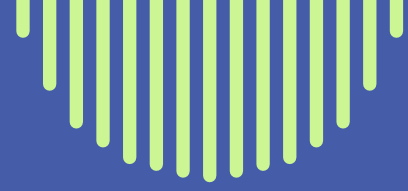# REIMAGINING

INNOVATION IN HEALTH, EDUCATION AND RESEARCH

MASTER PLAN AND LAND USE STRATEGY
ICT STRATEGY
INVESTMENT FRAMEWORK

DECEMBER 2018

LIVERPOOL
INNOVATION
PRECINCT

CONTENTS

1

SUMMARY OF FINDINGS AND ACTIONS

Following analysis of the existing ICT landscape and consultation with Liverpool Innovation Precinct (LIP) partners, this report has established the following findings and proposed a series of actions to implement the ICT strategy:

Key findings in this report:

— ICT governance is a low priority for Precinct partners.

— Most partners prioritise the shared digital objectives of interoperability and user experience well above governance, which limits their ability for integration and collaboration.

— Precinct partners mostly employ a hierarchical centralised ICT governance structure; whereby decision-making powers are held by high-level management in the respective organisational structures.

— Committee approach to decision-making is recommended, whereby powers are shared amongst smaller and more specific group of managers.

— Future work must promote the importance of governance to achieving the other, more favoured objectives of user experience and interoperability.

Key actions in this report's forward plan:

— Sign a standalone memorandum of understanding (MoU) to establish ICT governance as a subset to the Liverpool Innovation Precinct Steering Committee (LIPSC).

— Identify an ICT Governance Group Independent Chair.

— ICT Governance Group to establish and implement governance for three sub-workstreams: an Interoperability Workstream, User Experience Workstream and Governance Workstream.

— To implement a new and successful ICT shared platform, the following actions were identified:

  ¬ develop concept design for the new ICT shared platform

  ¬ develop design and functional specifications for the ICT shared platform

  ¬ develop funding model to support capital expenditure and operational expenditure costs for the ICT shared platform

  ¬ develop a procurement options assessment to determine the procurement process, types of contracts, metrics and resources required to implement an ICT shared platform

  ¬ develop a feasibility and investment report to investigate the cost-effectiveness, feasibility and profitability of the proposed ICT shared platform

  ¬ procure a ICT provider to build and commission shared platform.

Develop a change management/communications plan to implement new shared platform across precinct and partner organisations.

Figure 1 Bottom-up smart city development[1]
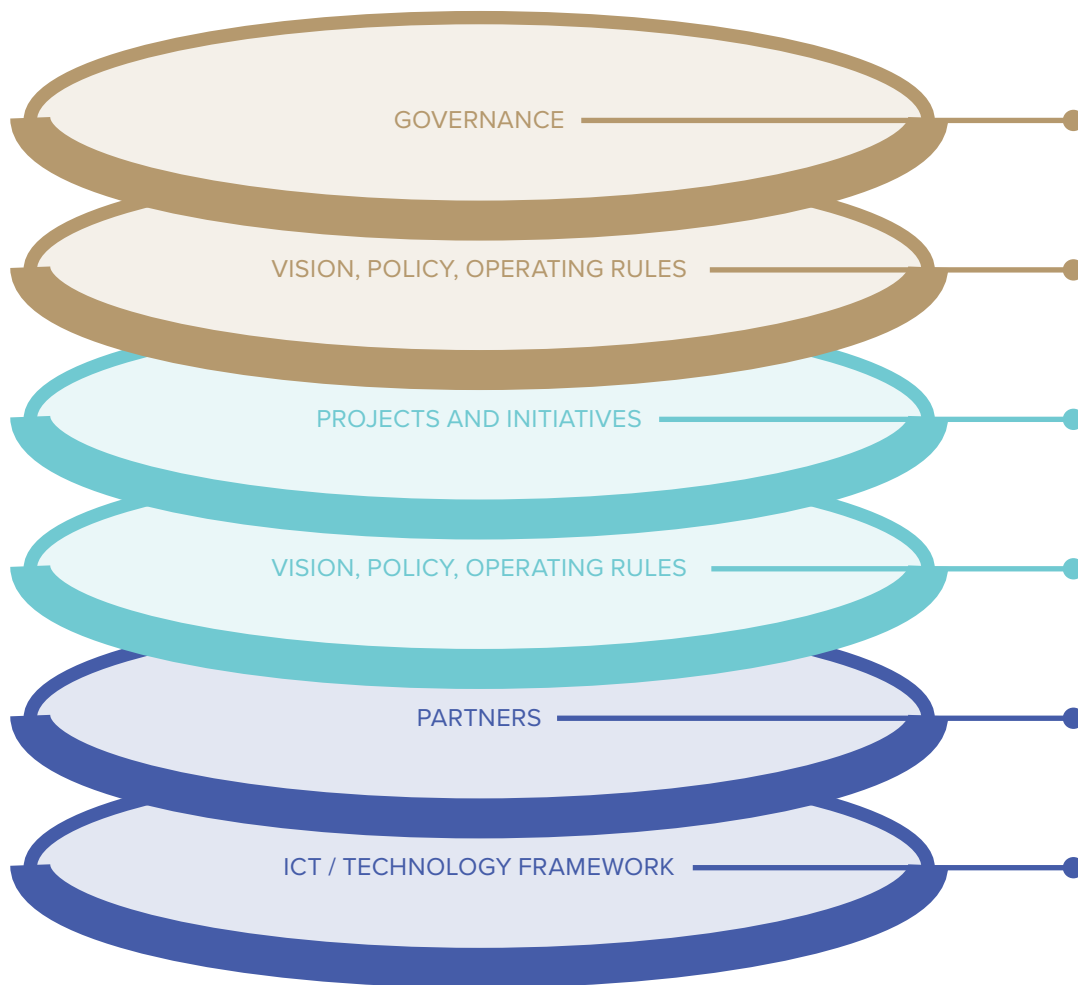
1 Adapted from Dameri, R 'Searching for a Smart City definition: a comprehensive proposal', International Journal of Computers and Technology, 2013, Vol 11(5), pp.25-44
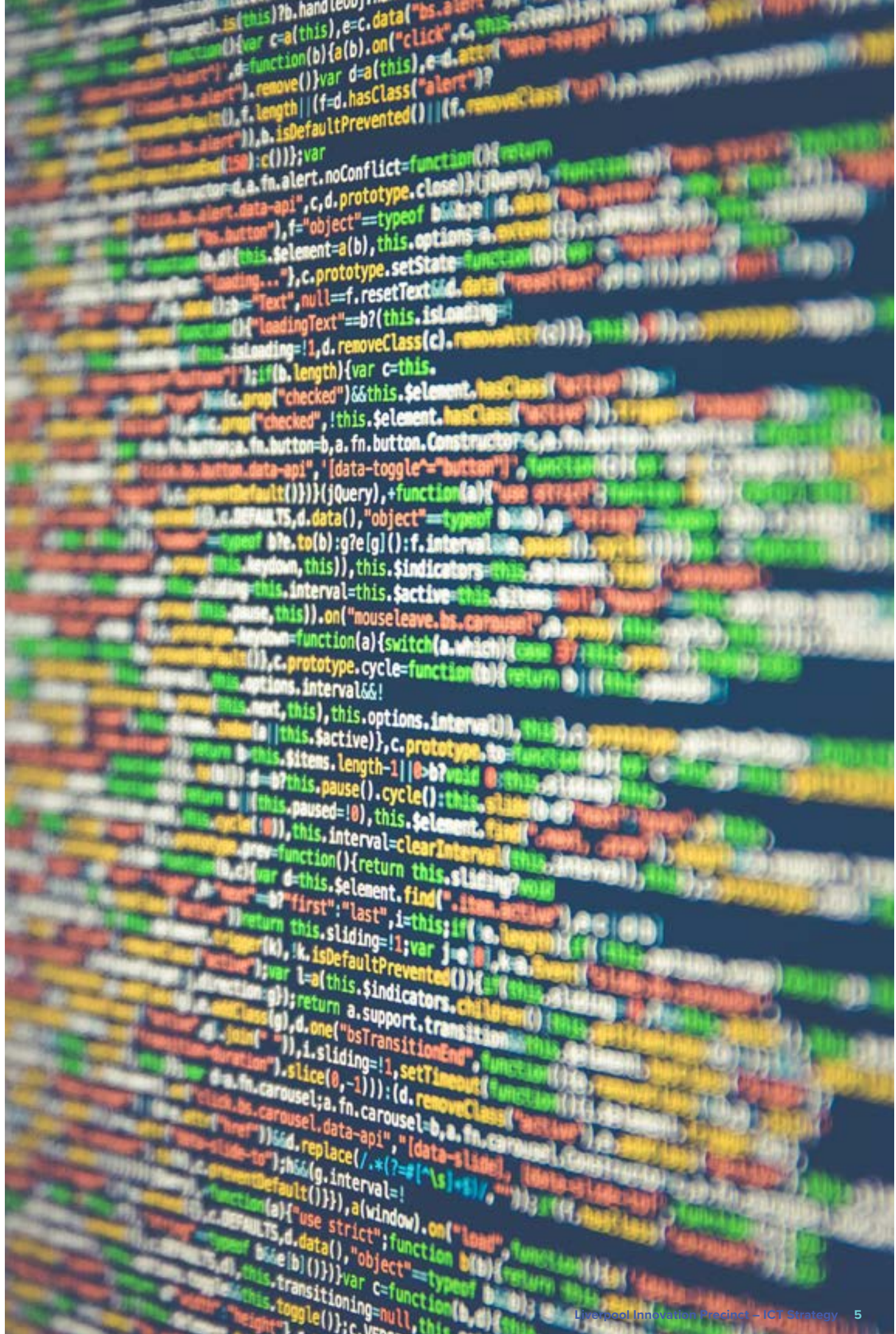
2

INTRODUCTION

2.1 About this strategy

This strategy was developed to identify a shared digital ICT vision and forward plan for the Liverpool Innovation Precinct (LIP). This strategy has been developed to:

— promote ideas of digital connectedness and collaboration

— raise awareness of the potential benefits ICT collaboration will have on the future of the LIP.

The ICT Strategy has the following objectives:

Interoperability (connected access) – ensuring compatibility and accessibility to a shared platform, supporting the participation of all precinct partners and their respective institutions/organisations.

User experience – integrating a simplified and accessible end user experience allowing for the collaboration of health, research, and education participants and professionals, and the wider Liverpool community.

Implementable smart governance – ensuring a robust and implementable governance framework that addresses operational challenges and relationships necessary in order to promote digital connectedness.

This strategy achieves this through establishing a vision (chapter 3) for the ICT strategy, which is based on these digital objectives.

To implement this vision, an analysis framework (chapter 4) is outlined to explain how this report identified the gaps between the current ICT landscape and the vision. This is achieved primarily through consultation with and a survey of precinct partners.

Through this analysis a number of findings (chapter 5) were identified and they have informed the proposed forward plan (chapter 6) that outlines a series of actions and a timeframe in which they need to be completed to further progress the ICT strategy.

2.2 Who was consulted in the development of this strategy

The following key stakeholders and organisations were consulted to construct an understanding of the current state:

— Liverpool City Council

— University of New South Wales

— University of Wollongong

— Western Sydney University

— Jobs for NSW

— Ingham Institute for Applied Medical Research

— Schools Infrastructure/Department of Education

— South West Sydney Local Health District

— South West Sydney Primary Health Network

— TAFE NSW.

2.3 Background

The Liverpool Innovation Precinct Steering Committee (LIPSC) was formed in 2017 with the primary objective of developing a vision for the Liverpool Innovation Precinct (LIP). The vision outlines that the LIP will not simply be represented by the locations of health and education institutions in Liverpool; it more reflects a rethinking of the way that we educate, provide health services, and research in an age of digital disruption, and emerging technologies and industries.

In June 2018, the LIPSC approved the development of a Liverpool Innovation Precinct Plan encompassing the:

— **Master Plan and Land Use Strategy** driving public and private investment decisions into Liverpool through the identification of land ownership, site parameters, development opportunities and constraints to the use of key sites within the precinct.

— **Investment Framework** identifying the existing and emerging strengths and assets attractive to future investor, capturing the potential productivity uplift for Liverpool

— **ICT Strategy** acting as an enabler to future partnership and collaborative innovation, with the focus of propelling Liverpool into a digitally-connected future.

The development of these documents was guided by sub-working groups with membership nominated by the LIPSC.

2.4 Purpose of this strategy

This strategy will guide the LIPSC to ensure that the LIP develops ICT systems and services that foster collaboration and digital connectedness between all precinct partners.

This strategy is not intended to solve the complex ICT problems experienced on a daily basis. Rather, it has been designed to raise awareness of the potential benefits ICT collaboration will have on the future of the LIP.

In order to realise these benefits, this document has been structured to provide an:

— overview of the key factors of success that frame an ICT service model

— outline the LIP's shared objectives of interoperability, an improved user experience, and sound governance

— examination of the existing ICT governance arrangements put into practice by all precinct partners, which will provide a structure for implementing an ICT collaborative solution.

The adopted methodology has attended to prioritised digital objectives and the variable components that define ICT governance itself: (1) the actors (2) the decision-makers (3) those that implement these decisions, and (4) the prioritisation of decisions being made.

As we learn more of the current dynamics of ICT governance utilised by each precinct partner, we develop a more accurate understanding of a future collaborative ICT solution. The solution will reflect the current effective ICT governance arrangements, and likewise processes of dysfunctionality. An effective framework that encourages collaboration between precinct partners involves a high-level transformative integration between both internal and external organisations.

Smart governance similarly sees the widespread adoption of a more community-based model of governance with greater connectivity being facilitated by more technologies.[2] Understanding that connectivity and a successful ICT collaboration framework will rely on socially and electronically networked communities, Liverpool must strengthen its existing alliances and partnerships to design innovative ways to extract new economic and social value from electronic networks and the public Internet.[3] To this end, a successful partnership model would activate new forms of human collaboration through the use of ICT to obtain better outcomes and open governance processes.[4]

To support and deliver this vision we must first discuss the influence of technologies within innovation precincts, and consider the key components that make up a successful ICT model.

2   Tapscott, D. & Agnew, D. 1999, 'Governance in the digital economy: The importance of human development', Finance & Development, Vol. 36, Issue. 4, pp.34–37

3   Sylvie, A. 2009, Networked Communities: Strategies for Digital Collaboration, IGI Global, London, p. 10

4   Meijer, A. & Rodríguez, M. P. 2016, 'Governing the smart city: a review of the literature on smart urban governance', International Review of Administrative Sciences, Vol. 82, Issue. 2, p. 400.

3

VISION

An integrated network across the Liverpool Innovation Precinct where collaboration and innovation are enabled by digital technologies.

3.1 Objectives

The Liverpool Innovation Precinct aspires to be a hub for collaboration, an innovation precinct. It intends to showcase a new generation of technology-powered industries and sectors that rely on proximity to markets as well as a talent pool that prefers urban locations and lifestyles.[5] Although technology does enable knowledge-based collaboration from remote locations, digital innovation within the precinct will promote industry diversification and a sense of instant community.

The desire to build a local and innovative ecosystem offering access to skilled workers and knowledge-sharing opportunities[6] would see Liverpool's businesses, workers, entrepreneurs, researchers, students, and investors gain advantages from the proximity and interaction precincts make possible.[7]

The ICT Strategy has the following objectives:

Interoperability (connected access) – ensuring compatibility and accessibility to a shared platform, supporting the participation of all precinct partners and their respective institutions/organisations.

User experience – integrating a simplified and accessible end user experience allowing for the collaboration of health, research, and education participants and professionals, and the wider Liverpool community.

Implementable smart governance – ensuring a robust and implementable governance framework that addresses operational challenges and relationships necessary in order to promote digital connectedness.

A more detailed description of these three objectives is provided below.

Figure 2 LIP shared digital objectives

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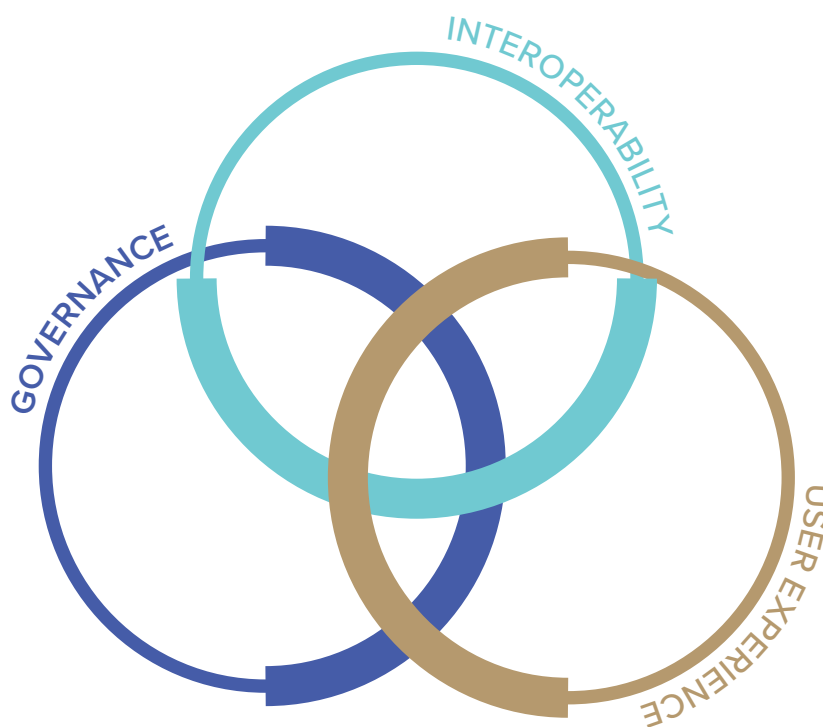
5   NSW Innovation and Productivity Council. 2018, NSW Innovation Precincts: Lessons from international experience: https://www.industry.nsw.gov.au/__data/assets/pdf_file/0011/172892/NSW-Innovation-Precincts.pdf

6   *Ibid.*

7   *Ibid.*

3.2 Interoperability

Interoperability refers to the ability that information systems demonstrate working together within and across organisational boundaries to advance common goals and shared strategic priorities. With interoperability comes improved processes of collaboration, promoting an accessible system to all health, research and education participants. There are three levels of information technology interoperability:

Figure 3 Levels of interoperability

SEMANTIC

STRUCTURAL
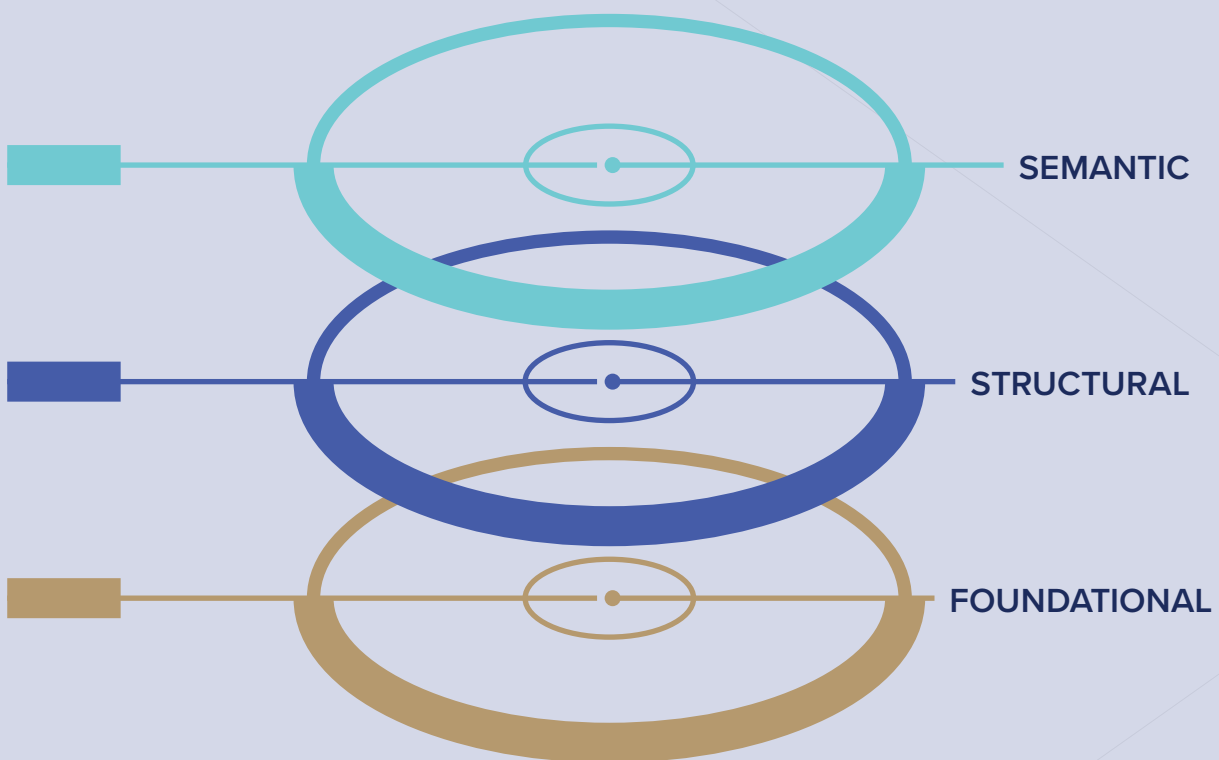
FOUNDATIONAL

Foundational interoperability – allowing data exchange from one information technology system to be received by another, without requiring the ability for the receiving information technology system to interpret that data.

Structural interoperability – an intermediate level that defines the structure or format of data exchange where there is uniform movement of data from one system to another such that the operational purpose and meaning of the data is preserved and unaltered.

Semantic interoperability – providing interoperability at the highest level, which is the ability of two or more systems or elements to exchange information and to use the information that has been exchanged.

The introduction and continuing development of the Internet and Email services are two prime examples in society today of interoperable ICT systems that demonstrate high levels of innovation. It is acknowledged that both platforms were highly successful as they were not limited by any restriction on protocols or number of participants.

The opportunity to integrate interoperable systems within the precinct does present both opportunities and challenges as outlined below.

Opportunities for interoperable ICT

Digital ID – an interoperable ID infrastructure is expected to enable new types of Web services-based systems that require seamless authentication.

Horizontal innovation – generally, this does not occur within an organisation but instead by users of a common product or application. Innovation can be created by the users themselves, voluntarily revealing their innovations and leading to the development of low-cost innovations, outside of the direction and support of their member organisation.

Incremental improvement on existing systems – by leveraging users' knowledge, resources and competencies on existing systems and applications, interoperability can assist in promoting the cross-pollination and sharing of ideas that lead to improvements and use of products and services.

Competition – Interoperability reduces lock-in effects and lowers entry barriers to participate.

Autonomy, flexibility and choice – interoperability leads to enhanced user choice and autonomy, as it allows systems, applications and components to be tested, mixed and matched for alternative functions.

Challenges for interoperable ICT

Security – an interoperable system allows open access to data, which when coupled with increased membership, could increase users access to data or ability to inject bad data into the shared platform.

Privacy – the increased level of interoperability may reduce individual privacy due to the increased availability of personal information and reliance on the formation of a robust technical platform and developed user controls.

Homogeneity – a single platform may decrease the level of innovation due to constraints on what is possible on or within the shared platform.

Reliability – as systems grow in complexity through integration, this may lead to an error in one system impacting other users of the shared platform.

Accountability – Interoperability can lead to an increase in the level of complexity in precinct partner relationships. The questions of responsibility and liability for the ongoing operation, maintenance and financing of the shared platform requires increased scrutiny during the development phase.

Accessibility – Increased interoperability may lead to users withdrawing from online environments due to increasing complexity in the systems, loss of security and data ownership, reliability of the new platform and perceived accountability for systems.

Increased levels of interoperability are likely to reduce barriers for digital access. As such, interoperability is a crucial building block for an accessible and open ICT ecosystem.

The question remains whether there is sufficient market incentive to entice the private sector to develop a solution that fulfils the digital objectives of each health, research and education partner. If not, the LIP partners will need to provide their own investment in the research and development of an interoperable system, which provide equitable access and usability.

The other key issue still to be addressed will be the role of law in the formation of a shared platform, as the creation of a digital ID system may lead to liability exposure for Precinct partners. Furthermore, the ongoing protection against copyright infringement and protection of intellectual property rights will also need to be thoroughly examined prior to the establishment of a shared platform arrangement. These issues and more will need to be worked through within each organisation, and collectively, if the goal of a shared solution is to be realised.

3.3 User Experience

This strategy's discussion of the user experience explores the core principles that are key to integrating a simplified and accessible end user digital service that allows for the collaboration of health, research, and education participants and professionals, and the wider Liverpool community. It neither intend to identify a solution nor design a concept platform for a future digital infrastructure or multi-tenanted application for the LIP.

The user experience is determined by a person's interaction and consequential response to the use of a product, system or service. As technological products are fast becoming more service-centred, the overall acceptance of a product is shifting more from the initial purchase to establishing a sustained and prolonged use.[8] A positive response is therefore driven by the quality of service provided within the product. We must conceptualise how a high-quality ICT service is received throughout the Liverpool Innovation Precinct.

When individuals use new technology, a process of appropriation sees the user making the technology one's own (Du Gay, Hall, Janes, Mackay & Negus, 1997).[9] However, in order to commit to this process of technological appropriation, the technology itself must be usable, perceivable, operable and ensure user safety and privacy.

An ICT service must have a usable interface, specific to its many users and tailored to meet the specific goals and requirements of each user. It must be accurate and complete to efficiently and effectively meet these requirements so as to be continually in use and of use. With a wide variety of expected end users, generating and maintaining a wholly positive attitude towards a single interface will prove to be a challenge. To mitigate this challenge, we must align with several priorities:

Perceivability – information and user interface components must be presentable to users in ways they can perceive.

Operability – user interface components and navigation must be operable.

Safety and privacy – the safety and privacy of users and minors must be monitored and integrated into the service provided, whilst similarly health, education, research and personal data and information must be protected from third party intruders.

If we are to completely address the above priorities of usability, perceivability, operability, and ensure that each user is safe and data private, we will enable the aforementioned process of technological appropriation.

Within this, process users will adjust to improve the usefulness of the technology, and similarly adapt the use of the technology to integrate it meaningfully in their activities and knowledge sharing exercises. When both processes are fully engaged, the LIP precinct partners will begin to operate collaboratively within a sustainable 'digital' culture and network.[10]

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8   Karapanos, E. 2013, Modelling Users' Experiences with Interact, Springer, Berlin, p. 58.

9   Sylvie, A. 2009, Networked Communities: Strategies for Digital Collaboration, IGI Global, London, p. 14

10   Sylvie, A. 2009, Networked Communities: Strategies for Digital Collaboration, IGI Global, London, p. 14

3.4 Implementable Smart Governance

Governance focuses on the long-term continued success[11] of a shared vision. For there to be a balance between an effective governance model and strategic priorities we heavily rely upon the willingness of each precinct partner to integrate and perceive a shared governance as adding value to the innovation precinct as a whole. An ideal approach would see governance at an executive level, and service delivery at an operational level working cooperatively and in harmony to achieve the same overall goal.[12] If the objective is to ensure that the governance framework is both implementable and robust, it must address the operational challenges and relationships necessary in order to promote digital connectedness. Absence of focus on either of these aspects will significantly undermine the decision-making framework, and the ICT strategy itself. At the same time, governance arrangements need to be sufficiently flexible so that a 'bridge' is established between business-as-usual operation and long-term policy/strategy decisions.[13]

The governance framework must be modular in that its operation should not be contingent on the participation of a single institution, but rather should allow for participants (and institutions) to change over time. This will enable the decision-making mechanism to grow and alter as the precinct itself develops in subsequent years. It must also be resilient in the sense that the structure and function of the governance arrangements must be able to withstand 'disturbances' to its environment,[14] as is likely to happen in a complex environment such as a developing innovation precinct.

In short, the partnership arrangements and governance framework must create an infrastructure environment which encourages knowledge exchange and learning between all members – hospital, academic and industry – in concrete ways.[15] By developing smart governance, the LIP can move beyond the benefits of mere colocation to actually enabling the monitoring, understanding and analysis of the challenges within the Precinct – and develop solutions that improve efficiency, equity and quality of outcomes.[16]

In its current stage of evolution, the LIP is a precinct being built on the concept of smart collaboration and relationships. Accordingly, the governance model will require consideration of not only smart decision making, but smart administration and collaboration. The ICT Strategy must underpin this and its governance should reflect the early stage of development, while being flexible enough to develop as the Precinct grows.

In our attempt to identify a suitable approach to ICT governance, it is first important to understand the current ICT governance arrangements within the LIP. This has been a significant challenge for the Working Group as many partners have been unable to share aspects of their current frameworks for a variety of reasons. Nonetheless, the role of governance in an ICT strategy is key to driving appropriate approaches to decision making, namely decision – strategy – goals – action – evaluation and accountability.[17]

For the purposes of the LIP ICT Strategy, it is suggested that the governance should be developed along themes, and be informed by accountability and performance metrics.[18] This will allow the identification of natural theme leaders who then take responsibility for driving particular deliverables within the ICT Strategy implementation.

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11   Wood, H. 2017, 'The benefits of good governance', Parity, Vol. 30, No. 9, pp. 19-20

12   *Ibid.*

13   De Vries, P. 'The resilience principles: a framework for new ICT Governance', J. on Telecomm. & High Tech.L Vol 9, p. 138

14   *Ibid*, p. 160

15   Meijer, A., Bolivar, M. 'Governing the smart city: a review of the literature on smart urban governance', International Review of Administrative Sciences, 2016, Vol 82(2), pp. 392-408

16   *Ibid.*

17   Dameri, R 'Searching for a Smart City definition: a comprehensive proposal', International Journal of Computers and Technology, 2013, Vol 11(5), pp, 25-47
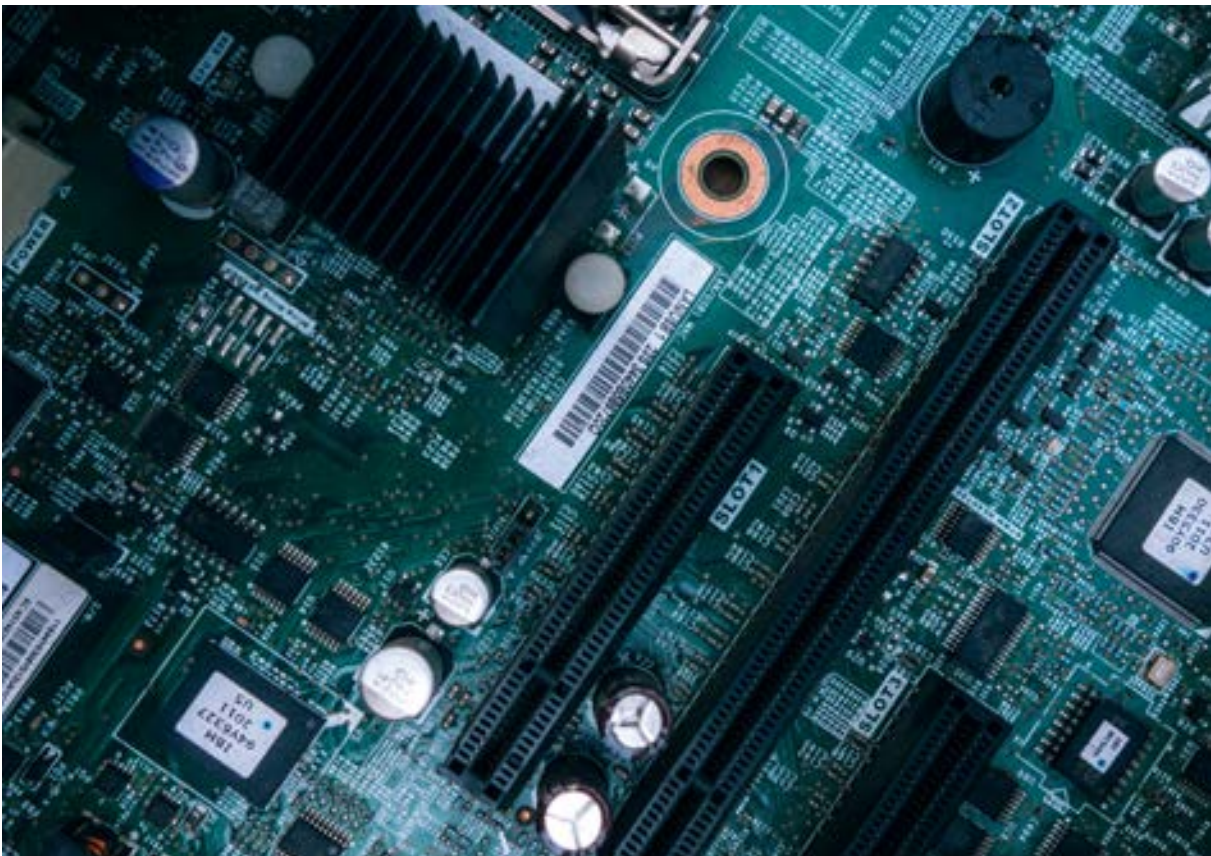
18   Jennings, G, Walsh, M 'Integrated health research centres for Australia' MJA 2013, Vol 199(5), pp. 320-321

In essence, an ICT Governance Group (IGG) should be established with appropriate senior representation to enable confident decision making, including an independent chair. Membership should be drawn in the first instance from those institutions with an existing commitment (financial and physical) to the LIP, with potential for expansion of the membership as committed partners emerge. Within the IGG, there should be identified leaders for the themes of user experience and interoperability; with the governance theme being led by the chair. This aligns with the key elements of a successful integrated ICT strategy and will enable the development of specific, measurable deliverables.

A governance sketch which describes the membership and responsibilities of key participants is below at Figure 4.

Figure 4   Governance Structure

ICT GOVERNMENT GROUP
INDEPENDENT CHAIR

IGG INTEROPERABILITY WORKSTREAM
INDEPENDENT
SME THEME LEAD

IGG USER EXPERIENCE WORKSTREAM
USER EXPERIENCE
SME THEME LEAD

IGG GOVERNANCE WORKSTREAM
IGG CHAIR TO LEAD

In this structure, the IGG provides strategic direction and leadership to the ICT Strategy project and is the definitive decision-making body within the governance structure. The IGG may elect, in some circumstances, to refer matters to the LIP Steering Committee for resolution where necessary.

The IGG will endorse key decisions made by each of the workstreams, and where issues are escalated, will form a decision to be communicated back down through the governance structure to the relevant workstream(s).

The IGG will consult with LIP partners and will provide direction to the ICT Project team on issues that arise from that group.

It is the responsibility of the IGG to:

— provide strategic direction and guidance to the ICT project to ensure achievement of actions required by the LIP Steering Committee on the Project

— identify and manage where necessary whole of precinct issues

— consider recommendations from the LIP partners and provide direction to the ICT project on these matters

— address key issues referred to the IGG by the workstreams

— ensure the interests of project stakeholders are identified and addressed

— ensures compliance with applicable government and partner institution policy frameworks

— monitor project risks and taking appropriate risk mitigation action as required.

The IGG will be convened on a monthly basis, or more regularly as required.

4

ANALYSIS
FRAMEWORK

4.1 Overview

This strategy aims to identify an ICT collaboration framework that promotes and enables ideas of digital connectedness and collaboration between all LIP precinct partners. A survey questionnaire was distributed to all partners within the LIP ICT membership to determine existing points of alignment and misalignment between each of the ICT decision-making arrangements, the implementation of those ICT decisions, the priorities that limit or enable those decision-making processes.

This semi-structured interview process formed the basis for a multiple case study and cross-case study analysis. The multiple case study approach not only reinforces a generalisation of results but also informs the types of recommendations necessary for implementation affecting the many industries involved. Tangentially, the cross-case study analysis delineated the apparent weak points, strengths, and priorities.

The methodological approach was designed to develop two insights:

A current state – an awareness of what present-day ICT governance arrangements are independently within the Liverpool Innovation Precinct

A future vision – an awareness of what a shared future for the Liverpool Innovation Precinct's ICT governance and priorities might look like.

This first insight improves an overall exposure to, and understanding of, immediate issues and ICT practices currently beneficial or disadvantageous within the current LIP ICT space. The second organises each partners' digital objectives (of access, user experience, and governance), decision-making areas, and individual governance arrangements to be recommended within a future ICT framework.

4.2 Innovation Precincts and Information Communication Technologies (ICT)

To inform the task at hand, it is important to address the multiple discourses surrounding Innovation Precincts and Information Communication Technologies within an Australian context. In doing so, we may better illuminate the benchmark qualities and expectations attributed to the digital future of the Liverpool Innovation Precinct and the significant role ICT has to play in it.

NSW Innovation Precincts: Lessons from international experience (2018), a report published by the NSW Government Innovation and Productivity Council, describes 'innovation' and 'precinct' to be widely used terminology within an Australian policy, planning and placemaking context.[19] A variety of terms used to articulate the same concept are dependent upon institutional discourse; where for example Jobs for NSW refers to 'innovation clusters', the Greater Sydney Commission refers to 'Health and Education Precincts' and 'Collaboration Areas'.[20]

According to the Melbourne Innovation District[21] there are five components that define an innovation precinct:

Public realm – re-imagining the ways that public spaces are used. Prioritising openness and shared public access and engagement for spaces, buildings, infrastructure and institutions.

Enterprise activation – leveraging existing strengths and assets to build an environment that creates new opportunities for enterprise activation, experimentation and scaling.

Social innovation – developing, collaborating, researching and prototyping in new ways and in new combinations to meet social needs.

Institutional design – designing and redesigning the way our systems and institutions work; building more effective systems for policy, governance and infrastructure.

Digitally-enabled technology – collaboration platforms and digital access to a community of innovators, producers and citizens.

In practice, not every location will grow to become an innovation precinct and, in the same way, not every precinct will achieve economic success. Innovation does not always occur within a precinct, it requires a comprehensive governance arrangement and a well-connected digital environment, along with a sustained commitment from anchor institutions.

A smart ICT solution and operable ICT service will therefore be vital to the success and sustainability of the Liverpool Innovation Precinct. While informing people's selection of where to study and live, technological innovations are endogenic to economic growth[22] and will ultimately encourage civic and academic participation alike.

19 NSW Innovation and Productivity Council. 2018, NSW Innovation Precincts: Lessons from international experience: https://www.industry.nsw.gov.au/__data/assets/pdf_file/0011/172892/NSW-Innovation-Precincts.pdf

20 *Ibid.*

21 Melbourne Innovation District 2018, Innovation knows no boundaries, viewed 2 November 2018, <https://mid.org.au/>

22 Pancholi, S. & Yigitcanlar, T., & Guaralda, M. 2014, 'Urban knowledge and innovation spaces: concepts, conditions and contexts', Asia Pacific Journal of Innovation and Entrepreneurship, Vol. 8 Issue. 1.

4.3 Hierarchical centralisation and hierarchical decentralisation

The assessment of current ICT decision-making and implementational processes allowed for a greater understanding of the types of ICT governance employed within the precinct today. If more ICT decisions were found to be effectively made and implemented involving professionals from within an organisation's ICT departments, then it could be deduced that a more internal and decentralised ICT governance was preferred overall. In contrast, if assessed that these processes were effectively carried by actors from other divisional areas within each organisation (e.g. higher-level managers), then a separate deduction could be made suggesting a more centralised and external governance mechanism as being preferential. It is crucial to also understand the types of ICT governance that are successful or effective, as a future ICT framework must be interoperable and accessible to all its users and tenants.

Figure 5 The governance spectrum: decision-making mechanisms and the relationship between hierarchical centralisation and decentralisation[23]
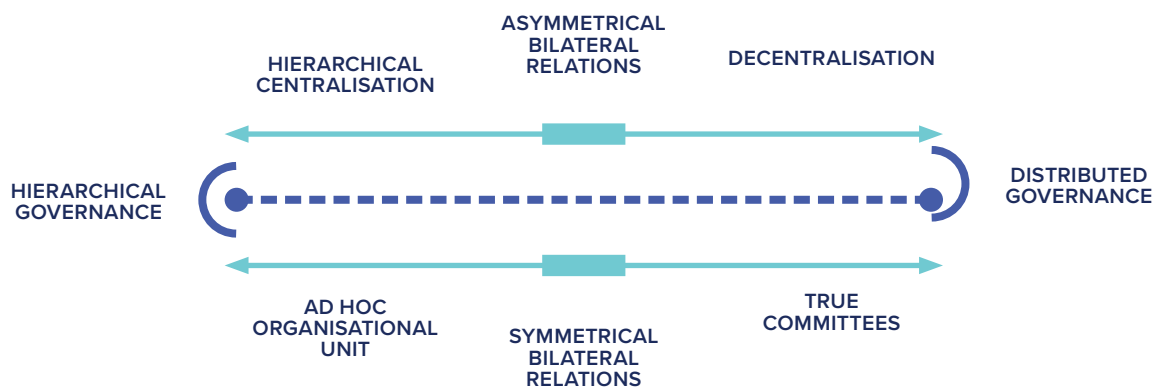
Understanding the differences between the two governance types is essential as it dictates the mechanisms utilised to make and implement decisions. Distinguishing between the two can be more simply articulated as:

Hierarchical centralisation – references decision-making power in the hands of the highest-level management in the organisational structure, or

Hierarchical decentralisation – attributes power to one or more lower-level employees within the organisation/ICT department.

The figure below illustrates the two types of hierarchical governance in discussion: centralised and decentralised (above the dotted line).

It similarly attends to the decision-making mechanisms inherent within these types of governance (below the dotted line). It is important to understand the types of decision-making mechanisms and how they operate as they will become useful when we address governance decision-making areas (e.g. ICT strategy).

Ad hoc organisational units – the decision-making power that is related to a specific area (e.g. ICT strategy) that is delegated a specific unit within the organisation.[24]

Bilateral relations – involving managers with equal decision-making power (symmetrical) or unequal decision-making powers (asymmetrical bilateral relations).[25]

True committees – whereby decision-making powers are shared amongst a group of managers.[26]

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23 Balocco, R., Ciappini, A. & Rangone, A. 2013, ICT Governance: A Reference Framework, Information Systems Management, Vol. 30, pp. 150-167
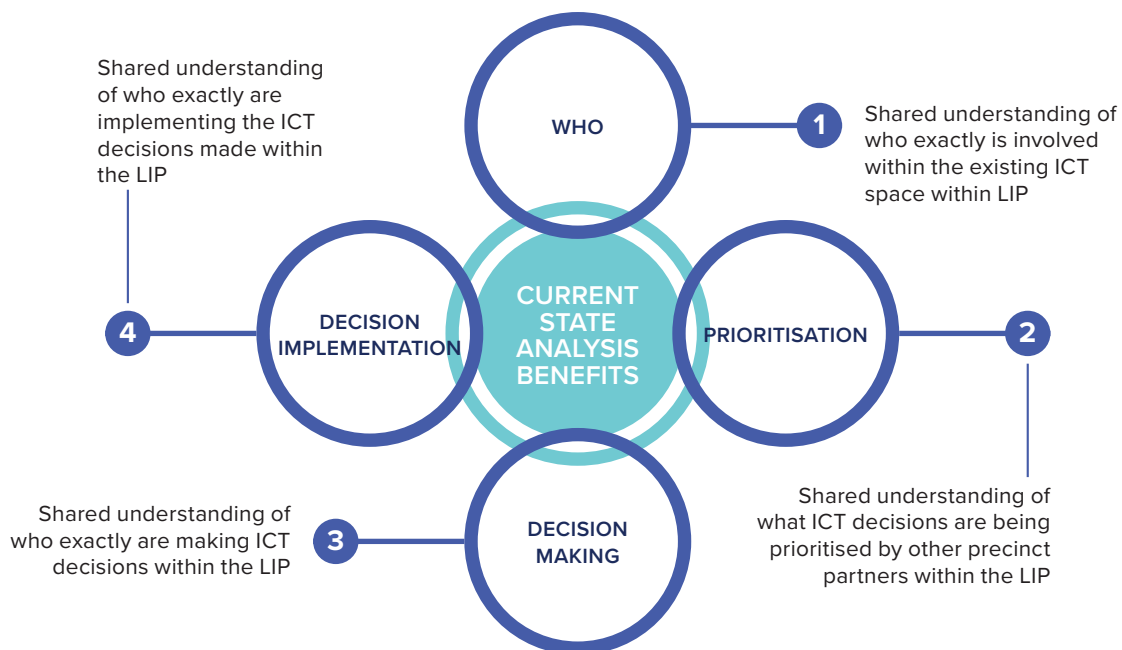
24 *Ibid.*

25 *Ibid.*
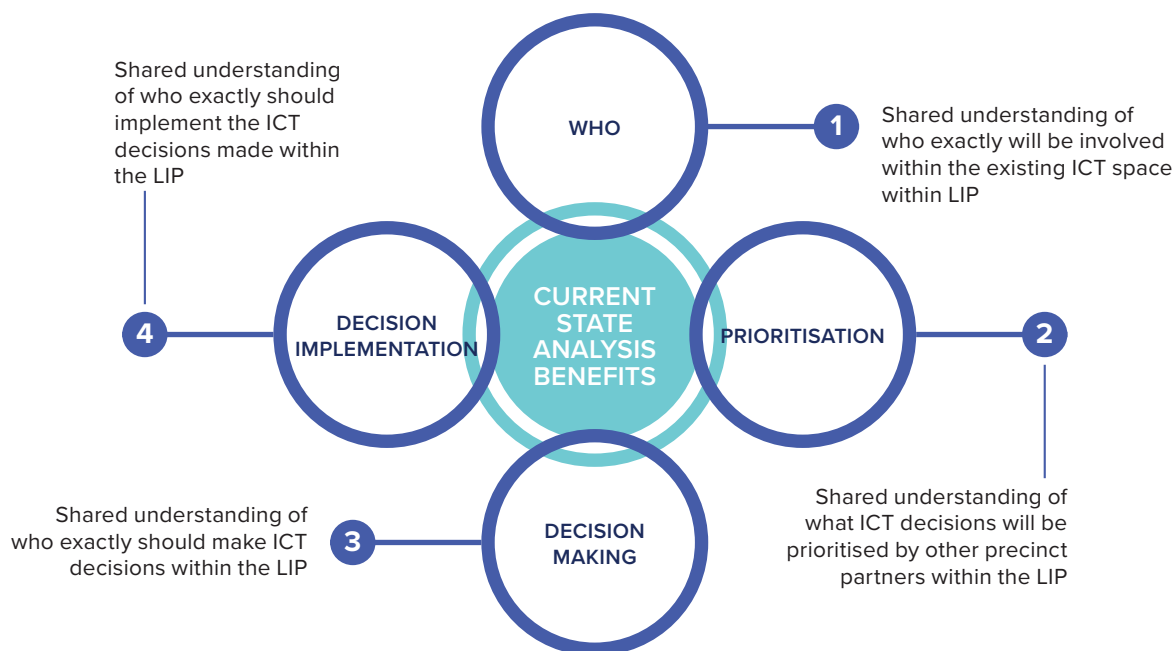
26 *Ibid.*

5

FINDINGS

Insights into the existing service experiences and future vision for the LIP ICT space provides precinct partners with an awareness of:

— what present-day ICT governance arrangements are independently

— what a shared future for the LIP's ICT governance and priorities might look like.

Figure 6   Benefits of a current state analysis

Shared understanding of who exactly are implementing the ICT decisions made within the LIP

Shared understanding of who exactly is involved within the existing ICT space within LIP

Shared understanding of who exactly are making ICT decisions within the LIP

Shared understanding of what ICT decisions are being prioritised by other precinct partners within the LIP

WHO — 1

DECISION IMPLEMENTATION — 4

CURRENT STATE ANALYSIS BENEFITS

PRIORITISATION — 2

DECISION MAKING — 3

Figure 7   Benefits of a future state analysis

Shared understanding of who exactly should implement the ICT decisions made within the LIP

Shared understanding of who exactly will be involved within the existing ICT space within LIP

Shared understanding of who exactly should make ICT decisions within the LIP

Shared understanding of what ICT decisions will be prioritised by other precinct partners within the LIP

WHO — 1

DECISION IMPLEMENTATION — 4

CURRENT STATE ANALYSIS BENEFITS

PRIORITISATION — 2

DECISION MAKING — 3

There is some evidence to suggest that within the current LIP ICT governance landscape, some precinct partners are employing a hierarchical decentralised ICT governance framework, whereby ICT management, ICT departmental staff and the internal users of technology hold power within decision-making processes (refer to Appendix A, Figure 1). Despite this, there is a clear representation that more partners are adopting a hierarchical centralised ICT governance, whereby decision-making control remains in the hands of the highest-level management (e.g. CIO, the Board, Operations and Corporate).

Almost all partners consider their individual ICT decision-making arrangements to be effective and successful (refer to Appendix A, Figure 2). In light of this response, it may be recommended that a hierarchical centralised collaborative framework be employed when considering a future ICT decision-making process. However, conditionally, decisions that lack complexity and strategic risk will require a more decentralised process. Evidence suggests that the implementation of ICT-decisions is complementary to the type of governance arrangements most precinct partners utilise. As ICT-decisions are made effectively by actors from other divisional areas within each organisation (e.g. higher-level managers), ICT decisions are implemented dissimilarly, by one or more lower-level employees within the organisation/ICT department (refer to Appendix A, Figure 3).

This data supports hierarchical decentralised approach to implementation as being effective and successful (refer to Appendix A, Figure 4). In some cases, respondents alluded to decisions being implemented by higher-level management, such as corporate services. However, this has been considered separately due to the nature of organisation itself (e.g. universities, schools).

Figure 8 Hybrid centralised and decentralised governance arrangement

HIERACHICAL CENTRALISED APPROACH

DECISIONS MADE

HIERACHICAL DECENTRALISED APPROACH

DECISIONS IMPLEMENTED
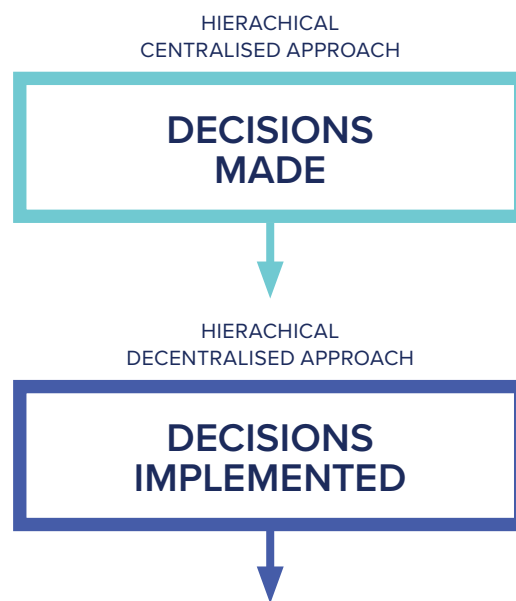
Q What are the most important ICT decisions within your organisation?

ICT decision areas
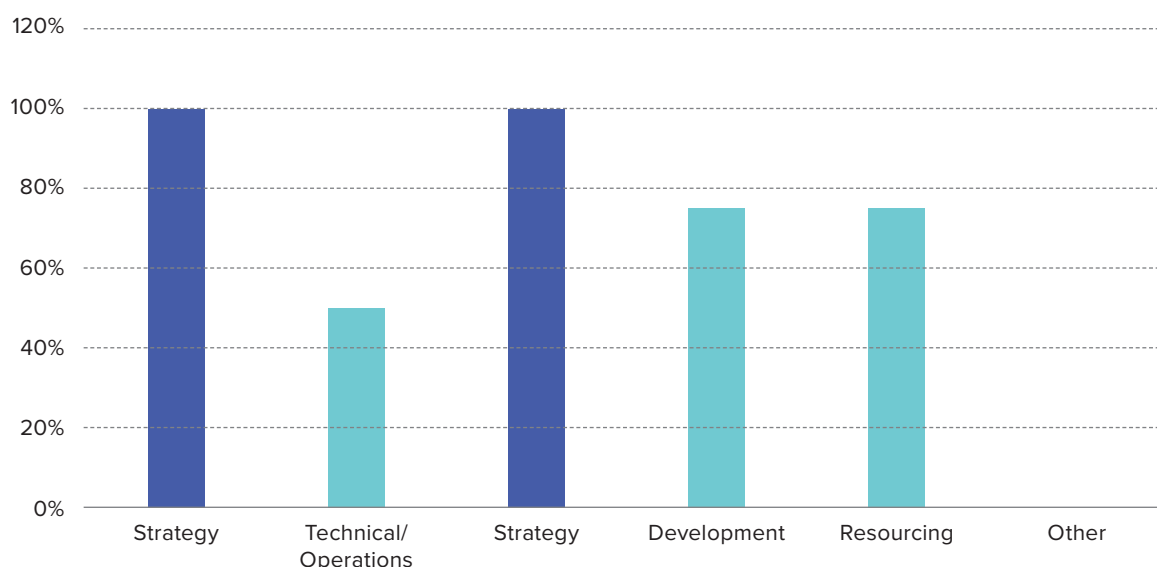
Scaling	Description
Tier 1	All respondents understood ICT strategy and ICT operations (technical) to be the most frequently considered areas within their respective organisations.
Tier 2	75% of respondents understood resourcing ICT and the development of ICT systems and processes to be the most frequently considered areas within their respective organisations.
Tier 3	Half of the respondents understood their ICT budget to be the most frequently considered area within their respective organisations.

According to the above tiered scaling system, we may pair several decision-making mechanisms to each decision-making focus area.

As strategy and operational decisions appear to be the most significant, categorised within the first tier, it is recommended that these types of decisions will be made by ad hoc organisational units. By doing so, decision-making power will be held by a specific area within the organisation or delegated to a specific unit within the organisation.

As decisions regarding ICT resourcing and development were responded to with almost as much significance, a symmetrical bilateral relations mechanism is recommended. This type of decision-making mechanism will involve divisional managers with equal decision-making powers to provide

oversight and action decisions ready for lower-level implementation. A second tiered scaling considers these decision areas to be of slight complexity by lower risk.

Budgeting for ICT systems and services was responded to as the least prioritised decision-making area within the Precinct today. In light of this, a true committee approach is recommended, whereby decision-making powers are shared amongst a smaller and more specific group of managers. In instances where budgetary decisions are considered to impact ICT strategy and resourcing, processes of escalation and a more centralised governance reaction will need to be employed.

Q Please rank the following priorities according to your current ICT model.

**Figure 10**   Current state model ICT prioritisation
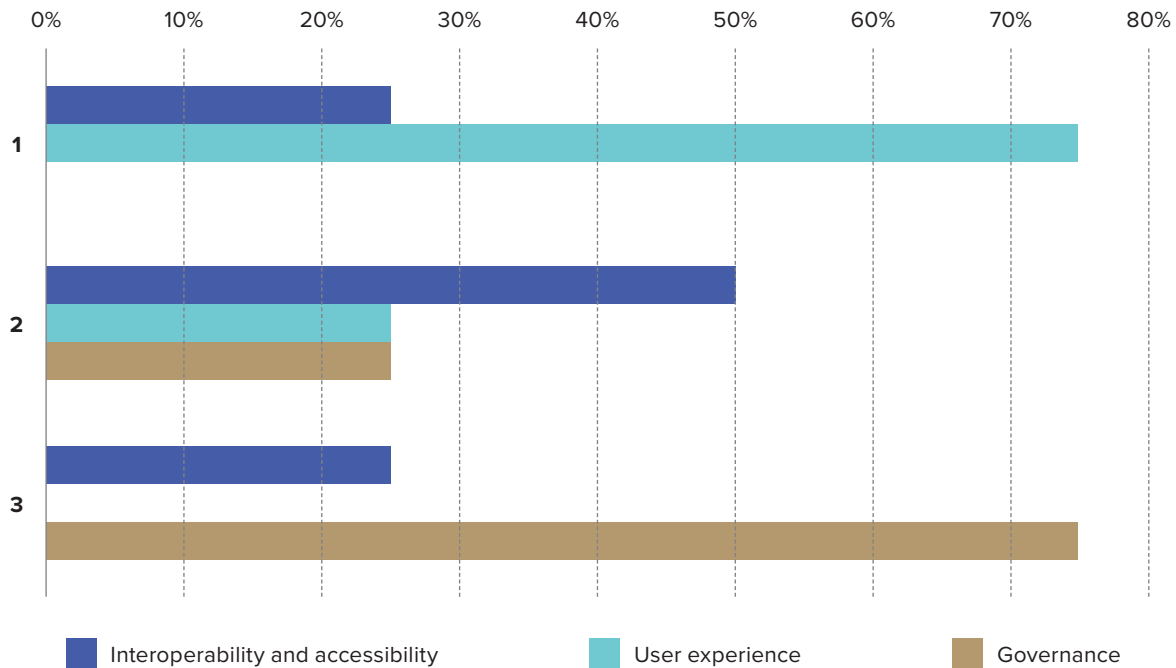
In order to assist in designing the Precinct's future vision and prioritisation of digital objectives, an understanding of existing priorities is crucial. The LIP's shared digital vision for a strategy that exemplifies ideas of digital connectedness and collaboration within the Precinct has been conceptualised by three notions: (1) accessibility, (2) user experience, (3) collaborative governance. As such, the existing prioritisation of these notions is represented above.

There is a clear delineation between governance as a priority and that of interoperability and the user

experience. More partners within the precinct are clearly focussed on the end-user experience and the capacity and capability for each user to access one safe and protected network. Most pertinent to the study itself was the level of prioritisation interoperability itself received. It is obvious that interoperability and access are presently considered to be the criteria to evaluate a successful ICT framework against. However, this strengthens the need to prepare a collaborative ICT partner framework that addresses these priorities and be implemented within the immediate future.

Q **Please rank the following priorities according to your vision of a future LIP ICT model**

Future state model ICT prioritisation

Legend:
- Interoperability and accessibility
- User experience
- Governance
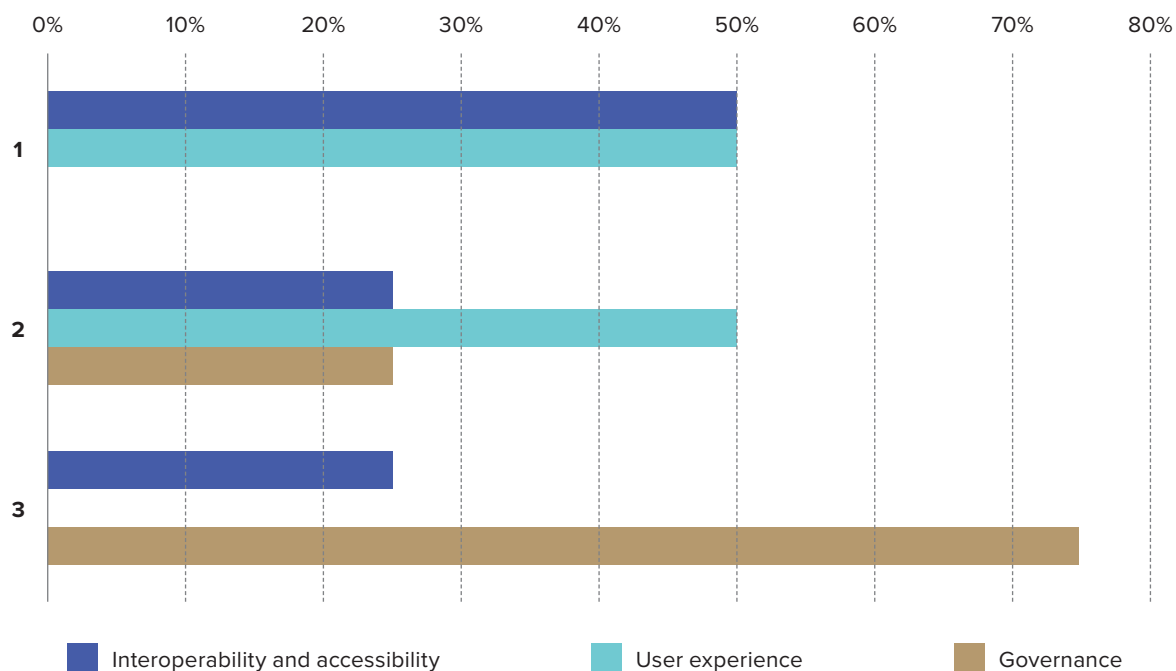
Resoundingly, and as expected, notions of an accessible service and an interoperable network were heavily prioritised. To this end, respondents additionally addressed ideas of connectivity when prompted to provide additional comments. In preparation for improved innovative technologies within the Precinct, the user experience was prioritised and linked to the importance of interoperability and accessibility. As represented above, governance was the least prioritise objective—strengthening the need for a collaborative framework moving forward.

6

FORWARD PLAN

This strategy has identified that the three main focus areas of interoperability, user experience and governance remain critical to the implementation of a successful ICT platform that meets the needs and aspirations of the LIP collectively.

Figure 12 LIP ICT Staging Roadmap

PHASE 1
IMPLEMENT GOVERNANCE

PHASE 2
DESIGN CONCEPT (SHARED) PLATFORM

PHASE 3
COMMISSION PHYSICAL/ DIGITAL INFRASTRUCTURE

In order to further progress the ICT strategy over the short, medium and long-term, the LIP must agree on the forward plan in order to establish a stepped approach to the ongoing development of a shared ICT platform. The steps identified as a result of this strategy are outlined below. The following actions have been identified over the next 24 months which align with the above steps and assign responsibility for the delivery of each milestone.

Milestone	Action	Timeframe	Responsibility
Implement Governance	Establish ICT governance as a subset to the Liverpool Innovation Precinct Steering Committee (LIPSC), through signing and implementation of a standalone memorandum of understanding (MoU).	3 months	LIPSC
	Identify ICT GG Independent Chair.		
	ICT GG to establish and implement governance for three workstreams.		
Platform Concept Design	Develop design and functional specifications for the ICT shared platform.	6 months	ICT GG to facilitate. External resource to develop
	Develop concept design for the ICT shared platform.		ICT GG to facilitate. External resource to develop
	Develop funding model to support capex and opex costs for the ICT shared platform.	12 months	ICT GG to facilitate. External resource to develop
	Procurement Options Assessment		LIPSC supported by external resource
	Feasibility and Investment Report.		LIPSC
Commission physical/ digital infrastructure	Procurement of ICT provider to build and commission shared platform.	24 months	LIPSC
	Develop Change Management/ Communications Plan to implement new shared platform across precinct and partner organisations.		
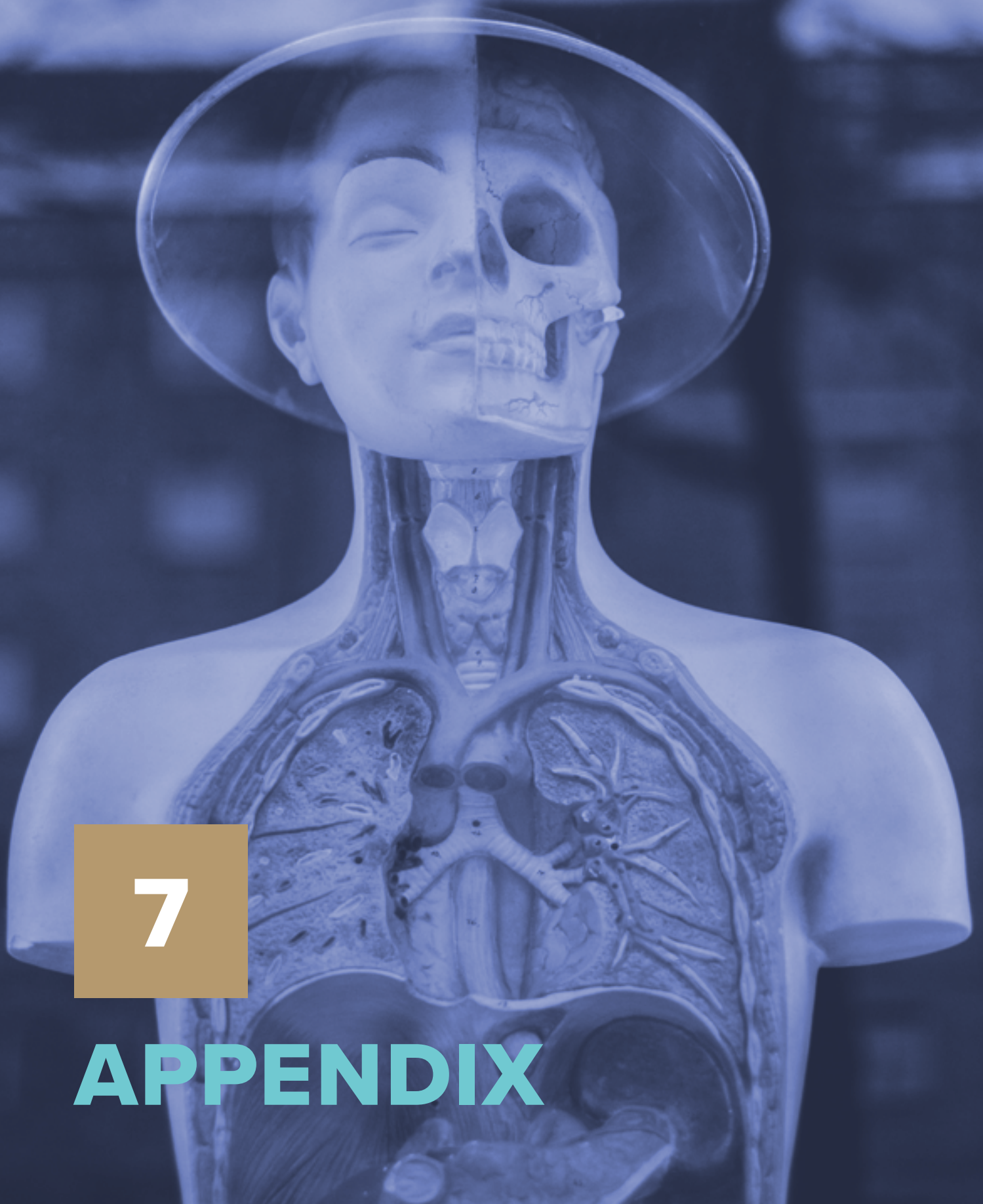
7
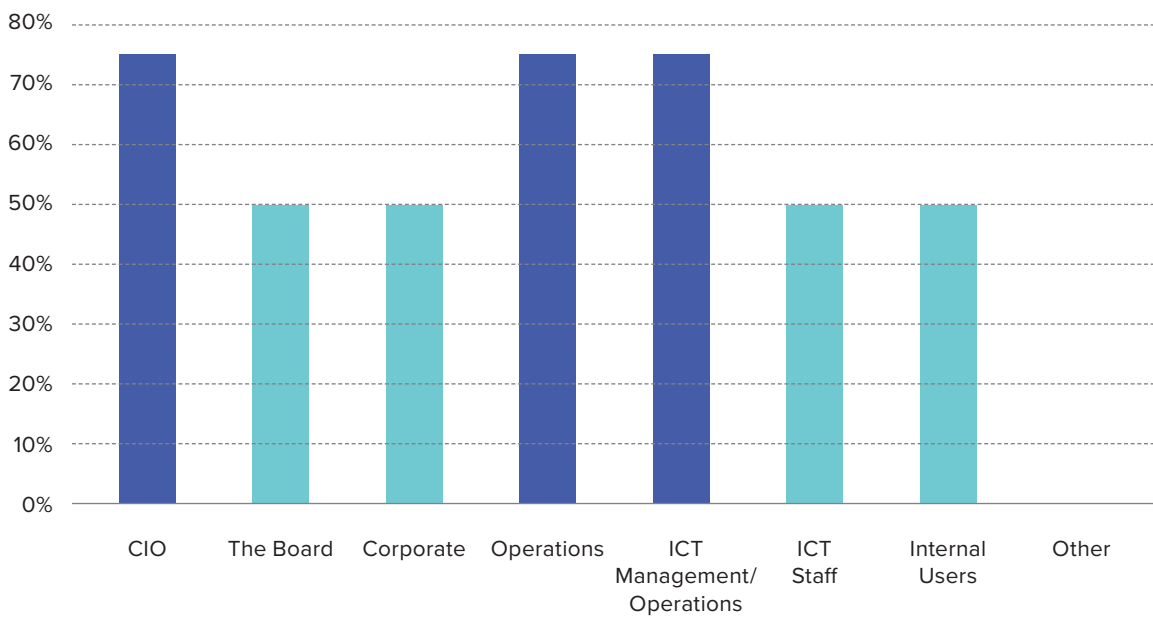
APPENDIX

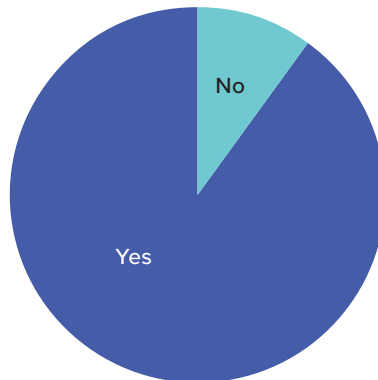# ICT Governance Arrangements and Responsibilities

Q Which of the following are responsible for ICT-decision making within your organisation?
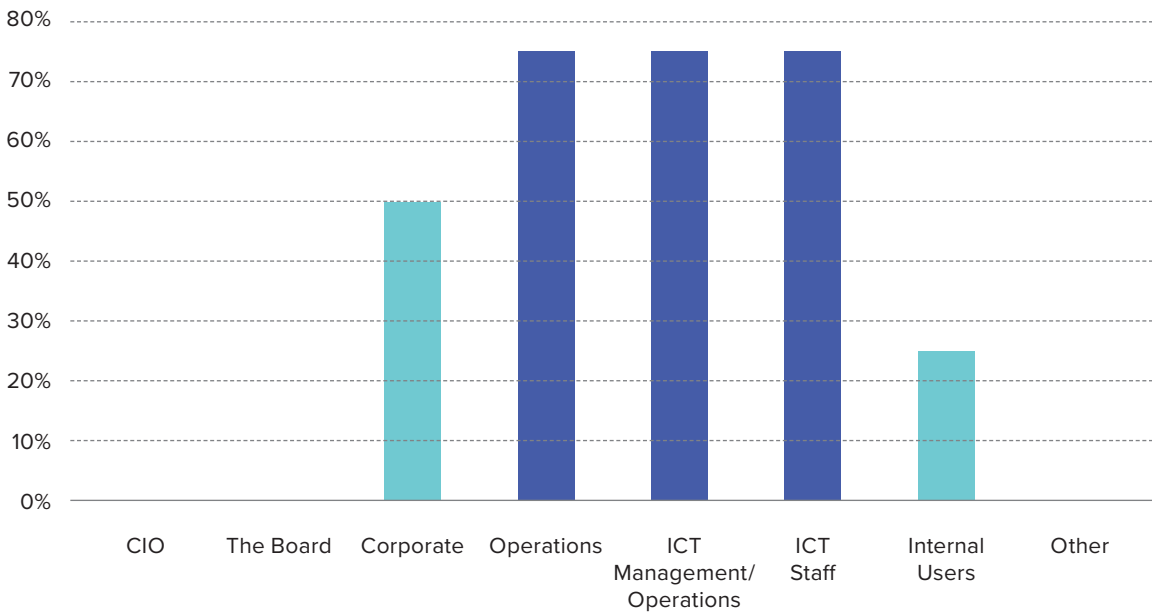
Figure 13   ICT decision-making

Q Do you consider these decision-making arrangements in your organisation to be effective?

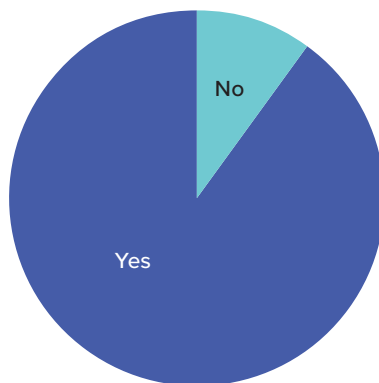**Figure 14**   Effectiveness of ICT decision-making

Q **Which of the following is responsible for the implementation of ICT-decisions within your organisation?**
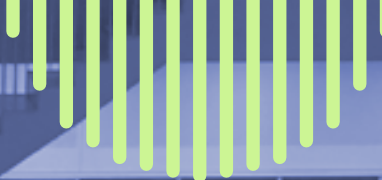
ICT decision implementation

Q **Do you consider these implementation arrangements in your organisation to be effective?**

Effectiveness of ICT decision implementation

LIVERPOOL
INNOVATION
PRECINCT

REIMAGINING

INNOVATION IN HEALTH, EDUCATION AND RESEARCH

MASTER PLAN AND LAND USE STRATEGY
ICT STRATEGY
INVESTMENT FRAMEWORK

DECEMBER 2018