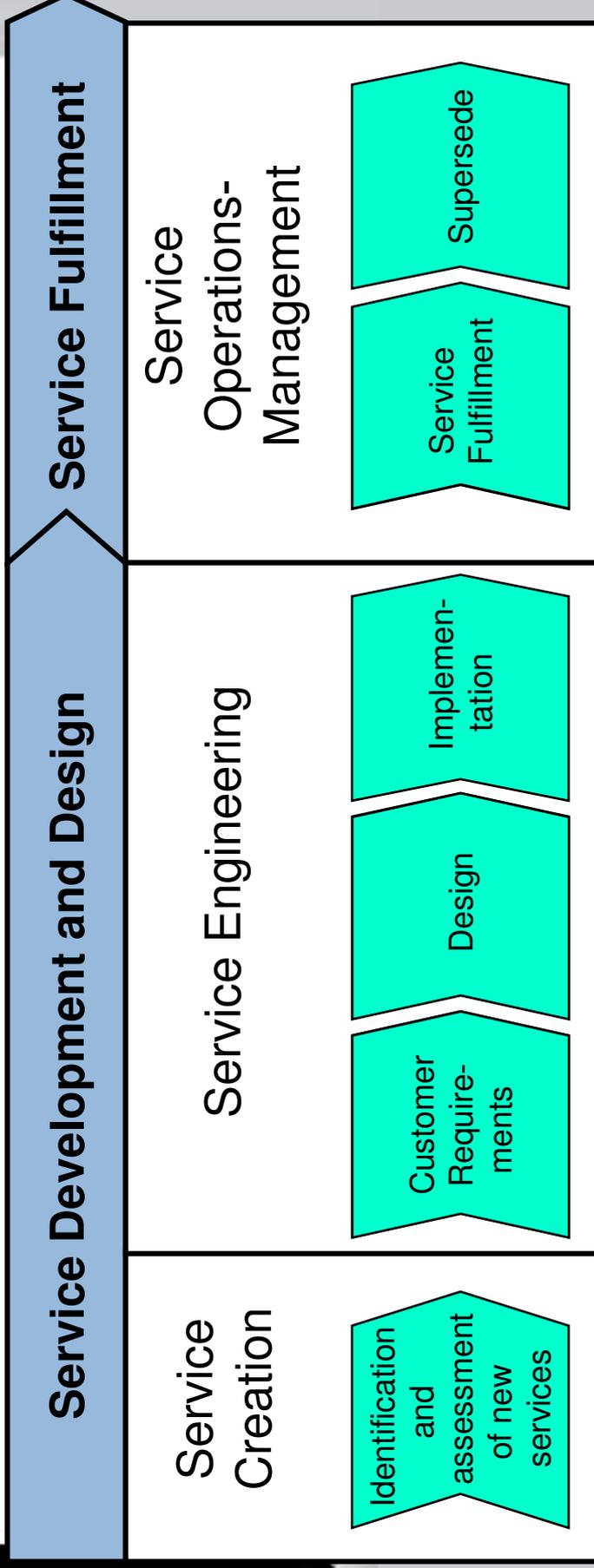
Sales and Services of Complex Systems



Information Ownership and Sharing Issues



System Support Solution



Objective 2 -
Development of new collaborative services and enhancement of existing services.

Objective 1 -
Development of an organizational model for collaborative service fulfillment.

You wouldn't design a new product without a product designer.

So why do organizations design new services without involving service designers?

Knowledge Expectation of a System Support Solution Engineer (Architect)

- Customer is part of the solution
 - Both support needs and actual participation
- Data management
 - Design authority, upgrades, version control, configuration management
- Safety and environment
 - OH&S, HACCP, long term sustainability, environmental impact
- Human factors
 - Organisational changes, service concepts, attitudes and approaches, training
- Work flow and processes
 - Intra and inter-enterprises
- Risk management, reliability assessment
 - Must be right first time and continue to be right throughout the life of PBC
- Whole of life costing
- Governance of outputs
 - Who does (and be responsible for) what in support and services
- Tools and infrastructure
 - Specially developed hardware, software, “products”, “systems”
- System and service thinking
 - Both the system being supported and the greater system around it

Master of Engineering (System Support Engineering)

with intermediate options
Graduate Certificate and Graduate Diploma

Designed and developed in
collaboration with BAE Systems,
Saab Systems, ASC and
University of South Australia



SAAB

BAE SYSTEMS

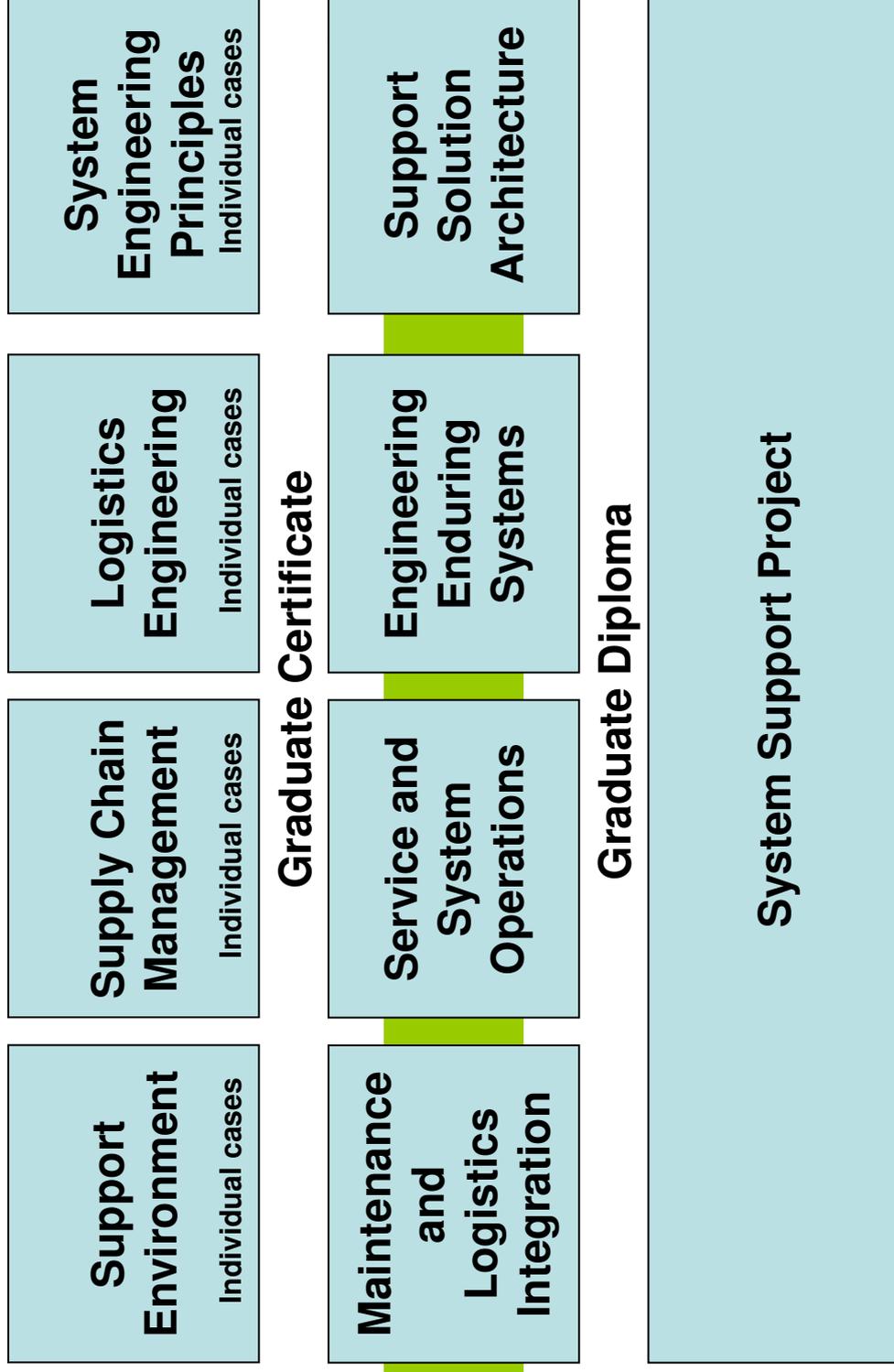
ASC



Program Design

- A collaborative approach involving academic educators, researchers as well as industry experts from Australia.
- An industry led learning environment that draws heavily on case studies from the local industry partners and their overseas offices.
- An action oriented learning environment where project work will draw directly from the issues and problems you are facing in your workplace.
- A part-whole-part approach where you will be introduced to all the major elements in the system support business model in the first course.
- A cross-disciplinary orientation to system support business solutions.
- A flexible delivery mode designed to accommodate mobile and busy professionals. The program will be offered as a part-time program with a mixed mode delivery.
- The assessment will be about your ability to define and solve messy and ill-defined problems.

Program Structure



Key Characteristics

- Designed to educate engineers in the new “performance based contracting” business environment with increasingly complex systems
- Amalgamating 4 important thinking styles:
 - Service thinking – customer oriented
 - System thinking – holistic and fully integrated outcomes
 - Business thinking – modelling competencies and value for money
 - Strategic thinking – enterprise and infrastructure designs enabling reliable system support solutions
- The graduates will be able to design system support solutions taking into account all engineering, business, logistics, services requirements

Entry Requirements

- Direct entry to the Master of Engineering program normally requires a bachelor degree or equivalent
 - No experience requirement for engineering degree holders
 - 3 years experience for other degree holders
- Applications without a bachelor degree but with sufficient industry experience will be considered entry to Graduate Certificate or Graduate Diploma
 - Entry to Grad Cert based purely on experience
 - Entry to Grad Dip based on Grad Cert or equivalent plus experience
 - Advancement to higher levels (GC to GD, GD to Master) will be subject to satisfactory progress at lower levels
- Recognition of prior learning
 - Proven learning and practising experience in certain subject matter may apply for exemption of that subject (course)

Thank YOU

For more information contact

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