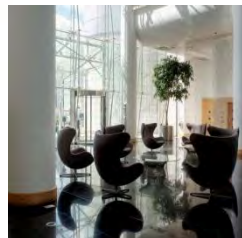# GLOBAL SWITCH

In house vs outsource

The ascent of data centre kind

27 November 2014

Agenda

1. Introduction

2. Overview of technical information

3. Data centre management

4. Outsourcing approach

5. Conclusion

- 1978

- 2000

- 2002

- 2008

- 2012

- Over 30 years' industry experience working for companies including Cable & Wireless, UBS and BT

- 15 years in the data centre industry

- Extensive knowledge from operating large scale data centres

- Focus on ensuring best-in-class operating procedures across global footprints

- Part of the peer review team for the CIBSE data centre design guide published in 2012

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- Founded in 1998
- Global Switch owns and operates its data centre properties
- Around 3,200,000 sq ft of gross space
- Ten data centres across seven markets located in Tier 1 city centres close to business, communications and internet hubs
- Low latency, network dense environments
- Better than 99.999% uptime
- Market leading track record
- Company asset value of £3.8bn as at 31 March 2014
- Internationally renowned customer base
- Financially strong
- ISO 9001, 14001, 18001, 27001
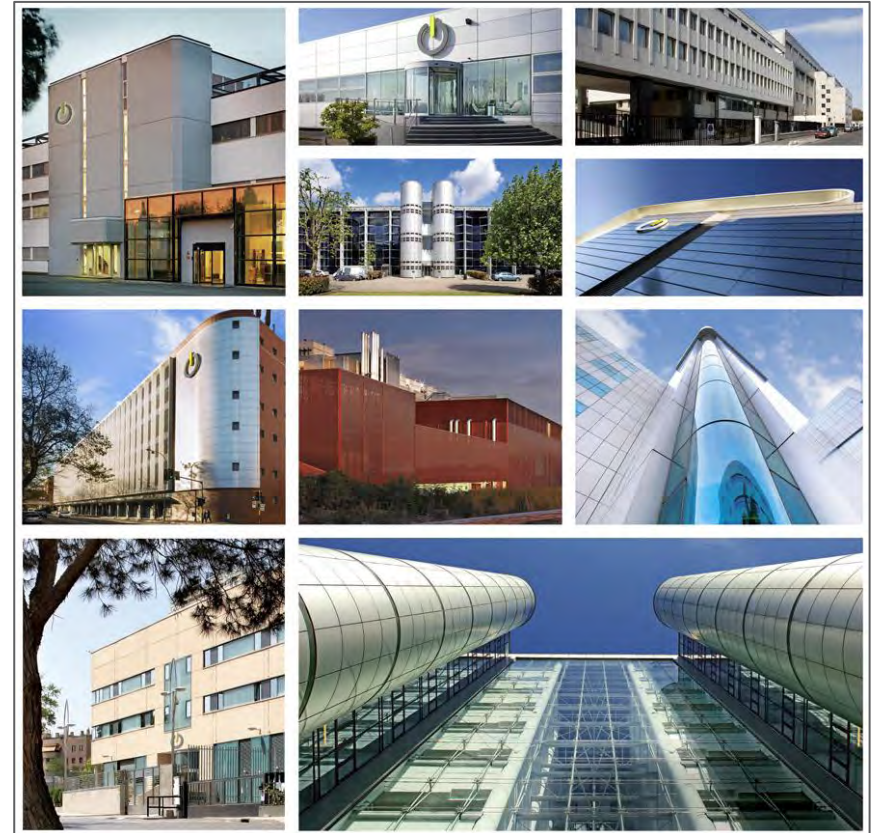
What happens in an internet minute?

Source: Intel

So what does a large scale data centre look like?

or

100 kW

45 MW of power and cooling

132kV Utility supply with N+1 redundancy

Global Switch London Campus

- Largest multi-tenanted data centre campus in Europe comprising London (East) and London (North)

- Around 1,000,000 sq m

- Currently has 74MW of standby power generation capability. Expandable by 44MW

- Largest privately operated HV network in the UK

- 100% of the consumed energy is from sustainable energy sources

- Our London data centre campus power generation capability is equivalent to the residential demand of Edinburgh

- Member of the techUK Climate Change Agreement that exempts Carbon reduction commitments (tax)

User environment

- A standard data centre rack consumes the equivalent of 96kWh per day, or enough power to supply 11 households for a day
- These are expected to operate without fail
- High density and reliability with minimised maintenance time
- Truly critical environments

The Uptime Institute	
Tier 1	Composed of a single path for power and cooling distribution, without redundant components, providing 99.671% availability.
Tier 2	Composed of a single path for power and cooling distribution, with redundant components, providing 99.741% availability
Tier 3	Composed of multiple active power and cooling distribution paths, but only one path active, has redundant components, and is concurrently maintainable, providing 99.982% availability
Tier 4	Composed of multiple active power and cooling distribution paths, has redundant components, and is fault tolerant, providing 99.995% availability

The evolution of data centres

	1980's		1990's		2000's		2010 onwards
Power density	75-300 w/m^2		300-500 w/m^2		500-1,500 w/m^2		~ 10,000 w/m^2
Fuels	Coal Nuclear		Coal Nuclear		Coal Nuclear Dash for gas Emerging green		Coal Gas Nuclear Green
Cooling	R11, R12, R22, R502 Main frame water cooling		Air cooling		Hot and cold aisle		Adiabatic Air containment Scalable air cooling
Emissions							0.16-0.29 GtCo$_2$e (from 2011-2020)
Drivers	Education Start of business computing Internet protocol established Tier 1		Carrier neutral hotels appear Networking equipment less expensive		Dot com bust Connectivity demands High power availability		Energy efficiency advancements ESOS/CRC CCA in the UK

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Source:: March of progress by Rudolph Zallinger

Source http://www.statusq.org/archives
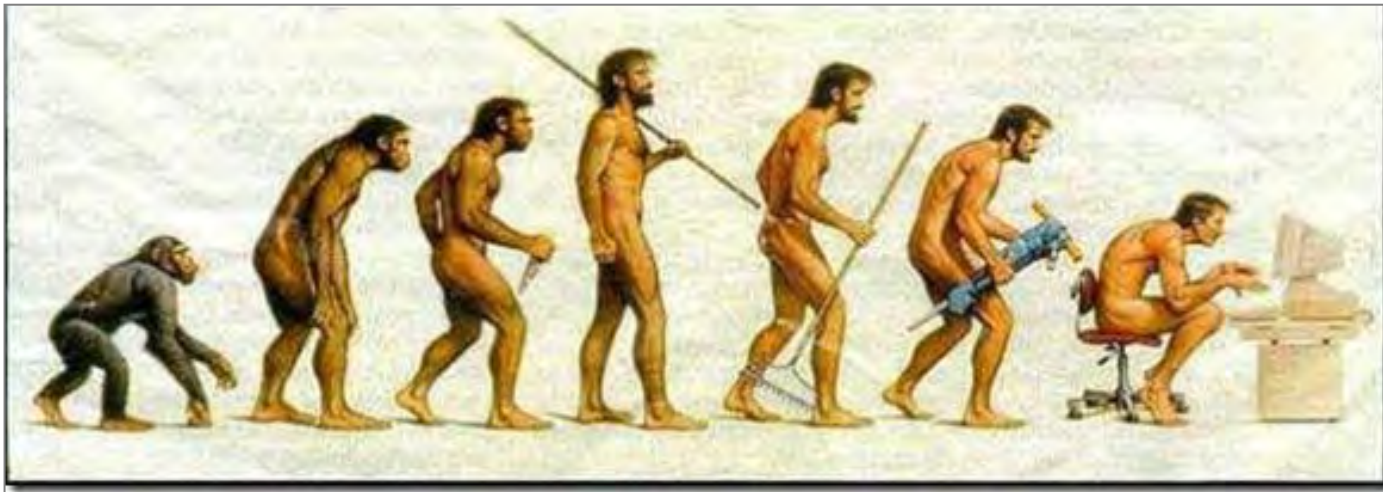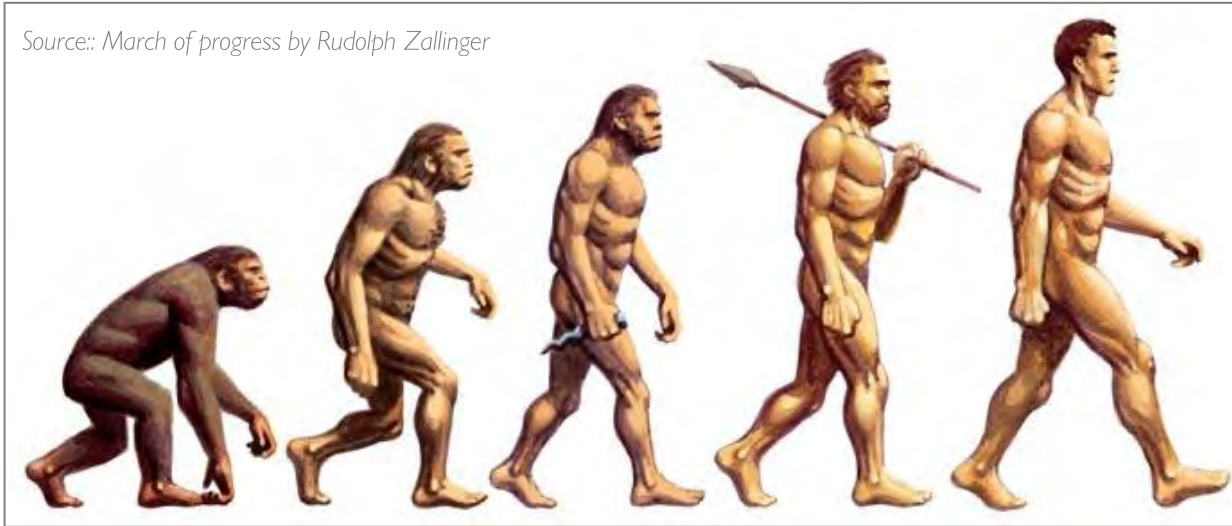
What is in the data centre?

Engineering Services	IT	Typical landlord services
Lots of space (1000's m)	10,000's of servers	Lighting
Mechanical (multiple MW)	1000's storage devices	Meeting rooms
Electrical (multiple MW)	Dense telecoms infrastructure	Lifts
BMS (Pervasive)	10^6 applications	Heating
Security (mission critical)	Multi-cloud environments	General facilities

Data centre development costs are higher compared to premium office buildings

Indicative Breakdown of Construction Costs		
	Premium Office Building	**Multi-Tenanted Data Centre**
Land	45%	10%
Structure and Civils	35%	20%
Fit-out	10%	10%
Mechanical and Electrical	5%	50%
Consultants	5%	10%
Total	100%	100%
Efficiency (gross to net)	80% to 90%	50% to 65%
Cost per gross sqm	£1,750 to £2,750	£6,000 to £8,000
Cost per net sqm	£2,000 to £3,000	£10,000 to £12,000

- Due to their highly specialist nature, data centres cost four to five times as much to develop as premium office buildings
- Data centres are expensive because they are highly engineered and designed to provide essential 100% uptime in power and cooling which requires significant infrastructure mainly in the form of standby power generators, UPS and cooling systems
- The specialist nature of data centres means that allocation of construction costs is also significantly different to a premium office building

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Source: Company estimates.

The Management requirement and responsibilities

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Profile

- Proficient management expertise and experience
- Broad engineering training and experience
- Cost conscious
- Can operate in both tactical and strategic modes
- Excellent managers of Stakeholders
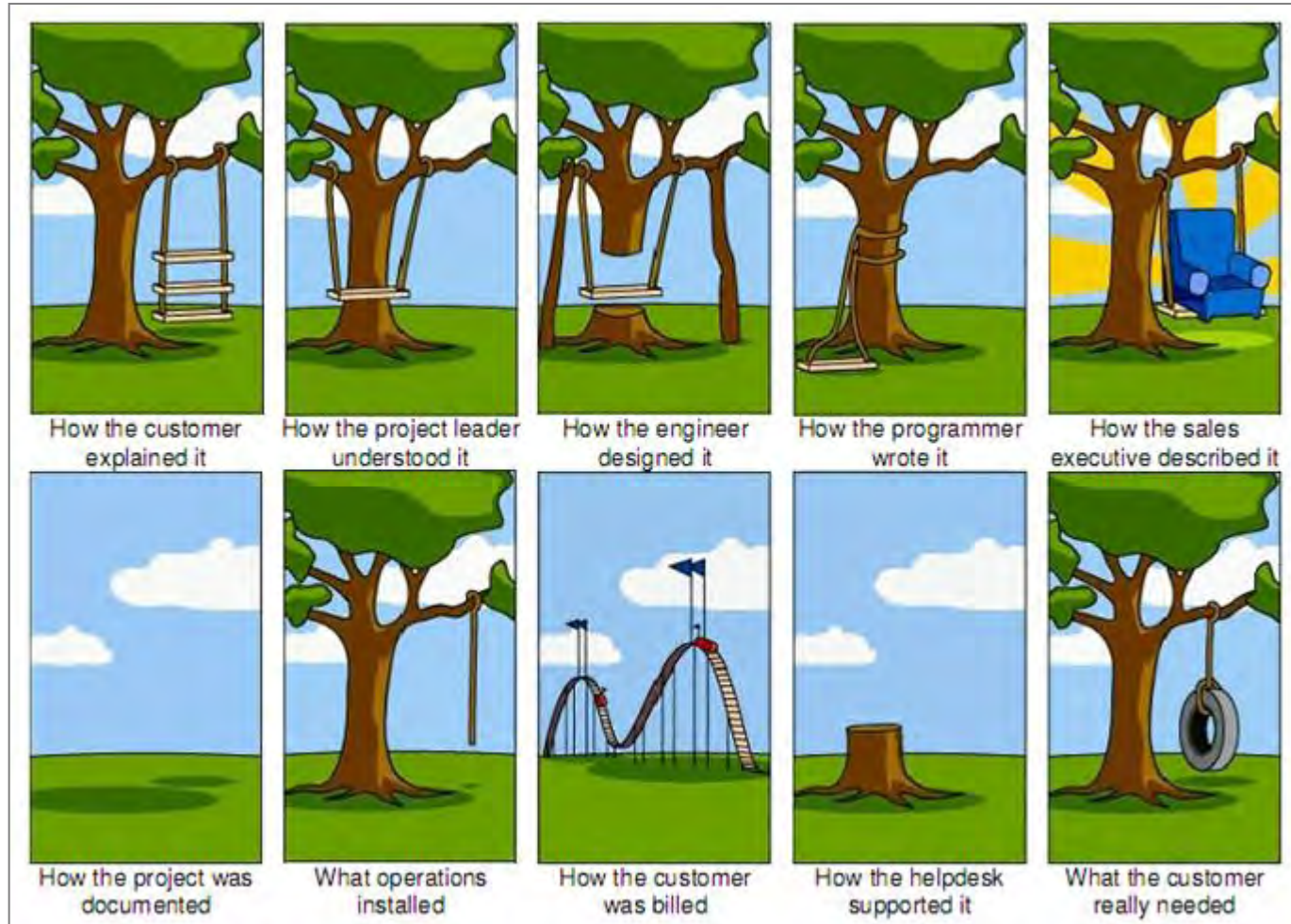- Customer service experience and skills

Responsibilities

- Intellectual Property
- Budget control
- Develop and maintain employee skills
- Identification and retention of key resource
- Grow and maintain shareholder value
- To customer

Challenges

▶ Quick response demanded by customers (new build/ expansion/ fault resolution)

▶ Flexible capacity demands by customers (Ups and downs)

▶ Cost controls- to preserve margin pressures and manage Shareholder value

▶ Ability to adapt to technology development

Source: http://www.tamingdata.com/wp-content/uploads/2010/07/tree-swing-project-management-large.png

The advantages of multi-skilled employees

- Flexibility

- Known labour costs

- Efficiency in planning

- Employee satisfaction

- Employee retention
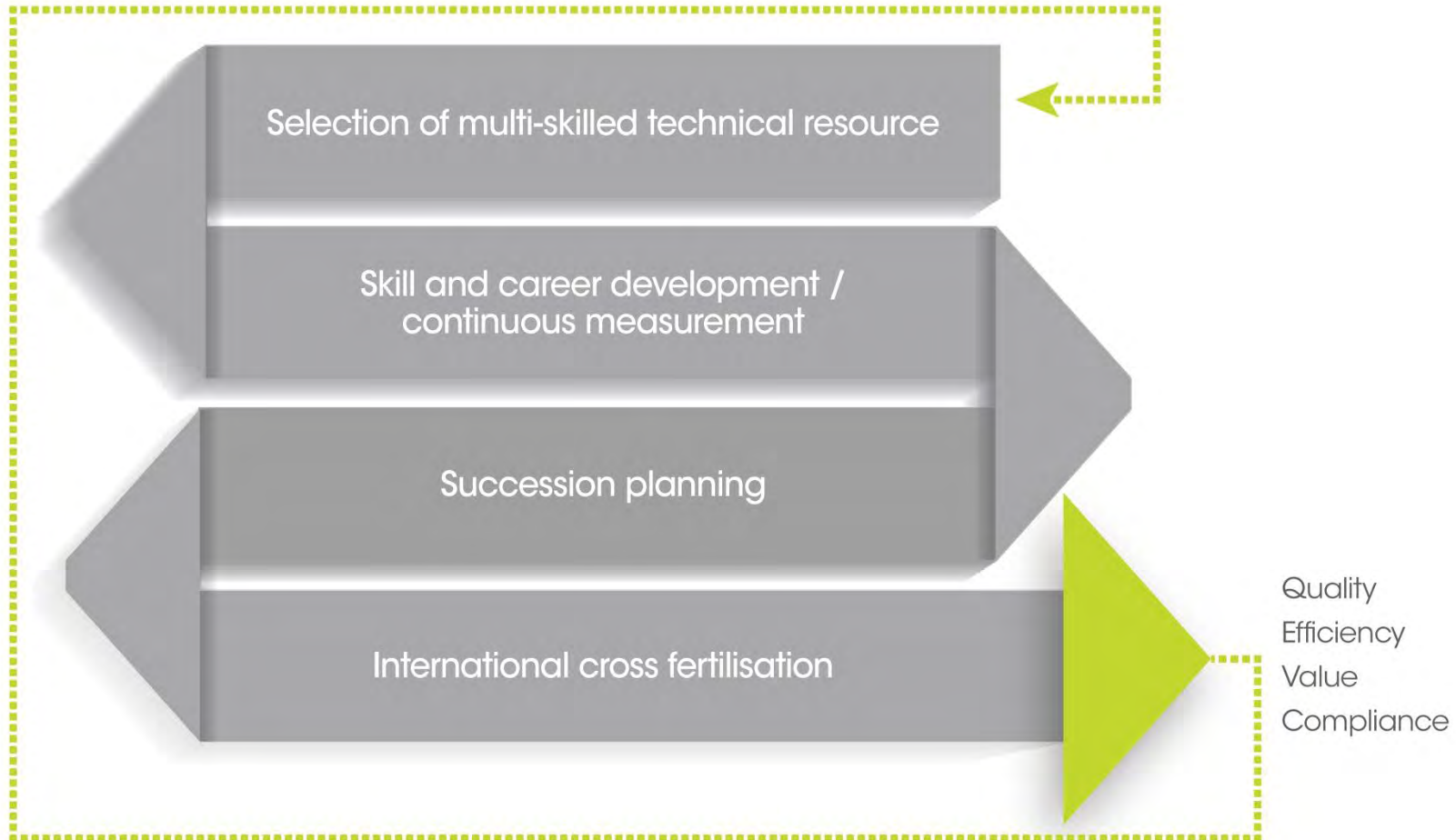
Operations roles and functions

Facilities Services and Contracts Manager	The Facilities Services and Contracts Manager is responsible for negotiating supplier contracts, on-boarding new suppliers and ensuring contracts are delivered as expected. This role covers all aspects of the datacentre, including soft services, technical contractors and for the sourcing of added value services. The Facilities Services and Contract Manager is responsible for the monitoring and control of supplier KPIs.
Facilities Shift Managers	Generally each site has four or five Facilities Shift Managers in order to provide 24x7x365 cover. The Facilities Shift Managers are responsible for ensuring that all Global Switch site infrastructure is operated and maintained in accordance with contracts and to industry best practice. The Facilities Shift Managers oversee the FM contractor team resources and ensure that planned preventative maintenance is carried out and reactive tickets are processed and closed in a timely manner.
Customer Services Manager	This role is responsible for managing additional value add services to customers, including cross connects, access permits, technical cleaning, fit out works, etc.

Source: Chamber orchestra Kremlin

Qualifications matrix

	Facilities Shift Manager (FSM)	Operations Manager (OM)
Recognised professional Electrical / Mechanical Engineering qualification	✔	-
Recognised professional Electrical / Mechanical Engineering qualification to degree level	-	✔
Institute of Leadership & Management (ILM) level 3 diploma in leadership & management	✔	-
Institute of Leadership & Management (ILM) level 4 diploma in leadership & management	-	✔
IOSH Managing Safely Certificate	✔	-
NEBOSH National General Certificate in H&S	-	✔
ILM Coaching & mentoring – level 2	✔	-
ILM Coaching & mentoring – level 3		✔
Institute of Asset Management (IAM) Certificate	✔	-
Institute of Asset Management (IAM) Diploma	-	✔
EU Code of Conduct on DC energy efficiency certificate	-	✔
Certified DC Management Professional (CDCMP) Certificate	-	✔
Internal Integrated Management System (IMS) Auditor Certificate	✔	-
High Voltage (HV) Certificate	✔	-
First Aid (FA) Certificate	✔	-
IEE Wiring Regulations 17th Edition	✔	-
Minimum of 5 years' experience in working in large hyper Critical Environments	-	✔
Minimum of 3 years' experience in working in large hyper Critical Environments	✔	-

Selection of multi-skilled technical resource

Skill and career development / continuous measurement

Succession planning

International cross fertilisation

Quality
Efficiency
Value
Compliance

Skill and career development

International cross fertilisation

Compliance

Quality

Always on

Succession planning

Value

Efficiency

Selection of multi skilled technical resource

Selective outsourcing is an effective strategy

- Outsourcing of maintenance and management of the data centre looks attractive

  - FM Contractors

  - OEMs

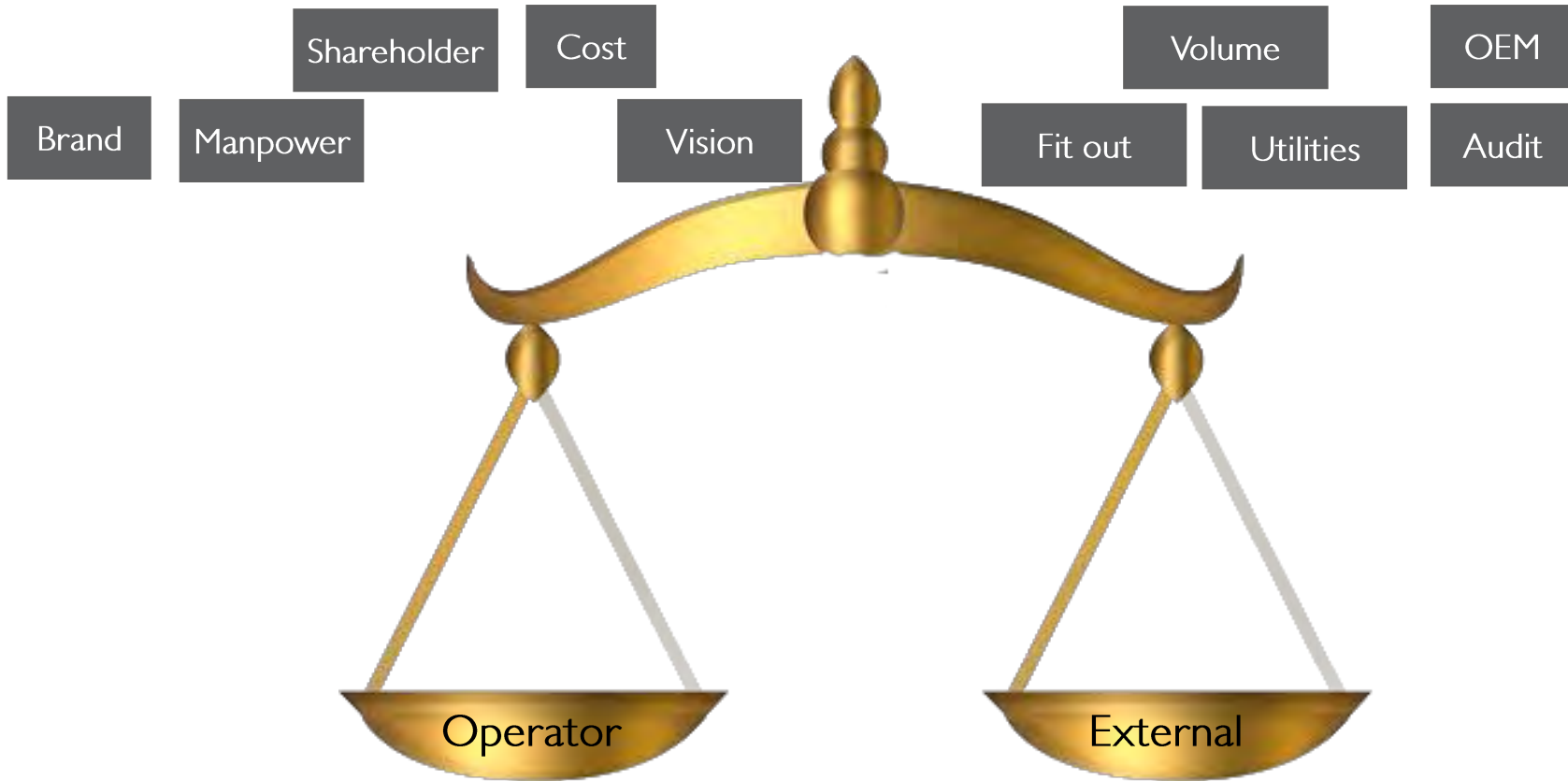 - Specialist engineering consultants

- Our approach to outsourcing

  By being selective about what we outsource and what we retain in house maintains greater control of the operation, finance and standards of service

  - Open communications

  - Clear lines of delegated authority (external stakeholder relationships)

  - Collaboration with reputable companies Maintain and control corporate values and standards (SLA's)

  - Maintain control of policies and procedures

  - Stewardship of standards and values

  - Best practices and knowledge should shared between the operator and the outsourced supplier

Global Switch do not follow the industry trends in our approach to outsourcing

Managing the balance of internal and external control

Brand | Shareholder | Manpower | Cost | Vision | Fit out | Volume | Utilities | OEM | Audit

Operator

External

Thank you for your time.
Questions

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