Digital Services Strategy

2018-2021

AUDIT SCOTLAND

BECOMING WORLD CLASS

Prepared for the Audit Scotland Board
October 2017

Audit Scotland is a statutory body set up in April 2000 under the Public Finance and Accountability (Scotland) Act 2000. We help the Auditor General for Scotland and the Accounts Commission check that organisations spending public money use it properly, efficiently and effectively.

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Introduction

1. In 2015 we developed a three year Information Services strategy. This was informed by extensive consultation with our colleagues and focused on supporting delivery of our strategic objectives set out in the Corporate Plan 2015-18.

2. The strategy was structured around two priority areas, resilience and innovation and these provided the foundation for us to deliver our digital services. We have lead and supported significant improvement projects in these areas:

    - **Innovation** – The relocation of Edinburgh and Inverness offices, together with the refurbishment of the Glasgow office provides modern, digitally connected and provisioned workspaces. Phase 1 & 2 of our Audit Intelligence project has delivered a data warehouse providing a variety of data analytics and presentation services. All staff have access to modern smart phones with a secure app store allowing colleagues to communicate better and work while traveling. Yammer is changing the way we communicate with colleagues, moving from static, one way broadcasts to targeted conversations
    - **Resilience** – Our connectivity has enhanced significantly, we have an improved infrastructure of high speed networks connected to our new dedicated business continuity centre. We have delivered high speed mobile network access, through dedicated units and company wide mobile phone hotspots. Our information security has been significantly strengthened by a new managed perimeter defence system, network segregating, virtualising servers and real time patching. In 2016 we achieved ISO 27001:2013 certification and we test the effectiveness of our business continuity and security provision through a range of independent annual audits.

3. There are some areas where we haven't met all of the requirements of our colleagues and where the challenges and opportunities have changed since the last strategy. This strategy responds to these.

4. This strategy, covering the period 2018-21, has been informed by a review of our operating environment and business drivers and extensive engagement with colleagues.

5. The strategy has been developed as a companion piece to the Digital Audit Strategy. It reflects on, and responds to, the rapidly changing digital environment and the new (and anticipated) business drivers over the course of the next three years.

6. While consolidating the resilience and innovation work streams this new strategy brings additional focus on security and integration and anticipates the need to strengthen the digital skills of all our colleagues.

7. This strategy will help us to deliver digital services that will enable colleagues to deliver high quality audits, get our messages out effectively and run the business efficiently. It is driven by the business, for the business.

The operating environment

8. In developing the strategy, we have carefully considered the complexity and opportunities of the digital world.

9. **Listening to our customers** – to inform this strategy we carried out a wide-ranging consultation programme. We asked our colleagues what they needed, what had worked, what hadn't and what they'd like in the future. Colleagues most value easy access to solid and reliable core systems like ishare and MKI. There was also a demand for light-weight portable devices for on-site and remote audit work. Some colleagues wanted more help with new technology whilst others wanted more freedom to learn and experiment themselves. They asked for more integration of our corporate data to provide clear business reporting and management information. All the feedback received has been condensed into the Appendix Idea Map.

10. **Security** – In 2015 there were, on average, 7,250 ransomware attacks a month targeting businesses. By 2017 this had risen to 33,600 attacks per month with an increased targeting of public sector organisations. The WannaCry ransomware attack in May led to 70,000 possibly infected devices in the NHS due to a lack of adequate security patching. In response to the continued and increasing threat the Scottish Government has initiated a Cyber Resilience action plan. This required Scottish public sector bodies to achieve a baseline of cyber security by March 2018.

11. **Cloud –** In 2015, 6% of U.K. businesses were utilising the cloud. By 2021 it is estimated that 80% of U.K. business will be using the cloud as their primary data repository. The growth of cloud services, and the competition between suppliers has seen a decrease in cost and an increase in quality and security. The U.K. and Scottish governments are actively encouraging public sector bodies to move to private or public cloud providers to take advantage of the resilience and high levels of availability they provide.

12. **Mobile** – Personal smartphone ownership and usage is now the norm, 85% of the U.K. population have access to a mobile phone and 68% have access to a tablet. 91% of adults used their smartphone daily. Business transition to mobile is far slower and where deployed smartphones are generally limited to email and telephony. Tablet use is even more limited and is used primarily by senior management for email and document review.

13. **Big Data** – Data underpins everything we do with the private sector having made substantial investment in big data technologies and machine learning for significant commercial gain. The public sector lags the private sector, in part as it does not have the same profit and commercial motive. Both the U.K. and Scottish government's digital transformation initiatives are promoting the delivery of public services via the effective use of data through open data and the data sharing code of practice.

14. **Recruitment** – The recruitment and retention of digital/IT specialists is very difficult. There is a significant shortage in skilled experienced staff worldwide and the U.K. could face an especially acute shortage if Brexit results in E.U. staff leaving the U.K. job market. This shortage in skilled specialists has driven up salaries. Since 2009/10 digital/IT specialist

salaries have risen 30% in real terms on average, while over the same period public sector wages have fallen by 4% in real terms.

15. **Legislation** – The 2012 and 2016 Scotland acts introduced new responsibilities for taxes, social security and borrowing which will require appropriate scrutiny and digital solutions will have an important part to play in this. Also, the General Data Protection Regulation (GDPR) will come into effect in May 2018. Both these legislative changes will require new resources and changes to existing systems and processes.

Strategic objectives

16. Our two main objectives remain; Resilience and Innovation.

17. **Resilience** – We will continue to ensure that we have robust, accessible and dependable systems in place to support all colleagues to work efficiently and effectively. Together with:
    - a significant increase in security measures and resources
    - delivering flexible, sharable mobile devices
    - strengthening the capacity and skills of the Digital Services Team.

18. **Innovation** – We will continue to develop digital solutions to support our ambition to be a world-class audit organisation. Together with:
    - integrating our internal information using big data and machine learning
    - continuously improving our digital delivery and work ethic by adopting new agile methodologies
    - encouraging and supporting the development of digital skills for colleagues of all abilities.

19. We will deliver these objectives by:
    - Investing in our future – by providing flexible high quality digital services and through using data efficiently and effectively
    - Investing in our digital capacity – through learning, development and recruitment, and by supporting innovation and a digitally enabled workforce.

20. This strategy sets out the work streams required to deliver the two objectives over a three-year period.

Resilience

21. Improving our resilience will increase our security, productivity and efficiency. We will continue to enhance our existing security systems while introducing new proactive defensive measures. We will continue to improve system availability ensuring colleagues can use the services, applications and information they need to carry out their work.

22. The resilience objective consists of three workstreams:

    - Always secure
    - Always available
    - Any device.

Always secure – security first

23. Our colleagues need confidence that their information is safe and secure and that we can provide assurance that we are following best practice. We will adopt a security first approach to all our systems and information. Always ensuring, before anything else, that the most appropriate controls are in place to protect the integrity, privacy and availability of our information.

24. We will:

    - Increase the security of all our digital systems, improving our existing malware protection and network security and implement advanced threat management systems
    - Securely configure and rapidly patch all systems
    - Diversify our platforms and segregating networks wherever possible
    - Manage, safeguard and encrypt all our controlled and personal data
    - Expand our system monitoring and enhance our incident management processes
    - Strengthen and upskill the Digital Services Team to help improve our security and incident management approach
    - Reshape our management arrangements to implement an enhanced risk management regime and ensure we can provide a 24/7 response to any security incidents
    - Continue to educate and inform our colleagues on developing security risks
    - Maintain ISO27001:2013 certification
    - Implement the National Cyber Security Centre's (NCSC) 10 Steps to Cyber Security (Figure 1) and achieve Cyber Essentials PLUS certification
    - Actively participate in the NCSC's Cyber Security Information Sharing Partnership (CiSP).

Figure 1 - 10 Steps to Cyber Security

Always available – robust and high quality services

25. Our colleagues work in multiple locations and need access to information and digital services at all times. If there is an issue, they need to know immediately and be updated on its resolution. They also want to be assured that we are using efficient and effective hardware, software and systems that support them do their work.

26. We will:

- Continue to move business critical systems to managed secure cloud services
- Continue to replicate all our information and services to a secure location which is highly resistant to failure
- Ensure that we are using and maintaining high quality systems to support our audit work and business management
- Provide shared, lightweight and secure mobile devices that can be used as both a laptop and tablet
- Ensure all our information is accessible from the internet via a browser or app, independent of our infrastructure
- Continue to provide multiple independent wired connections, together with WiFi and high speed mobile data for our systems
- Enhance our WiFi provision to maximise bandwidth for our innovation zone and personal devices
- Perform proactive monitoring of our services, providing live updates of service availability to all our colleagues.

Maximising flexibility and resilience

27. Transitioning to cloud based services will provide colleagues access to our information at any time in a way that suits them best.

28. 80% of our systems and information is stored on servers situated in our offices and replicated to our secure business continuity site. Continuing to transition to Office 365 will allow us to move our existing on site systems to online services, which provide 99.9% uptime, automated patching, maintenance, capacity management, backups and business continuity. Online services are independent of our infrastructure and are accessible on any modern device by an app or modern web browser. This ultimately means colleagues will have improved access to the services and data they need.

29. We will:

- Provide all our colleagues with Microsoft Office services from the cloud with direct secure access via mobile app and modern web apps
- Provide cloud based SharePoint (ishare) and OneDrive (my site) to store and synchronise all our information which can be accessed anywhere from a modern web

browser or mobile device. In doing this we will assist the business to greatly simplify records management and the requirement for metadata

- Continue the transition from desk phones to mobile and web devices – allowing colleagues to receive and make calls from any mobile device or web browser as well as video conference, share screens and transfer files
- Pilot moving our virtualized non-Office 365 systems such as MKI to a secure private cloud
- Provide Audit Intelligence services on a highly scalable and sharable cloud service, elements of which will be available to other public sector bodies and members of the public.

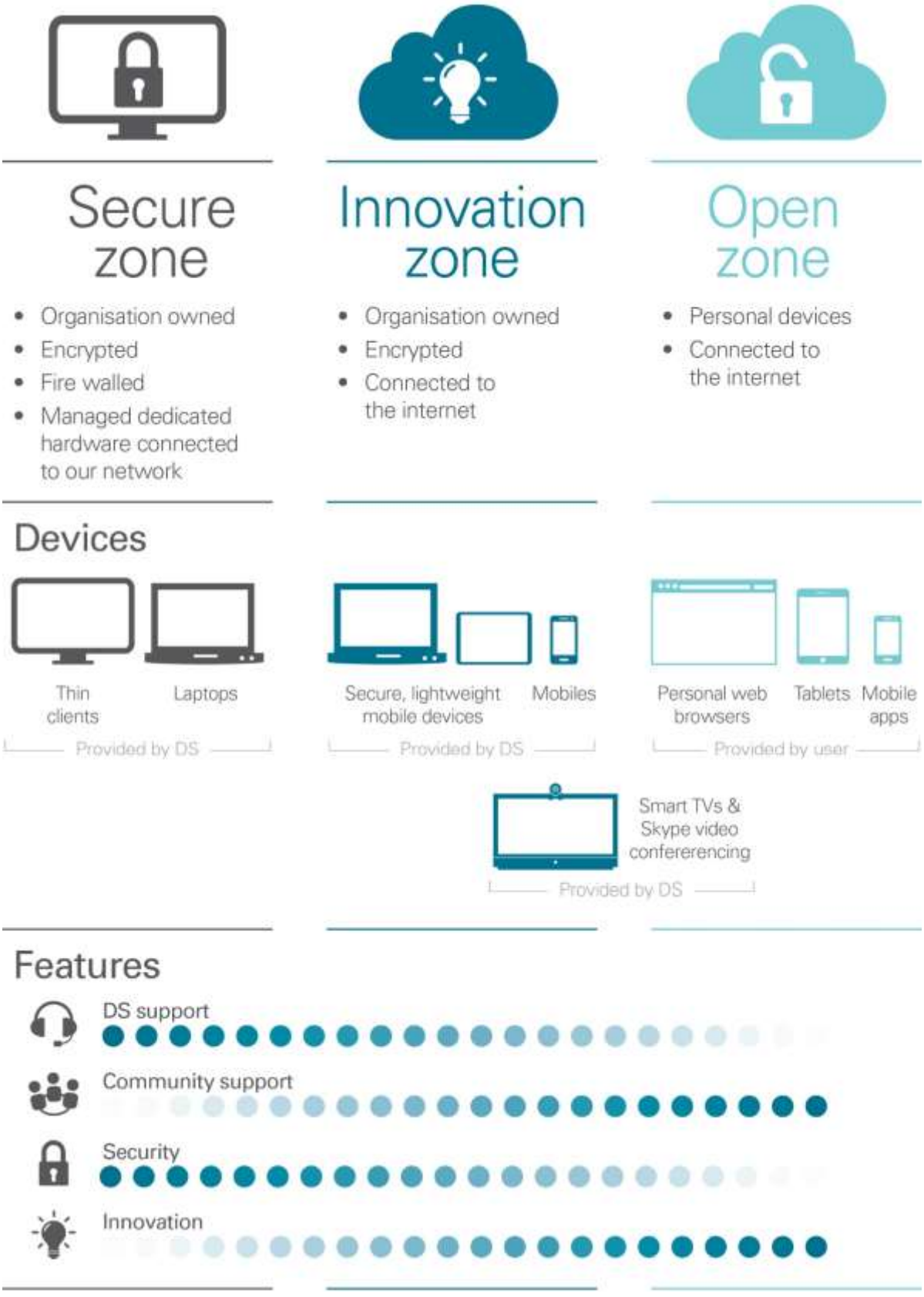
Any device – supporting choice, remaining secure

30. Our colleagues are looking for the additional flexibility they experience with personal mobile devices while retaining the benefits of the traditional thin clients and laptops.

31. Ever increasing security threats require increased security, but locked and high security environments can make it difficult for colleagues to be innovative and work efficiently. The introduction of different zones to allow colleagues to work flexibly while staying secure has proven very successful. We will continue to provide '**zones'** where colleagues can select the most appropriate working environment which balances security and innovation and which suits their task. The zones (Figure 2) are:

    - **Secure zone** – using laptops and thin clients in a highly protected and managed environment where security is paramount. In this zone, all data is encrypted and backed up, internet and email access is protected, filtered and managed and all systems are proactively managed by the Digital Services Team
    - **Innovation zone** – using mobile devices, which can be used anywhere, for specific tasks and where innovation is encouraged. In this zone internet access is less restricted and colleagues have the freedom to install apps from a managed app store. Innovation zone devices are encrypted and can be remotely wiped if required. Organisational information is accessed through the secure channels of Citrix and Office 365. Colleagues are encouraged to develop and share their own skills in using innovation zone devices and services
    - **Open zone** – colleagues use their own devices, smart TVs and conference systems. In this zone, colleagues can access information via Office 365 and Citrix in a managed environment where we can restrict actions, such as sharing and wiping only Audit Scotland data. Visitors can also connect to TVs, audio and conference systems for presentation purposes.

Figure 2 - Zones



Innovation

32. We want to both drive and support an environment where:
    - understanding our information is paramount and the tools we use to manage and analyse information becomes secondary
    - colleagues are encouraged to explore and experiment with different tools to develop inventive solutions
    - innovation becomes central to our continuous improvement.
33. These will drive efficiency, productivity and effectiveness, support our strategic objectives and help us to achieve our corporate vision.
34. Five workstreams support this objective:
    - Digital skills – supporting our colleagues
    - Digital working – supporting a digital community
    - Open data – maximising the benefits
    - Business intelligence – making the most of our own data
    - Agile development – promoting a culture of innovation

Digital skills - supporting our colleagues

35. It is widely recognised in the audit profession that digital skills are both a requirement and will be an area of growth in the years to come. Our consultation told us that some colleagues want more help with using new devices and systems, others requested greater access to self learning material, while others wanted better ways to share their new ways of working.
36. The speed at which systems change has increased significantly, with mobile and web apps updating on monthly cycles. The old methods of staged, controlled releases with delivered customised training are no longer viable. Colleagues also work outside standard hours and will need to access a variety of educational material appropriate to their needs and skills.
37. We will:
    - Work with the Personal Development and Growth Group to understand the digital development needs of our colleagues and identify solutions
    - Provide a library of inclusive online learning material that colleagues can use at any time
    - Expand the use of colleague knowledge and skill sharing via social media
    - Develop regular events where colleague can meet specialists to get guided hands on experience
    - Implement a no resistance, simple ticketing system to help provide directed support from any device.

Digital working - supporting a digital community

38. Our colleagues tell us that they can sometimes find it difficult to locate the information most relevant to them. They also want to easily but safely communicate and share information with colleagues and stakeholders.

39. The digital environment reduces the cost of communicating and sharing to almost nothing. This allows low value information to be broadcast to everyone making it more difficult to extract the relevant 'high value information' from the irrelevant 'low value information'. Businesses can waste significant resources managing low or no value information, particularly in the form of email. We will provide colleagues with more tools to avoid the 'low value noise' and focus their communication on high value information, to increases business efficiency.

40. We will:

    - Continue to promote high value information systems such as group messaging, where colleagues find and follow staff or people outside the organisation that are working in similar fields and thus building a community of experts. At the same time, we will deprecate low value systems such as broadcast email with the aim to increase business efficiency
    - Provide expansive personal cloud storage where colleagues have a searchable online area available anywhere on any modern mobile device. Where they can easily share information with colleagues and stakeholders
    - Provide a large capacity email system which provides active and passive filtering to organise and triage email based on individual colleagues needs
    - Embed accurate personalised search across all systems and promote a cultural change where colleagues search for content rather than navigate to a possible location.

Open data – maximising the benefits

41. The digital economy generates enormous amounts of data and we must continue to expand our skills and systems to collect, collate and analyse this data. Colleagues need access to a range of tools to explore data sets, answer analytical questions and present data in ways that identify underlying patterns and trends. These analytical techniques will allow us to better understand and plan our own business.

42. The sharing of data benefits the entire U.K. public sector, allowing for more accurate forecasting and planning and by reducing inefficiency. We want to continue to play an active role in the open data community and ensure appropriate data is available to third parties who can verify and expand on our analysis and use it to inform debate and policy development and support scrutiny.

43. Our objective is to provide maximum flexibility and integration with all our systems and other external services by using open data and complying with accredited open industry standards that define the methods and procedures for software which connects data and services.

44. We will:

- Implement phase 3 of the Audit Intelligence project which aims to migrate the infrastructure to the cloud, embed data analytics into the audit process and push for improved data analysis skillsets. Colleagues will have immediate access to automatically imported data and can access data from anywhere on any device
- Continue to provide a suite of analytical and presentation solutions for both numeric and textual data. As the data is open and conforms to appropriate standards, colleagues can either select from the solutions we will provide or chose from web based open source solutions that integrate with open data standards
- Make our public audit data available in an open format to use without restrictions and which can be downloaded from the internet
- Require that all systems and services we develop or procure comply with an open data requirement and open industry standards
- Phase out legacy non-standard compliant/open data systems and replace them with compliant systems
- Adopt a web and 'mobile first' approach for all new solutions, wherever possible selecting open source solutions, and ensure all our internal development is open source.

Business intelligence – making the most of our own data

45. Our colleagues tell us they would like to better understand and explore our management information. We collect operational information such as time recording, HR records and audit team rotations but it sits on different systems in different formats. Colleagues would like a solution that combines all this information in an easily accessible way.

46. Many of our corporate systems are based on legacy software, much of which uses proprietary data formats and does not comply with open industry standards. This makes integrating data for meaningful reporting difficult.

47. We will:

- Support the business to procure or develop new corporate systems that support open data and open industry standards
- Develop solutions based on our Audit Intelligence system to integrate our corporate information into a suite of Management Information reports allowing colleagues to explore, analyse and present corporate information
- Work with Morgan Kai to access and report on our audit information from our core auditing application
- Use workflow solutions to integrate our corporate information into automated Office 365 management information dashboards

- Pilot ‘machine learning’ systems to provide deeper insights into our own business processes and resource transactions.

Agile development – promoting a culture of innovation

48. Through proactive research and experience the Digital Services Development Team are constantly adapting and evolving with the goal to continuously improve on current work processes. We integrate new technology and methodologies into our workflows, we prototype and adopt – or discard if they don’t fit. Agile development provides significant cost savings by preventing resources being lost on non-viable projects.

49. We will:

- Encourage and promote successful working methods to the rest of the business
- Run our development team as a start-up team, trying new ideas quickly with virtually no overhead and fully implement where prototypes are successful
- Celebrate success but also accept failure as a potential outcome, learning from the experience
- Adopt a ‘fail fast’ approach, using regular and quick reviews to identify where continued investment in a project would be false economy
- Develop in-house code which works across different platforms and devices and which integrates with open cloud based data
- Use a streamlined agile project management framework tailored to best suit the team and business
- Implement projects using lightweight and focused ‘sprints’ where project work is priority and distractions are reduced
- Deploy regular outputs from sprints which offer immediate access to new functionality.

Implementing the strategy

50. This strategy lays out an expanded three-year framework to continue to deliver an ambitious programme of change that will help achieve our vision of being a world-class audit organisation. It provides the architecture needed to transition our digital systems to a security first, cloud based infrastructure where our mobile colleagues can access our corporate information and analyse data from any device. It increases flexibility and choice, encouraging an innovative knowledge sharing culture.

51. The strategy delivers a road map for supporting both the technical and cultural changes needed to participate in the digital economy, while ensuring appropriate levels of security and compliance.

Investing in our future – building a better organisation

52. We will deliver the service and device components of the strategy within the existing revenue and capital budget projections.

53. Over the previous three years the cost of digital devices has decreased while the quality and functionality has increased. Cloud based computing continues to promise considerable savings on physical hardware, but while in the transition phase we will continue to replace hardware as required.

54. Open data, open industry standards and open source solutions offer considerable savings and flexibility. As we look to replace our legacy corporate systems we must ensure we are in the best position to maximise these savings and reduce our reliance on long-term and inflexible contracts.

55. Due to the extremely difficult recruitment market our workforce budget requires sufficient flexibility, delivered as part of our Building a Better Organisation programme, to recruit and maintain digital specialists as needed.

56. We have projected a slight increase in revenue expenditure from 2018/19 as we increase our investment in ongoing security systems and strengthen our workforce to support this change.

57. Our capital expenditure will support resilience and innovation though investment in security appliances, replacement servers and an increasing focus on going mobile.

58. We will:

- Develop detailed workstream resource plans through our Project Management Office (PMO), reporting on a quarterly basis
- Provide KPI’s to measure our efficiencies over time and in comparison, with other SAI’s.

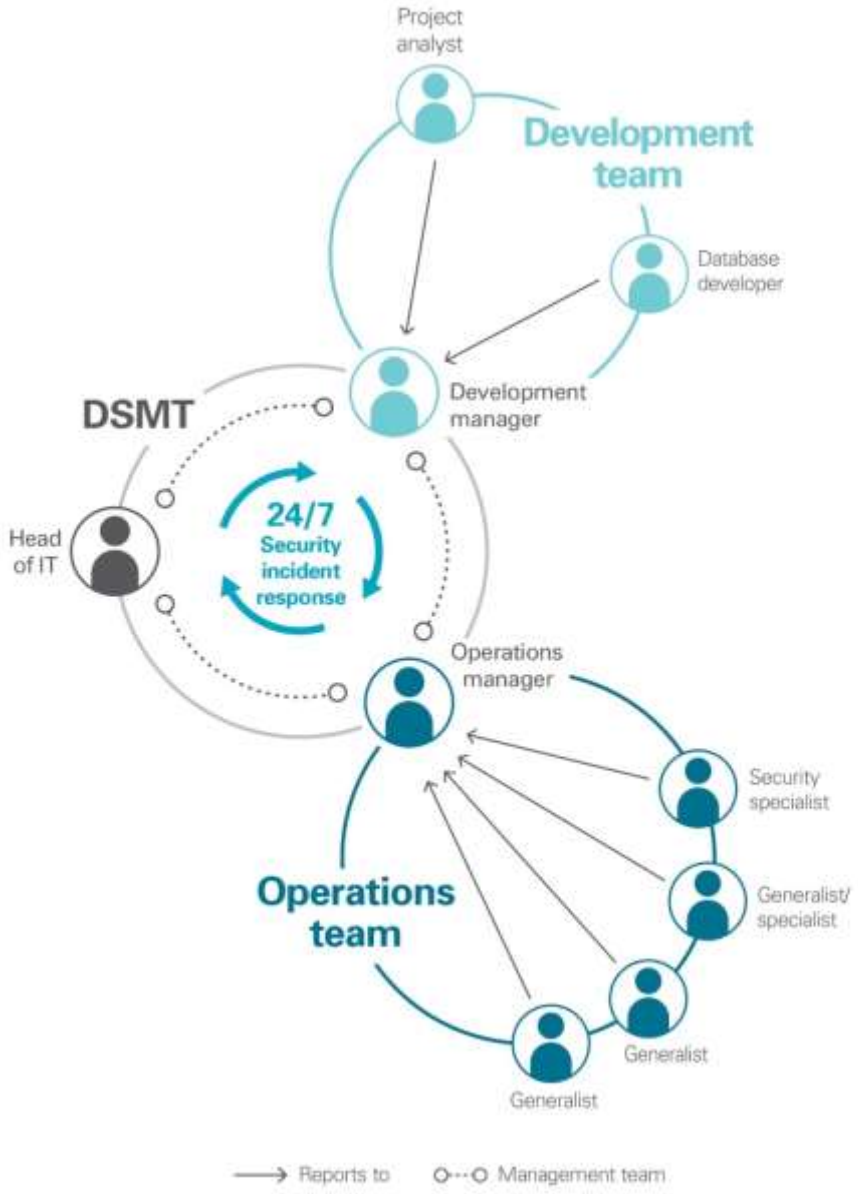
Investing in our digital capacity

59. Our skilled digital team is a critical resource. With such a high demand for skilled digital staff, average salaries are being driven upwards such that even employers offer alternative benefits and flexible ways of working are having to offer additional remuneration to retain key digital experts. We therefore need to develop a market aware remuneration process, consistent with new recruitment flexibility delivered through our Building a Better Organisation approach. This will help us to recruit, retain and reward expert digital staff while structuring our team to ensure that staff turnover does not disrupt digital provision and projects. As we continue to transition to cloud services, we are shifting our skills to support this. With the increased focus on security all our digital staff will be required to expand their skill set accordingly. Our resilient team structure is presented in figure 3.

60. We will:

- Provide a resilient and flexible Digital Services Management Team that has the experience and authority to manage, at any time, the increasing threats to digital security
- Expand our PMO role to take over day-to-day project management allowing specialist digital staff to focus on service delivery and incident management
- Provide specialist security training and accreditation for all Digital Services staff
- Provide flexible remuneration that accounts for individual skills and alleviates external market pressures.

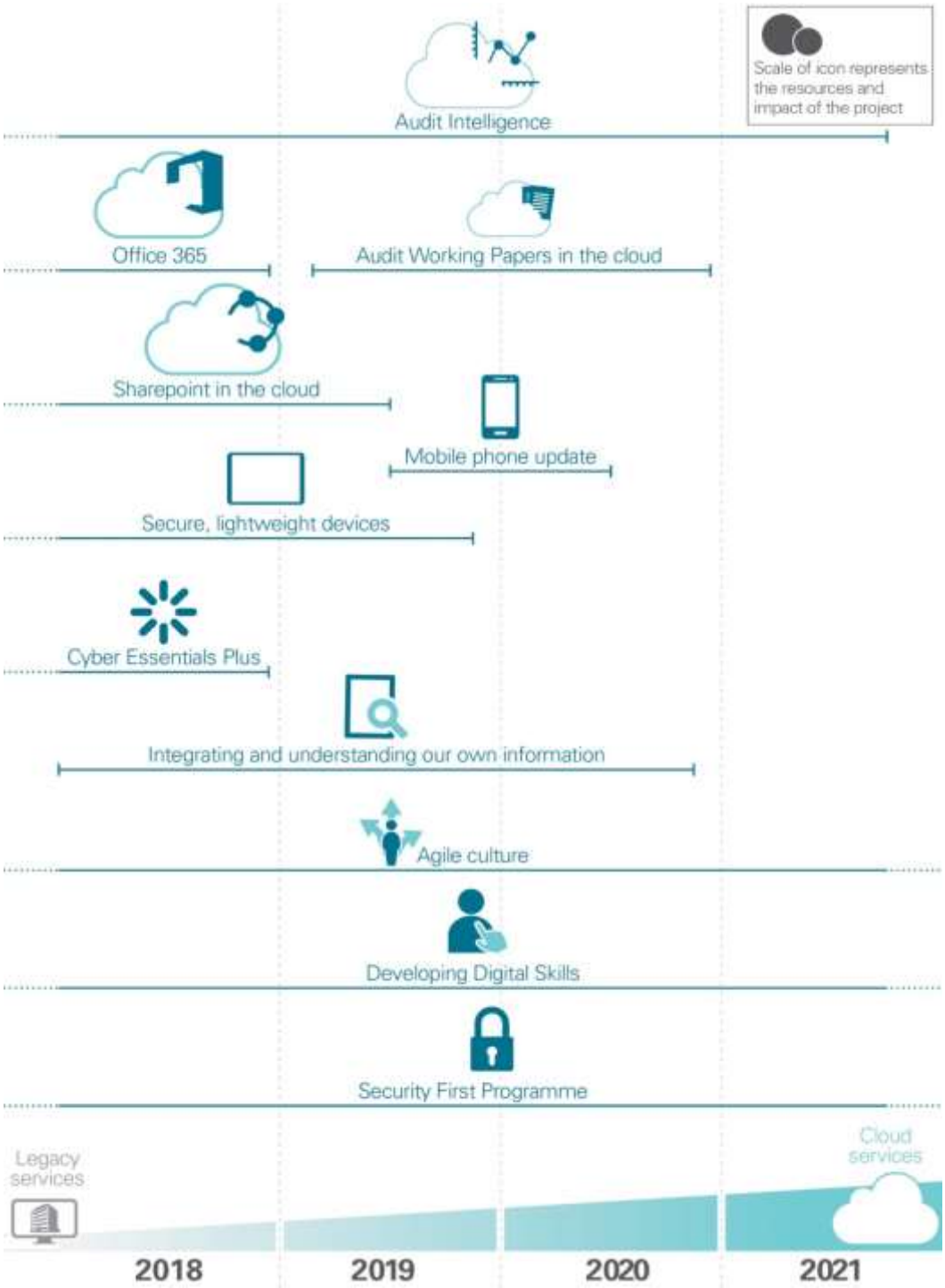
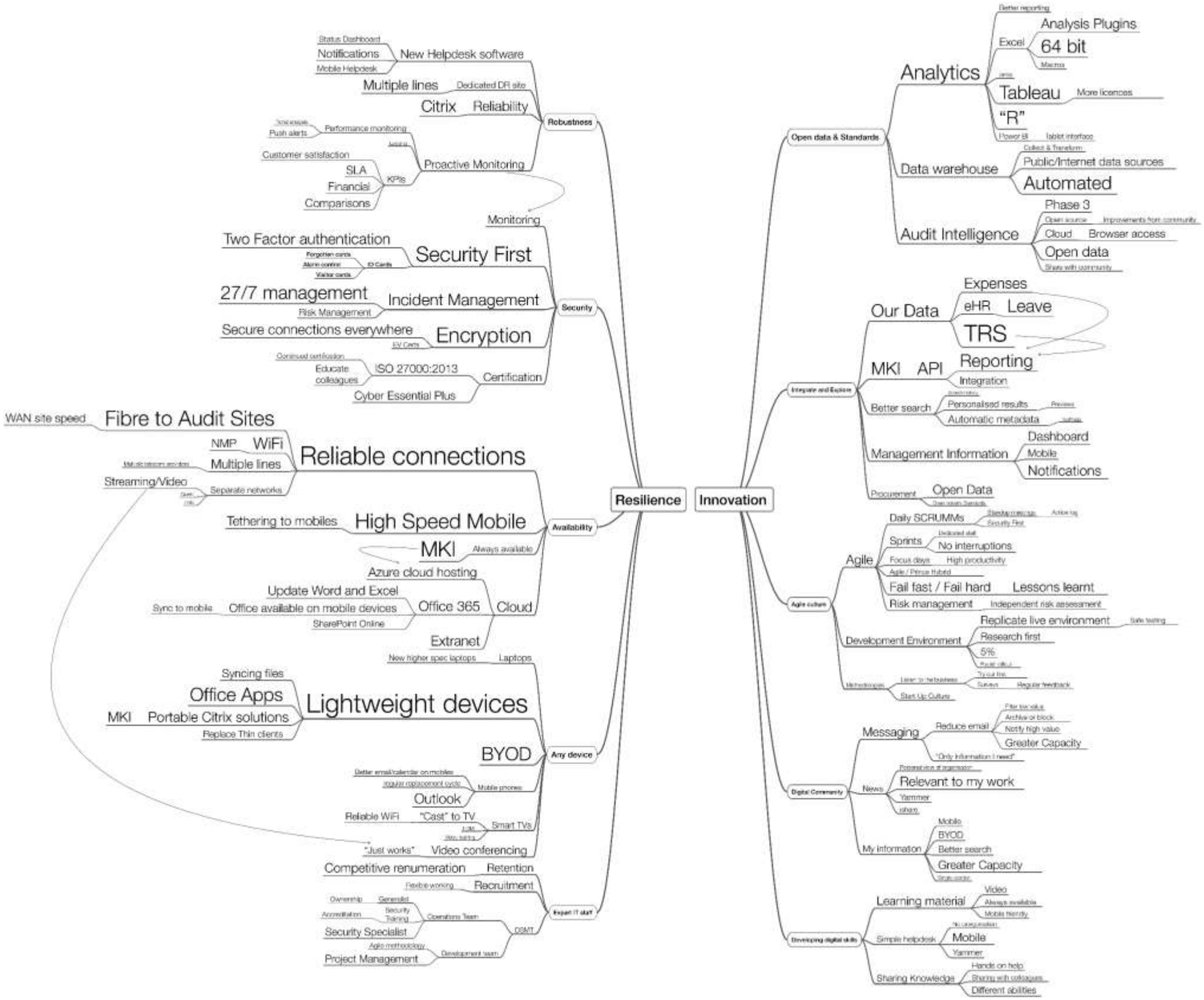
Figure 3 – Digital Services Resilient Structure



Timeline

62. An indicative timeline for the works programme is presented in figure 4.

Figure 4 – Timeline



Appendix – Ideas Map