Brook Community Primary School

ICT Operational Strategy

Published Date: **October 2019**

Reading Notes:

1. While this document remains complete and meaningful if printed, it has been written with the intention of being read online as it contains many useful Hyperlinks.

2. This document should be reviewed every 6 months to ensure it remains relevant to the changing technology landscape and requirements of the School.

Version History:

Version No.	Status	Author	Date
0.1	1st Draft	WT	August 2019
0.2	Revision	WT	September 2019
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Reviewers:

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Contents:

1. Summary of ICT Vision:

Brook Community Primary School's ICT Vision is:

***"To provide a High Quality, Reliable and Secure ICT capability for all, supporting both operational and curriculum delivery. We will be an exemplar of technology adoption and integration, not just within Kent but Nationally*."**

2. Background:

Brook Community Primary School currently has an operational ICT infrastructure and service provision that has evolved over time through necessity rather than managed and directed through strategic thinking. This is often the case with small schools due to the primary focus of the school being, quite rightly, curriculum delivery.

The school's internet prevision is provided by a line of sight connection to Lady Joanna Thornhill Endowed Primary School, Wye. This is a low bandwidth connection that is regularly and consistently interrupted due to weather and seasons of the year.

The structured cabling throughout the school is old copper that in most cases has been in place since the early 90's and in some cases is routed throughout the site in precarious ways and has needed to be replaced on occasions due to accidental damage or weather damage.

Core business services and applications, such as email and document storage, are currently provided by a Kent EdTech provider, while some workloads are running on a local server in the main office.

Applications used for curriculum delivery are managed by the school's Head of Computing.

IT support services are currently provided by a local SME who provides a similar service to other schools in the area.

A qualified public sector ICT consultant, with extensive experience of networking, cyber security, Cloud migration, successfully implementing disruptive technologies and Change Management, has recently been engaged to: define an ICT Vision, Operational Strategy and assist in the delivery of change required to the current architecture.

3. Strategy Funding:

As a small School, funding is very tight, there is a small amount of the annual budget allocated to ICT but this is typically to cover the running costs of live services.

All funding for ICT Infrastructure changes will be sought through alternative routes in the first instance such as: Department for Education capital funding opportunities, Kent County Council support and other Government / Local Authority Initiatives, Projects or Programmes.

4. Scope of this Strategy:

4.1. In Scope:

This strategy covers the following 6 areas of ICT in Brook Community Primary School:

1. **Wide Area Network (WAN).**
2. **Local Area Network (LAN) Infrastructure.**
3. **Cloud Technology.**
4. **Using technology more effectively.**
5. **Protecting our school's data.**
6. **Approach to Technology and Service procurement.**

4.2. Out of Scope:

The scope of this Vision does **not** include the delivery of the Computing curriculum, this is included in the Computing Policy.

This Vision is limited to and focused on the technology and infrastructure required for the school to operate and function in the modern world. However, the same technology and infrastructure will support and enable the delivery of the Computing curriculum.

The Computing policy can be found on the Brook Community Primary School website.

5. Wide Area Network (WAN):

Definition: A telecommunications network that extends over a large geographical area for the primary purpose of computer networking. In the case of Brook Community Primary School, this is specifically referring to Outward Internet Connectivity.

As the number of services using the internet has increased (and continues to increase significantly) broadband plays an increasingly important role.

A School can be major users of technology and have many users who regularly access the internet simultaneously. Schools require a high-quality broadband connection that is superior to that required in a domestic setting.

High quality WAN connectivity:

- will better enable many of the school's day-to-day operations;
- can provide opportunities to reduce costs and access better services;
- will make sure that everyone using the internet in the school community does so in a safe and secure way.

A good connectivity solution will:

- be fast enough for staff and pupils to use, even at busy times;
- be reliable so that staff have complete confidence in the system;
- protect the school community from external threats and unsuitable material by providing a secure online environment without restricting normal use.

5.1. What technologies are available

There are a range of technologies that can be used to deliver a broadband service. Their availability and cost vary according to the location of the school.

The 2 most common types of connection are fibre or copper based.

5.1.a. Fibre connections

Fibre is sometimes described as:

- a leased line
- fibre to the premises (FTTP)

FTTP uses a fibre optic cable between your provider's network and the school. Services will sometimes be more expensive, but speed is:

- consistent
- faster
- guaranteed

The connection is often dedicated to the school.

5.1.b. Copper Connections

Copper is often described as:

- fibre to the cabinet (FTTC)
- asymmetric digital subscriber line (ADSL)

ADSL uses a copper cable to connect the school to your provider's network all or part of the way.

Most domestic broadband uses this method. For business or educational purposes fibre-based connections should always be the preferred option.

5.2. Download and Upload Speed

Services are typically defined by their download speed – this is the rate at which data can be downloaded from the internet.

However, schools should also consider the upload speeds of a broadband connection: the rate at which data from the school is uploaded to the internet. This is particularly important for Cloud-based services such as online telephony, video content and email services.

5.3. Safe and Secure Connectivity

The online safety of members of the school community is critical. A high-quality broadband service will provide:

- filtering that suits the needs of the different kinds of users in your school - for example, guests, staff or older pupils;
- good quality reports on internet use and issues;
- immediate alerts in the event of unsafe behaviour so you can take appropriate and prompt action.

5.4. Benefits of High-Quality WAN Connectivity

Economy – saving money

A high-quality broadband solution could save money by enabling the use of Cloud-based solutions instead of on-site products or services.

Efficiency – saving teachers' time

A reliable connection can enable staff to:

- make greater use of online resources, safe in the knowledge they will work well in lessons;
- collaborate with colleagues at other locations without having to travel.

Effectiveness – what you can do

Good quality broadband will connect our school reliably and quickly to the outside world.

It will allow teachers, students and admin staff to make use of resources in the Cloud without frustration or delay, secure in the knowledge they will be accessible when needed.

It will also help teachers to:

- increase the use of online digital resources and media to support teaching - complementing or replacing existing resources;
- access materials away from the school;
- make resources available from lessons for pupils to use outside class without effort or delay;
- ensure that internet use is monitored, access controlled, and that appropriate staff are properly alerted of any at-risk behaviour.

6. Local Area Network (LAN) Infrastructure:

Definition: A computer network that interconnects computers within a limited area such as a residence, school, laboratory, university campus or office building. Ethernet and Wi-Fi are the two most common technologies in use for local area networks.

ICT infrastructure is the physical and technical components of an individual school network. In some cases, this could include a network connection between schools, like the current arrangement between Brook Community Primary School and Lady Joanna Thornhill Endowed Primary School, Wye.

It comprises several different systems, including:

- physical cabling and data connections that form part of the building fabric, typically using copper cabling with fibre-optic links between buildings;
- switches that move data from one place to another and make sure it is routed correctly;
- wireless equipment - wireless access points (WAPs) and their controllers, these provide the wireless connectivity (Wi-Fi) required in various locations inside or outside of buildings;
- equipment to connect to the internet and to other schools, including routers, firewalls and systems for security or filtering;
- management systems to control and coordinate these systems in a cohesive, secure and effective way. Often with monitoring and reporting capability.

Poor infrastructure will have a negative impact on lessons and staff. Investment in infrastructure requires a sound strategy that looks several years ahead.

6.1. Review and Documentation

- Our current physical and virtual infrastructure
- Infrastructure services
- Core business applications
- Line of business applications
- End user compute layer – devices used by people, Desktops, Laptops, Tablets, Phones, Smartboards, TVs, Projectors
- Any areas that will require further attention over the next 3 to 5 years

We should also consider:

- Contracts – what service and support contracts and warranties do you have in place for the systems on which the school depends
- Stability and performance – what works well and is trusted and what causes frustration
- Curriculum delivery strategy - what plans do you have to increase educational use of Cloud and online services in the short and medium term

6.2. Benefits of Effective LAN Infrastructure

Economy – saving money

The ongoing running costs of poor ICT infrastructure can be significant. For example, poor ICT infrastructure can result in schools needing to invest more in:

- technical support
- replacing individual parts

A planned programme of design, investment and support will reduce long term costs.

Efficiency – saving teachers' time

Good ICT infrastructure should be reliable and seamless.

When staff trust that their systems and infrastructure work, they can use them to reduce workload, for example, by improving communication, collaboration and planning.

Reliable systems also eliminate the need for teachers to prepare alternative approaches, should technology fail.

Effectiveness – what you can do

Well-functioning and well-maintained infrastructure:

- allows teachers, students and admin staff to use technology in a timely and appropriate manner
- supports teaching and learning

For example, good infrastructure allows students and staff to:

- log on to their devices quickly
- share content and material
- provide online feedback quickly and reliably

7. Cloud Technology:

Definition: The on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the consumer. Cloud computing allows companies to avoid or minimize up-front IT infrastructure costs and reduce the running costs of service.

The term “Cloud” describes systems or services that are hosted and managed online, rather than locally in the school building. Computers, including mobile devices and smartphones, now increasingly operate in this way.

Moving some of our existing systems and services to the Cloud;

- has the potential to make services more useful and engaging;
- can break down barriers encountered with older systems, such as remote access;
- can lead to a cost saving;
- can be more secure.

Many staff, pupils and their families will already be experiencing the benefits of having made the move to the Cloud. They will now expect this kind of service in all aspects of their lives.

The school is already using some Cloud-based services, such as:

- communication tools - including email, instant messaging, video conferencing and telephony;
- new versions of core office applications - including online collaborative versions of word processor, presentation and spreadsheet software;
- specialist applications - including HR and finance systems, management information systems (MIS) and curriculum software and content;
- back office systems - including document storage, backup, content, filtering and user and device management;
- online servers - for example, full versions of school servers hosted online and managed over the internet.

Some organisations have everything in the Cloud with a server free solution. For others, a ‘hybrid’ approach is more suitable, with a mix of Cloud and locally hosted systems or services. A suitability assessment for each solution or service needs to be undertaken to decide what is best for the school.

Moving to the Cloud should be gradual, well planned and managed. It should be specific to the School’s requirements and should be reviewed periodically to ensure continued alignment to any changes to the requirements of the school.

7.1. Benefits of Moving to the Cloud

Economy - saving money

Moving to Cloud-based services can reduce costs by:

- reducing licence costs – leading technology providers offer free-to-use Cloud services, including communication tools and core office applications;
- using Cloud only user devices – cost effective and reliable devices, designed to link directly to Cloud applications, are widely available and usually cheaper than the systems they replace;
- using pay as you go services – some Cloud-based services are charged on a pay as you go basis;
- saving money on the energy required to run and cool on-site servers.

Cloud-based services could also help financial planning:

- predictable annual subscriptions;
- reduction in capital refresh costs - for example, reducing the need to replace old servers;
- the need to replace 'Cloud only' devices less often, it may extend the lifespan of older devices.

Efficiency – saving teachers' time

Moving to Cloud-based services can:

- give staff the flexibility to access services from wherever they are, using the devices that are most convenient for them;
- support collaboration by helping staff to easily share and co-author documents, files, lesson content and plans – reducing duplication of effort;
- make it easier for teachers and pupils to research, analyse and use new curriculum resources;
- reduce the time it takes to access data and applications anywhere, due to faster log in times.

Effectiveness – what you can do

Moving to Cloud-based services can make it easier to access applications and content, wherever there is an internet connection:

- reducing the workload of local technical support teams, as applications can be automatically updated and managed;
- mitigating the risk of files and data being lost.

It could also support flexible working as your data can be accessed remotely and securely at any time.

7.2. Moving Brook Community Primary School to the Cloud

7.2.a. How are we using the Cloud already?

- what Cloud-based services does the school already use?
- whether staff, pupils or parents are using unofficial services, where the school does not currently have a Cloud-based service
- are we using existing services to their full potential?
- current mix of old and new systems
- what benefits have been seen by using these services – such as efficiency, access, security and online safety?

7.2.b. Could we use more Cloud-based services?

- what other functions could be used in the Cloud?
- how would this functionality be introduced to teachers and pupils?
- how using Cloud-based services supports the school overall strategy;
- whether you need a Cloud champion to support the school's strategy;
- how much could be saved and how to reinvest it.

7.2.c. Does Brook Community Primary School have the right infrastructure?

- Is the current internet connection sufficient? – NO, a full fibre connection is required.
- Does the school network offer the right level of connectivity? – Both wired and wireless infrastructure need attention.

Both can act as a single point of failure. The LAN infrastructure and the WAN connectivity need addressing to ensure they are reliable to provide the increased performance needed, if Brook Community Primary School wants to consider a move to the Cloud.

8. Using technology more effectively:

In April 2019, Department for Education published a strategy entitled “Realising the potential of technology in education: - A strategy for education providers and the technology industry”. In this strategy it states that:

“*Technology works best in education when strategically introduced by skilled, and confident staff. The best leaders place a strong focus on how technology can improve processes and teaching, they build digital capability amongst their staff and achieve good value for money through their procurement. We know however that many leaders can struggle to know where to start with technology; they may be experts in education but are often not experts in digital technology. The same is true for teachers – we know that confidence and willingness are among the main barriers to adopting digital technologies, and that ensuring teachers have adequate training available is often the biggest challenge*.”

8.1. Technology @ Brook Community Primary School

Brook Community Primary School is fortunate to have Leaders and Techers who are skilled and confident with a focus and understanding of how technology can improve processing, teaching and provide good value for money.

The Technology Leadership Team comprises of:

- The Headteacher
- Head of Computing
- Business Manager
- A Member of the Board of Governors
- An independent ICT Consultant

Together they have a common understanding of the ICT vision, the Strategy defined to achieve the vision and the change challenges that need to be overcome to transform Brook Community Primary School to an exemplarof technology implementation and integration in the School.

9. Protecting our School's data:

9.1. Department for Education defined areas of Data Protection Act

Below are the Department for Education defined 7 key areas that schools need to address under the Data Protection Act (DPA). Brook Community Primary School intends to adhere to these guidelines and any and all amendments or iterations due to GDPR, EU Exit and any future changes to the DfE guidance.

1. Overarching legal requirements

Schools should ensure that their personal data is processed in compliance with the DPA.

2. Data processing

Schools, as data controllers, have a responsibility to ensure that the processing carried out by their Cloud service provider complies with the DPA. The best way to do this is to have a contract and a data processing agreement in place.

3. Data confidentiality

When choosing a Cloud service provider schools should select a data processor providing sufficient guarantees about the technical and organisational security measures governing the processing to be carried out and must take reasonable steps to ensure compliance with those measures.

4. Data integrity

Data integrity has been defined as "the property that data is authentic and has not been maliciously or accidentally altered during processing, storage or transmission". To assist schools in understanding if the Cloud service being provided by a particular company is likely to comply with the DPA in relation to data integrity, suppliers will be asked to confirm their compliance.

5. Service availability

Service availability means ensuring timely and reliable access to personal data. One threat to availability in the Cloud which is often outside the responsibility of the Cloud service provider is the accidental loss of network connectivity between the client and the service provider. Data controllers should therefore check whether they have adopted reasonable measures to cope with the risk of disruptions such as backup internet network links. Data controllers should also assess the level of risk and whether the school is prepared to accept that risk.

6. Data transfers beyond the European Economic Area (EEA)

To assist schools in understanding whether the Cloud service being provided by a particular company is likely to comply with the DPA in relation to permitted transfers of personal data beyond the EEA, suppliers will be asked to confirm they meet the requirements of the DPA.

7. Use of advertising

Recognising the particularly sensitive nature of the data likely to be processed in a Cloud service aimed at schools, there is particular concern in relation to the use of advertising and the extent of data mining which providers of Cloud-based services may adopt in relation to user data.
To assist schools in understanding if the Cloud service being provided by a particular company will involve serving advertisements or engaging in advertisement-related data mining or advertisement-related profiling activities, suppliers will be asked to confirm their policy.

ICO guidance states:
"In order to target advertisements, the Cloud provider will need access to the personal data of Cloud users. A Cloud provider may not process the personal data it processes for its own advertising purposes unless this has been authorised by the Cloud customer and the Cloud customer has explained this processing to Cloud users. Remember that individuals have a right to prevent their personal data being used for the purpose of direct marketing".

So, the school would have to agree to the advertising and then would have a duty to explain to staff and pupils what personal data would be collected, how it will be used and by whom, and what control they have over the use of their data in this way.

As there are obvious difficulties with schools deciding if children are competent enough to understand any explanation of their data being used for advertising, and to understand and exercise their right to object, without parental involvement it would seem sensible to avoid this in solutions for schools, especially where children are concerned.

9.2. General Data Protection Regulation (GDPR)

Brook Community Primary School may need to update policies for managing personal data as changes are made to infrastructure, and services are moved to the Cloud.

The data protection toolkit for schools includes more information.

9.3. Using technology in education

Department for Education has published the following collection of guidance for schools looking to move to the Cloud.
Guidance and support for education providers who want to increase their use of EdTech.

9.4. Cloud Security Principles

The National Cyber Security Centre (NCSC) have published the following 14 Cloud Security Principles. Brook Community Primary School will follow these principles for any Cloud services they decide to implement. More detail can be found by using the Hyperlink heading for each principle.

1. Data in transit protection

User data transiting networks should be adequately protected against tampering and eavesdropping.

2. Asset protection and resilience

User data, and the assets storing or processing it, should be protected against physical tampering, loss, damage or seizure.

3. Separation between users

A malicious or compromised user of the service should not be able to affect the service or data of another.

4. Governance framework

The service provider should have a security governance framework which coordinates and directs its management of the service and information within it. Any technical controls deployed outside of this framework will be fundamentally undermined.

5. Operational security

The service needs to be operated and managed securely in order to impede, detect or prevent attacks. Good operational security should not require complex, bureaucratic, time consuming or expensive processes.

6. Personnel security

Where service provider personnel have access to your data and systems you need a high degree of confidence in their trustworthiness. Thorough screening, supported by adequate training, reduces the likelihood of accidental or malicious compromise by service provider personnel.

7. Secure development

Services should be designed and developed to identify and mitigate threats to their security. Those which aren't may be vulnerable to security issues which could compromise your data, cause loss of service or enable other malicious activity.

8. Supply chain security

The service provider should ensure that its supply chain satisfactorily supports all the security principles which the service claims to implement.

9. Secure user management

Your provider should make the tools available for you to securely manage your use of their service. Management interfaces and procedures are a vital part of the security barrier, preventing unauthorised access and alteration of your resources, applications and data.

10. Identity and authentication

All access to service interfaces should be constrained to authenticated and authorised individuals.

11. External interface protection

All external or less trusted interfaces of the service should be identified and appropriately defended.

12. Secure service administration

Systems used for administration of a Cloud service will have highly privileged access to that service. Their compromise would have significant impact, including the means to bypass security controls and steal or manipulate large volumes of data.

13. Audit information for users

You should be provided with the audit records needed to monitor access to your service and the data held within it. The type of audit information available to you will have a direct impact on your ability to detect and respond to inappropriate or malicious activity within reasonable timescales.

14. Secure use of the service

The security of Cloud services and the data held within them can be undermined if you use the service poorly. Consequently, you will have certain responsibilities when using the service for your data to be adequately protected.

10. Our approach to Technology and Service procurement:

10.1. The DfE "Schools' buying strategy

> *"Each year, schools in England spend around £10bn of non-staff costs, including £470 million on software and hardware for learning. Colleges spend £140 million a year on technology. However, due to the nature of school and college accounting, we believe that schools and colleges are spending far more than these figures imply, including for example spend on ICT by schools to support school administration. "*

The following is taken from the "DfE strategy Supporting effective procurement"

DfE have developed recommended buying deals for schools, so they can get cheaper prices through pre-negotiated contracts for a wide range of products and services, including education technology. This includes 7 different endorsed ICT deals covering a wide range of technology products and services.

One of the 7 ICT deals, a deal known as 'the G-Cloud deal', which is available through the government Digital Marketplace platform, is helpful for schools that want to purchase either Cloud-based technology that is not included in standard buying catalogues, or Cloud support to help move information and services to the Cloud or provide ongoing support. Further guidance on the G-Cloud framework is available at www.gov.uk/ the digital. We assess and refresh the list of recommended deals on a regular basis, working with partners and schools to continuously improve the offering.

The buying deals and procurement guidance are available from The Buying for Schools Gov.UK page. Further developments are being planned to make it easier for schools to use our deals. DfE are also taking steps to assess the benefits of existing buying catalogues and will consider how to signpost the best products from these catalogues.

DfE understand that knowing what technology to buy to address an education provider's needs is often a challenge. They have been working with the British Educational Suppliers Association to support a trial of their LendED service, an ***online lending library for EdTech software*** *where educators can try products before they buy. This service will enable schools, colleges and other providers to access information about a wide range of products, read user reviews and try out products for free. The service already has well over 150 products and services available for educators to view, compare and try.*

DfE are exploring how to facilitate a better online marketplace for EdTech, to help schools and other providers connect with a wide range of trusted, quality products. This will ensure that they are able to draw on the opinions and experiences of their peers, achieve value for money and help to buy products and services quickly and effectively.

DfE are also ***trialling an offer of independent and tailored buying advice*** *through Buying Hubs in the South West and the North West of England, which includes testing a service to directly manage procurement for schools. The aim of the pilots is to test models for potential national roll-out.*

DfE also directly engages with local School Business Manager Networks to increase awareness of our work to improve procurement practices across the school system.

Source, DfE strategy Supporting effective procurement.

10.2. Brook CP School's Approach to Procurement.

Brook Community Primary School's approach to future procurement of technology and service will be guided by DfE strategy and guidance, making use of pre-arranged deals, frameworks and G-Cloud marketplace to ensure value for money.

11. Roadmaps

The strategic goals and initiatives outlined in this strategy will help achieve our Vision, the technology and Systems roadmaps outline our implementation plans and ensure that technology and infrastructure investments will meet the short-term and long-term goals of the school.

11.1. Technology roadmap

A technology roadmap (also known as an IT roadmap) is a visual representation of the plan for technology initiatives. A technology roadmap typically outlines when, why, and what technology solutions will be implemented to help the school move forward while avoiding costly mistakes.

11.2. Operational IT systems roadmap

An IT systems roadmap identifies the systems that enable core capabilities. It outlines current capabilities, future needs, and the improvements planned in order to reach our strategic goals.

11.3. Brook Community Primary School Roadmaps

Both of the above mentioned Roadmaps are currently in development and will be published as independent documents and added to this strategy as an Annex once finalised.