Framework for

ICT Technical Support

Becta
ICT Advice

FITS Introduction

FITS Introduction Contents

Key

Glossary term: Glossary term
Cross reference: Cross reference

Becta ICT Advice

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FITS Introduction

FITS 1 What is FITS?

FITS stands for Framework for ICT Technical Support and it is based on the IT Infrastructure Library (ITIL).

ITIL is derived from the collective experiences of ICT technical support providers all over the UK. It represents their learning curve over the last 20 years and has been distilled into a set of common processes applicable to any establishment using ICT. We have applied them to schools, and FITS is designed to enable you to by-pass all the mistakes commonly made and implement the processes successfully from the start.

The emphasis of FITS is on proactive tasks as well as reactive ones. It views technical support not just as a function responsible for resolving incidents, but as a service provider whose main objective is to prevent incidents from occurring in the first place. We see this as the ultimate goal of technical support and we aim to help you make it happen.

There are many benefits of FITS. Here are just a few.

- gives you the benefit of hindsight over the last 20-plus years of the development of ICT technical support techniques.
- It contains tried and tested processes that have been adapted with the school environment in mind.
- It provides simplified and ready to use processes that can be used immediately.
- It contains templates, checklists and downloads that can be used as they are or personalised.
- It has a quick-start approach to help you make the best use of time and resources available and see quick results.
- It separates administrative tasks and technical tasks to help you assign the most appropriate resources.
- It helps you keep costs to a minimum.
- It helps you protect teachers from having to get too involved in technical support issues.
- It helps you measure technical support as shown in our example service report (see Appendix A).

This section is for the technical and non-technical alike and aims to promote a common understanding of the meaning and requirements of technical support. Please encourage all of those involved in ICT provision to join us in this groundbreaking venture and help you implement best-practice technical support methods in your own school.

FITS 2 Quick start

We recommend that you begin by reading FTS 3 Full overview of FITS, FITS 4 Approach to implementing FITS and FITS 5 Implementation of FITS, but if you want to go straight to the process guides, here is the full list.

- Service Desk
- Incident Management
- Problem Management
- Change Management
- Configuration Management
- Release Management
- Availability and Capacity Management*
- Service Level Management
- Service Continuity Management
- Financial Management

* Includes Preventative Maintenance and Network Monitoring

FITS 3 Full overview of FITS

In FITS there are 10 main process topics, each covering a different area of best-practice technical support and each with a complete and separate set of material devoted to it. However, there are inter-dependencies between them and common 'best practice' themes across them all. We would also like to demonstrate to you that these processes could help you outside the ICT arena, so that you might consider this before embarking on implementation.

Whilst the FITS processes are presented separately, they are most effectively implemented in a structured way. We aim to advise you on how to implement these processes in a controlled and successful manner, acknowledging the fact that you are likely to have limited resources. We therefore recommend that, before starting, you read FITS 4 Approach to implementing FITS and FITS 5 Implementation of FITS.

FITS 3.1

What are the themes of 'best practice'?

A number of common themes characterise best practice:

- repeatable processes
- project management
- consistency
- customer care
- communication.

In technical support each of these contributes to a quality service.

FITS 3.1.1 Repeatable processes

Repeatable processes	Benefits
An efficient and effective way of performing the same or similar tasks a number of times without unnecessary variation – for example: • handling computer incidents • planning technical changes • building a computer operating system.	Simplified training for those carrying out the tasks • Time not spent 'reinventing the wheel' • Reduction in incidents caused by installations being carried out in a different way each time

FITS 3.1.2 Project management

Project management	Benefits
A method for managing all projects to be used in all aspects of best practice – for example: • in the implementation of best-practice processes themselves • within the context of the processes when implementing ICT systems or planning change.	• Clear objectives are set at the outset of the project. • Timescales and budgets are set and adhered to. • The planning is consistent. • Relevant parties are communicated with.

FITS 3.1.3 Consistency

Consistency	Benefits
A common and reliable approach achieved through having repeatable processes and a standard project management method. It should apply to all things – for example: • the questions asked of a user reporting an incident • the rigorousness of testing before the release of a new product • the type and frequency of data collected for measurements and reports • the regularity of reports.	• It creates a professional image. • Users know what to expect each time they use technical support. • Consistency is easier to manage than inconsistency.

FITS 3.1.4 Customer care

Customer care	Benefits
Empathy with end-users and their needs achieved through good communication and understanding from their perspective. Remember that: • ICT is a means to an end, not an end itself • ICT is not as important as its purpose • ICT is different things to different people • one person's minor printer problem is another person's crisis.	• Properly focused technical support • Priorities that are important to the school as a whole • A productive and successful school • Happy users • Happy technicians!

Communication	Benefits
You need a free flow of information between all parties, so there must be communication between: • ICT/technical support staff and those in charge of the school • ICT/technical support staff and users • ICT/technical support staff and suppliers • ICT/technical support staff and their colleagues. For examples of communication, see below.	• Mutual understanding between users and technical support • Mutual understanding within technical support • Ability in technical support to present a unified, knowledgeable front • Customer focus and care
Tools can be used to aid communication – for example: • a shared log of incidents • email to circulate notification of technical change and downtime of systems • user documentation published to communicate standard procedure information.	• Anyone with access to shared systems can provide a user with a status update. • Email is a fast way of communicating with a number of people at once. • User documentation can be created once and used often.

Examples of communication

There are many things to communicate, for example:

Communication topic	Between
The occurance of an incident in the classroom	ICT user – technical support
The status of a reported incident and estimated time to fix	Technical support – ICT user
The impact of a technical change scheduled to take place later in the week	Technical support – all ICT users
The addition of 10 new computers to the overall hardware maintenance requirement	Technical support – supplier
The strategic need to implement a new suite of equipment to meet curriculum requirements	School management/headteacher – ICT
The procedure for logging incidents and what the technical support function can and can't do	Technical support – all ICT users

FITS 3.2

What are the FITS processes?

The FITS processes are listed below and match in name and definition the processes of the IT Infrastructure Library. We have adapted the processes themselves to form a manageable and relevant set of procedures that are ready to be implemented in schools.

Service Desk	The single point of contact within the school for all users of ICT and the services provided by technical support. 
Incident Management	To detect, diagnose and resolve ICT incidents as quickly as possible and minimise their adverse impact on normal operation. 
Problem Management	The detection of the underlying causes of incidents and their resolution and prevention. 
Change Management	The managed and recorded introduction of changes to hardware, software, services or documentation to minimise disruption to ICT operation and maintain accurate configuration information. 
Configuration Management	Implementing and maintaining up-to-date records of ICT hardware, software, services and documentation and showing the relationships between them. 
Release Management	To plan, test and manage the successful implementation of software and hardware. To define release policy and to ensure that master copies of all software are secured centrally. 
Availability and Capacity Management	To ensure that ICT services are available for use consistently as agreed. To ensure that all ICT processing and storage capacity provision match present and evolving needs. 
Service Level Management	The process of defining, agreeing and documenting required service levels and ensuring that these levels are met. 
Service Continuity Management	To minimise the impact on ICT service of an environmental disaster and put in place and communicate a plan for recovery. 
Financial Management	To ensure that the ICT and technical resources are implemented and managed in a cost effective way. 

FITS 3.3

What value can be added to the processes?

Added value is the extra benefit that the technical support function can provide that may be outside the arena of ICT. It is important to consider what added value may be possible in order to reveal potential cost savings overall. The possibility of adding value may help to justify the effort and cost required to implement best-practice processes.

Much of FITS can be applied to services outside ICT and extending them to other areas minimises the number of different processes in use in the school and provides a simplified, central service for users.

Process	Application	Benefits
Service Desk	A service desk or central point of contact need not be restricted to taking calls for computer support only – it could be used as a point of contact for all services – for example: • reporting faults on non-ICT equipment • furniture requirements • ordering stationery supplies	• The cost of a call logging system could be spread across all services, not just ICT incident logging. • Data from the system could be used to report the performance of all suppliers, not just those responsible for ICT.
Change Management	The concept of change management is just as valid outside the ICT area. All changes have some potential impact on day-to-day operations – for example: • electrical testing may affect the power supply to the entire school • building works may affect the kitchen's ability to provide meals for pupils and staff.	• The same methods of planning, approval and communication are used for all changes, not just ICT ones. • There is only one process to learn.
Service Level Management	Service level agreements need not apply only to the provision of ICT services but could be used to define and monitor all services provided either internally or externally – for example: • a heating maintenance company's response time and performance • the adequacy of sports ground maintenance.	• The cost of implementing Service Level Management may be spread across more departments. • The effort taken to implement it yields a greater return. • Service level management principles are applied to all services, not just ICT.

Pooling resources with another service-providing department and considering the possibility of cross training may enable the school to make better use of existing resources. Look for similarities and suggest ways of combining ICT with other services.

FITS 4 Approach to implementing FITS

In our experience, ICT technical support departments have little free time to spend on implementing processes and procedures because day-to-day activities are unpredictable and must take priority.

Our aim is to help you begin to remove some of the unpredictability by introducing best-practice processes in small steps and so begin to realise the benefits as quickly as possible with the minimum impact on your normal activities.

Each section takes a standard approach. It is also important to remember that there are some key success factors when attempting to implement processes like these.

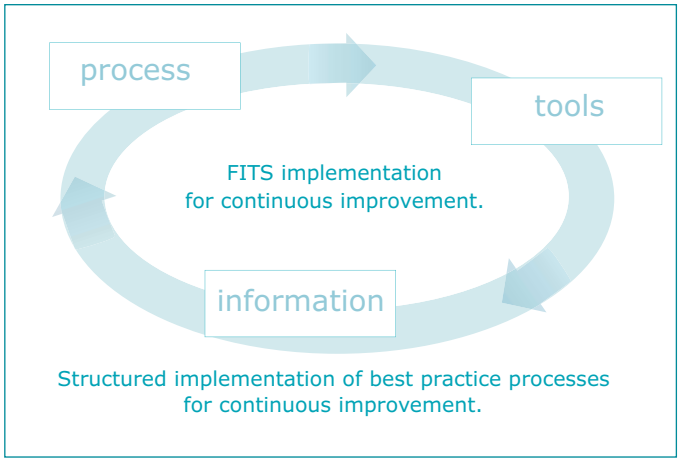
FITS 4.1

Cyclic implementation

We believe that a cyclic approach is beneficial, as it enables you to build solid foundations on which to develop your processes without spending an unrealistic amount of time on getting started. We have used our collective experience to apply the lessons we have learned over many years to develop this approach for schools to help them to implement successful best practice from the outset.

The first edition of our material is available now and each section defines the steps we believe are sufficient for you to introduce best practice in each of the processes in your school.

The cyclic approach is illustrated in the FITS Implementation Approach diagram below:



The FITS ethic is 'keep it simple'. FITS also promotes a cyclic approach to its implementation: start small and make continuous improvements.

This first set of material introduces the processes with easy to follow instructions and simple tools to use. When you have implemented the processes, you will use the tools to gather information to make further improvements and thus enter the next cycle.

This process of refinement allows you to implement best practice in manageable, bite-size pieces. You will therefore reap the benefits from an early stage and not be overwhelmed by extra work.

FITS 4.2 Standard format for each process

The content of each section is similar:

Introduction to process	• Aim and objectives	**Operations guide for process**	• Operations resources
Overview of process	• What it is • Why use it • Who uses it • How it works • What it costs	**Roles and responsibilities for process**	• Details of all roles
Implementation guide for process	• Defining what needs to be done • Preparing to implement • Implementing • Reviewing the implementation • Implementation resources	**Toolkit for process**	• Tools • Examples • Templates • Checklists • Links
Operations guide for process	• What needs to be done • When it needs doing • Measurements • Operations resources	**Review of process**	• Recap of process • Checklist

FITS 4.3 Critical success factors

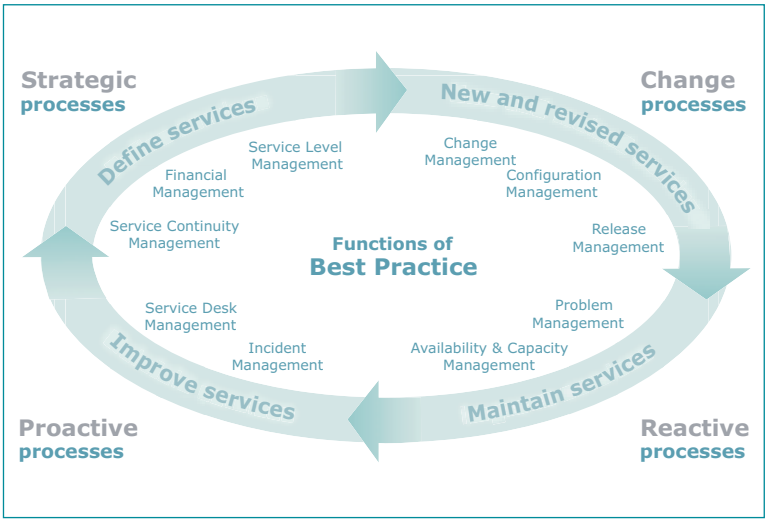
General guidelines for implementing best practice processes:

Get support	Get the support of your managers, teachers and headteacher before starting to implement processes – you will need their backing to make them enforceable and they will appreciate being involved early on.
Get buy in	Get buy in from users and of course the rest of the ICT/technical support team – they may have a useful contribution to make and will be more amenable to change if they are involved in it.
Have a strategy	Have a strategy and plan your implementation for suitable times – discuss your plan with managers, teachers and headteacher.
Have a campaign	Have a communication and publicity campaign to keep all affected parties such as users, suppliers or school managers, informed – build up their enthusiasm and ease live implementation.

Keep it short	Don't try to do too much at once – take one process at a time and make it work well before moving on to the next one.
Keep it simple	Try out a process using one or two people before launching it across the whole school – it will make wider implementation much easier.
Be realistic	Be realistic about what is achievable – it takes time for processes to show results and make improvements – don't expect instant solutions.
Allow enough time	Allow enough time for participants to learn the new processes and get used to them – they need to become habit and this takes time.
Measure it	Start to take measurements and produce reports as early as possible so that you can demonstrate progress and maintain motivation.
Don't give up!	If a process takes too long to show results or isn't working, don't be deterred. Try again – letting things slip back to old ways won't solve anything.

FITS 5 Implementation of FITS

We have grouped the processes together under four headings, to illustrate the nature of each process and where they fit into the lifecycle of technical support. These groups are:



- strategic processes
- reactive processes
- change processes
- proactive processes.

This is graphically represented in the diagram opposite

FITS 5.1 Functions of best practice

FITS 5.1.1 Where to start

As this is a renewable cycle, it should be possible to begin with any process. However, depending upon the maturity of your ICT and technical support implementation, there are appropriate places to start to maximise the chance of success. We have suggested below a recommended implementation path depending upon your current status – one for those who already have some ICT in place and are providing a level of technical support and one for those who are implementing ICT and technical support from scratch. If you do not wish to follow these paths, you will find that specific prerequisites are highlighted in each process so you should not feel restricted to these options only.

FITS 5.1.1.1 Recommended path for established technical support and/or ICT functions

Reactive processes	Address reactive processes first, as there is always a reactive workload. Any improvements that can be made in the handling of this workload will help free up time to focus on the proactive processes.
Proactive and change processes	Implement proactive and change processes with each other in mind because they are largely interdependent.
Strategic processes	Implement strategic processes as is convenient. They can be considered at any time independent of the day-to-day technical support already in place.

Suggested order of process implementation for established technical support functions

1	Service Desk
2	Incident Management
3	Change Management
4	Availability and Capacity Management: Network Monitoring
5	Configuration Management
6	Availability and Capacity Management: Preventative Maintenance
7	Release Management
8	Problem Management
Any time	Service Level Management
Any time	Service Continuity Management
Any time	Financial Management

Strategic processes	Address strategic processes first, to ensure that what is implemented is in line with overall requirements and that technical support services are focused accordingly.
Change processes	Implement change processes next so that the introduction of ICT is of a high quality.
Reactive processes	Then address reactive processes to handle customer calls following the introduction of ICT services. Consider overlapping this with the implementation of the change processes to ensure that these are in place ready for the first customer calls to come in.
Proactive processes	Implement proactive processes last. The change processes already implemented should have ensured that the ICT installed is relatively problem free. However, these processes are needed to maintain quality.

Suggested order of process implementation for new ICT and technical support functions

1 Financial Management
2 Service Level Management
3 Service Continuity Management
4 Release Management
5 Change Management
6 Configuration Management
7 Service Desk
8 Incident Management
9 Availability and Capacity Management: Network Monitoring
10 Availability and Capacity Management: Preventative Maintenance
11 Problem Management

FITS 5.2 Roles and resources

When planning to implement processes, you will need to consider the role requirements and the resources available to you. Your resources may include:

- technical support staff
- ICT teaching staff
- other teaching staff
- school administrative staff
- other school staff
- suppliers
- contractors
- technical staff from other schools.

It is important to consider the available resources carefully to ensure best fit of people skills with process roles and their requirements. When assigning roles to individuals, consider similarities to other existing responsibilities and individual aptitudes and try to accommodate these.

Remember too that technical jobs are not just technical. There is an element of administration that is essential – updating records, procedures and diagrams, providing reports and updating fault logs, solutions and knowledge bases. These are vital aspects of all roles and should not be neglected.

In FITS we have kept each process separate so that you can apply each one in the way that is most suitable for each individual school. Practical suggestions for assigning roles are explored in each process section separately. There are likely to be more roles than there are people, which will mean that some roles must be combined for one person to carry out. Some roles can be combined easily, whereas some present conflicts of interest to be avoided (see FITS 5.2.1).

As a rule of thumb you will find that the roles in FITS can be defined as three types – managerial, technical and administrative. You may find it helpful to examine the roles and responsibilities section of each process before you start implementing any one. This will help you to decide in advance on the allocation of all roles and responsibilities and start with a structured team.

FITS 5.2.1

Conflicts of interest to be avoided

Combining reactive and proactive processes	The immediate response often required when resolving incidents interrupts planned and scheduled preventative work, which often falls by the wayside or is badly executed. This might be overcome by implementing a strict 'surgery-hours only' approach to incident handling or outsourcing problem management to a supplier.
Combining originator and implementer roles with approver roles in Change Management	It would be inappropriate to allow the same person to initiate and plan a change and also approve it. Approver roles could be assigned to people outside the ICT arena.

FITS 6 Understanding technical support

Technical support is the function responsible for ensuring the continued operation of ICT equipment and services. Technical support is a necessity in any organisation that is dependent on its ICT. It is not always easy to justify, but not having it is a risk.

In this section we make the case for implementing technical support and put to you some ideas and suggestions that may help to justify it as a dedicated function in schools where it may be seen as an unaffordable luxury.

FITS 6.1

Role of technical support

Those responsible for technical support should ensure that the ICT services needed by users are available when they are required and can perform the tasks required of them in a suitable manner. They are responsible for resolving incidents, but the ultimate achievement is as far as possible to prevent incidents occurring in the first place.

However, resolving incidents must take priority over all preventative work and this can often result in the whole team's rapid descent into full-time fire-fighting in order to fulfil their obligations. To improve the technical support service, those involved in

it must become proactive in order to reduce the number of incidents that they must react to. To make time to be proactive, this may mean improving methods of managing incidents.

Being proactive is a continuous cycle of identifying problems and making changes and this should provide a healthy counter-balance to incident resolving and dealing with new requests from users.

There should be a technical support strategy (see FITS 6.2) that outlines how this service will meet the requirements of the overall ICT strategy.

FITS 6.2 Technical support strategy

The technical support strategy should focus on how to deliver the ICT services that are required. What those services are should be determined by the overall ICT strategy as defined by the end-users. Technical support staff should, by all means, offer suggestions and input to the overall ICT strategy. A good relationship between those carrying out technical support (service providers) and leaders and users within the school (customers) should be as interactive as possible. Each party has its own specialisms and can contribute to the overall success of the ICT infrastructure.

Technical support strategy may include roles and responsibilities in the team, supplier selection and the development of mechanisms for handling incidents, new requirements, the testing and implementation of new software, the upgrading of hardware and the overall tracking of licences, equipment and so on. These topics are covered in the different FITS processes. A good technical support strategy will incorporate all of them.

If you are responsible for technical support strategy, here are some helpful hints.

- Technical support strategy must relate to the overall ICT strategy.
- Establish who is responsible for overall ICT strategy – this may be the headteacher or someone with delegated responsibility.
- Develop an early collaborative relationship with the person responsible for ICT strategy and encourage them to include you in the planning of future changes.
- If you are a technical support person, be proactive and suggest improvements constructively – you are well positioned to do this in a small, informal environment such as a school.
- Use the ICT strategy to define priorities for technical support
- Regularly review the technical support strategy and ensure that it remains aligned to any changes to ICT strategy.

FITS 6.3 Defining a technical support strategy

A technical support strategy should give consideration to how technical support functions will be provided. We discuss below defining the ICT services provided, the technology required and the resources you will need.

Technical support also requires some form of leadership and control to maintain the technical support strategy and ensure that the people involved keep to it.

FITS 6.3.1 What are the ICT services provided?

Services are the ICT systems that are used both in the learning environment and also to support the school's administration. It is important to understand what services are to be supported when defining the technical support strategy, as these determine the technology requirement.

Services should be defined in the overall ICT strategy. Start by finding out if there is an overall ICT strategy that includes details of the services required and planned. In

an ideal world this will have been agreed across the school and have been committed to paper – but it may be that it has developed without a paper trail or that there is no clearly defined strategy at this stage. Ask the headteacher or person responsible for ICT in the school what they have in terms of overall strategy. An ICT school development plan may give some indication of the plan.

Alternatively, if you are responsible for ICT strategy and there is none as yet, start by documenting the following important factors:

- ICT systems actually in use
- What these ICT systems are for
- Who uses them.

Use the ICT strategy or your initial information gathering to define the requirements of technical support and use this early stage in the process to build an ongoing relationship with the appropriate representatives of the users.

FITS 6.3.2

What technology is required?

Technology is the hardware and software that make up the services. It is important to understand what technology is required so that it is clear what has to be supported and what skills are required.

Technology may be defined in an overall ICT strategy or in the technical support strategy.

If technical support staff are required to determine technology requirements, they also have an opportunity to take into account what will be needed to support it. A small team must consider the impact on resources of technology selection.

Tips on planning for new technology	Tips on supporting the technology you have
• Try to select a small range of manufacturers and models to keep the technical knowledge and spares required to a minimum. • Try to select popular products that are widely supported outside the school. • Try to plan the bigger picture and consider the requirements of the whole school and the potential for sharing rather than focus on individual requirements.	• If you have a variety of different hardware and software, a third-party maintenance or support supplier can be a good option as it is likely to have the broad range of skills required. • Remember that third parties will need to be involved in any changes you plan – they will need to agree to its ongoing support and this may affect the cost. • A larger, non-specialist supplier may be a good choice if you want to redesign your infrastructure as it may have a wide range of experience and skills covering diverse equipment types. • Try to use a supplier that understands the education environment.

FITS 6.3.3

What resources are required?

Resources are the people, time and money involved in supporting the technology and the services. It is important to understand the resource requirement to assist with deciding on staffing levels and what is supported in house or by external suppliers.

The resource requirement is determined by the services and technology to be supported. In an environment where resources are limited, it is important to consider the support requirements of ICT and take this into account when developing the overall strategy for ICT services and technology. Technical support can therefore make an important contribution to the overall strategy.

Because resources are limited, it is important to consider all resourcing options, both in considering what new services and technology are required and as a result of the services and technology already implemented. These are explored in more detail in the following sections. If you have a limited amount of resource and a large amount of work, you may find our technique for resource allocation helpful (see FITS 6.3.3.6).

FITS 6.3.3.1

In-school technical support staff

Ideally a school should have some level of technical support. This may range from part-time responsibility for co-ordinating ICT requests and liaising with technical suppliers through to a team of technicians, network managers and so on.

If you have some in-school technical support staff but not enough to comfortably support everything, they should adopt the following approach.

- Concentrate on core activities – the main ICT systems in use or the most important ones – and consider outsourcing for anything else.
- Have agreed priorities of types of work such as: 1 fixing incidents, 2 installing new equipment, 3 training others in ICT.
- Avoid being spread too thinly – for example, to provide consistent levels of support, ensure that two people are both skilled across a carefully defined range rather than have two specialists who cannot provide cover for each other. If specialisms are unavoidable, ensure that these apply to non-core activities.

FITS 6.3.3.2

Involving the rest of the school in technical support

The rest of the school can take part in technical support and this may be a way of agreeing ways of providing support for diverse equipment or filtering the resolution of incidents.

Here are some of the things that, if appropriate, the rest of the school can become involved in.

Being a 'super-user'	A network of general super-users can provide a level of logging, filtering and resolving of incidents and requests. This can help to create a virtual helpdesk and can be particularly useful in schools with multiple buildings or sites.
Being a 'specialist'	A one-off piece of equipment used only by the science department may be best supported by the science department.
Being a 'technical author'	If training teachers or pupils in the use of software is part of your responsibility, you may be able to share the workload by asking your students to write 'How to…' guides to help other users. It will help them consolidate their own learning too.

FITS 6.3.3.3

Collaborating and sharing resources with other schools

Other schools can be a useful source of additional resources and it may be possible to create a mutually beneficial relationship.

Here are some of the possibilities:

- collaborating with other schools in the area to create a virtual ICT technical support team
- collaborating with other schools to create a virtual service desk
- collaborating with other schools to share bought-in technical support services
- sharing spares and storage spaces with local schools

- providing off-site storage for back-up tapes for each other
- agreeing to provide loan equipment or temporary space for each other in an emergency
- developing a technical support strategy with other schools.

Don't forget that it is easy for disagreements and misunderstandings to arise, though, especially when money is involved. It will be necessary to reach formal agreement on some of these.

FITS 6.3.3.4

Using suppliers for technical support

Suppliers will always be required for the purchase of hardware and software. They can also be a useful source of technical knowledge about the products they sell or they may provide specialist technical support services.

Suppliers can be useful for providing a number of services.

Contracting out	Contracting out some services entirely on a permanent basis may be an option. This removes the need for any participation in the process by the school and might be applied to asset management, for example.
Outsourcing	Outsourcing of technical support is really a partial contracting out – you still need to use the ICT equipment yourself and you are dependent on the level of service provided by the outsource company. This needs to be carefully managed.
Support or maintenance contracts	Entering into third-party contracts for support or maintenance can be cost effective for specialist equipment or services.
Temporary services	Filling of temporary requirements using bought-in services, for example holiday cover or a temporary need, can be a costly solution if it becomes a full-time requirement but can provide cost-effective flexibility when needed.
Consultancy	Consultancy should be kept for one-off exercises such as the setting up of new equipment or the installation of software.

Getting the best from suppliers

Cultivate your suppliers and get the best from them. The table below shows how you might do this.

Build good relationships	If you build a good rapport with suppliers, you may be able to use their knowledge from time to time as a third-level resource.
Provide good documentation	If your suppliers support your systems, good technical documentation will endear you to them. Ask them what they need.
Give enough notice	Make sure you know how much lead-time your suppliers need to meet your requirements. Don't spring things on them – ask them how long they need.

Transfer skills	Enhance local knowledge and free up your supplier's time by asking them to transfer appropriate skills to your own staff. Be realistic about what is possible, though. In-house staff need to have time to assume additional tasks or roles and trying to acquire all skills internally may be counter-productive if core services are neglected as a result.
Ask their advice	If you are planning changes to your ICT, ask your supplier(s) for their technical advice. They may have important knowledge to share, but remember to stay in control when it comes to purchasing.
Establish a common understanding	Help to ensure a common understanding of agreements by producing a 'working practices' document. This should be a document describing in plain English the expectations of all parties, which removes assumptions in the day-to-day working relationship.
Benefit from their experience	Talk to suppliers about any processes you are considering implementing, such as change management, if they are responsible for making the ICT changes on your network – they may be able to extend their own processes to you.
Be professional	Ensure that the right level of formality exists between the school and the supplier. If they provide you with an ongoing service, contracts need to be in place.
Welcome them	Help to build familiarity between technical support supplier representatives and school staff by accompanying new technicians, introducing them to key staff and ensuring that they have what they need.

FITS 6.3.3.5

Other resources

Solutions to limited resources do not have to be people oriented. A little lateral thinking can generate some alternative ways to spread responsibility for technical support. The table below suggests some possibilities.

Spares	Consider the cost of some spares versus the cost of a fast-response support contract. It may be cheaper to swap out faulty equipment so that you have longer in which to fix it.
Documentation	Help users to help themselves by producing a user handbook giving simple diagnostic techniques and instructions for non-technical tasks such as changing a toner cartridge in a printer. This is explored in more detail in FITS 7 Tools for technical support.

FITS 6.3.3.6

Technique for resource allocation

The following technique can be used to allocate resources to tasks.

Step 1	Identify all the tasks to be carried out in a given period such as a school term.
Step 2	Estimate the person-time required for each task.
Step 3	List the tasks in priority order and note the amount of person-time required alongside.
Step 4	Calculate the amount of person-time available in the given period. This is the number of people available x number of hours available.
Step 5	Starting at the top of the list of tasks, accumulate the person-time required until the total matches the person-time available. Anything beyond this point is unachievable.

Keep the list up to date with new requirements and review priorities regularly.

You can download from the FITS website a resource allocation template (see Appendix B) for this technique.

FITS 6.4 Management of technical support

Technical support requires some level of management. In schools this may be carried out by a hands-on technician, or it may be carried out by a non-technical person responsible for managing internal or external technical resources.

The principles in FITS will help manage ICT technical support in the most efficient and effective way possible, because the processes are repeatable and help to make best use of limited resources.

FITS 6.4.1

Technical management – advantages and disadvantages

Advantages	Disadvantages
A technical manager will have a better grasp of technical issues and their implications and is able to represent the technical needs of support to the rest of the school.	The range of skills required is broad, as good management skills are required as well as technical skills.
Having a technical manager enables a more flexible workforce, as the manager can readily fill the breach in a technical emergency if no one else is available.	A technical manager may have a conflict of interest. For example, they may get too involved in resolving technical issues at the expense of management duties such as overall co-ordination of workload and communication with customers.
A technical manager may work closely with other technicians and may have a good understanding of what is happening in the team, what people are doing, what the real issues are and what processes and procedures are being followed or not being followed.	A technical manager may be prone to using technical jargon, which may alienate users.

FITS 6.4.2

Non-technical management – advantages and disadvantages

Advantages	Disadvantages
A non-technical manager can ensure that technical matters are expressed to the rest of the school in non-technical terms and therefore improve communication	A non-technical manager is unable to carry out technical tasks and help out in the event of a major problem or absence of technical staff.
A non-technical manager can remain focused on the management of processes and issues and not get drawn into trying to resolve technical matters.	A non-technical manager is more removed from the technical issues themselves and may be less likely to pick up on issues that technicians may have in relation to processes and procedures and customer needs.
A non-technical manager is likely to view ICT in terms of service requirements rather than technical requirements, so may have a clear view of the users' needs	A non-technical manager may find it difficult to communicate technical needs and become a barrier in discussing them with other school staff or suppliers.

FITS 6.4.3

Processes

A process is a chain of events starting with an input and ending with an output. For example, the actions of identifying, logging, investigating, diagnosing and resolving an incident on a computer comprise a process. You could have a slightly different process each time if the tasks required are in your head, but it is more efficient and effective if your process is the same each time. A good process is simple, with no unnecessary steps, forms or handovers. Administration should not take more time than the job itself!

There are a number of processes involved in providing technical support. Some are reactive and deal with incidents as they occur. Some are proactive and are aimed at preventing incidents in the first place or generally improving the service. FITS contains all the processes you need for efficient and effective technical support.

The FITS processes are based upon the IT Infrastructure Library (ITIL) processes and have been tailored so that they are more directly relevant to providing technical support in schools. We have kept each process separate so that you can apply each one in the way that is most suitable for your school. Once you have implemented a FITS process, though, it becomes your process. Each process must have an owner who is responsible for making sure that it is followed and that any changes to it are approved.

It is a good idea to include the implementation of processes in the technical support strategy for your school. This can be developed from year to year to make continuous improvement.

FITS 7 Tools for technical support

Tools are the software, techniques, equipment and information that you can use to help provide good technical support.

You can buy some that are ready to use immediately or configurable to your requirements. Some are manual techniques for you to follow; some are for you to create yourself. We have categorised them as follows:

- general tools
- process tools
- knowledge bases
- specialist tools.

FITS 7.1 General tools

General tools include:

- communication aids, such as the telephone and email
- tools to create documentation such as word-processing software
- tools to create calculations or reports and graphs such as spreadsheet software
- tools to create databases such as database software.

These are basic tools and require application to the task of technical support. We have done this for you throughout the FITS processes and made them available to you as downloads.

FITS 7.2 Process tools

Process tools can be used to help support the processes and make the task of technical support easier to manage.

Example process tools

- Software to manage the logging and resolution of incidents and requests
- Software to manage the workflow of change management
- Software to record configuration and asset details
- Software to generate reports to monitor workload and performance
- Service desk telephone systems

These tools do not replace processes: they merely automate them. The tools do not instantly improve technical support but are designed to streamline and speed up the management of the processes. The tools gather data and can generate reports but the reports must then be interpreted and decisions taken to make a difference to the quality of technical support.

Process tools tend to be expensive and expectations of their benefits are usually high. Purchasers of process tools often expect reduced costs and quick results. Implemented properly, they should improve the operation of processes and by speeding them up enable fewer staff to accomplish more than may have been previously possible. However, these benefits take time to realise and reduced costs, if there are any, will be a long way down the line.

Before you buy expensive process tools, make sure that your processes work and are familiar to all participants. If you automate a chaotic process you will only speed up chaos. Also some degree of expertise is required to implement complex process tools and there are no short cuts. They need to be planned and tested no matter how big or small the implementation is. Beware of the hidden cost!

We recommend in the first instance that you use the FITS process tools that we have created especially for use with FITS.

FITS 7.2.1 FITS process tools

To get you started, we have created some basic process tools using office automation tools that you should already have access to. These include, for example:

- spreadsheets and databases for recording data
- templates for call logging and change requests
- checklists of tasks to perform
- graphical reports for data entry.

We recommend that, in keeping with the FITS approach, you use these simple tools in the first instance to implement basic processes and then review and refine them in phases. You will find them in a separate tools section within each FITS process and they are referenced at the relevant points in each implementation and operations guide.

FITS 7.3 Knowledge bases

Knowledge bases can be bought ready made or they can be created in house.

Examples of ready-made knowledge bases

- Technical support databases about specific products
- Computer-based training products

Examples of in-house knowledge bases

- Technical support database about the infrastructure configuration
- Technical support documentation
- User documentation

An example of user documentation to create where resources are limited is a user handbook (see FITS 7.3.1). This provides a source of information to help users to help themselves and to answer frequently-asked questions without taking up valuable technical support time. Another useful user document is the technical support charter (see FITS 7.3.2), which can be used to set user expectation and is easy to put together and issue.

FITS 7.3.1 User handbook

A user handbook will, of course, be different in every school so it is something that you would have to create locally, but we have put together some guidelines on how to do this and what to include.

A user handbook is easy to implement and easy to become useless. Follow our suggestions for a successful user handbook that saves valuable time both for technical support staff and for users.

- Content
- Design tips
- Publication
- Marketing
- Managing it

Content

Here are some ideas of what you could include in a user handbook. Don't try to include everything. Just consider those items that will make a big difference in your school, and leave out the less significant. Ask yourself 'What are the frequently asked questions?'

Introduction	State the reason for publication and the purpose.
Services	List ICT systems in use, including specialist equipment such as interactive whiteboard or colour printer. Describe what and where they are.
Procedures	Give instructions for logging calls, borrowing equipment, ordering consumables, etc.
Checklists	Include diagnostic checklist for self-help on incidents, etc.
Incident management information	Include details of call logging priorities and examples of how priorities will be assigned, target resolution times, etc.
Contact information	List service desk telephone number, escalation or emergency telephone numbers, etc.
Sample forms	Include a sample incident/request sheet.
User guides	Describe how to use certain equipment, how to install consumables, etc.
Security policy	Outline password regulations, authorisations required, user responsibility for equipment, etc.
User obligations	Describe user responsibilities such as care of equipment, not installing personal software, not moving equipment without authorisation, etc
Training information	Outline details of internal or external courses.
Added value	Add value by including items not directly related to ICT, for example fire procedures or building and administration services information.

Design tips

Name it	Give it a good name so that it can be referred to and is remembered easily. 'Self-help IT handbook' is probably not a good idea!
Use plain English	Avoid using jargon – it alienates those not familiar with it.
Keep it concise	Keep it factual and to the point.
Index it	Make it easy to find things.
Know your audience	Focus it on user needs, not technical support needs.
Make it easy to use	Make it easier to use than it is to ask a technician. Encourage people to choose to use it rather than have to enforce it.
Keep it generic	Avoid using specific information such as people's names – personalising it too much may create an overhead of maintenance when things change.
Make it manageable	Consider how much time you can spend keeping the handbook up to date when deciding what information to include. A successful handbook should be a trade-off between the time spent on producing and maintaining it and the time saved by providing pre-emptive information.

Publication

There are a number of ways to publish a handbook.

Intranet	Publish on an intranet site for ease of maintenance but provide printouts of incident-logging information in case the user can't access the online version.
Hard copy	Publish paper copies and secure them to computers or issue numbered copies to all staff.
Posters and labels	Extract key information and turn into posters for notice boards, classroom walls or labels to stick on the side of the monitor.

Proof-read it!

Marketing

Your audience needs to be aware of the user handbook, so marketing is important.

Launch	Launch the handbook with a presentation.
Induction	Carry out induction courses for all staff, including technical support staff.

Publicity	Advertise it on notice boards and mention it at every opportunity, especially if the nature of a call to technical support makes it obvious that it hasn't been used.
Feedback	Ask for feedback and constructive criticism and acknowledge it.
Follow up	Ask people if they use it and check copies attached to computers to see that they are well worn through use. If they are not, target the users of the computers in question.

Managing it

Once you have created your user handbook, you must manage it.

Update it	Keep the handbook up to date. • Maintaining an electronic version is easier than publishing and reissuing paper copies. • Use the Change Management process to identify updates to the handbook.
Own it	Assign an owner to the handbook, so that someone is responsible and accountable for it.

FITS 7.3.2

Technical support charter

A technical support charter is a one-page guide that is issued to all users and posted on walls and notice boards or kept with computers. It can form part of a user handbook but it is useful to issue it as a separate document as well because it gives just highlights of information for quick reference.

Trying to be all things to all people is a major cause of perceived poor service – those providing technical support run from one crisis to the next, and no one is particularly happy with the service. But if you don't set any rules, then user expectation can be higher than your resources allow.

We recommend that you issue a charter as soon as possible, even if you haven't yet defined some of the items in our example. All information given to users proactively eliminates a need to ask and answer questions, so ultimately saves time both for technical support and for users. If all you have is a telephone number, publish that and build your charter from there.

A charter sets expectations and helps to enforce them.

Sets expectation	A charter sets out the way in which technical support intends to work and what it expects of its users. The purpose of it is to take control of the relationship between support and users by giving them useful information and instructions. It also helps technical support to manage its time more effectively.
Aids enforcement	In our example technical support charter (see Appendix C) you will see that accepted methods of contact in this case are by telephone, by email and in person to the technical support office. The 'catch a technician in the corridor' method of call logging is not accepted here! If you begin by stating clearly what you expect from users, it becomes easier to tackle those who persist in breaking the rules. It also establishes a starting point from which to negotiate changes over which technical support has some level of controls.

FITS 7.4

Specialist tools

Specialist technical support tools are those that perform specific technical functions – for example:

- network monitoring software
- disk imaging software
- auditing software
- configuration software.

These will be discussed in more detail in the relevant FITS process sections.

FITS 8 Measuring the performance of technical support

It is important to measure both the actual service that is delivered to users (see FITS 8.1) and the effectiveness of processes used by technical support in this delivery (see FITS 8.2). This is to highlight current performance and identify potential issues and improvements that could be made.

Measurements must be relevant and consistent for them to be worth while: implementing processes without measurements lacks focus and control. It is better to take one or two accurate and useful measurements than several of dubious value or integrity.

What are measurements for?	• To help you understand the level of service that is being provided • To enable you to make continuous improvements • For sharing with ICT users – whether you are proud of them or not!
What do you do with measurements?	• Analyse them • Monitor trends and investigate variances • Use them as the basis for asking questions • Make decisions, taking into account the answers to your questions • Understand what they mean
What don't you do with measurements?	• Take them at face value • Ignore them

Use measurements, but remember that the ICT user will judge performance on perception, not hard facts. You may be able to prove that a service was available 95% of the time but if an ICT user rings the service desk and the telephone wasn't answered, their perception of the service will be poor. On the other hand, your ICT users do not suddenly become unhappy with the service if the telephone is answered in six rings instead of your target of five, or if the average number of calls resolved at the first attempt decreases from 50% to 40%.

All types of customer, not just ICT users, are affected by their interaction with people and whether the attitude and care they receive is appropriate at their time of need. It is impossible to measure, but it is vital to take into account the importance of customer care as well as the provision of statistical information. Do your very best for customers at all times, not just the minimum required to meet statistical targets.

There is specific information about suitable measurements in each FITS process section, along with guidance and tools designed to help you start to measure performance.

FITS 8.1 External metrics

External metrics are to measure service delivery and should indicate any issues that may be causing a detrimental impact on users of the ICT services.

Example external metrics

- Length of time elapsed between identifying an incident and resolving it
- Number of calls logged in a given period
- Number of calls logged in a given period sorted by priority
- Number of calls logged in a given period sorted by category
- Number of changes implemented in a given period
- Number of successful changes in a given period
- Number of failed changes in a given period
- Availability of ICT services

FITS 8.2 Internal metrics

Internal metrics are to manage the processes and should indicate any issues internal to ICT that may have an impact on service delivery.

Example internal metrics

- Availability of individual components such as routers and servers – used to calculate service availability
- Breakdown of time taken by each participant in the life cycle of an incident
- Breakdown of time taken in each step of the life cycle of an incident
- Percentage of incidents resolved by the service desk in a given period
- Number of changes approved in a given period
- Number of changes rejected in a given period
- Length of meetings when considering change and trend over time
- Number of changes resubmitted following failure during testing

Appendices

Appendix A Service report – example and template

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Service Level Management example service report

	Enter Monthly figures in the columns below				
	v	v	v	v	
Enter months >	March	April	May	June	Totals
Number of incidents logged >	20	36	30	45	131
Average time to incident resolution >	2	3	3	2	
Number of problem >	4	12	9	17	42
Average time to problem resolution >	4	7	6	3	
Number of incidents resolved by Service Desk >	4	8	11	15	38
Number of incidents referred by Service Desk >	16	28	19	30	93
Number of incidents fixed remotely >	2	4	5	8	19
Number of incidents fixed by visit >	16	30	25	24	95
Number of incidents closed in period >	18	34	30	32	114
Number of problems closed in period >	3	8	11	15	37
Number of incidents still open >	2	4	4	17	27
Number of problems still open >	1	5	3	5	14
Number of computers installed >	3	6	2	1	12
Number of software applications installed >	3	4	12	10	29
Number of printers installed >	0	1	4	0	5
Number of requests for change processed >	3	2	0	4	15
Number of successful changes >	2	1	5	4	12
Used server disk space (gigabytes) >	25	26	27	28	
Available server disk space (gigabytes) >	5	4	3	32	

Save and print

http://www.becta.org.uk/techicalsupport/
published September 2003

sl_report_example2.xls
page 1 of 2

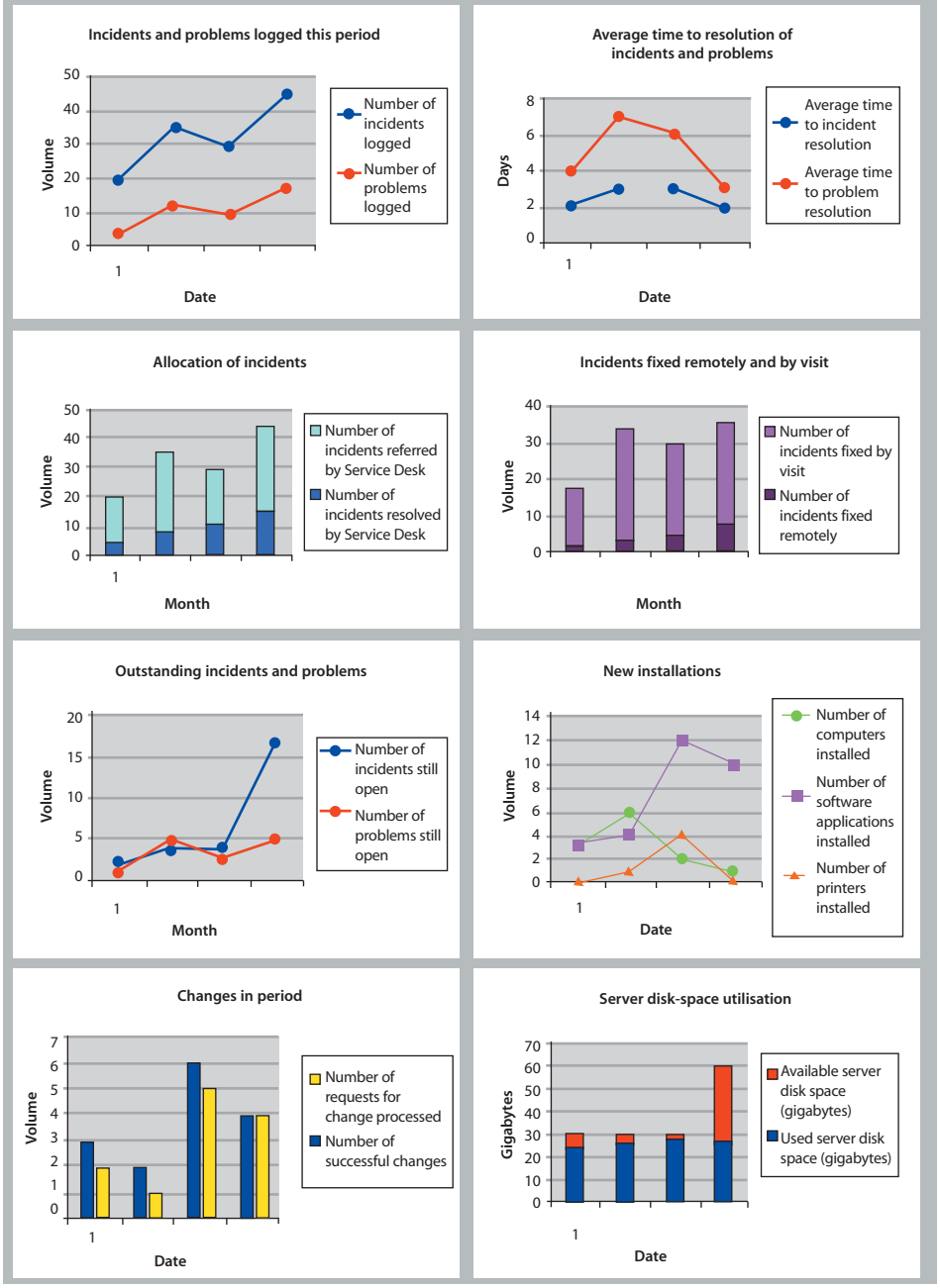
You can find the template for this report on the FITS website [**http://www.becta.org.uk/tsas/index.cfm?refsect=ntss&bcsect=default&sect=servlevel&id=tt5367**].

Framework for ICT Technical Support (FITS)

Becta | ict advice

Service Level Management example service report

Report period: March to June 2003



http://www.becta.org.uk/techicalsupport/
published September 2003

You can find the template for this report on the FITS website [**http://www.becta.org.uk/tsas/index.cfm?refsect=ntss&bcsect=default&sect=servlevel&id=tt5367**].

Becta ICT Advice

Technical Support Advisory Service (TSAS)

Introduction

Resource allocation

Period start date:
Period end date:
Review date:

Total resource hours available

Number	Task	Task hours needed	Resource hours remaining
Enter hours needed for each task and deduct from hours available			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
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25			
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28			
29			
30			

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published September 2003

You can find the template for this report on the FITS website [**http://www.becta.org.uk/tsas/index.cfm?refsect=ntss&bcsect=default&sect=fits&id=tt5106**].

Becta ICT Advice

Framework for ICT Technical Support (FITS)

Introduction

Technicial Support Charter

ICT Technical Support Objective

ICT Technical Support's objective is to be a central point of contact for the processing and resolution of all incidents and requests relating to ICT equipment and services.

Contacting Technical Support

- By telephone: Extension 1234
- By email: ict.technical.support@schoolname.ac.uk
- In person: Room 123, Administration Block

ICT Technical Support is open for calls between 0800 -1200 and 1400 –1600, Monday to Friday. A voicemail service is available for out-of-hours calls and these will be logged and processed at the start of the next shift.

Priorities and Service Targets

Calls are prioritised in accordance with impact on classroom and administrative activities as defined below:

P	Description	Definition	Time to respond	Time to fix
	High Impact	Incident with immediate impact on scheduled classroom or administrative activities	15 minutes	1 hour
	Medium Impact	Incident with same day impact on scheduled classroom or administrative activities	1 hour	4 hours
	High Impact	Incident with immediate or same-day impact and all requests	4 hours	8 hours

Information required

When an incident or request is raised the following information is required to enable efficient and effective processing. Please be prepared to provide this when you call or include it in any email correspondence:

- ⓘ Your name
- ⓘ Your contact number
- ⓘ Your location
- ⓘ Your availability
- ⓘ Impact of Incident
- ⓘ Specific deadline for resolution
- ⓘ Description of Incident or Request
- ⓘ Asset tag number of equipment

Security

Please note that for security reasons password reset requests are subject to security key checking. These are issued by the Head Teacher's office. Please contact them on extension 4444 for further information.
Information provided

When an incident or request has been logged the following information will be given to you:

- ⓘ Call reference number (e.g. ABC123) – a unique identifier for your record
- ⓘ Priority code (i.e. 1, 2 or 3) – to indicate target response and fix times
- ⓘ An estimated response time - relating to the Priority code and current circumstances

Updates

When the call logging process is complete the incident or request record is assigned to an appropriate technician for resolution. ICT Technical Support will monitor progress and communicate regular updates to you. If you would like an update in the meantime please call ICT Technical Support and quote your call reference number.

Escalation

If, at any time, you feel that your incident or request is not being progressed reasonably in accordance with the service level targets stated please contact the ICT Technical Support Supervisor on extension 9876.

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Glossary

10Base-T	A networking standard that supports data transfer rates up to 100 Mbps (100 megabits per second). 10Base-T is based on the older Ethernet standard but is 10 times faster than Ethernet; it is often referred to as Fast Ethernet. Officially, the 10Base-T standard is IEEE 802.3u. Like Ethernet, 10Base-T is based on the CSMA/CD LAN access method.
AppleTalk	Inexpensive LAN (local area network) architecture built into all Apple Macintosh computers and laser printers. AppleTalk supports Apple's LocalTalk cabling scheme, as well as Ethernet and IBM Token Ring. It can connect Macintosh computers and printers, and even PCs if they are equipped with special AppleTalk hardware and software.
Asset	Component of a business process. Assets can include people, accommodation, computer systems, networks, paper records, fax machines, etc.
Availability	Ability of a component or service to perform its required function at a stated instant or over a stated period of time. It is usually expressed as the availability ratio: the proportion of time that the service is actually available for use by customers within the agreed service hours.
Availability Management	To ensure that ICT services are available for use consistently as agreed.
Bandwidth	The amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in bits per second (bps).
Baseline	A snapshot or a position which is recorded. Although the position may be updated later, the baseline remains unchanged and available as a reference of the original state and as a comparison against the current position.
Bridge	A device that connects two LANs (local area networks), or two segments of the same LAN that use the same protocol, such as Ethernet or Token Ring.
Buffer	A temporary storage area, usually in RAM. The purpose of most buffers is to act as a holding area, enabling the CPU to manipulate data before transferring it to a device.
Build	The final stage in producing a usable configuration. The process involves taking one or more input configuration items and processing (building) them to create one or more output configuration items (eg software compile and load).
Capacity	Ability of available supply of processing power to match the demands made on it by the business, both now and in the future.
Capacity Management	To ensure that all ICT processing and storage capacity provision match present and evolving needs.
Category	Classification of a group of configuration items, change documents, incidents or problems.
Change	The addition, modification or removal of approved, supported or baselined hardware, network, software, application, environment, system, desktop build or associated documentation.

Change Management	The managed and recorded introduction of changes to hardware, software, services or documentation to minimise disruption to ICT operation and maintain accurate configuration information.
Client	The client part of a client/server architecture. Typically, a client is an application that runs on a personal computer or workstation and relies on a server to perform some operations. For example, an email client is an application that enables you to send and receive email.
Client/server architecture	A network architecture in which each computer or process on the network is either a client or a server. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers) or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources such as files, devices and even processing power.
Configuration management database (CMDB)	A database which contains all relevant details of each ICT asset, otherwise known as a configuration item (CI), and details of the important relationships between CIs.
Configuration Management	Implementing and maintaining up-to-date records of ICT hardware, software, services and documentation, and showing the relationships between them.
Definitive software library (DSL)	The library in which the definitive authorised versions of all software CIs are stored and protected. It is a physical library or storage repository where master copies of software versions are placed. This one logical storage area may in reality consist of one or more physical software libraries or filestores. They should be separate from development and test filestore areas. The DSL may also include a physical store (fire-proof safe, for example) to hold master copies of bought-in software. Only authorised software, strictly controlled by Change Management and Release Management, should be accepted into the DSL. The DSL exists not directly because of the needs of the Configuration Management process, but as a common base for the Release Management and Configuration Management processes.
Device	Any computer or component that attaches to a network.
Error trap	A signal informing a program that an event has occurred. When a program receives an interrupt signal, it takes a specified action (which can be to ignore the signal). Interrupt signals can cause a program to suspend itself temporarily to service the interrupt.
Ethernet	A LAN (local area network) architecture developed in 1976 by Xerox Corporation in co-operation with DEC and Intel. Ethernet uses a bus or star topology and supports data transfer rates of 10 Mbps. The Ethernet specification served as the basis for the IEEE 802.3 standard, which specifies the physical and lower software layers. Ethernet is one of the most widely implemented LAN standards.
FDDI (Fibre Distributed Data Interface)	A set of ANSI protocols for sending digital data over fibre optic cable. FDDI networks are token-passing networks, and support data rates of up to 100 Mbps (100 million bits) per second. FDDI networks are typically used as backbones for wide area networks.
Financial Management	To ensure that the ICT and technical resources are implemented and managed in a cost-effective way.

Firewall	A system designed to prevent unauthorised access to or from a private network. Firewalls can be implemented in both hardware and software, or a combination of both. Firewalls are frequently used to prevent unauthorised internet users from accessing private networks connected to the internet, especially intranets. All messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.
Gateway	A node on a network that serves as an entrance to another network. In schools, the gateway is the computer that routes the traffic from a workstation to the outside network that is serving web pages. In homes, the gateway is the ISP that connects the user to the internet.
Gigabit	When used to describe data transfer rates, it refers to 10 to the 9th power (1,000,000,000) bits. Gigabit is abbreviated Gb, as opposed to gigabyte, which is abbreviated GB.
HTTP (hypertext transfer protocol)	The underlying protocol used by the World Wide Web. HTTP defines how messages are formatted and transmitted, and what actions web servers and browsers should take in response to various commands. For example, when you enter a URL in your browser, this actually sends an HTTP command to the web server directing it to fetch and transmit the requested web page.
Hub	A connection point for devices in a network. Hubs are commonly used to connect segments of a LAN (local area network). A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets.
ICT	The convergence of information technology, telecommunications and data networking technologies into a single technology.
Incident	Any event which is not part of the standard operation of a service and which causes, or may cause, an interruption to, or a reduction in, the quality of that service.
Incident Management	To detect, diagnose and resolve ICT incidents as quickly as possible and minimise their adverse impact on normal operation.
ITIL	The OGC IT Infrastructure Library – a set of guides on the management and provision of operational IT services.
LAN	A computer network that spans a relatively small area. Most local area networks (LANs) are confined to a single building or group of buildings.
LocalTalk	The cabling scheme supported by the AppleTalk network protocol for Macintosh computers. Most local area networks that use AppleTalk, such as TOPS, also conform to the LocalTalk cable system. Such networks are sometimes called LocalTalk networks.
Logical topology	The logical topology is the way that the signals act on the network media, or the way that the data passes through the network from one device to the next without regard to the physical interconnection of the devices.
MAC (media access control) address	Each device on a network can be identified by its MAC address, a hardware address that uniquely identifies each node of a network. In IEEE 802 networks, the data link control (DLC) layer of the OSI reference model is divided into two sub-layers: the logical link control (LLC) layer and the MAC layer. The MAC layer interfaces directly with the network media. Consequently, each different type of network media requires a different MAC layer.

Management information base (MIB)	A management information base (MIB) is a database of objects that can be monitored by a network management system. Both SNMP and RMON use standardised MIB formats that allow any SNMP and RMON tools to monitor any device defined by a MIB.
Network	A group of two or more computer systems linked together. The two types of computer networks of interest to schools are LANs (local area networks) and WANs (wide area networks).
Network interface card (NIC)	A network interface card (NIC) is an expansion board inserted or built into a computer so that the computer can be connected to a network. Most NICs are designed for a particular type of network, protocol, although some can serve multiple networks.
Network traffic	The load on a communications device or system.
Node	A processing location. A node can be a workstation or some other device, such as a printer. Every node has a unique network address, sometimes called a data link control (DLC) address or media access control (MAC) address.
OSI reference model	The OSI (open system interconnection) model defines a networking framework for implementing protocols in seven layers. Control is passed from one layer to the next, starting at the application layer in one station, and proceeding to the bottom layer, over the channel to the next station, and back up the hierarchy.
Packet	A piece of a message transmitted over a packet-switching network. One of the key features of a packet is that it contains the destination address in addition to the data.
Packet switching	Refers to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message.
Peer-to-peer network	A type of network in which each workstation has equivalent capabilities and responsibilities. This differs from client/server architectures, in which some computers are dedicated to serving the others.
Physical topology	The physical layout of devices on a network. Every LAN (local area network) has a topology – the way the devices on a network are arranged and how they communicate with each other.
Port	In TCP/IP and UDP networks, an endpoint to a logical connection. The port number identifies what type of port it is. For example, port 80 is used for HTTP traffic.
Problem	The underlying cause of an incident or incidents.
Problem Management	The detection of the underlying causes of incidents and their resolution and prevention.
Protocol	An agreed format for transmitting data between two devices.
Protocol stack	A set of network protocol layers that work together. The OSI reference model that defines seven protocol layers is often called a stack, as is the set of TCP/IP protocols that define communication over the internet.

Proxy server	A server that sits between a client application, such as a web browser, and a real server. It intercepts all requests to the real server to see if it can fulfil the requests itself. If not, it forwards the request to the real server.
Release Management	To plan, test and manage the successful implementation of software and hardware. To define release policy and to ensure that master copies of all software are secured centrally.
Remote monitoring (RMON)	Remote monitoring (RMON) is a network management protocol that allows network information to be gathered at a single workstation. For RMON to work, network devices such as hubs and switches must be designed to support it.
Request for change	Form or screen used to record details of a request for a change to any CI within an infrastructure, or to procedures and items associated with the infrastructure.
Router	A device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs (local area networks) or WANs (wide area networks) or a LAN and its ISP's network. Routers are located at gateways, the places where two or more networks connect.
Segment	A section of a network that is bounded by bridges, routers or switches. Dividing an Ethernet into multiple segments is one of the most common ways of increasing available bandwidth on the LAN.
Server	A workstation or device on a network that manages network resources. For example, a file server is a computer and storage device dedicated to storing files. Any user on the network can store files on the server. A print server is a computer that manages one or more printers, and a network server is a computer that manages network traffic. A database server is a computer system that processes database queries.
Service Continuity Management	To minimise the impact on ICT service of an environmental disaster and put in place and communicate a plan for recovery.
Service Desk	The single point of contact within the school for all users of ICT and the services provided by Technical Support.
Service level agreement	Written agreement between a service provider and the customer(s) that documents agreed service levels for a service.
Service Level Management	The process of defining, agreeing and documenting required service levels and ensuring that these levels are met.
Simple network management protocol (SNMP)	A set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in management information bases (MIBs) and return this data to the SNMP requesters.
Star topology	A LAN (local area network) that uses a star topology in which all nodes are connected to a central computer. The main advantages of a star network are that one malfunctioning node does not affect the rest of the network and that it is easy to add and remove nodes.
Switch	A device that filters and forwards packets between segments of a LAN (local area network). Switches operate at the data link layer (layer 2) and sometimes the network layer (layer 3) of the OSI reference model and therefore support any packet protocol.

TCP/IP (Transmission Control Protocol/Internet Protocol)	The suite of communications protocols used to connect hosts on the internet. TCP/IP uses several protocols, the two main ones being TCP and IP.
Token ring	A type of computer network in which all the computers are arranged (schematically) in a circle. A token, which is a special bit pattern, travels around the circle. To send a message, a computer catches the token, attaches a message to it, and then lets it continue to travel around the network.
Topology	The shape of a LAN (local area network) or other communications system. Topologies are either physical or logical.
User datagram protocol (UDP)	A connectionless protocol that, like TCP, runs on top of IP networks. Unlike TCP/IP, UDP/IP provides very few error recovery services, offering instead a direct way to send and receive datagrams over an IP network. It is used primarily for broadcasting messages over a network.
WAN	A computer network that spans a relatively large geographical area. Typically, a wide area network (WAN) consists of two or more LANs (local area networks). Computers connected to a wide area network are often connected through public networks, such as the telephone system. They can also be connected through leased lines or satellites. The largest WAN in existence is the internet.
Workstation	Any computer connected to a LAN (local area network).