Integration of technology and services

The manufacturing sector

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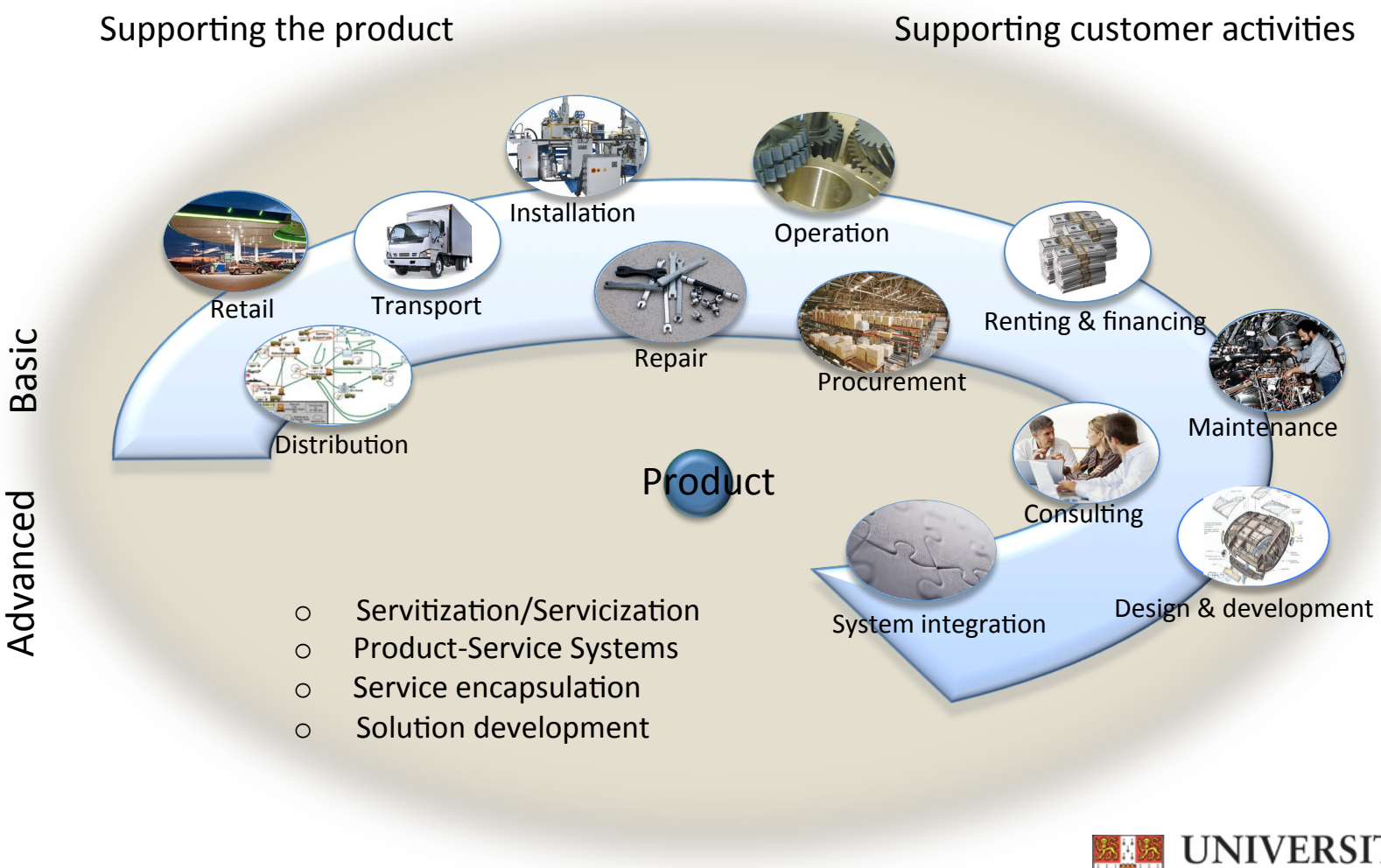
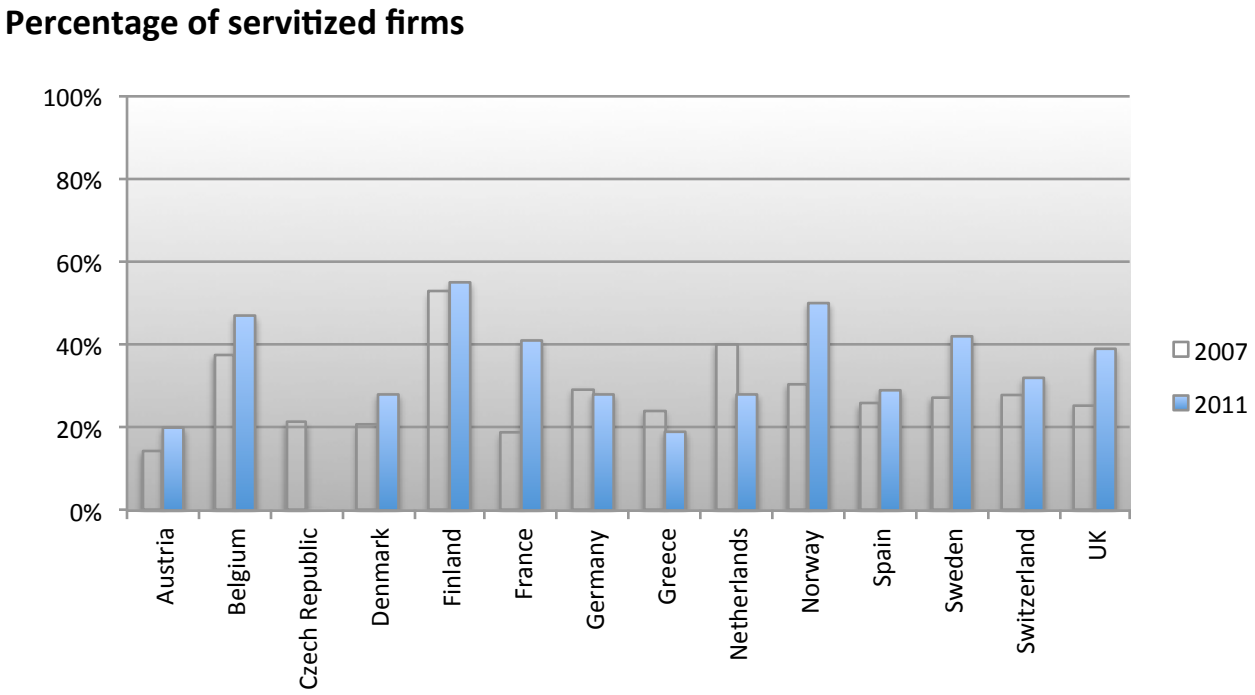
The service trend

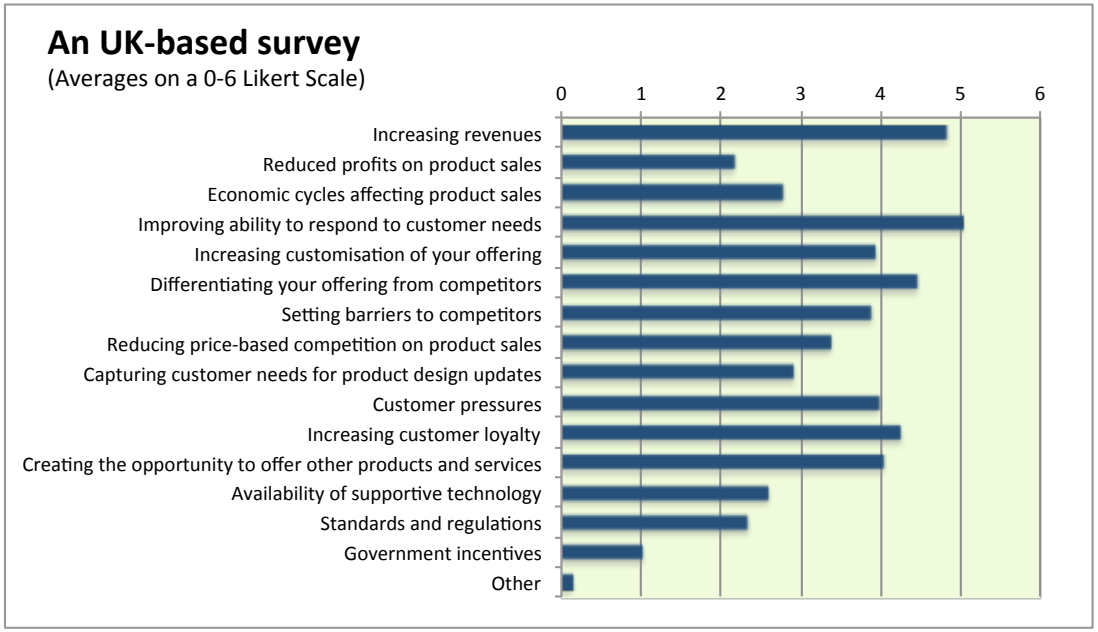


Shift to services of EU firms



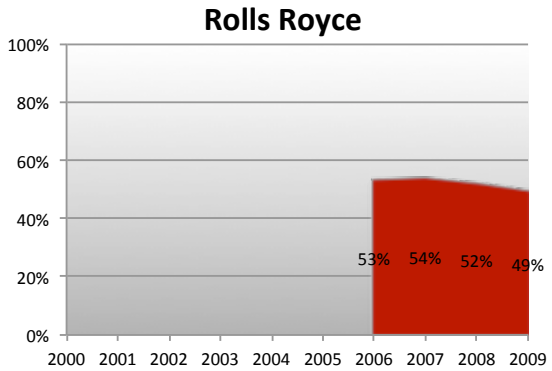
Arguments for services

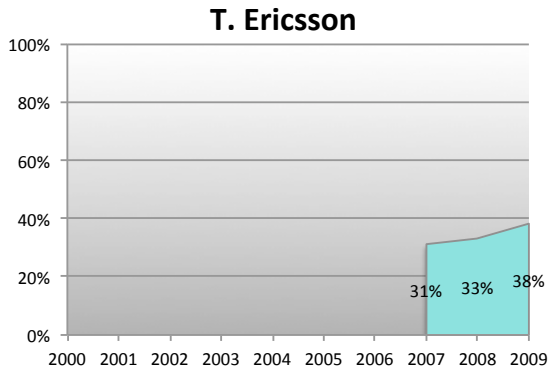
- **Competitive arguments**
  Services differentiate the total offering and create more sustainable competitive advantage
- **Economic arguments**
  Services offer new and less volatile revenue. Services are more profitable than products
- **Customer-based arguments**
  Customers increasingly outsource service activities. Offering services reinforces the relationship with the customers and opens up the opportunity of new business

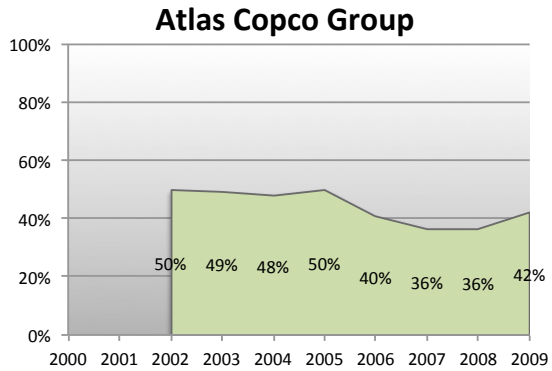


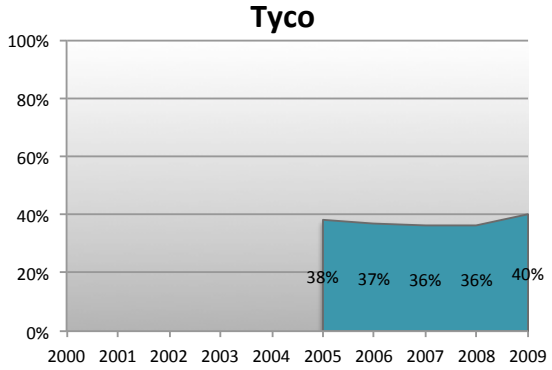
Results achieved

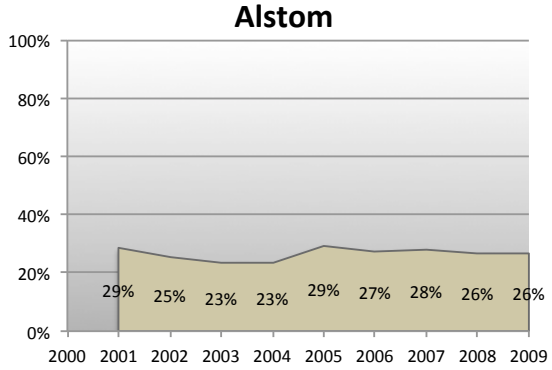
Share of service revenues

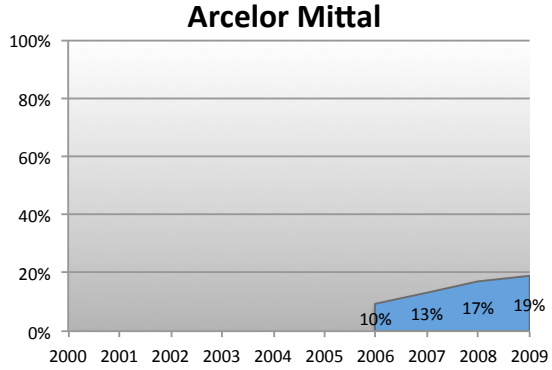












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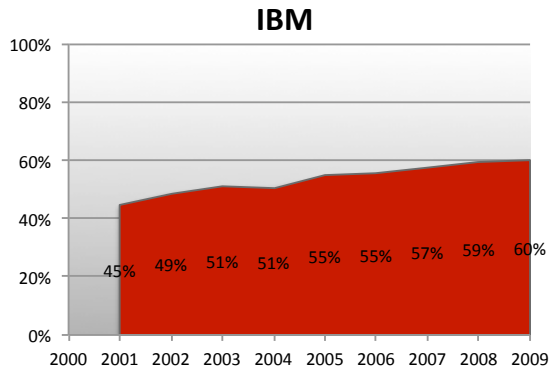
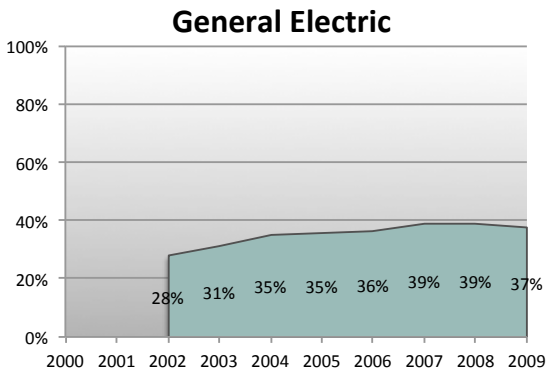
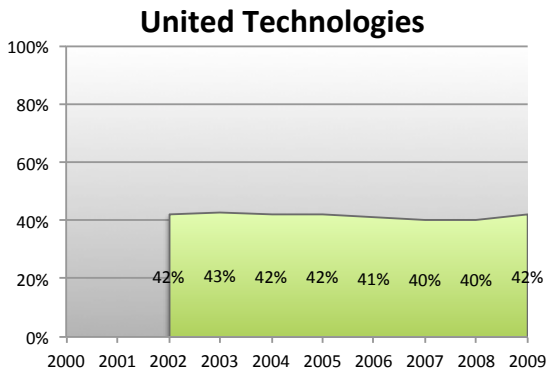
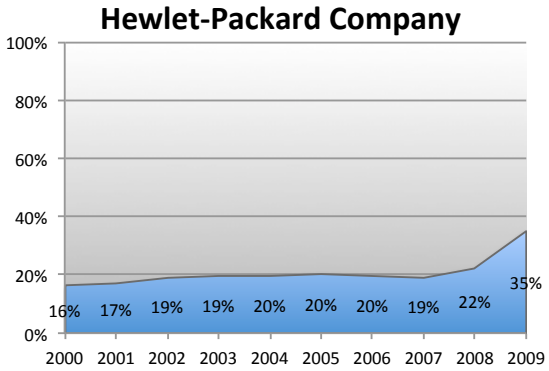
USA experience

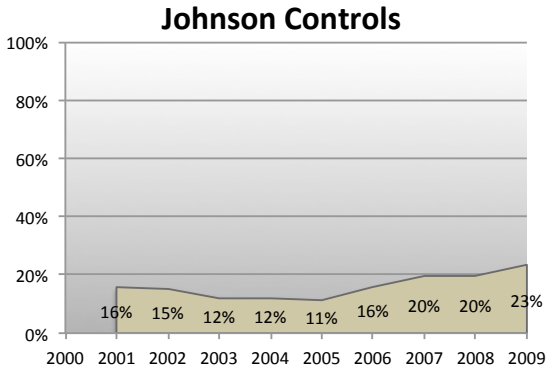
Share of service revenues

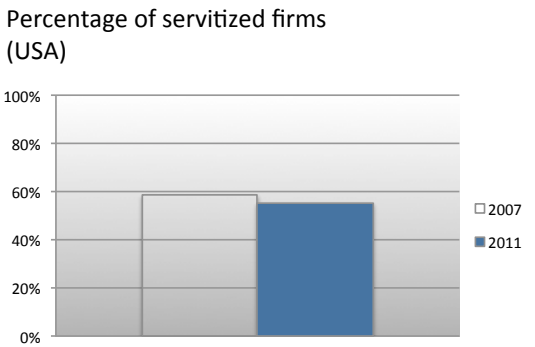












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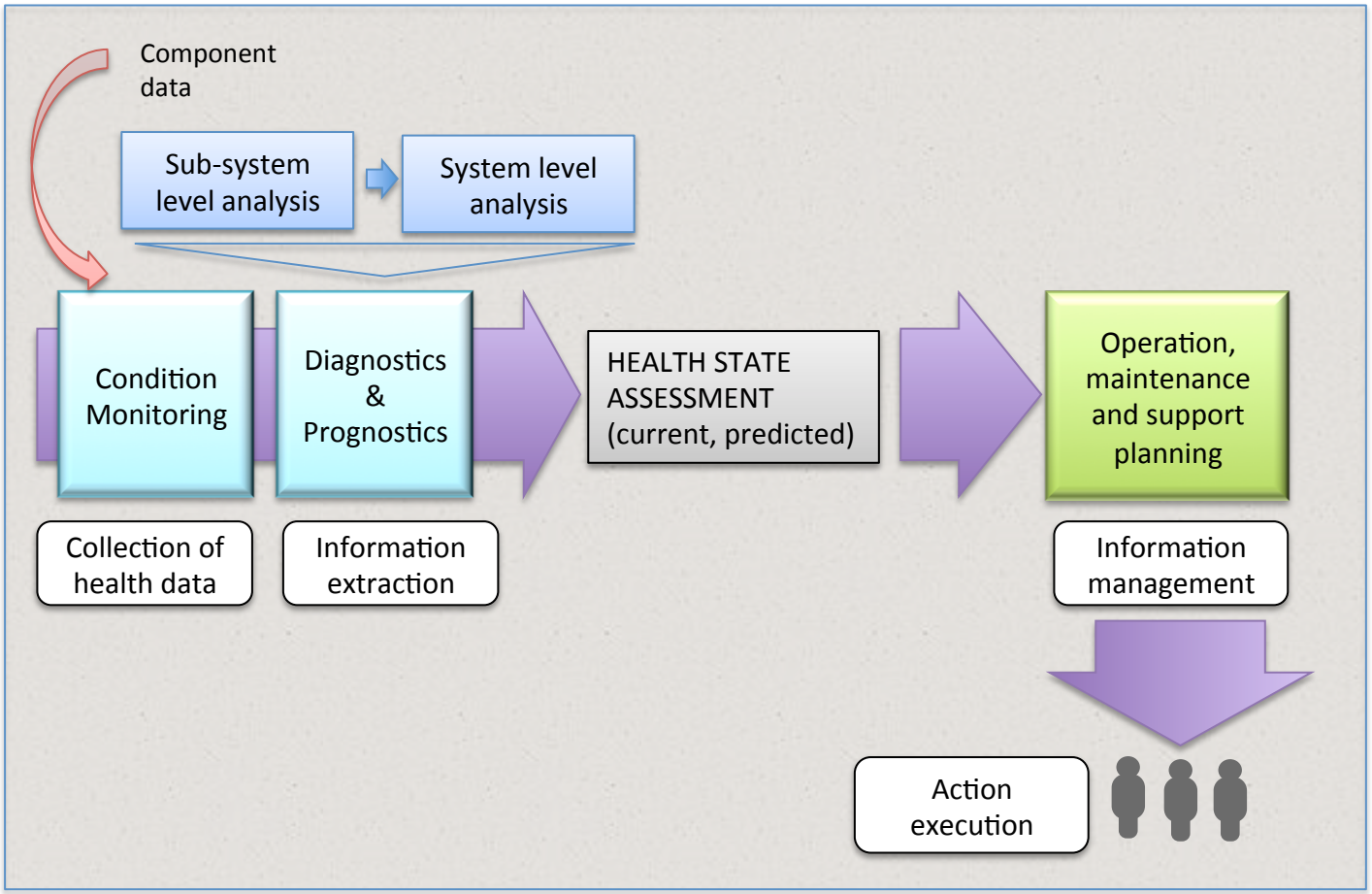
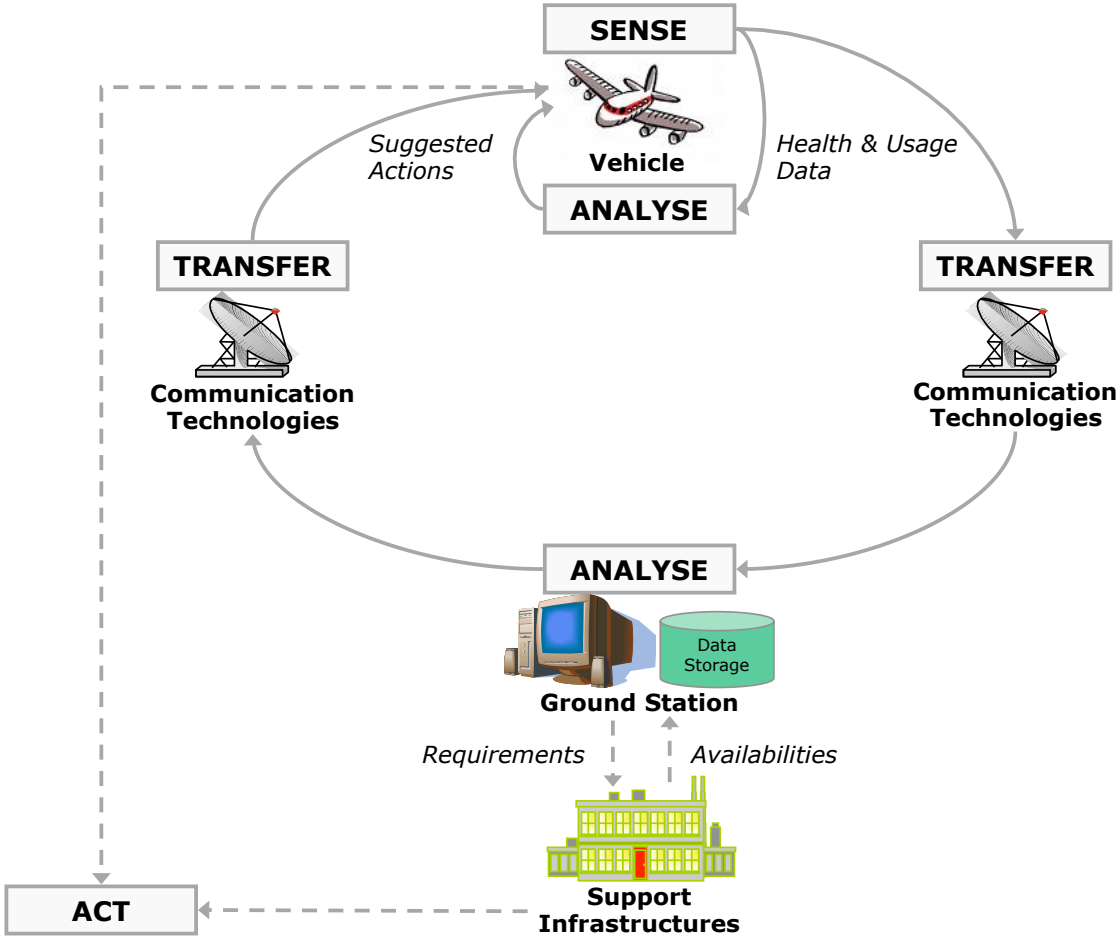
Technology enabled services

The Asset Health Management strategy

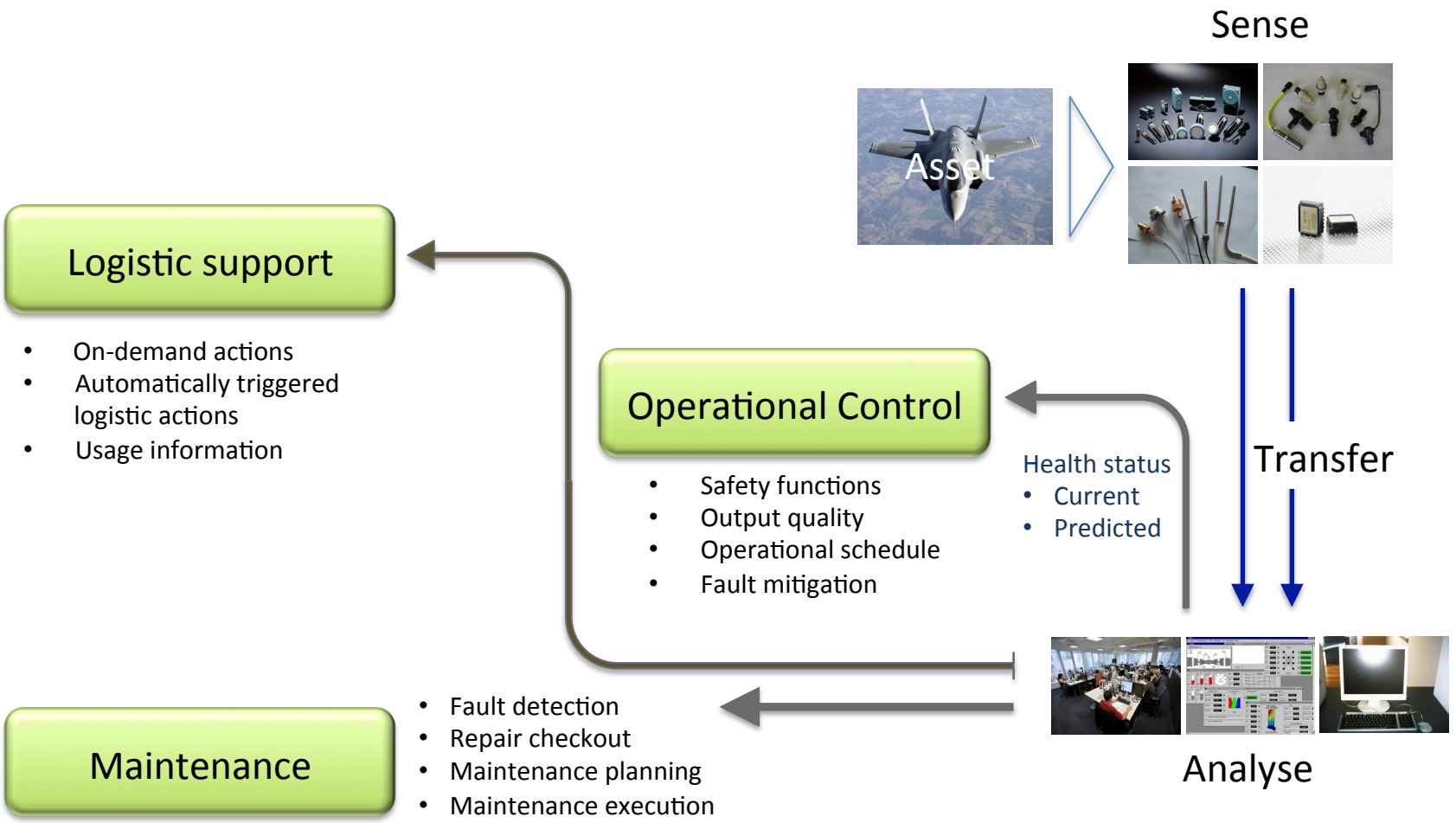


Capture of asset condition, both current and predicted, and use of this information to enhance operation, maintenance and logistic support

An asset health management system



Embedded services



Benefits of the system

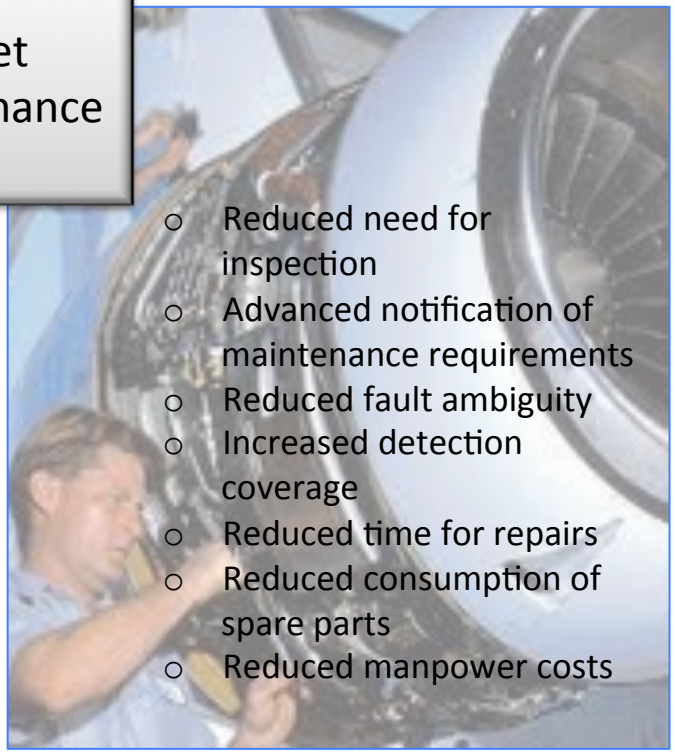
Asset operation

- Adaptive control
- Improved survivability
- Increased safety
- Maximised utilisation

Asset support

- Improved responsiveness
- Increased supply reliability
- More aggressive supply management

Asset maintenance



- Reduced need for inspection
- Advanced notification of maintenance requirements
- Reduced fault ambiguity
- Increased detection coverage
- Reduced time for repairs
- Reduced consumption of spare parts
- Reduced manpower costs

Other examples: the energy sector

Asset health management mainly used for failure prediction and condition-based maintenance

Asset operation:

- Elimination of potentially disastrous events
- Improved performance and productivity

Asset maintenance:

- Increased reliability and reduced downtime
- Extended maintenance/service intervals
- Cut back on costly tower climbs

Asset support:

- Optimal time for specific actions

Other examples: the machinery sector

Asset health management mainly handles early warning notifications and automatic response

Asset operation:

- Improved asset usage and reduced energy consumption
- Automatic response

Asset maintenance:

- Increased reliability and reduced downtime
- Prevention of shutdowns and failures
- Increased lifetime of non-consumable parts
- Elimination of unnecessary service visits

Asset support:

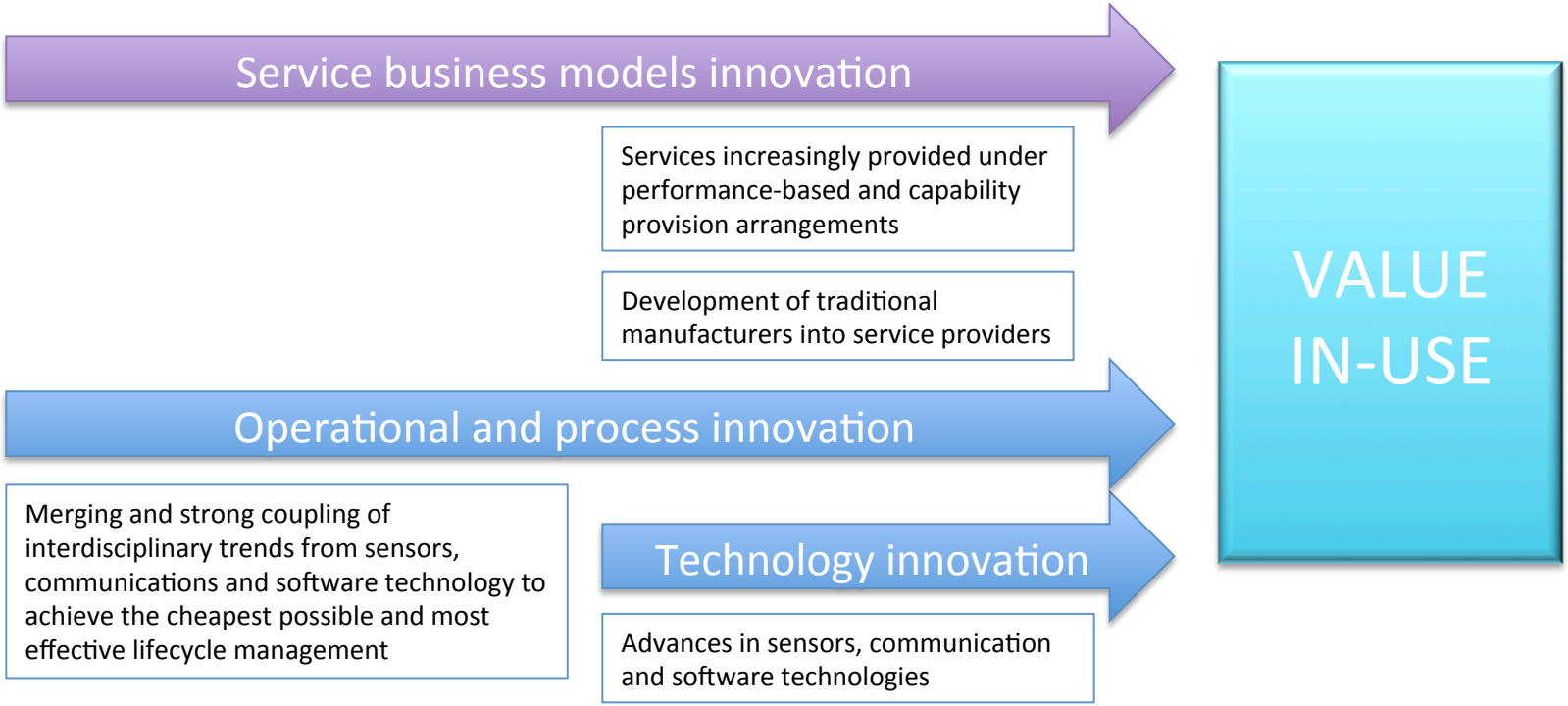
- Reduced time-intensive administration

Why the manufacturer?

- Reduced cost and increased potential of the system due to inclusion from early design phases
- Sharing of sensors and data processing capabilities with instrumentation installed with other purposes
- Use of field data to design product modifications and upgrades

New product-service models

The route of innovation



There are several barriers

- Radically new approach to asset design
- Cultural shift in asset life-cycle management

Technology

- Cost of the hardware and software needed perform the health management tasks
- Relatively recent technologies developed in isolation, which makes it difficult to carry out accurate cost-benefit analysis

Service

- Level of complexity of the service system several orders of magnitude higher than for traditional services
- Knowledge of how to design and deliver complex service systems still at its infancy

Which result into explicit challenges

Technology

Determine the functions to prioritise in the system in order to create the greatest service value

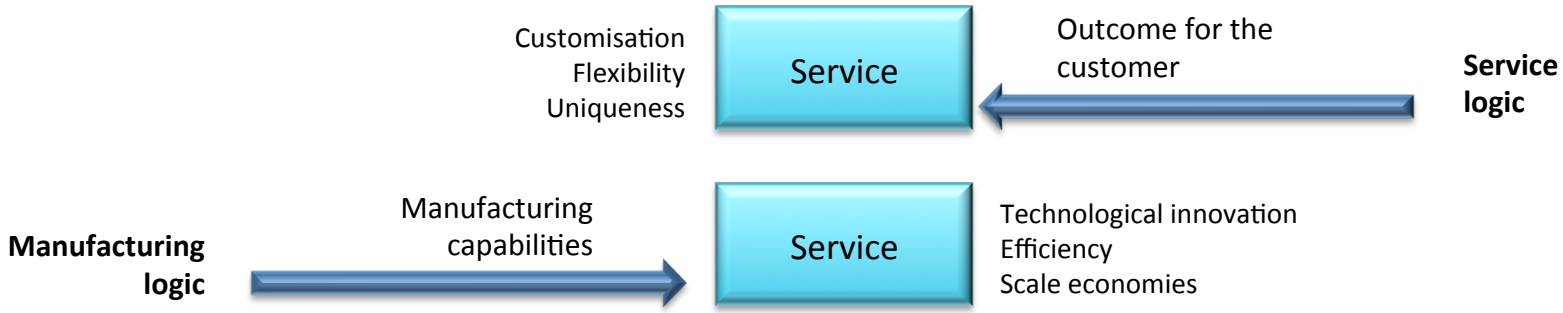
Determine the subsystems, components and elements to include in order to achieve the most cost-effective implementation

Service

Achieve business models that enable individual firms in the service system to capture the greatest value

Achieve effective configuration of resources, information, and technology through shared business processes in the service system

The importance of 'starting with the customer'



The business case

The future

- Asset health management technologies will be increasingly developed as a competitive proposition for after-care service providers
- Service business models will be increasingly focused on extracting value from technology implementation
- Stringent cost-benefit requirements will be placed on the development of new applications of health management technologies
- Complexity of service systems will grow, and the development of service science, management and engineering will be of crucial importance for effective service delivery
- Expectation of unsuccessful stories if not sufficient emphasis is given to customer centricity

Conclusions

- There seems to be a significant opportunity in recent technological advances to support service innovation
- Emerging forms of service contracting, especially in the context of servitization strategies, encourage in-depth exploration of these opportunities
- The implication is a paradigm shift in the way complex technical assets are designed, operated, maintained and supported through the life-cycle
- Barriers to adoption and implementation challenges originate from the cost of the technology and the complexity of the organisational network needed to deliver the services
- A core message is that technology and service innovation alone are not enough. Their development and integration has to be aimed at realising new ways to provide value to the customers