

Resources and Fire & Rescue Overview & Scrutiny Committee

21 January 2016

WCC IT Systems - Fitness for Purpose

Recommendation

That the Resources and Fire & Rescue Overview & Scrutiny Committee endorse the approach being taken to improve the quality of our IT Systems

1. Executive summary

1.1 IT systems are key to the effective and efficient delivery of services. Those systems are expected to meet an ever more complex range of requirements - everything from day to day operational activities, complex partnership working, through to support for sophisticated, evidence-based strategic decision making. They also need to offer excellent value for money.

1.2 To be fit for purpose our systems need to be capable of:

- seamlessly contributing to business processes that rely on more than one IT system;
- making some of their system features available to other IT systems so those features can be reused across many different business processes;
- making the data they manage available in controlled and appropriate ways so that it too can be reused across different systems;
- taking advantage of generic features and processes that can be built once and then reused in many IT systems, rather than being built from scratch every time;
- supporting the needs of an increasingly mobile workforce;
- meeting customer demand for high quality online systems;
- meeting the requirements of sometimes diverse stakeholders.

1.3 We have made good progress in recent years in developing and delivering systems that are fit for purpose. We have achieved this by:

- creating an overarching Applications Strategy;
- establishing a strong and effective Technical Design Authority to ensure the Applications Strategy is put into practice;
- adopting modern development tools and methods;
- developing key, generic features and processes that can be reused;

- adopting Software as a Service (SaaS) and other utility computing i.e. systems and infrastructure available over the internet;
 - starting work on an Information Assets Register so we are clear what systems and data we have and how data is used.
- 1.4 We have legacy systems that do not display all of the characteristics demanded of more modern systems. We need to take the opportunity to address these limitations as we replace and re-procure those systems. There are in some cases mitigating actions we can take in the meantime to make our legacy systems more fit for purpose.

2. Introduction

- 2.1 At their Work Programme event in July 2015 the Corporate Services O&S Committee requested a report about WCC's IT systems, whether they are fit for purpose, and capable of sharing information across different services. This report has been written to satisfy that request.
- 2.2 The report defines what "fit for purpose" means and describes the steps we have taken to achieve fitness for purpose since we published our Applications Strategy in 2012.
- 2.3 We restate the case for procuring and building systems in line with the guiding principles set out in our Applications Strategy in order to overcome issues in our legacy systems. Only by treating systems as part of an overall, integrated design, will we achieve systems that are fit for purpose and capable of supporting WCC to deliver quality, cost-effective services.
- 2.4 Key points in each section are highlighted in bold type and summarised in section 6.
- 2.5 This report is intended for a non-technical audience, but inevitably there are technical terms used in the report. A glossary of terms is provided in Appendix A at the end of this report for ease of reference. A list of the systems considered in preparing this report is shown in Appendix B.

3. What makes IT systems fit for purpose?

- 3.1 IT systems in a modern organisation need to be capable of:
- seamlessly contributing to business processes that rely on more than one IT system;
 - making some of their system features available to other IT systems so those features can be reused across many different business processes;

- making the data they manage available in controlled and appropriate ways so that it too can be reused across different systems;
- taking advantage of generic features and processes that can be built once and then reused in many IT systems, rather than being built from scratch every time;
- supporting the needs of an increasingly mobile workforce;
- meeting customer demand for high quality online systems;
- meeting the requirements of sometimes diverse stakeholders.

3.2 IT systems need to meet all these criteria to be truly fit for purpose. The following sections explore the implications of this in more detail.

A business process perspective

3.3 Organisations run business processes to deliver their services. Complex business processes (e.g. in Health and Social Care) rely on multiple systems in multiple organisations. However, traditional closed or “silo” systems do not typically integrate well and cannot share information with each other. This introduces constraints and inefficiencies:

- there are multiple manual hand-offs from one system to another. Each hand-off introduces a time delay, and the possibility that a case will fall into a black hole between teams or organisations. Time delays could, for example, lead to hospital beds being blocked while a case is manually transferred to social care teams;
- it is impossible to maintain an overview of the entire process and how an individual case is progressing. If problems arise in one part of the process it is difficult to identify them and keep track of them, particularly where a case is being passed between teams in different organisations;
- it is likely the data will need to be manually duplicated in each system as the case passes through. This is time consuming and costly, and can introduce inaccuracies. Duplicated data is likely to get out of step over time as it is difficult if not impossible to keep data synchronised across systems as changes occur. The customer is likely to be asked the same questions by different practitioners if information cannot be easily shared between systems;
- it is impossible to quickly and efficiently analyse overall process performance, and to identify where delays are occurring. This makes performance management and continuous improvement difficult or impossible to achieve;
- information about customers is buried in separate systems, making strategic analysis difficult or impossible. Subject access requests are more difficult and time consuming to fulfil.

Taking a business process perspective allows an organisation to identify:

- what data is needed to support different business processes and where that data resides;
- which functions are generic and could be reused across numerous business processes. Reuse enables faster, more reliable systems delivery;
- how and when different systems will be involved in delivering business processes, and how those systems should integrate;
- how to maximise efficiency in delivering business processes.

3.4 However, in order to integrate effectively in this way, individual IT systems need to be built using open standards and need to be capable of integrating effectively with the other systems involved in shared processes. Data needs to be able to flow as needed between systems so that key case information can be shared. In modern systems this is typically done using what are called Application Programming Interfaces (APIs) - standard, documented methods that allow different systems to talk to one another.

The availability of APIs, built to open industry standards, is a key requirement we should demand in any system we procure or build.

Reusing key system functions

3.5 Key functions recur across many business processes. For example, numerous business processes require that orders are raised and invoices paid. Traditionally this functionality would be available in the corporate financial system, but would also be reproduced from scratch in many separate line of business applications. This frequently leads to the need to enter financial data twice, or to implement expensive batch integrations between different systems. If financial coding structures change they have to be changed in every system that has implemented an order and invoice process. It is far more effective to make the common functionality in the main system available to other systems so that they can reuse it rather than recreating it. This is cheaper, quicker and more reliable.

The ability of systems to use APIs to make key features available for reuse, and to reuse features from other systems, is a key requirement we should demand in any system we procure or build.

Taking advantage of generic features and processes

3.6 In section 3.5 we discussed the need for systems to reuse common functions across systems. The example used was very specific to the domain in question (financial transactions). Other functions are much more generic and should be specified and implemented as common capabilities. Examples include:

- how we identify users and authenticate them to give them access to different systems;
- how we take online payments;
- how we store documents and records related to individual cases;
- how we manage bookings and appointments across a range of services.

3.7 Line of business systems may provide some of these capabilities, but it is often more efficient and effective to use a shared generic solution. For example, storing documents and records in a corporate Electronic Document and Records Management System rather than in numerous line of business systems delivers a number of benefits:

- greater flexibility and reduced cost when changing line of business systems;
- common approach to retention and disposal policies, allowing better compliance with the Data Protection Act;
- single place to view all documents relating to a customer, making subject access requests easier to respond to;
- common methods to retrieve documents from different sources, facilitating reuse.

3.8 Reuse of generic features or common capabilities depends on systems that are built to common open standards using modern methods. These systems make it easier to separate the 3 layers that constitute a system - the user interface, the business functions/processes, and the data. These are known as “tiered” systems. The common capabilities can then become part of what is known as the IT architecture, the “lego bricks” that can be quickly and easily assembled in different ways for different purposes because they are all made to a common design standard.

Common, generic capabilities should be built once and made part of the IT architecture. Individual IT systems should separate the user interface, business function, and data components and be capable of consuming these generic capabilities.

Managing data effectively

3.9 Traditional closed or “silo” systems manage data in isolation from other systems. This leads to the “same” data being repeated in different systems, which is costly, inefficient and leads to inaccuracy. Customers are often required to provide the same information many times, depending on the practitioner they are dealing with and the service they are receiving. Repetition and inaccuracy leads to poor customer service.

- 3.10 Systems built to modern standards are able to make their data (e.g. data about customers) available in controlled and appropriate ways, so that it can be reused across different systems. The data can then be managed in a coherent way, and made available to meet strategic as well as operational requirements.
- 3.11 Where possible, systems should hold their data in line with national or international standards (schema) so that it can be more easily aggregated and analysed. This supports the concept of Big Data (the analysis of large and diverse sets of data to spot trends, opportunities, and threats), which can help any organisation adapt and compete in times of rapid change. An Information Architecture documenting what data we hold, where it is held, and where the same data are held in different places, is needed to help achieve common standards.
- 3.12 Where data - typically about customers - are unavoidably held in different operational systems it should be possible to aggregate the data into a “golden record” using data matching software. The golden record can deliver a number of benefits:
- detect and prevent fraud by spotting patterns and discrepancies in different systems;
 - support more sophisticated customer insight;
 - signpost customers to services they are entitled to but not receiving;
 - support the Tell Us Once process so that customer records are consistently updated in all our systems when a customer’s circumstances change;

This makes life more convenient for customers, but also drives down costs for the council.

Systems we procure or build should improve our data management. The ability to enhance our corporate and strategic use of information and Big Data initiatives is a key requirement we should demand in any system we procure or build.

As a minimum, where key corporate data assets are concerned, the capability to deliver data to our data matching software is a key requirement we should demand in any system we procure or build.

Our systems should adhere to an Information Architecture and agreed data standards.

Supporting a mobile and flexible workforce

- 3.13 Modern and flexible working increases productivity, improves customer service, and allows WCC to make the most efficient use of its office accommodation.

This has already helped deliver £4.37m of property savings. It also has benefits in terms of work-life balance, staff morale and staff retention. Our IT systems need to support mobile working to maximise these benefits, and to do so in a cost-effective manner.

- 3.14 User interfaces to IT systems, delivered in a web browser, that adapt to the type of device being used (laptop, tablet, smartphone) provide the greatest flexibility, and do not need to be accessed from a corporately provided device, unless there is a specific security risk to be addressed. If systems are run outside the WCC corporate network and are available over the internet they can be accessed from any location, delivering much greater flexibility. Where necessary those systems should also support off-line working; in a rural county such as Warwickshire it is not possible to guarantee an internet connection.
- 3.15 Systems accessed over the internet using a web browser also open up the possibility of using much cheaper devices than the standard corporate PC.

The capability to deliver to a mobile workforce using standard web browsers and eliminating the need for client-side software and internal network connections is a key requirement we should demand in any system we procure or build.

Digital delivery to customers

- 3.16 Digital delivery of services is 20x cheaper than the telephone; 30x cheaper than the post; and 50x cheaper than face to face contact. Wherever possible and appropriate we should be delivering our services using digital channels.
- 3.17 Digital services should be digital from end to end. We need to go beyond the e-Government aspiration to simply put electronic forms online. The online services we deliver should be fully integrated with our internal systems and, where appropriate, with systems in partner organisations. Digital services should allow customers to easily prove eligibility for services, get access to related services, and check progress on all their service requests in one place. This relies on our systems integrating with each other and with external systems too.
- 3.18 For maximum convenience customers should only need to register for an online account once, and be able to use that online account to access any WCC service, and any service from partner organisations too.

For customer-facing systems, the ability to deliver or participate in fully digital services is a key requirement we should demand in any system we procure or build.

Delivering to all stakeholders

- 3.19 Systems often have to meet the diverse needs of different users, from operational users to strategic planners. Different users may have quite different requirements that can be difficult to meet in a single system. Systems may be capable in principle of meeting a range of needs; the needs they actually satisfy will depend on how those systems are configured and implemented.
- 3.20 To ensure we have systems that are operationally and strategically fit for purpose it is necessary to understand the requirements of all stakeholders. Adhering to the good practice discussed in previous sections is key to delivering flexible systems that can meet a wider range of requirements, and requirements that will inevitably change over time.
- 3.21 In order to fully meet the needs of all stakeholders we should ensure that all systems are subject to Equality Impact Assessments and that they are accessible to all users. The ability of systems to collect equality data on users would provide evidence whether all users are in fact able to access our systems.

The full range of key stakeholders should be included in system specifications to ensure IT systems are built and configured to meet the widest possible range of essential requirements. This is likely to include stakeholders from outside the immediate operational business area directly affected, and should include IT representation to ensure good architectural principles are met.

4. How have we been addressing these issues?

- 4.1 Section 3 defines the characteristics IT systems should display in order to be fit for purpose. In 2012 we published WCC's Applications Strategy as part of an overarching ICT strategy. This is our blueprint for how we should procure and build IT systems to ensure they are more fit for purpose. The fundamental principles of that strategy still hold, but we are currently updating the Applications Strategy to take account of progress over the past 3 years and advances in the market. This section outlines the significant progress made in achieving the aims of the Applications Strategy since 2012.

Modern development tools

- 4.2 Information Assets now uses a software tool called Ruby on Rails for the majority of internal system developments. Ruby on Rails:
- produces browser based applications that will run on any device and can take advantage of the accessibility features inherent in modern browsers;

- automatically builds in accessibility features thanks to the development frameworks we are using;
- allows us to deliver adaptive designs that will work on a range of devices from laptops to smartphones;
- supports the production of tiered applications (see 3.8 above) that allow functions, processes and data to be reused;
- automatically generates APIs (see 3.4 above) to give access to system functions, processes and data;
- supports rapid development suitable in an Agile development project (see section 4.11 for more information on Agile methods).

4.3 Ruby on Rails has been used extensively to build new systems, and to replace our legacy Lotus Notes systems. Systems include WES subscriptions, Payroll services to schools, Accident Recording, and the WCC Bulletin Board.

Developing reusable capabilities

4.4 We have taken opportunities to develop reusable capabilities wherever possible. For example, Information Assets has implemented a common, corporate platform for Electronic Documents and Records Management (EDRM), based on Microsoft SharePoint. This will provide a number of benefits:

- provide a single version of the truth for key documents and records, with a central place to manage versions;
- use of APIs so that documents in the EDRMS can be referenced from the Warwickshire Web Site and Intranet, rather than duplicated, with automatic version control;
- a common API-based approach to storing case-related documents and records linked to specialised line of business systems (e.g. HRMS, CareFirst/Mosaic). This allows the functions in the EDRMS to be reused in other systems, but allows staff to access documents through their familiar system interfaces. This approach also reduces issues when we migrate to different specialised back office systems (as we currently are with our care systems);
- because SharePoint, which delivers our EDRMS, is largely hidden from users behind a set of APIs, it will make it easier to migrate to a different EDRM platform in future if the need should arise.

4.5 The AtlasWeb property system has been designed for reuse and for browser access. AtlasWeb is the one major corporate system where we are in control of both the data design and the business process logic. Property Information is managed consistently in a single place to a much greater extent than other corporate information. Over 80% of AtlasWeb users feel that property information is efficiently and effectively maintained.

- 4.6 Where legacy systems are not strategically compliant (e.g. the HRMS HR system) IA has been building APIs as required to support enhanced service delivery to schools and other customers. The Payroll Direct system is a good example of this approach, giving schools access to good quality online forms to request payroll changes for their staff, but based on data in HRMS. The same approach is being used in the e-Absence system that will be available to schools to record staff absences and claim insurance for supply cover.
- 4.7 In relation to identity management, WCC has been working in collaboration with the Government Digital Service to understand how local government could take advantage of the GOV.UK Verify service. Verify provides a single online identity that a citizen can use to access all government services. It gives government certainty that the person online is who they say they are. There would be huge customer benefits if the same online id could be used to access local government (and NHS) services as well as government services (see 3.18 above). WCC has been leading the local government engagement in this field, recognised in the 2014 Real IT Awards, in which WCC won in two categories. Verify also delivers the foundation for sophisticated online data sharing between government and local government in order to establish eligibility for service online in real time.
- 4.8 We have made extensive use of the Google APIs in order to reuse Google functionality wherever possible. For example, we are using Google IDs to log in to our Ruby on Rails systems so that WCC staff do not have to be issued with and remember another set of credentials every time.
- 4.9 Data matching software has been bought as part of a DCLG funded counter-fraud project that involves WCC and all the Warwickshire district and borough councils. This will help us create a customer “golden record”, linking the individual customer records we hold in multiple line of business applications (see 3.12 above).
- 4.10 We use a common, 3rd party online payments system for all our in-house systems, and have developed a single system to record online transactions so they can be credited to the right accounts.
- 4.11 The time recording and work take-on systems developed in Ruby on Rails are being adopted by several teams across WCC.
- 4.12 Finally, we are currently piloting a replacement for the staff intranet. If successful this will provide a common content management platform that could be used for the Warwickshire Web Site as well. The replacement intranet allows users to log in and therefore removes the need for separate content

management systems to manage public vs restricted content. It will provide one place to find unstructured content, replacing numerous current systems.

Adoption of Agile methods

4.13 Agile is a highly collaborative method for developing systems; the agile team contains systems analysts, developers and, crucially, customers/users. The team work closely together to decide what the development priorities are, and the system is developed in small, bite-sized chunks that everyone reviews on a regular basis to ensure it is fit for purpose. The team works within an overall scope and brief, but they are given a lot of freedom to define the order in which the priorities will be tackled. The overall aim is to create a usable system as quickly as possible, and to add to it and improve it over the lifetime of the Agile project.

4.14 There are a number of benefits:

- customers and developers have a shared understanding of what is being done. Communication is good and there are no last minute surprises;
- priorities can be reviewed frequently as circumstances change or new requirements emerge (as they can at any time in an Agile project);
- it is much easier for customers to engage in the process and understand what they are getting when they are seeing developed software on a regular basis. This is more meaningful than signing off a long, impenetrable user requirements document;
- the system can be released in phases with the first release happening as soon as useful and usable software has been developed. This delivers value more quickly;
- the process leads to good team morale;
- as a result of all this, quality systems are delivered more quickly and efficiently.

4.15 Agile methods are now being used by Information Assets and the Firmstep team in the Customer Service Centre. Reactions from systems analysts, developers and customers have been positive. For Agile methods to work optimally it is important that all stakeholders' interests are represented.

Creation of Technical Design Authority (TDA)

4.16 A TDA was set up in Information Assets in 2011. Its members represent: the ICT Strategy; Applications Architecture; IT Security; Information Management; Production Services; and IA Business Partners. Its remit is to:

- assess IT systems proposals for strategic fit;
- ensure that, wherever possible, IT systems enhance the ICT architecture rather than diminish it;

- maximise opportunities for reuse;
- avoid duplication of data and system functions wherever possible;
- ensure systems employ security measures proportionate to risk;
- ensure good information management principles are being followed.

4.17 The TDA is a key governance lever to ensure the ICT Strategy is implemented in practice. It has identified several instances where 3rd party systems have had significant security flaws, and it has on occasion been possible to work with suppliers to remedy these. The TDA has developed a set of standard questions that can be used in 3rd party system procurements and this has given a much clearer focus on the necessity for those systems to be built using open standards and modern methods.

Software as a Service (SaaS) and Utility Computing

4.18 Warwickshire has been a leading local authority in adopting SaaS, evidenced by the move to Google for email and other collaboration tools. SaaS can (but does not necessarily) reduce costs, and delivers systems that can be accessed wherever an internet connection is available. They therefore support access from any device, which can over time reduce our reliance on expensive, Warwickshire configured laptops and PCs. Adoption of Google Mail immediately created the option to make corporate email available to staff not connected to the WCC network. It is often much quicker to set up and configure a SaaS offering, rather than hosting a system internally.

Information Assets Register

4.19 Many of the services we deliver rely on partnership working. Nowhere is this more evident than in Health and Social Care. A condition of sharing information with the health services is that we have documented our systems and other software and hardware assets. An Information Assets Register should include:

- system purpose;
- system ownership;
- system users;
- a risk assessment;
- type of information held (personal, corporate or both);
- with whom information is shared;
- current information sharing agreements;
- retention and disposal arrangements;
- hosting arrangements;
- security and business continuity/disaster recovery arrangements

4.20 Unless we have an Information Assets Register in place our ability to share data and run shared business processes with health and other services will be severely affected. The Information Assets Register will also highlight

opportunities to reuse data, and identify where data is being duplicated and managed ineffectively. It can help manage system lifecycles more effectively. Work started in 2015 on assembling an Information Assets Register to meet these requirements.

5. Making our systems more fit for purpose

5.1 Our existing systems differ in the extent to which they meet the requirements set out in this document. In some cases we are running old legacy systems that predate some of the ideas discussed here. In other cases the market is not yet mature enough to offer fully compliant systems that meet all of our business needs. Regardless of the extent to which our systems are built using open standards and modern methods, they vary considerably in the extent to which they meet the requirements of the various stakeholders. In short, we can do better.

5.2 We will make our systems more fit for purpose over time by:

- adhering to the principles set out in our Applications Strategy;
- aiming for the characteristics of good systems set out in section 3 whenever we build or procure systems;
- by building on the approaches set out in Section 4;
- by strengthening the governance relating to systems development and procurement as the Resources Directorate becomes a commissioning organisation.

6. Summary of key points

6.1 This section summarises the key points made in each of the preceding sections of the report. By following these recommendations WCC will benefit from more coherent and effective IT systems that deliver the full functionality required to the greatest number of stakeholders.

- **The availability of APIs, built to open industry standards, is a key requirement we should demand in any system we procure or build.**
- **The ability of systems to use APIs to make key features available for reuse, and to reuse features from other systems, is a key requirement we should demand in any system we procure or build.**
- **Systems we procure or build should be assessed for how they enhance or detract from our data architecture. The ability to enhance our corporate and strategic use of information and Big**

Data initiatives is a key requirement we should demand in any system we procure or build.

- **As a minimum, where key corporate data assets are concerned, the capability to deliver data to our data matching software is a key requirement we should demand in any system we procure or build.**
- **Our systems should adhere to an Information Architecture and agreed data standards.**
- **Common, generic capabilities should be built once and made part of the IT architecture. Individual IT systems should separate the interface, business function, and data components and be capable of consuming these generic capabilities.**
- **The capability to deliver to a mobile workforce using standard web browsers and eliminating the need for client-side software is a key requirement we should demand in any system we procure or build.**
- **For customer-facing systems, the ability to deliver or participate in fully digital services is a key requirement we should demand in any system we procure or build.**
- **The full range of key stakeholders should be included in system specifications to ensure IT systems are built and configured to meet the widest possible range of essential requirements. This is likely to include stakeholders from outside the immediate operational business area directly affected and should include IT representation to ensure good architectural principles are met.**

Background Papers

None

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7. Appendix A - glossary of terms

Agile development	A highly collaborative development method in which multi-disciplinary teams (including customers) work together to define requirements (described in short, meaningful “user stories”), agree the priority and order of development, and regularly review the software that has been developed. Customers can see and contribute to the production of their system as it develops
Applications Architecture	The overall framework within which all our IT systems (or applications) co-exist. By designing an architecture for our applications we can ensure they integrate effectively, and that data, processes, functions, and common capabilities can be built once and reused wherever possible. Over time this reduces costs, increases reliability, shortens delivery times, and improves customer journeys. See also ICT Architecture and Systems Architecture.
Application Programming Interfaces (APIs)	An API is computer code that gives a system developer defined access to specific data, functions, processes or capabilities. Well-designed APIs allow a developer to assemble the parts needed to create a system without having to build all those parts from scratch. APIs support reuse. Systems written in completely different technologies and computer languages are able to share APIs using industry standard protocols/techniques.
Applications Strategy	The blueprint for how IT applications/systems should be designed and implemented to deliver services in the most efficient, effective, flexible and cost-effective way.
Big Data	A term used to describe the methods, tools and techniques used to analyse large and diverse sets of data to spot trends, opportunities, and threats. Increasingly organisations are analysing unstructured information generated by social media tools (Facebook, Twitter etc.) alongside traditional structured data.
Business Process	A business process is the steps taken to deliver a particular service or outcome. Those steps may be a combination of manual and computerised activities. Many organisations are now attempting to think about business processes from a customer’s point of view. A typical “customer journey” may combine several otherwise separate business processes, spanning systems, teams and even organisations. The challenge is to string these together into an effective “end to end” process for the customer.

Business Process System	A system that helps to manage complex business processes from “end to end”, even where they span systems, teams and organisations. The business process system makes it easier to track a case throughout its life, and to identify how efficiently a process is working.
Data	Data consists of facts, figures, codes, research and statistics. Much of our data is held in structured electronic databases but can also be in printed reports.
Electronic Document and Records Management System (EDRMS)	A system for creating, storing, finding and managing records and documents. An EDRMS manages records and documents through their whole lifecycle, from creation to destruction, according to agreed retention rules.
Enterprise Architecture	An Enterprise Architecture is a holistic view of an organisation that documents the processes it runs, the data it uses, and the systems it employs. It is an effective tool for identifying duplication and opportunities for improvement and streamlining in line with an organisation’s strategic aims.
Golden Record	The “single version of the truth” that represents the most accurate information an organisation has about any entity. For example, a customer may appear in numerous databases. Different databases may be more or less up to date. Data matching software is used to create a single “Golden Record” that can then be used to ensure that a customer’s record is kept up to date and accurate everywhere it appears
ICT Architecture	Wider in scope than an Applications Architecture (see above), the ICT architecture defines all of the components that comprise our ICT estate (e.g. our telephony networks, wifi systems and so on). An architectural approach ensures that common components are reused as much as possible, and that all elements of the ICT estate coexist and interoperate effectively
Information	Data that has been processed into a form that gives meaning and value
Information Architecture	The blueprint for how information is managed, classified, stored, and accessed in the organisation. Helps to manage information efficiently, reducing duplication and improving findability.
Line of Business	An IT system that serves the needs of a particular area

System	of the business
Online Portal	A web site that allows a customer to log on and view all the information that is relevant to them. A personalised view of information relating to, and transactions carried out with, an organisation.
Open Standards	Standards agreed by the IT industry that allow systems and components from different companies to work with one another. Unlike proprietary standards, open standards create effective market competition, flexibility, innovation and cost reduction
Software as a Service (SaaS)	Software systems available over the internet (“the cloud”) that are typically paid for on a per user/per use basis without the need for long contract periods. Some SaaS products are available at no cost.
Systems Architecture	The overall framework within which all our IT systems (or applications) co-exist. By designing an architecture for our applications we can ensure they integrate effectively, and that data, processes, functions, and common capabilities can be built once and reused wherever possible. Over time this reduces costs, increases reliability, shortens delivery times, and improves customer journeys. See also Applications Architecture and ICT Architecture.
Technical Design Authority (TDA)	A group of experts who assess ICT procurements, designs and implementations against the ICT Strategy and advise on compliance.
Tell Us Once	A procedure that allows a customer to report a change of circumstance (e.g. change of address) once, and for that change to be acknowledged and acted on by every organisation the customer has agreed to alert.
Tiered System	An IT system built in a way that explicitly separates the 3 main system components - the user interface; the business logic/processes; and the data. APIs are used to link the 3 elements together. The same APIs can be used to integrate the system with other parts of the Systems Architecture.
Utility Computing	The provision of computing power, storage and other infrastructure services over the internet (“the cloud”) where the customer pays for what they use without the need to invest in capital assets. This can be a particularly cost-effective way of responding to short-lived peak demands, or for provisioning short-lived development environments.

8. **Appendix B - Systems considered in preparing this report.**

- Agresso financial system
- Altair Pensions system
- HRMS HR and payroll system
- WILMa - Warwickshire's Interactive Learning Management system
- AtlasWeb Property Information system
- Unstructured information (web/intranet content, documents and records)
- Firmstep CRM
- Visual Files legal case file system
- CMIS - Committee Management Information System
- Electronic Document and Records Management System (EDRMS)
- MagiqueGalileo risk and audit management
- Mosaic Social Care system
- Highways system
- Street lighting system
- Trading Standards system
- Library management system
- Management Dashboard system
- Performance Management system