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POWERLINK QUEENSLAND REVENUE PROPOSAL

Supporting Document - PUBLIC

Powerlink Queensland
Digital Asset Management - Framework

Delivering better value

Powerlink – Digital Asset Management - Framework

Policy stream	Asset Management	
Endorsed by	Digital Asset Strategies Manager	[redacted]
Authored by	Group Manager Strategy and Planning	[redacted]
Approved by	Executive Manager Investment and Planning	[redacted]

Version history

Version	Date	Section(s)	Summary of amendment
1.0	13/10/2015	All	Original version

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1. Introduction

1.1 Purpose

This document outlines the framework for the asset management of all digital assets.

1.2 Scope

The scope of this document applies to digital assets in Powerlink. Business IT is excluded.

1.3 References

Document code	Document title
External	Investment planning methodology – General planning techniques *Queensland Government Chief Information Office | V3.0.1 | 2014.*
External	Investment planning methodology – Application planning techniques *Queensland Government Chief Information Office | V3.0.1 | 2014.*
External	Investment planning methodology – Technology planning techniques *Queensland Government Chief Information Office | V3.0.1 | 2014.*
AM-STR-1037	Asset Management Strategy

1.4 Defined terms

Terms	Definition
ISO55000	International Standard for management of physical assets.

1.5 Roles and responsibilities

Who	What
Strategies Analyst(s)	Delegated Author(s). Responsible for period review and updated versions.
Digital Asset Strategies Manager	Reviewer. Ensures fitness of purpose for Digital Asset Management.
Group Manager Strategy and Planning	Responsible Author. Ensures organisational commitment to the framework outlined in this document through consultation.
Executive Manager Investment and Planning	Approver. Supports the use of this framework in the organisation.

2. Digital Assets

Digital assets transcend traditional asset management methodologies such as ISO55000 and predecessors that focus on physical assets primarily. Digital assets, while still based on physical assets are far more integrated, complex and are subject to a wider concept of value beyond 'utilisation'. As such, principles from technology investment methodologies have also been integrated with the traditional physical asset management approaches to create the digital asset management framework.

2.1 Complexity of digital assets

Digital assets are an order of magnitude more complex than physical assets due to heterogeneity, interrelatedness and dynamism as outlined in Figure 1.

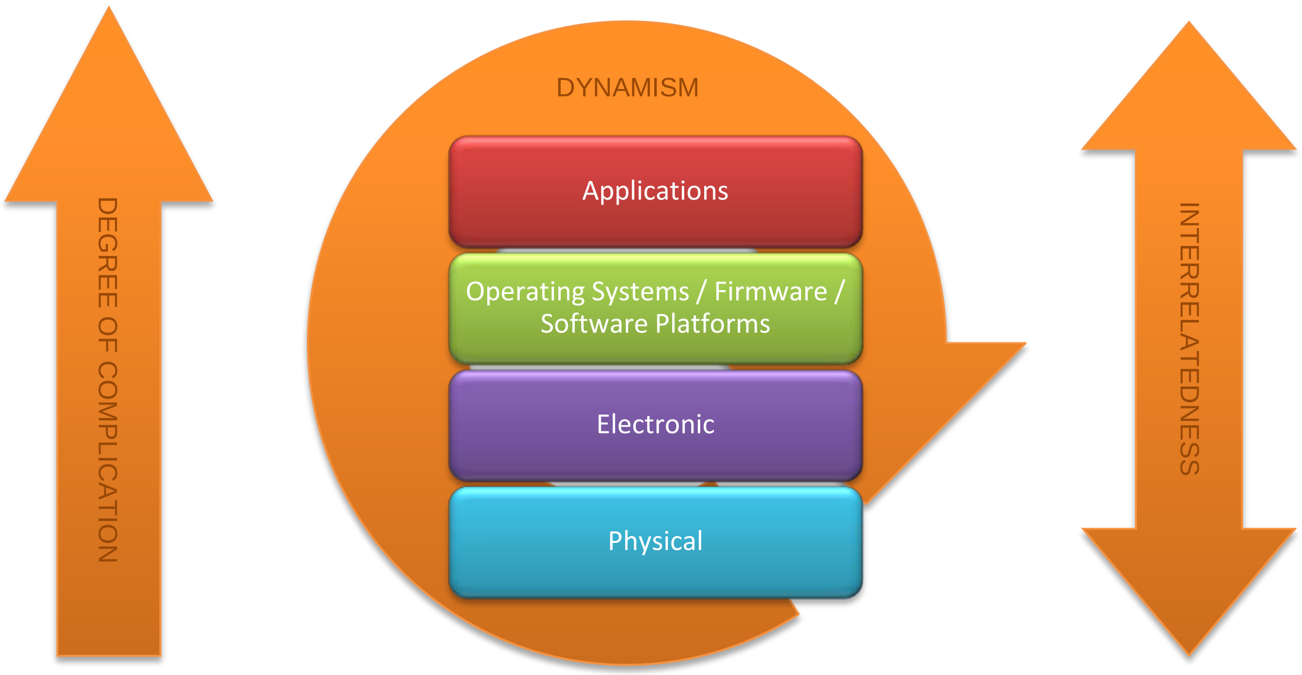

Figure 1 – The complexity of digital asset management

Digital assets are highly heterogeneous in their degree of complication, occupying a spectrum ranging from simple physical assets to purpose built enterprise application. As such a 'one size fits all' approach to asset management is not sufficient. The digital asset framework therefore distinguishes between categories of asset in order to provide adapted practices suitable to degree of complication inherent to the asset. These categories are applications are Applications, Operating Systems / Firmware / Software Platforms, Electronic and Physical (see section 3.2 below).

A second contributor to complexity of digital asset management is the concept of interrelatedness. More complicated assets are reliant on and comprised of less complicated assets. For example, an enterprise level software application depends on operating systems, electronics and ultimately physical assets. This has two-way implications, in that:

- The end of life of an application may necessitate reinvestment into some or all lower level asset category instances, regardless of their individual asset life cycle.
- The end of life of a physical component may necessitate reinvestment into some or all of the higher level asset category instances, regardless of their individual asset cycle.

Appropriate lifecycle planning, as well as selection of technologies and assets that minimise the degree of interrelatedness are both required to manage the risk of these scenarios eventuating.

Finally, digital assets are more highly exposed to dynamism than primarily physical assets like HV plant in that change is rapid, constant and may originate from many sources both internal and external to the organisation. Understanding and being able to monitor these potential change vectors is critical to asset life cycle management.

3. Digital Asset Management

In order to perform asset management in this complex environment the organisation must be able to:

- Understand change vectors affecting digital assets;
- Understand issues of interrelatedness, and ensure these dependencies are planned for, or mitigated via selection of digital assets that ‘de-couple’ asset categories; and
- Define, classify and manage assets according to category, understanding the exposure of each category to each type of change vector and interrelatedness.

3.1 Change vectors

There are four distinct change vectors that must be considered and monitored during the asset life cycle in order to perform prudent asset management of digital assets. These are:

- Business utility;
- Total cost of ownership;
- Obsolescence; and
- Physical condition.

These vectors are not mutually exclusive – an asset is simultaneously exposed to all of these vectors and an investment decision occurs when any of these forces reaches a trigger condition. However the level of exposure to each of these vectors varies across asset category such that one of these vectors is likely to drive most of the investment decisions for that category.

3.1.1 Business utility

Organisations strive to create value for their external stakeholders sustainably while complying with regulation. However this definition of value is variable over time in both quantity and type. In order to meet this changing value proposition the organisation may need to either invest in new assets to create new capability, or dispose of unproductive assets whose capability is no longer required.

The business must outline its strategic direction in order for business utility to be assessed. This framework recognises the Powerlink business strategy and divisional plans outlined in the Governance stream of the document management framework as the enunciated and committed direction used to make changes to digital assets.

3.1.2 Total cost of ownership

For most assets, running costs represent the vast majority of the total asset cost. Occasionally innovation and competitive forces may create situations where early replacement of an asset with a new asset (i.e. incurring additional acquisition cost and/or write off) can be justified by the reduction in operating costs.

Service providers have a pivotal role in ensuring that the total cost of ownership of assets under their remit are well understood and must have appropriate systems and processes in place for capturing costs associated with digital assets for the entire asset lifecycle.

3.1.3 Obsolescence

Obsolescence is the inability to support a product, system, or service for ongoing use despite it being in reasonable working order. While life extension is possible, an unsupported product has a significantly increased risk profile as a lack of spares and expertise increase the consequences of failure, lack of cyber security mitigations also increases both likelihood and consequences of risks associated with legacy digital assets. Obsolescence differs in its asset management treatment in that it is typically addressed via a ‘fleet-wide’ replacement decision where the organisation will strategically divest all instances, rather than targeted at individual assets.

Service providers must perform vendor management in order to ensure that obsolescence is mitigated as practicable and that the maximum notification is available to support asset management decisions.

3.1.4 Physical condition

Physical devices are subject to mechanical and environmental stresses that cause wear and tear that ultimately engenders a finite technical life before failure.

Where physical condition can be measured and predicted with a high degree of confidence, techniques such as inspection and measurement can be used to pre-empt failures and enable just-in-time replacement of individual assets – where the asset is of sufficient value that such effort is justified. Commodity assets may be replaced based on age as this offers a useful proxy for more detailed inspection techniques while minimising the cost of managing the asset. Finally, assets that are able to be replaced easily, and for which the consequences of failure are low may simply be replaced as they fail.

Service providers must perform condition assessment and/or fault management to enable physical condition to be assessed and monitored.

3.2 Asset categories

The following represents categories of digital asset.

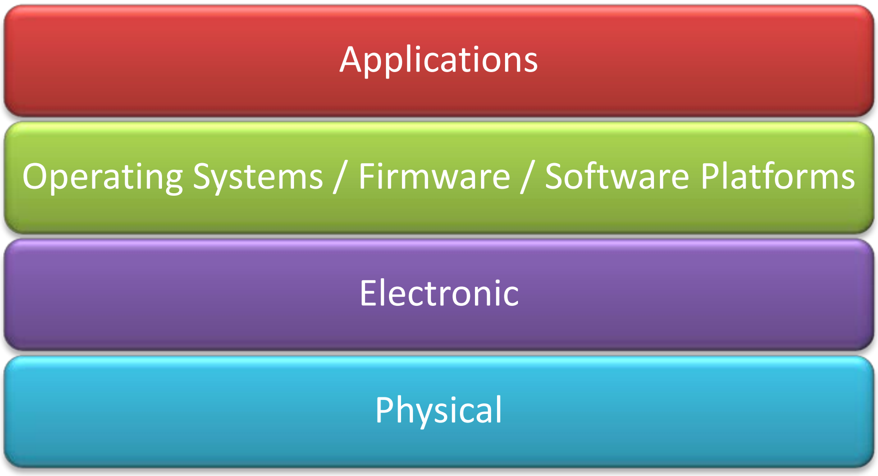

Figure 2 – Categories of digital asset

3.2.1 Applications

Application assets are items of software that are used to support a business activity such as data collection and analysis or systems administration.

Examples include:

- Management systems and element managers;
- Terminal services and Human Machine Interfaces (HMI); and
- Power system applications.

3.2.1.1 Planning and investment

Investment in applications is primarily justified by business utility – creating efficiencies aligned with the business strategy or meeting compliance requirements. Planning and investment includes not only the initial procurement decisions, but decisions to take major version upgrades or add additional functionality.

3.2.1.2 Operation, maintenance and refurbishment

Operations of applications are the responsibility of the business to support their intended use. Maintenance of assets generally includes minor version upgrades in collaboration with vendors to address issues of defects, cyber-security or incremental functionality improvements.

Applications cannot be refurbished, but may be life extended beyond service provider capability if the risks to the business are acceptable.

3.2.1.3 Exposure to change vectors

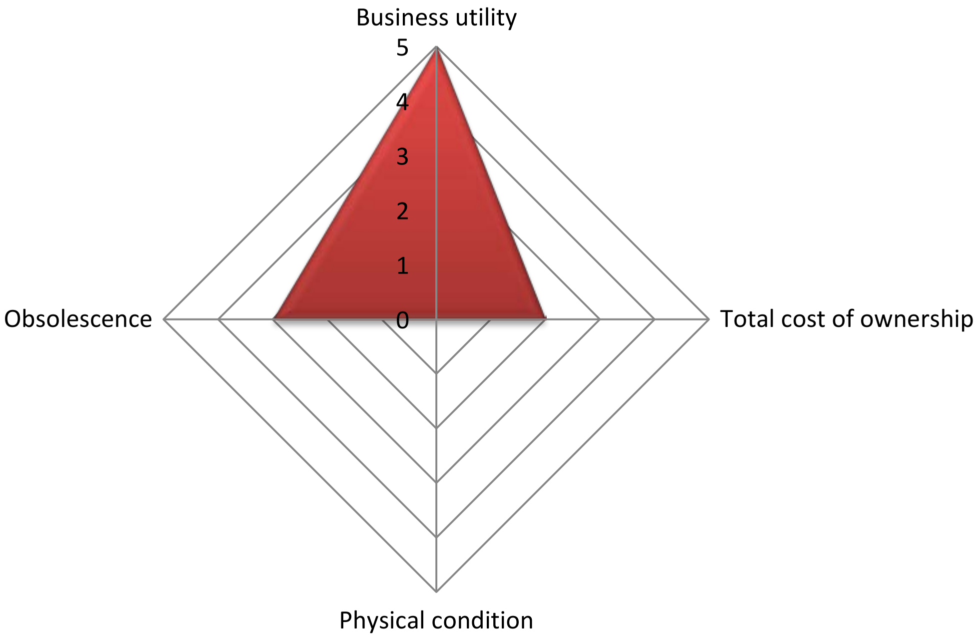

Figure 3 - Likelihood of change vectors for the application asset category

Figure 3 – outlines the exposure of the application category to change vectors. Applications are most subject to change based on their business utility, though occasionally the business may be forced to replace systems based on eroded service provider capability or disruption / innovation impacting total cost of ownership. Applications by their nature do not contain any aspects of physical condition.

3.2.1.4 Interrelatedness

Category	Degree of interrelatedness	Category
Application	→ Moderate. Application vendors are likely to only support a limited set of operating systems or legacy device firmwares such that changing an application could result in the need to change the platform. The more specialised the application the more likely this is to be a factor.	Operating Systems / Firmware / Software Platforms
	← Low. Only generational changes are likely to result in applications being replaced or upgraded as backwards compatibility is usually a key feature.	

3.2.2 Operating Systems / firmware / software platforms

Operating System / firmware is software native to hardware used primarily to enable functionality of the hardware. Software platforms are common use systems that provide generic functionality to applications.

Examples include:

- Operating systems and hypervisors running on computer hardware;
- Firmware running on networking and security devices;
- Firmware running on telecommunications equipment;
- Firmware running on intelligent electronic devices. and
- Database Management Systems, web servers, directory and network services.

3.2.2.1 Planning and investment

Investment in operating systems / firmware / software platforms is driven by technical service providers to support the required capability in compliance with asset management principles and standards.

3.2.2.2 Operation, maintenance and refurbishment

Operations of operating systems/firmware/software platforms are the responsibility of technical service providers and generally involves performance and capacity management. Maintenance of operating systems and firmware generally includes minor version upgrades in collaboration with vendors to address issues of defects, cyber-security or incremental functionality improvements.

Operating systems / firmware / software platforms cannot be refurbished, but may be life extended beyond vendor support dates if risks can be mitigated.

3.2.2.3 Exposure to change vectors

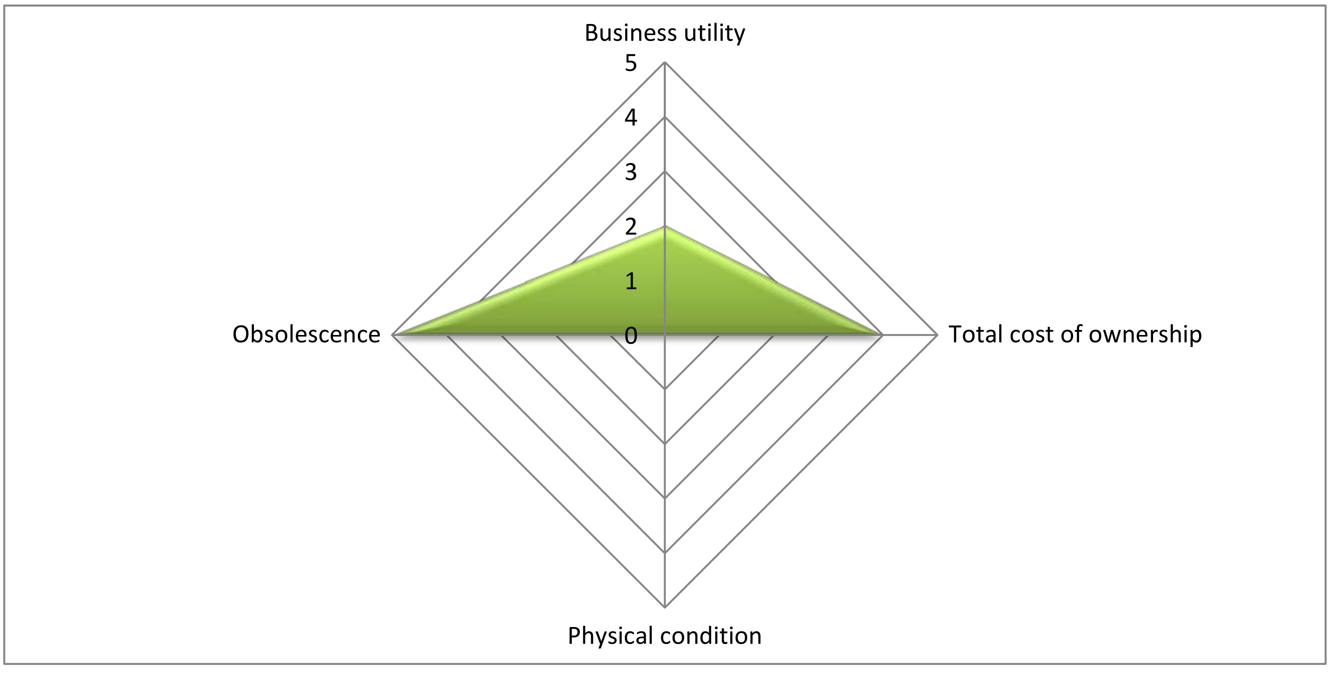

Figure 4 - Likelihood of change vectors for the operating systems / firmware / software platform asset category

Figure 4 – outlines the exposure of the application category to change vectors. Operating systems / firmware / software platforms are most likely to be impacted by obsolescence as software generally has a short product life. Total cost of ownership is also a likely vector as support costs represent a large and ongoing part of the overall asset cost of software. Business utility may also necessitate change as new features may be available in later or alternative products. Operating systems / firmware / software platforms by their nature do not contain any aspects of physical condition.

3.2.2.4 Interrelatedness

Category	Degree of interrelatedness	Category
Operating Systems / Firmware / Software Platforms	← Moderate. Operating systems and especially hypervisors are less coupled to underlying hardware than in the past.	Electronics
	→ High. Firmware is tightly coupled to its underlying hardware.	

3.2.3 Electronics

Electronic assets are primarily composed of semiconductors and some limited moving mechanical parts.

Examples include:

- Intelligent electronic devices;
- Networking and security devices;
- Telecommunications equipment; and
- Computer hardware.

3.2.3.1 Planning and investment

Investment in electronics is driven by technical service providers to support the required capability in compliance with asset management principles and standards.

3.2.3.2 Operation, maintenance and refurbishment

Operations of electronics are the responsibility of technical service providers, though is generally limited to fault detection. Maintenance is limited to the physical aspects of the device (such as fans).

Electronics cannot be refurbished, but may be life extended beyond vendor support dates if risks can be mitigated.

3.2.3.3 Exposure to change vectors

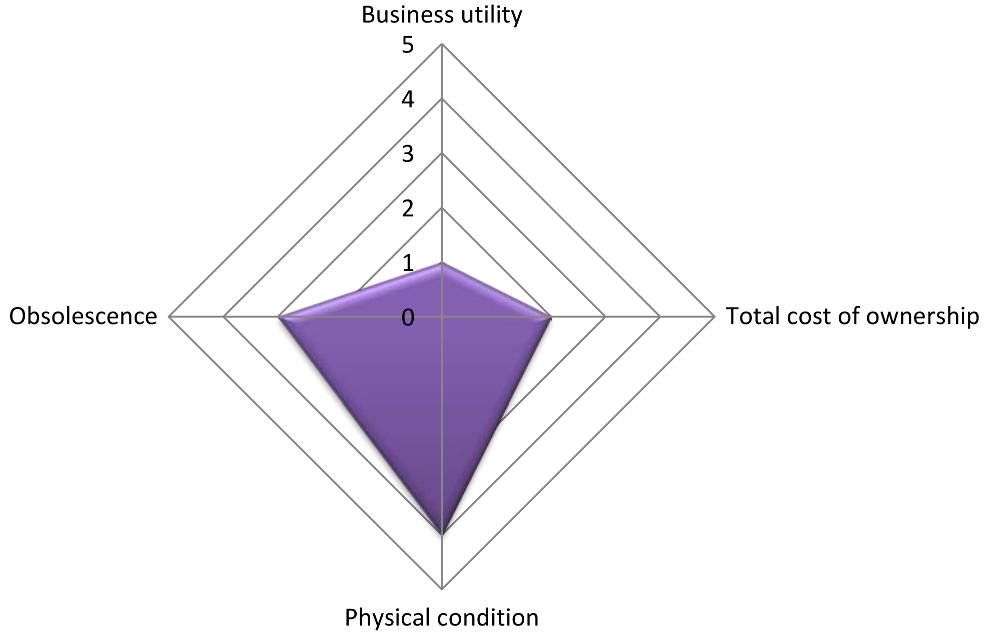

Figure 5 - Likelihood of change vectors for the electronics asset category

Figure 5 – outlines the exposure of the electronics category to change vectors. Electronics are most likely to impacted change in physical condition due to the limited life of semiconductors. Obsolescence is also a key change vector as electronic devices generally have a limited vendor support periods. Changes in total cost of ownership could potentially occur, though this is far more likely in centralised environments like the datacentre rather than in field deployments due to the extreme changeover costs in labour. It is unlikely that business utility will be a change vector, though this is possible.

3.2.3.4 Interrelatedness

Category	Degree of interrelatedness	Category
Electronics	←→ Low. Electronic devices are generally made to form factors based on standardised physical configurations.	Physical

3.2.4 Physical

Physical assets are assets and materials primarily mechanical or passive in nature.

Examples include:

- Telecommunications towers; and
- Buildings, racks, wiring and fibre.

3.2.4.1 Planning and investment

Investment in physical assets is driven by technical service providers to support the required capability in compliance with asset management principles and standards.

3.2.4.2 Operation, maintenance and refurbishment

Operations of physical assets is largely non-existent as the assets are passive and static. Maintenance of physical assets is key to their longevity, with a need to inspect and test them periodically.

Physical assets may be able to be refurbished and can be life extended subject to an appropriate ongoing condition assessment with consideration of the consequences of asset failure.

3.2.4.3 Exposure to change vectors

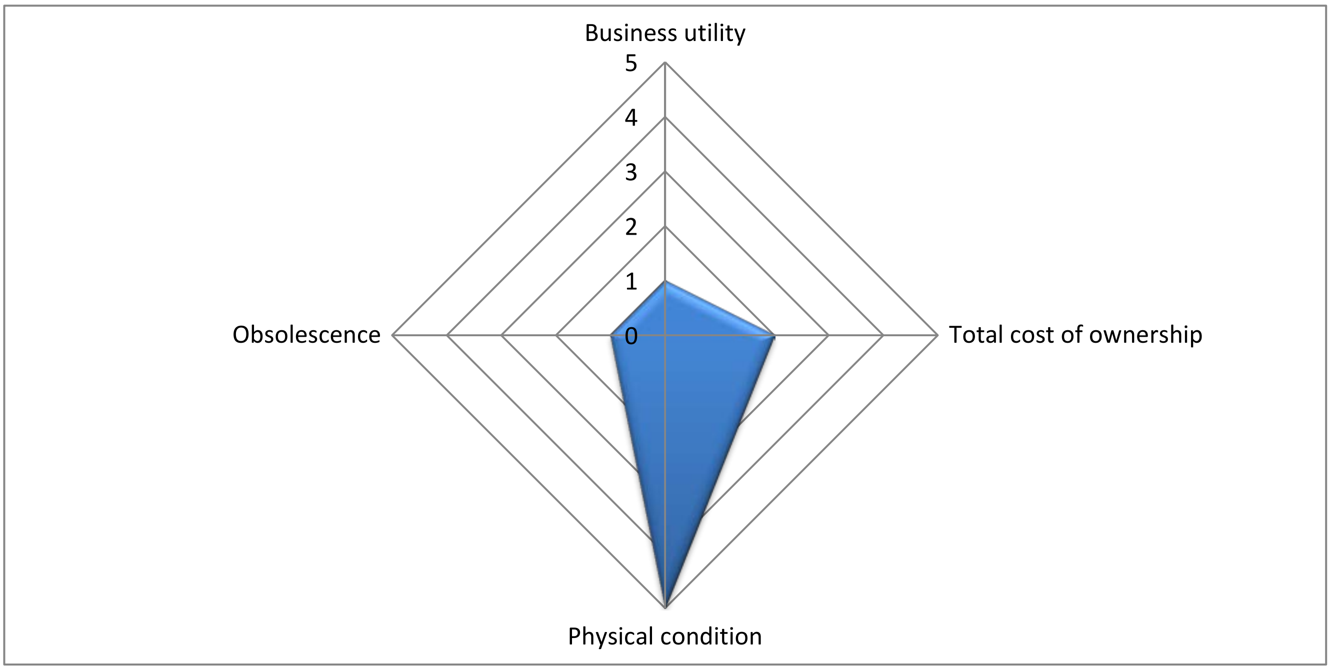

Figure 6 - Likelihood of change vectors for the physical category

Figure 6 – outlines the exposure of the physical category to change vectors. Physical assets are primarily affected by changes in physical condition, though potentially total cost of ownership could also factor if maintenance and inspection activities costs escalate. Business utility and obsolescence are both possible but extremely unlikely change vectors.

4. Distribution list

Internal	Contact details
☒ Investment and Planning	Group Manager Portfolio and Business Management
☒ Infrastructure Delivery & Technical Services	Group Manager Infrastructure Technical Services
☒ Operations and Field Services	Group Manager Technical and Network Services
☒ Operations and Field Services	Group Manager Network Operations Services
☒ Finance and Business Performance	Group Manager IT Strategies and Architecture
☒ Finance and Business Performance	Group Manager Project Assurance and Delivery