

Service logistics control towers



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DEFINITIONS

Service Logistics encompasses all logistic activities needed to deliver the *functionality desired by the customer*, or to *ensure the safe and secure functionality of a domain system*. Domain systems may be production equipment, household appliances, electronic devices, infrastructural systems (energy net, IC networks, physical infrastructure, a.o.)



Service supply chains are, different than other product supply chains, an instrument to deliver a *desired functionality* to her customers, through the sales of the use of *technological products* and through the programs focused on maintenance, upgrading and safe usage of products during the *entire life cycle*, up to the final disposal, take back and recycling of these products.

Key developments that will impact service logistics

Technological developments

Internet of Things, Connectivity and (big) data, new materials, additive manufacturing, robotics, virtual and augmented reality, design for serviceability

Supply Chain Innovations

Cross chain collaboration centers, Physical Internet, Integration of product-information-financial flows

Changes in markets / economies

Servicization, vertical collaboration/synchronization, sharing economy, lead service provider, new business models between asset/function owner – service supplier - OEM

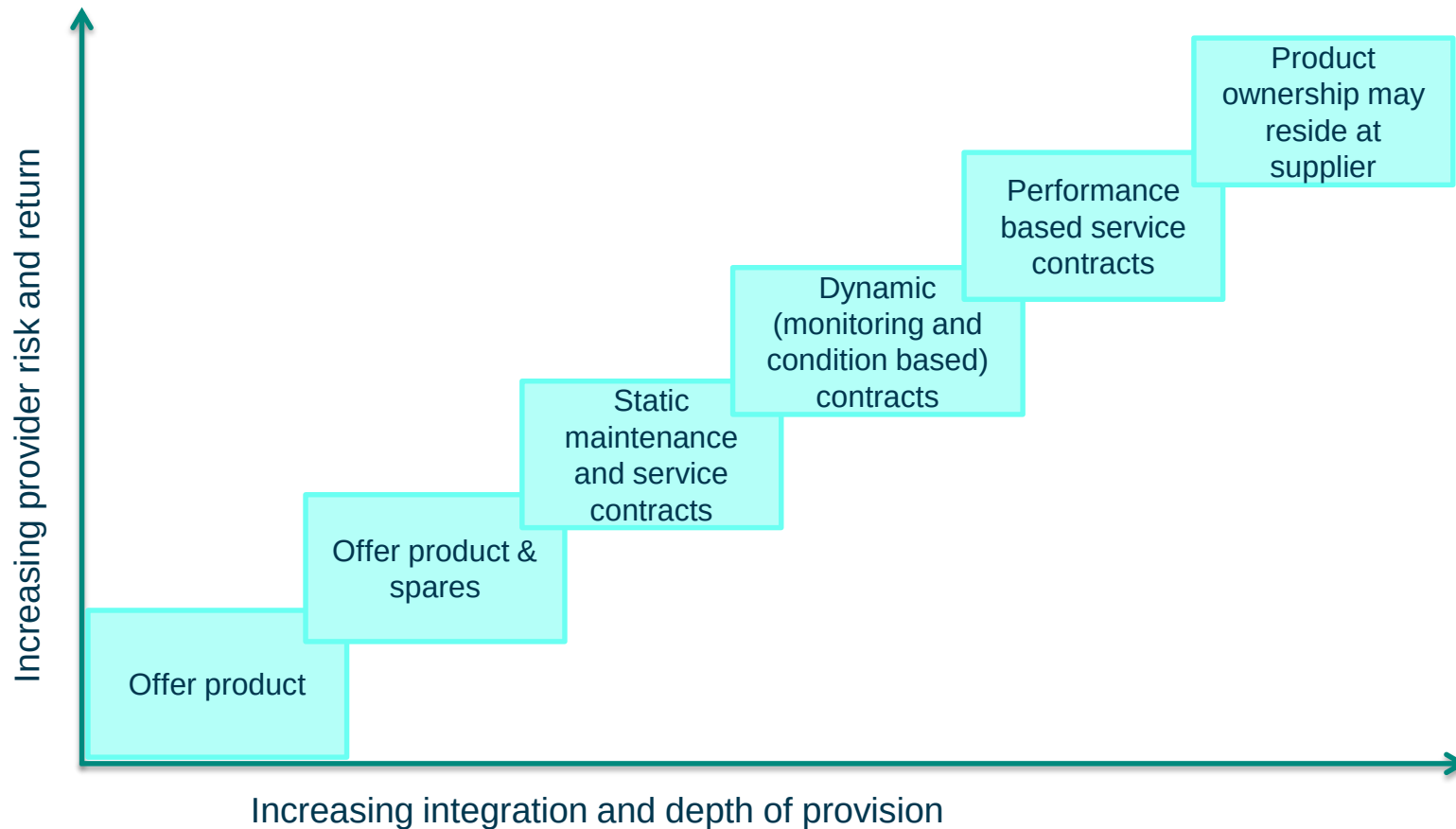
Sustainability

Lack of natural resources, circular economy and re-use, product life cycle approach

Governance / legislation / society / culture

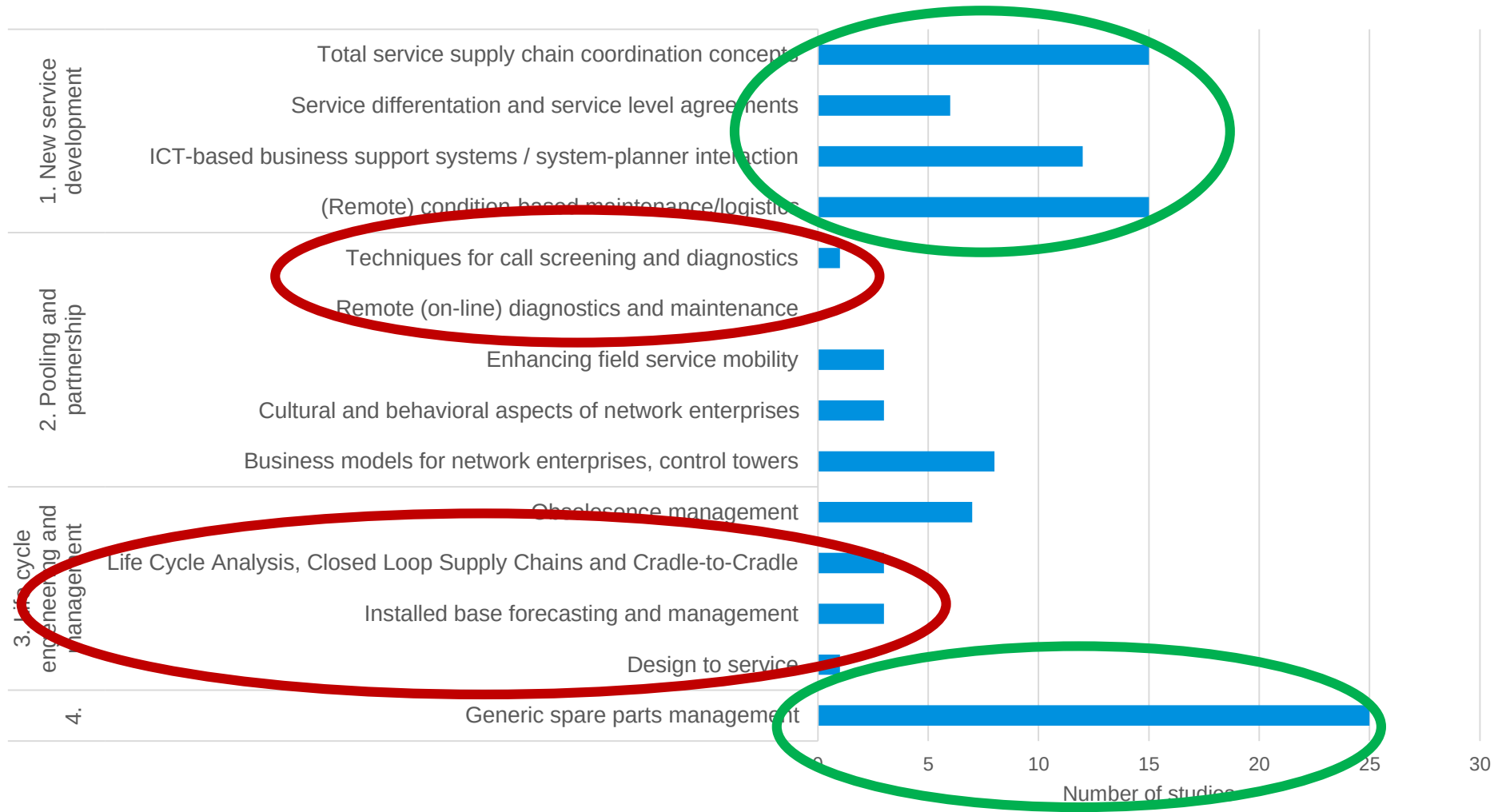
Safeguarding essential infrastructures, financial regulations, 24/7 economy, customer service expectations

Service Market Developments



Modified after Andy Neely, Cambridge Service Alliance, 2013

Studies carried out so far



Control Tower needs according to ASML

Strategic: agreements on Operational Expenditures budgets, capacities and resources, and availability targets (SLA's), determination of safety stocks

Tactical: monthly planning meetings to evaluate demand changes, and the consequences in terms of inventory positions and purchase orders, including financial consequences

Operational: continuous performance monitoring based upon demand and supply sensing, and appropriate action if needed (such as advancing orders, safety stock adjustments to prevent non-availabilities or excess stocks).



Developments at IBM



*How to move from a lean to an **agile** company*

*IBM increasingly assumes the role of a **service organisation**, due to the fact that customers no longer own hardware but use computing power of (IBM) datacenters.*

*Uninterrupted functionality is key, but increasingly an issue of IBM itself. At the same time, it opens possibilities for consolidation (e.g. stock keeping at these data centers). **Fault-tolerance systems** are in data centers are realized by **redundancy and duplication**, making the system less vulnerable to disturbances.*

***Information on installed base system performance** can still be improved significantly. IBM is still a highly cost-driven organisation. Service is insufficiently (or not at all) consulted when it comes to relations with suppliers. Also, new system development is not always considering serviceability as a primary constraint.*

Data-driven operational excellence at Fokker Services

Control of the operation of the entire supply chain centrally.

ABACUS program: exchange pool shared among a large group of operators in order to quickly deliver thousands of component. HQ controls the repairs and replacements in the pool to cost-efficiently guarantee sufficient pipeline of the components, taking into account detailed information both from the demand side and the supply side. Repair shops are fed detailed information which allows them to properly prepare and align their repair resources: Materials, Mechanics, Methods and Machines.

Challenges towards data-driven operational decisions in the supply chain are:

- **Conceptual model** of relations between key operational decisions, the KPIs influenced by those decisions, and the data that should drive the decisions
- **False positives:** situations where alerts are given, but no action is needed.
- **Human factor:** How to trigger human decision makers based on data.



Thales: moving towards Performance Based Contracts

THALES

Various options for PBC's:

- *Timely delivery of spare parts (following SLA's) and execution of repairs*
- *Adopting full responsibility for system availability*
- *Adopting responsibility for capabilities (including the situation in which the service provider, i.e. Thales, installs an alternative system with the desired functionality*

To that end, a control tower should

- *Provide **accurate information** on expected demand*
- *Coordinate and **synchronize suppliers' deliveries***
- ***Coordinate parts deliveries and possibly also service engineers and tool provisioning** to customers.*



VanDerLande Industries: feasibility of service contracts

VanderLande Industries has installed many systems worldwide but many of them are no longer monitored, i.e. completely out-of-sight.



A control tower should focus on four key strategic values:

World class (and worldwide) availability: *VLI has many installed bases in any of the five continents, e.g. in Russia, Southern America, Australia, China. Bordercrossing parts supply is meeting specific problems.*

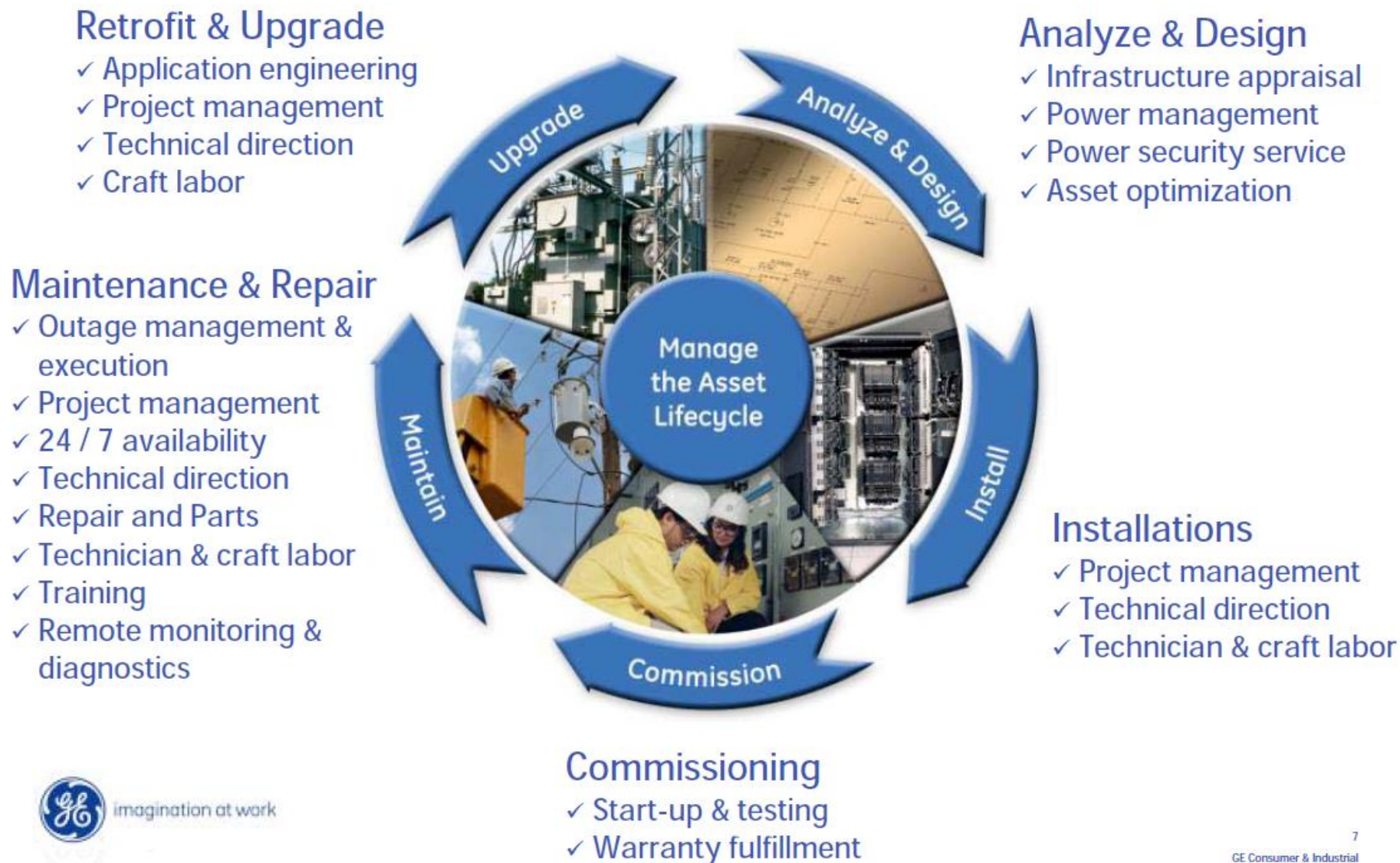
Easy doing business: *an interactive website (parts.vanderlande.com) supports customers to order parts in a user-friendly way, based upon their own configuration*

One stop shopping: *asset owners of different systems, supplied by various manufacturers, should be able to order all necessary parts from VLI*

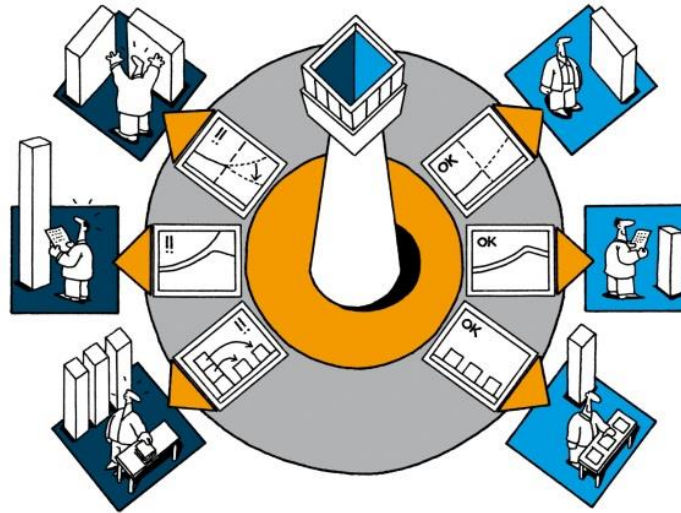
Value for money: *due to economies-of-scale, VLI should be able to realize an excellent performance at a competitive price.*



Power Reliability Lifecycle Services at General Electric

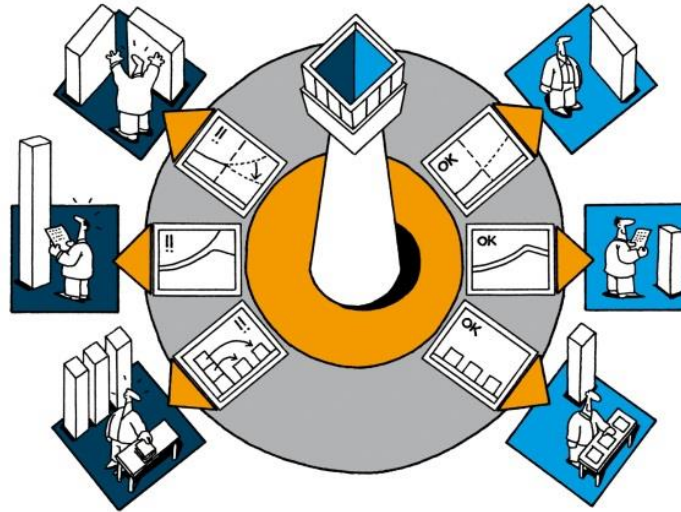


What is a Control Tower in service supply chains?



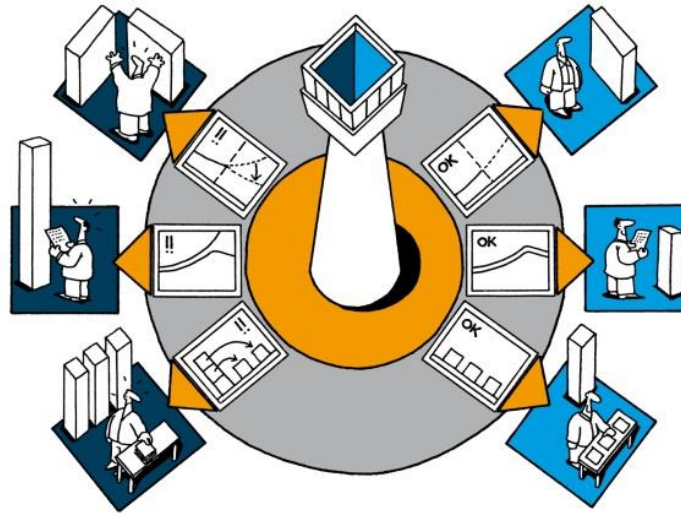
A control tower in a service supply chain should address all aspects of logistic support needed to ensure the uninterrupted functionality of systems that are needed to satisfy a client's demand. It is based on an up-to-date product and parts portfolio, a continuous data flow on actual and potential system use, and balanced financial agreements.

Key Performance Indicators as a basis for control



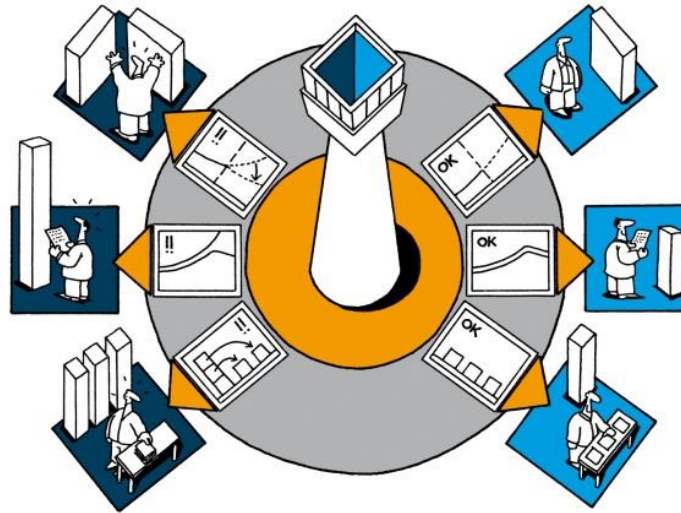
Any control tower logic should be based on a balanced set of Key Performance Indicators which reflect the context in which a system operates. They may be related to safety, security and dependability, or cost considerations, and should be reflected in unambiguous Service Level Agreements.

Control tower decision structure



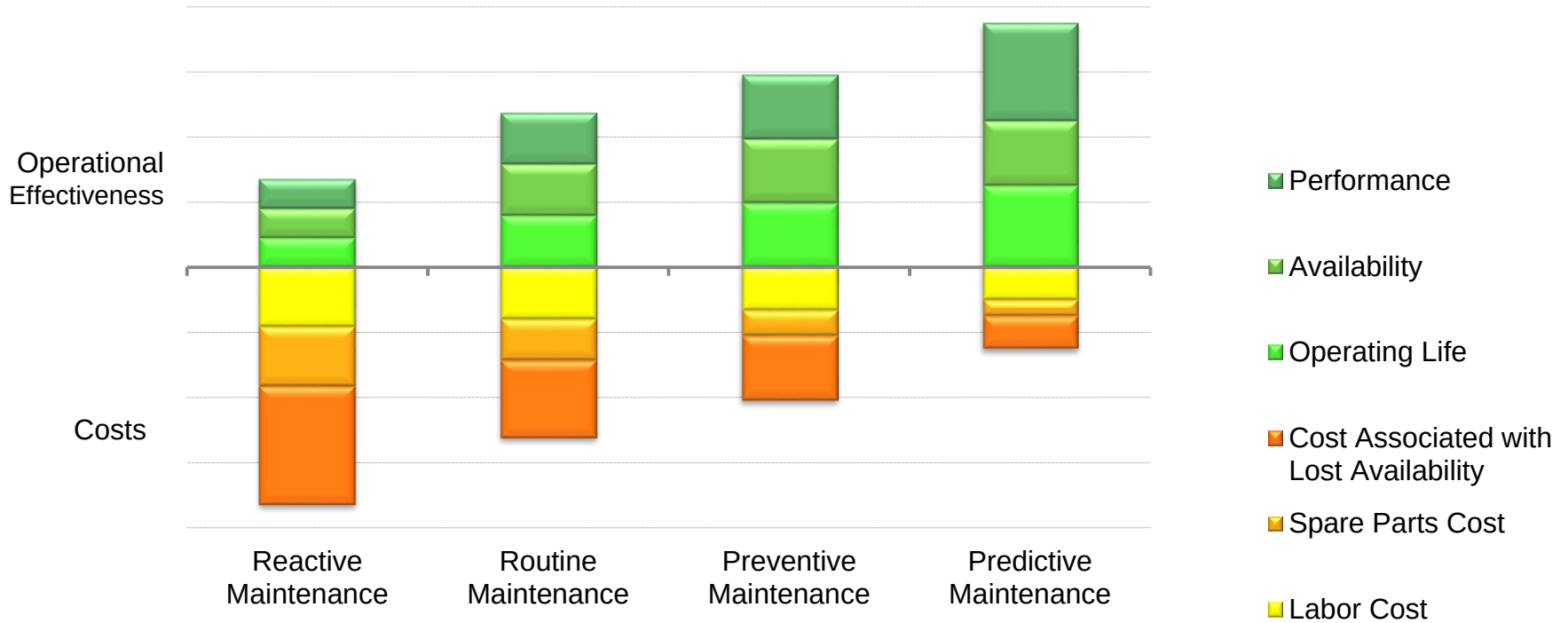
A control tower should clearly distinguish between strategic, tactical and operational decisions. Strategic decisions concern policy definitions, tactical decisions regard to policy adaptations and operational decisions refer to actions based upon system state changes. Essential is to avoid unnecessary nervousness.

Logistic support and system maintenance/upkeep

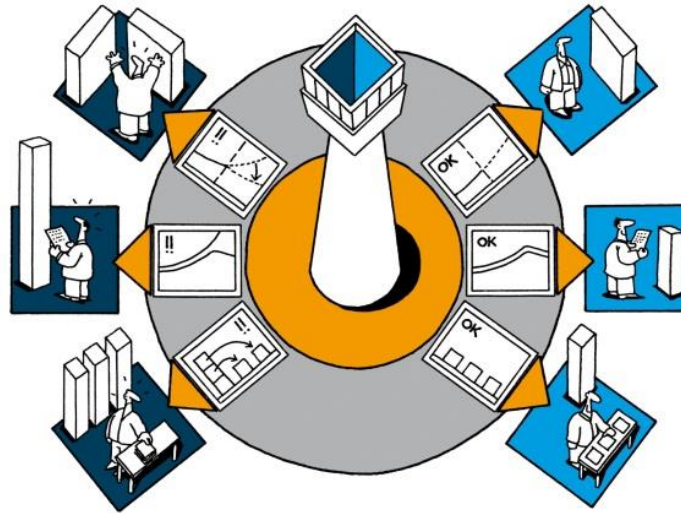


Logistic support in a service supply chain should be closely linked to the maintenance and service strategy a system requires. Reactive, routine, preventive and predictive (e.g. condition-based) maintenance differ significantly in their impact on materials and parts requirements.

Increasing the Operational Effectiveness and Lowering the Total Cost of Ownership of a client's system

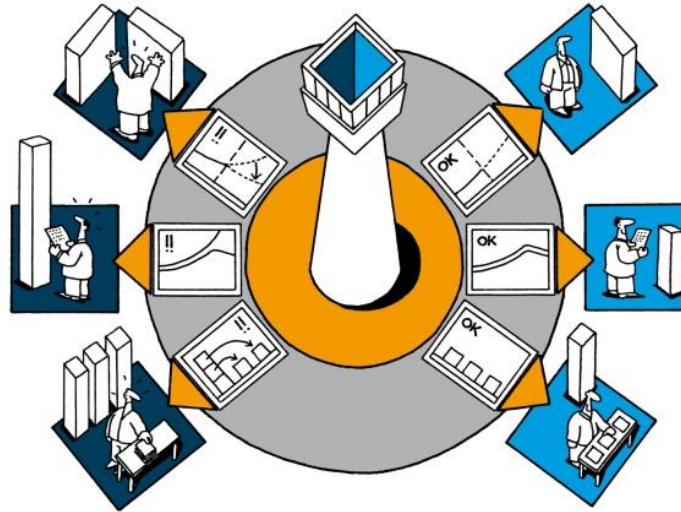


Terotechnology



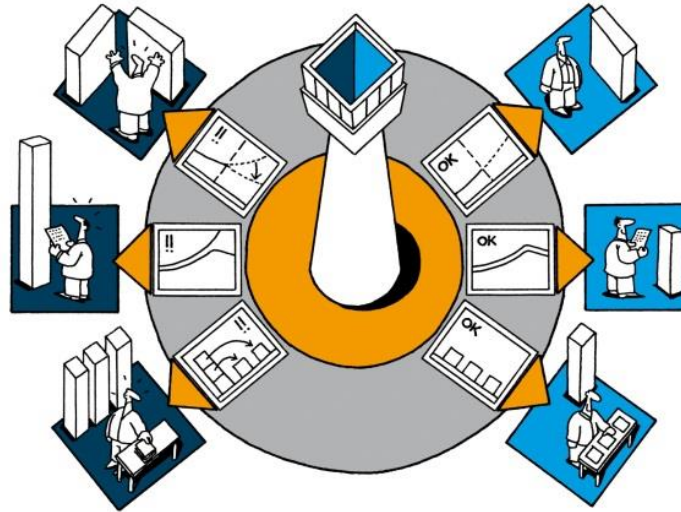
Aggregate information on system use stored in a Control Tower should be evaluated to feed possible retrofits and upgrades of systems, and eventually as input for the design of new system generations (so-called terotechnology)

Information as the basis for a control tower function



A control tower should have access to any information needed to execute its tasks properly. Such information includes data on asset performance, information on past, current and future system use, as well as information on customer and supplier current and future performance, and finally decisions of external stakeholders. At the same time, it should avoid nervousness by installing proper control limits.

Financial considerations and business propositions



A control tower cannot properly function without sound financial agreements with its partners along the supply chain, both upstream and downstream. Sound business models should clearly reflect the win-win of a shift of e.g. a shift of responsibilities from asset user to service provider / OEM, or the value of horizontal and vertical collaboration.

ProSeLo Next, WP 3 – Service Control Towers

- 1. What are the key decision functions of a service control tower, assuming a integral supply chain and lifecycle perspective? Which decisions should be centralized and which not?*
- 2. What information is needed to timely trigger a need for operational actions, what are these actions, and how to avoid system nervousness due to overreaction?*
- 3. How to properly adapt to the various life stages of equipment (phase-in, mature, phase-out)? How to react to changing demand characteristics?*
- 4. How to operate a repair shop, given resource, parts and flexibility limitations? When to deviate from agreed working conditions/hours and decide to crash management action?*
- 5. What level of integration is needed between materials and resource planning (parts and components, engineers and tools)?*

Conclusions

- *A service control tower is a tool, not a goal in itself. It's goal should be to provide the basis for smart asset and service management through excellent logistics support at affordable costs.*
- *Depending on the context in which target assets or systems operate, appropriate performance indices should be defined, as well as smart policies to realize them.*
- *Adequate data recording provides a starting point, while tools based on sound analytical methods are indispensable to reach quantifiable results. In addition, **significant effort is needed to train employees / staff***
- *Even more important is the design of sound business models that clearly demonstrate the win-win, and achieves a fair allocation of the benefits to both asset owners and service providers.*

Questions/discussion?