Infection Control IT Implementation and Evaluation Project

Report prepared for the Department of Health, August 2005

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Executive Summary

This report, to the Department of Health, presents the findings of implementation and evaluation of three Infection Control Software Systems. The Infection Control IT Implementation and Evaluation (ICIT/IAE) Project Board recommendations are also presented.

There is a demand and requirement for information systems to support the activities of infection control and infection control teams in acute hospitals. “A Systems Evaluation ProjecT for Infection Control (ASEPTIC)” defined the user requirements for infection control functions in acute hospitals, assessed current systems and recommended those to be piloted against the requirements. The ICIT/IAE project was undertaken to implement and further evaluate the three systems recommended by ASEPTIC.

The principal aim of the ICIT/IAE project was to provide recommendations with regard to the use of infection control systems to support local infection control teams and infection control practices in NHS Trusts. The scope of the project was to implement and then evaluate three infection control systems for local use. Each system was tested in three NHS Trusts (nine Trusts in total). The evaluation was based upon the assessment of the:

- Installation, configuration and interfacing with the Laboratory Information Management System (LIMS) alone.
- Communication, professionalism and approaches of each of the suppliers.
- Ability of the systems to support local trust internal alert organism reporting, outbreak detection and case management.

The systems were evaluated against their ability to support the local activities of infection control teams and infection control in acute hospitals. This project was not designed to evaluate or provide information on systems to report on mandatory healthcare associated infections (HCAI) surveillance. While the infection control systems evaluated may support such surveillance, this was not the primary goal or intent and this facility was not evaluated as part of this project.

Eight out of the nine Trusts experienced delays during implementation. By 31 March 2005, seven out of the nine systems were installed and being used locally. As of 31 May 2005, seven out of the nine Trusts had decided to keep the Infection Control software that they piloted and completed business cases for funding. This includes two EpiQuest sites, all three ICE sites and two ICNet sites.

EpiQuest had difficulties at the LIMS interfacing stage due to trust staff shortages and communication issues and was still completing installation and configuration in two out of three Trusts on completing of this report. Its training was found to be lacking structure and not fit for purpose. Two out of the three Trusts would not recommend the software or the company at this stage, but one is continuing to work with the company and this view may change. The third trust is not continuing with the company or the software.

ICE had difficulties interfacing with the LIMS in all its Trusts. In one trust there were difficulties in networking the software across the trust and in the other two Trusts there were some difficulties with code recognition across the LIMS/ICE interface. Training was found to be lacking structure and not fit for purpose. However, this was reviewed by the company and was being changed. All three Trusts would recommend the company and the software, but not without reservations.

ICNet has installed in all three of its Trusts, although more work is required on configuration in one of the Trusts. The training was fit for purpose. The company’s approach to trust staff was questioned by one trust. Two Trusts would recommend the software and one trust would recommend the company.

The third trust would not recommend the company and did not wish to comment about the software due to an incomplete evaluation.

Trusts looking to implement infection control software need to ensure that a good project team is established and that the implementation has the necessary endorsement and involvement of senior management to ensure that staff are given support and time for installation and training. A multidisciplinary project team consisting of at least Pathology, Infection Control and trust IT disciplines need to work closely with the company to establish a contract plan in advance so that all parties know when and how much time will be required, by staff, for installation, configuration and training.

Recommendations

1. Trusts should review each system to ensure that the system they choose is the most compatible with their LIMS, working practices and level of available IT competence.

2. The Trusts need to ensure that a good project team is established and that this has the backing and involvement of senior management, to ensure that staff are provided with sufficient support and time for installation and training.

3. The project team needs to work closely with the company to establish a contract plan in advance so that all parties know when and how much time will be required, by identified staff, for installation, configuration and training.

4. The working practice and IT proficiency of the infection control team needs to be taken into consideration when reviewing an Infection Control system, or when talking to Trusts currently using one of the Infection Control systems, as the usability of the systems is somewhat dependent upon this.

5. A Patient Administration System link will enhance all the systems and should be considered when developing a business case for such systems.

6. Trusts should take into account external factors that may influence infection control software in the future such as NHS Connecting for Health.

7. Compliance with the electronic Government Interoperability Framework (e-GiF) is mandatory for public sector developments involving IT systems (new and/or legacy) contributing towards e-service delivery. As part of this pilot project, we have received statements from all three suppliers regarding e-GiF compliance which are included in Appendix 2. The Project Board therefore recommends that this mandatory requirement be taken into consideration when selecting an Infection Control System.

8. The ICIT/IAE board recommends, based on this evaluation, and the above caveats that the systems supplied by ICE and ICNet are fit for purpose as defined by the user requirement documentation provided by the ASEPTIC project.

Project Background

As part of the service level agreement with the Department of Health, the Health Protection Agency was required to undertake an independent review of computerised systems for alert organism and alert condition surveillance.

The contract for this review was awarded to South Devon Health Informatics Services. The review was entitled 'A Systems Evaluation Project for Infection Control (ASEPTIC)' and commenced on 3rd February 2003.

The ASEPTIC project remit was as follows:

- To define the user requirements relating to surveillance and management of infection control functions in acute hospitals.
- To assess the currently available computer-based infection control systems against the user requirements documentation (URD).
- To recommend which of the currently available computer-based infection control systems were suitable for piloting in acute hospitals.
- To advise on the design of a suitable 'pilot' and the resources required to undertake 'pilot' testing.

ASEPTIC reviewed nine IT systems for infection control. The key recommendations, endorsed by the Project Board, were that:

- Three systems should be piloted as soon as practicable.
- The inclusion of three systems was dependent on some further development in the case of one supplier, which was subsequently undertaken.
- The three systems were: EpiQuest, ICEnterprise, and ICNet.

The Department of Health and the Health Protection Agency have provided funding for the Agency to take these recommendations forward.

The Infection Control IT Implementation and Evaluation Project (ICIT/IAE) project started in January 2004 with three hospital sites in the South West Region. In April 2004, this was increased by a further six sites - three in the North East and three in the South East. To ensure a 'level playing field' all the Trusts were of a similar type and all installation had to be completed by the end of June 2004 so that a three-month 'working' period was then available by October 2004 to enable a full evaluation of both the implementation and use of the three systems.

A Project Board was established which included representation from the Trusts as well as individuals with skills in infection control and IT systems and Agency staff with detailed regional knowledge (referred to in this report as regional leads). The board met regularly to review the evaluation and systems implementation progress.

Structure of Evaluation

Recruitment:

The Companies.

The three companies were put forward for piloting following the ASEPTIC project.

The Trusts.

All NHS Trusts in the South West region were asked to contact the regional leads if they wished to be considered as a pilot site for one of the systems. At the time of selection of South West Trusts it was only possible to finance three sites. Therefore three sites, which were similar in patient population, case mix and activity, were put forward to the companies. The

companies then made a choice between these three Trusts based on the LIMS (Laboratory Information Management System) system information available.

Following the publication of the ASEPTIC report, acute Trusts in the North East expressed an interest in piloting Infection Control software if the opportunity ever arose. Those that expressed interest were put forward for the ICIT/IAE project.

The South East region also participated in the evaluation. The Regional Epidemiologist approached all laboratories in the South East region to consider taking part in the evaluation project. Demonstrations of the three software systems were arranged and all interested parties were invited to attend. The three Trusts with a particular wish to participate were put forward for the ICIT/IAE project. One trust withdrew from the evaluation project due to contractual issues, which were unrelated to the system and supplier originally selected for the evaluation. Agreement was reached for a replacement trust to participate within the South East region. This new trust had the infection control systems demonstrated to them along with other laboratories in the region. At this initial stage this trust was not selected for the evaluation, however the trust decided to proceed with implementing the ICNet system. When a further site was required as a replacement for evaluation in the South East, it was agreed that this trust could be utilised. However, it is important to recognise that the implementation stage in this trust was conducted outside of the evaluation project.

The selection of Trusts and companies resulted in the combinations detailed in figures 1 and table 1; some Trusts have more than one site and or more than one LIMS system.

Figure 1. Trusts and sites

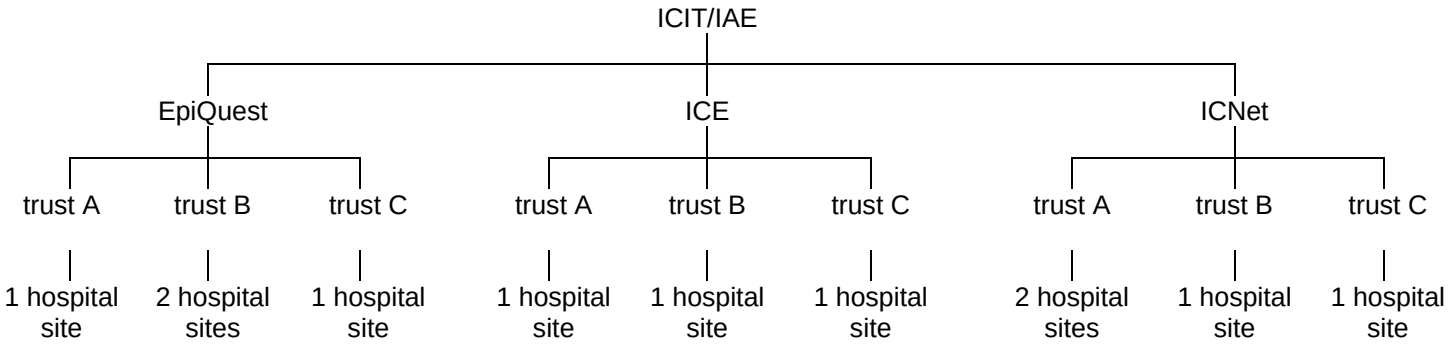

Table 1. LIMS systems used

	EpiQuest	ICE	ICNet
Telepath 1	Y		Y
Mysys/Sunquest	Y		
Woodard/Sysmed/Winpath		Yx2	
Apex	Y	Y	Y
EDS/Swift			Y

Time scales.

At a preliminary meeting in January 2004 between the companies and Agency representatives, a time schedule was agreed (see figure 2). All the companies were in favour of a presentation of the findings at The Society for Healthcare Epidemiology of America (SHEA) annual meeting in April 2005. It was therefore proposed that 31 January 2005 would be the end point for the project, allowing time for the submission to SHEA.

Subsequently, the project was extended to 31 March 2005 to enable a full evaluation of system functionality as several of the trial sites experienced serious delays in implementation and training. This extension was on the basis that the evaluation process with Trusts had to be completed by 31 March 2005. All the participating Trusts and two of the three companies supported the Project Board's decision to extend the time for implementation and evaluation.

Limitations.

At the preliminary meeting in January 2004, it was agreed by the Agency and company representatives that the finance available would only cover one installation in one site per company in each region with only one interface to hospital systems. It was agreed that the LIMS was a critical link to the project. The Project Board held to this initial agreement throughout the rest of the project, although it does recognise the limitations and difficulties that this might have caused the companies and the limitations this places on some of the functionality of the systems. In particular, by not including the funding for a link to the PAS (Patient Administration System) it was realised that case management may include some manual data entry of patient location etc.

The Trusts were given the opportunity to set up and use the system as if they had purchased it outside the project. This aimed to provide a 'real' evaluation, with the trusts able to use the system, as they deemed fit and necessary. The project board recognised that this could cause potential difficulties in evaluating the use of the system. Therefore, a broad evaluation questionnaire was designed to account for the scope of use.

Questionnaire design and delivery.

The board agreed that evaluation would be via a questionnaire, administered by the project managers or regional leads to the Trusts project team, and that the Trusts would have time to reflect on the questionnaire before signing and submitting it. This would allow them to discuss their responses and change them should they feel it necessary to do so.

The evaluation questionnaire was developed from the criteria previously identified by the ASEPTIC project. These criteria defined the requirements and characteristics an infection control surveillance system would need to meet, with input from and validation by the stakeholder group of the ASPETIC project.

The broad categories of the evaluation questionnaire were:

- IT audit based on the software and interface with the Laboratory Information Management System (LIMS) and excluding system interfaces with the Patient Administration System, the theatre system and the pharmacy system.
- Communication and professionalism of software companies.
- Ability of software to deliver the three principal requirements: alert organism reporting, detection of outbreaks and case management.

Once the Project Board had developed the questionnaire, it was sent out to the stakeholder group for comment. The stakeholder group consisted of the three companies' management teams and the nine Trusts' project teams.

The final questionnaire can be found in appendix 3.

Figure 2 Time scales

	Jan-04		Apr-04		Jun-04		Dec-04		Jan-05				
Original time outline	First meeting, funding for three Trusts	Discussion, implementation and payment in South West region	Funding for two more regions = six more Trusts	Discussion, installation, configuration and payment for other Trusts	All systems ready for evaluation period	Evaluation period	End of evaluation	Processing evaluation data	ICIT/IAE report.				
	Jan-04		Apr-04		Jun-04		Dec-04		Jan-05		Feb-05	Mar -05	May-05-Jul 05
Actual time outline	As above	As above	As above	As above	Installation and payment not complete	Installation and configuration continues	Project extended	Installation and configuration and evaluation continues	Interim report being drafted	Installation and configuration and evaluation continues	Interim report due. Payment to Trusts completed	End of evaluation period	Final report due to Dept. of Health

Feedback from Questionnaires. (Table 2)
These findings are correct as of the completion of the evaluation period ending 31 March 2005, with data taken from questionnaires completed in November 2004 and March 2005.

	EpiQuest / Oraldent	**ICE / Prism**	**ICNet**
The Trust Management	All of the Trusts' management were aware of the Trusts' IC teams involvement in the project and they were fully supportive. In one trust this support was within the confines of NHS Connecting for Health, and this was given priority over the EpiQuest interface, which caused delays.	All of the Trusts' management were aware of the Trusts' IC teams involvement in the project and were fully supportive.	All of the Trusts' management were aware of the Trusts' IC teams involvement in the project and were fully supportive.
Formal approval process	None of the Trusts had to undertake a formal process within the trust for participation in the project, but all received verbal agreement from various boards and heads of departments.	One trust had to go through their trust's formal approval process via the IM&T steering group which took a couple of weeks and involved the IC surveillance nurse and the deputy director of IT. None of the other two Trusts had to undertake a formal process, but one had to inform various boards and heads of departments.	Two Trusts had to go through their trust's formal approval process via the IM&T steering group, which took a couple of weeks in one trust and approximately six weeks in the other. It was the consultant microbiologists in both Trusts who prepared the paperwork for this process. The other trust did not have to undertake a formal process but had to inform various boards and heads of departments.
Contact with the company	All three Trusts identified a main contact for the companies, a project lead and a project team mainly consisting of at least one consultant microbiologist, laboratory staff, infection control staff and IT staff. The teams usually met during routine staff meetings and produced informal notes and actions.	All three Trusts identified a main contact for the companies, a project lead and a project team mainly consisting of at least one consultant microbiologist, laboratory staff, infection control staff and IT staff. The teams usually met during routine staff meetings and produced informal notes and actions.	Two out of the three Trusts identified a main contact for the companies, a project lead and a project team mainly consisting of at least one consultant microbiologist, laboratory staff, infection control staff and IT staff. The teams usually met during routine staff meetings and produced informal notes and actions. The Project Lead and point of contact in one trust was repeatedly by-passed by the company who contacted other staff members, some of whom were not part of the project team. This had a detrimental affect on working relationships between the

	EpiQuest / Oraldent	ICE / Prism	ICNet
			trust and the company. One trust did not set up anything formal in terms of project management or a project team, relying instead on the infection control team to progress work as required. In retrospect, the trust felt that a project team might have been beneficial.
Installation Server	The software was installed onto the trust's server in all three sites. There were no complications with the installation. However in one trust installation was delayed by approximately three months due to payment/contractual issues.	Installation in two of the three Trusts was delayed. In one trust this was due to the trust needing to purchase a server, which resulted in two weeks delay. With the other trust the delay, of about a month, was due to difficulties networking the software across the trust. This delay was further compounded by poor IT support from the Trusts' external IT support.	All sites were given the loan of a "cube" server that already had the IC system loaded onto it. The cube was placed on site and is accessed via the NHS Net. In two out of the three Trusts there was no delay in the installation of the hardware/cube. In one trust there was a delay of approximately two months due to the formal processing of the pilot project documentation. There has been no special requirement or changes required to the hardware configuration, networking etc to operate the IC system.
Hardware	No PCs were purchased by any of the Trusts, as there were sufficient already available.	No PCs were purchased by any of the Trusts, as there were sufficient already available.	No PCs were purchased by any of the Trusts, as there were sufficient already available.
Operating system	The system operates on a Windows 2000 server and on Windows 98, 2000 and XP PCs	The system operates on a Windows 2000 server and on Windows 98, 2000 and XP PCs.	The system operates on a Windows 2000 server and on Windows 98, 2000 and XP PCs.
Company contribution to installation	One trust agreed that the company contributed effectively to the installation and supplied sufficient information to the trust. This enabled them to fully understand what was required for installation. The company also sought sufficient information from the trust to fully understand the LIMS system and anticipate problems with the interface. Installation took approximately one day but was delayed due to configuration.	One trust agreed that the company contributed effectively to the installation and supplied sufficient information to the trust to fully understand what was required for installation and also sought sufficient information from the trust to fully understand the LIMS (Laboratory Information Management System) system and anticipate problems with the interface.	One trust agreed that the company contributed effectively to the installation and supplied sufficient information to the trust to fully understand what was required for installation and also sought sufficient information from the trust to fully understand the LIMS (Laboratory Information Management System) system and anticipate problems with the interface. Installation took approximately one day but was delayed due to configuration.

	EpiQuest / Oraldent	ICE / Prism	ICNet
	One trust believed they supplied sufficient information for the company to fully understand the LIMS system and anticipate problems with interfacing, but they felt they had been left with insufficient guidance on how to complete the installation or how to configure the data input. The company, although available, were not always on site to help with the installation or configuration when it was not working. The data file transfer not yet automatic and the configuration of the data for transfer time consuming. Without PAS access they found that data transfer was time consuming.	One trust agreed that the company supplied sufficient information so that the trust fully understood what was needed to install the IC software. However, the trust also felt that the supplier failed to sufficiently specify the interface requirements, which led to a delay in matching to outputs from the LIMS (Laboratory Information Management System) system. The trust provided all the data that was requested and staff were available to complete any required work.	One trust strongly disagreed that the company contributed effectively to the installation as they did not supply sufficient information to the trust to fully understand what was required for installation and they also did not seek sufficient information from the trust to fully understand the LIMS system and anticipate problems with the interface. The company continued to insist that the link would work and just slot in and run. This took approximately three months to resolve.
	One trust could not comment on installation at time of the evaluation.	One of the three Trusts felt that the company did not contribute effectively to the installation process and that installation was held up due to poor communications regarding interface requirements.	One trust agreed that the company contributed effectively to the installation and supplied sufficient information to the trust to fully understand what was required for installation and also sought sufficient information from the trust to fully understand the LIMS system and anticipate problems with the interface. The trust was not able to provide all the requested information and the assistance and co-operation from Electronic Data Systems was required to facilitate installation. This did not hold up the installation, as the trust staff were available when required.
Configuration Networking	The IC system is networked and does not require administrative rights to either the network or the client machines for operation.	The IC system is networked and does not require administrative rights to the network or the client machines for operation.	The IC system is networked, and does not require administrative rights for operation in two out of the three Trusts.
	System configuration is still ongoing at this time in the three Trusts. Local administrators are able to set the alert organisms and additional data items. However, the system is difficult to adjust for local practices and procedures and it is focused with health care billing in mind.	The system is able to be configured and adjusted for local practices and procedures and the local administrators can set and add additional alert organisms. However, in one trust there have been some difficulties with code recognition across the LIMS/ICE interface.	The system is able to be configured and adjusted for local practices and procedures and the local administrators can set and add additional alert organisms. However, this does require the new organism code to be picked up from the LIMS system, which is dependent upon local expertise.

	EpiQuest / Oraldent	ICE / Prism	ICNet
Contingency and Security Backup	In all three sites the system is subject to regular backups within the trust's normal backup routine and the system is available during backup.	The IC system is subject to regular backups, or will be, and in all three Trusts this backup is within the trust's normal backup routine. In one trust the system is unavailable during this process as they backup onto a CD-rom.	Two Trusts regularly backup the IC system within the normal trust backup routine and the IC system is available during this time. One trust regularly backups the system out of hours but not during the trust's routine backup.
Password protection	The IC system is password protected and has different levels of security access	The IC system is password protected and has different levels of security access.	The IC system is password protected and has different levels of security access
	None of the Trusts had investigated if the system had an audit process, but the company informed them that it did based on user password.	The audit trail was based on computer access rather than user, but this is believed to have been changed although no trust has tested this to check.	There is also an audit facility, which tracks users.
LIMS interface	One trust had linked its LIMS (Laboratory Information Management System) to the IC system via an export from the LIMS in a format specified by the supplier. One trust was having difficulty producing the export in the format requested by the supplier. One trust has suffered severe staff shortages during the project and could not answer this section.	The IC system has been linked to the Laboratory Information Management System (LIMS) in all three Trusts and this has been achieved using an export from the LIMS in a format specified by the supplier.	The IC system has been linked to the Laboratory Information Management System (LIMS) in all three Trusts and this has been achieved using an export from the LIMS in a format specified by the supplier.
	Two Trusts reported that the local trust team had contributed substantially to the interface in order to adhere to the IC system needs and that delays of approximately eight months were incurred at this stage. In one trust this delay was due to trust issues, including an upgrade of the LIMS system, and the other trust incurred delays due to the complexity of getting the LIMS data into a suitable format for the EpiQuest IC system without a PAS link.	The local IT teams contributed substantially in two out of the three Trusts and had some involvement in the third. However, in one trust the interface would only suffice for the pilot project and would not be adequate as a permanent solution.	The local trust team contributed substantially to the interface in order to adhere to the IC system needs. The local laboratory teams conducted this process. One trust has found that this was relatively easy and managed to complete in one day. The process in this trust was further helped by the fact that the network infrastructure could support and transfer the file. The other two Trusts have had delays in completing the interface one due to constraints of staff availability and the requirement for a lot of input from external support (Electronic Data Systems Co-

	EpiQuest / Oraldent	ICE / Prism	ICNet
			operation) to enable suitable file exchange for the ICNet system. The installation in the third trust was delayed due to an incompatibility between the LIMS and the IC software. A great deal of time was given by the laboratory staff to try and address this and the laboratory team established a solution. This caused a delay of approximately three months. Following further investigation relating to this third trust, it has been identified that any incompatibility between the LIMS and the IC software is due to an operational practice and configuration of the LIMS and not as a consequence of the interface with the IC software.
	Data items (including organism code and specimen type) are taken directly across from the LIMS without translation.	Data items (including organism code and specimen type) are taken directly across from the LIMS without translation. In one trust these data do not have to be edited or enhanced. However, one trust has to manually enter specimen type and patient location in certain areas of the database.	Data items (including organism code and specimen type) are taken directly across from the LIMS without translation. In one trust, and on one site in another trust, the data have to be enhanced i.e. manual entry of patient location once in the IC system in order to achieve consistent data for infection control management.
Training	Two Trusts had been provided with user documentation for its product. One trust was unable to comment if this was fit for purpose as they had only just started using the IC system. The other trust found it not fit for purpose, as the directions were misleading because the software did not respond as expected. The documentation was very "Americanised" and the trust staff resorted to writing their own notes for use. The company are reviewing the wording in the manual.	All three Trusts had been provided with user documentation. Two Trusts agreed that this was fit for purpose, one trust did not.	All of the Trusts have access to an electronic user document, but no hard copy is available. Two Trusts felt that this was not fit for purpose, one because they found it to be out of date. The third trust had not used it and therefore could not comment.
	The formal training required for the software was two days off-site training. None of the three Trusts could provide staff for this. Two	Training has been provided to all three Trusts. All of them found that is was not fit for purpose as it tended to be problem fixing	All three Trusts had training and all had agreed that this was fit for purpose. In two Trusts, staff required one session before they

	EpiQuest / Oraldent	ICE / Prism	ICNet
	Trusts had informal training, but both felt that more would be required once the software was being fully utilised. One of these Trusts disagreed that it was fit for purpose as there was no set training scheme. One other trust felt unable to comment and had not been using the software. So far two Trusts have had approximately three training sessions with up to three people being trained in each session. One trust has not had training due to staff shortages and therefore could not comment on training.	rather than practice training. At the time of writing, each trust had approximately three training sessions with up to six people being trained at once. All three Trusts had further training, which was more focused.	could use the system and this training was conducted on a one to one or two to one basis. In one trust, staff required three sessions before they could use the system and this training was conducted on a two to one basis.
The Company Professionalism	All three Trusts agreed that their first impression of the company was that it was highly professional.	All three Trusts agreed that their first impression of the company was that it was highly professional.	All three Trusts agreed that their first impression of the company was that it was highly professional.
	Two out of the three Trusts changed their view of this professionalism over time as claims made by the company were not met in practice.	All three Trusts began to feel, over time, that there was a lack of understanding by the UK team of the software and how an IC team may wish to use it.	Over time, one trust continued to hold this view and felt the company to be very professional and supportive. The other two Trusts changed their view over time and, although it was felt that the company's abilities were good, their attitude in different situations did not enhance working relations.
Communication	Two out of the three Trusts believed that the company communicates effectively. The other one disagreed with this. Two Trusts agreed that the company took into account the views, needs and constraints of the individuals/departments in the trust and that they were sufficiently flexible and customer focused with their demands/requirements. The other did not comment.	One of the trust's first impressions was that the company communicated effectively, the other two disagreed with this. However, one trust has changed its views on this and believes that communication has improved. Two Trusts agreed that the company took into account the views, needs and constraints of the individuals/departments in the trust and that they were sufficiently flexible and customer focused with their demands/requirements. One trust felt that although the company	All three Trusts agreed that their first impression of the company was that it communicated effectively. One trust agreed that the company took into account the views, needs and constraints of the individuals/departments in the trust and that they were sufficiently flexible and customer focused with their demands/requirements. Two Trusts thought that the company staff

	EpiQuest / Oraldent	ICE / Prism	ICNet
		listened to the views, needs and constraints of the individuals/departments in the trust they were not always acted upon, and that sometimes the company would expect immediate priority and not consider the other priorities of the staff.	seemed not to realise how busy the staff were and persistently contacted the trust staff. This contact was not always through the agreed channels set by the trust and the company. They also appeared keener on new developments rather than satisfactorily resolving existing problems.
Software introduction	One trust felt that the software was introduced in a very satisfactory way. The other two were not given a demonstration prior to the project.	The three Trusts all felt that the software was introduced in a very satisfactory way.	Two Trusts had very satisfactory introductions to the software including a demonstration. This was not required in the third trust as the company had previously visited there.
	Three Trusts, at this time, disagreed that products' capabilities were borne out in practice.	Two Trusts agreed that the basic capabilities of the product were borne out, but that it was not possible to get the full benefit of ICE due to the lack of a link to PAS, which was not included in the pilots. One trust said it was too early to decide.	Two Trusts agreed that the basic functions of the products capabilities were borne out in practice. The third trust agreed that the functions of the products capabilities were borne out in practice and that the system exceeded their expectations.
	All of the Trusts agreed that the company had identified contacts that were always available by email or phone, but a response was sometimes delayed due to time differences between here and the USA. This improved when UK staff numbers were increased.	All of the Trusts agreed that the company had identified contacts that were always available.	All of the Trusts agreed that the company had identified contacts that were always available.
Contact with other users	None of the Trusts were put in contact with another trust using this software.	Two out of the three Trusts were given other Trusts they could contact who had the system. The third trust was not.	One trust was provided with details of other Trusts using the software in Wales and Scotland, which was too far to visit, and the other two were not provided with other trust contacts. However, an ICNet users' conference was facilitated in October 2004.
Recommendation by the trust	Although the three Trusts could not recommend the company, or the software, at this stage, two Trusts are pursuing the project in partnership with the company and	All three Trusts would recommend the company and the software but not without reservation.	One trust would recommend the company and the software. One trust would not recommend the company and did not wish to comment about the software due to an

	EpiQuest / Oraldent	ICE / Prism	ICNet
	the new English technical support and believe progress is being made. The other trust is not continuing with the software or the company.		incomplete evaluation. The other trust would recommend the software, but not the company.

How the Trusts used the systems (Table 3)

These findings are correct as of the completion of the evaluation period ending 31 March 2005. The three EpiQuest sites were unable to comment on this section as they had insufficient time to use the system and complete a fair evaluation.

	ICE / Prism data from all three piloting Trusts	ICNet data from all three piloting Trusts
Alert organism surveillance: Scope of importing	The IC system can include patients on more than one hospital site. There is full access to the IC database from multiple sites or locations, users at different locations can use the IC database simultaneously. Analysis of "alert organisms" can be grouped by hospital site and case management tools can provide site based lists of patients needing ICT follow up.	The IC system can include patients on more than one hospital site. There is full access to the IC database from multiple sites or locations, users at different locations can use the IC database simultaneously. Analysis of "alert organisms" can be grouped by hospital site and case management tools can provide site based lists of patients needing ICT follow up.
Alert organism surveillance: What trust chose to do:	Two Trusts chose to do all relevant microbiology results from both hospital and community patients. One trust chose to do all the normal range of "alert organism" results from the LIMS system, all relevant positive microbiology results and all relevant microbiology results from both hospital and community patients.	One trust chose to do all the normal range of "alert organism" results from the LIMS system from hospital patients. One trust chose to do all the normal range of "alert organism" results from the LIMS system from both hospital and community patients One trust chose to do all the normal range of "alert organism" results from the LIMS system, all relevant positive microbiology results and all relevant microbiology results from hospital patients.
(Glossary at back)	Two Trusts imported data on: MRSA +ve cases; MRSA +ve screens; MRSA -ve screens; *C. difficile* cases; GRE cases and Group A Streptococcal infections	One trust imported data on: MRSA +ve cases; MRSA +ve screens; MRSA -ve screens; *C. difficile* cases; GRE cases; other resistant organisms such as ESBL; serology reports and Norovirus infections.

	ICE / Prism data from all three piloting Trusts	ICNet data from all three piloting Trusts
	One trust only set up the system in the pilot study for MRSA and *C. difficile* as the trust felt that including more organisms with difficult antibiotic screens may be too much for laboratory staff during the pilot.	One trust imported data on: MRSA +ve cases; MRSA +ve screens; *C. difficile* cases; GRE cases; and Group A Streptococcal infections. They would like to include MRSA -ve screens and other resistant organisms such as ESBL producers but this would require coding in the path system (this is not an ICNet issue). One trust imported data on: MRSA +ve cases; MRSA +ve screens; *C. difficile* cases; Group A streptococcal infections and rotavirus. They would like to include MRSA -ve screens; GRE cases; other resistant organisms such as ESBL producers; but the rule base to get the data form their laboratory system is difficult (this is not necessarily an ICNet issue).
Alert organism surveillance: importing data	One trust had difficulty importing data if the hospital number was missing. This is a local problem and using an alternative unique ID is being examined. There were no importing difficulties reported from the other trust. One trust had difficulties with the ward location and anatomical site import.	One trust had difficulty importing data and considered that detailed training on how to import data from the pathology system would have been beneficial. One trust still has difficulty importing from the pathology system and work continues on this export/import. Data is added manually where necessary, but this is time consuming. One trust had difficulties when the pathology system went down. This was not an ICNet issue, but left the IC system unpopulated with current data until the path system was operational.
	All the antibiotic susceptibility results that were requested were imported successfully in both Trusts.	All the antibiotic susceptibility results that were requested were imported successfully in both Trusts.
Alert organism surveillance: manual data entry. The Trusts were asked if the IC database allowed	All agreed that this was within the systems capabilities. One trust had attempted this. One	Two Trusts had attempted this and agreed that this was within the systems capabilities. The other

	ICE / Prism data from all three piloting Trusts	ICNet data from all three piloting Trusts
manual data-entry of the following information: entry of cases not normally contained on the laboratory system e.g. clinically diagnosed TB; current /updated patient location with dates; surgical wound information; operative details - type of procedure; operative details - surgeon(s); operative details - dates of procedure;	trust was aware of these capabilities but had not used them. One trust was aware of these capabilities but could not access the fields at the time of evaluation.	trust was aware of these capabilities but had not tried to use them.
Alert organism surveillance: mandatory reporting. The Trusts were asked if the IC database produce the following information to assist with production of DH mandatory reports; all positive significant blood cultures – quarterly; *S.aureus* & MRSA positive blood cultures – quarterly; GRE positive blood cultures – quarterly; *C. difficile* totals – quarterly; and if this was for hospital and community samples.	One trust reported affirmatively to all. One trust report 'Yes' to all except positive significant blood cultures. One trust reported that this had not been attempted and so could not respond.	One trust reported 'Yes' to all of the above, but only for hospital samples. One trust said 'Yes' to hospital MRSAs, GREs and *C. difficile,* but they had the system set up to exclude all staphs or community samples. One trust said 'Yes' to hospital MRSAs, and *C. difficile. It* could not comment on GREs, as there were none during the surveillance period. It had not attempted *C. difficile*, total *S. aureus* or total blood cultures.
Alert organism surveillance: analysis of alert organisms	All three Trusts reported that without the PAS link, the performance of the IC system in providing analysis for "alert organisms" was workable, but would be enhanced by a PAS link.	Two Trusts reported that the IC system in providing analysis of "alert organisms" was very satisfactory. One trust said the IC system was satisfactory in providing analysis for MRSA and *C. difficile,* but required some work to provide the other alert organisms.
Alert organism surveillance: providing case management	All three Trusts reported that without the PAS link the performance of the IC system in providing "case management" was workable, but would be enhanced by a PAS link.	One trust reported that the performance of the IC system in providing "case management" was very satisfactory. Two Trusts reported that the performance of the IC system in providing "case management" was satisfactory.
Key features required	Both Trusts agreed a PAS link was required.	One trust reported that the *C. difficile* reported results could not be easily de-duplicated. One trust reported that it was not easy to see

	ICE / Prism data from all three piloting Trusts	ICNet data from all three piloting Trusts
		negative screen results as they were not located with the positive results. One trust reported that a PAS link was required and that there should be a rationalisation of where to record isolation details. At present, this does not copy over and there is a duplication process of data entry, giving room for potential errors.
Security	One trust was content with the security features. Two Trusts were worried about the lack of a password, but this was quickly rectified. One trust agreed that the IC system maintained a log of everyone who accessed it, dates and times of access, actions performed by users, the addition of new records, a log of changes to records so that the previous data could be viewed if required. The trust did not know if it maintained a log of when records were deleted. One trust agreed that the IC system maintained a log of everyone who accessed it, dates and times of access, but did not think that it maintained a log of actions performed by users, the addition of new records, a log of changes to records so that the previous data could be viewed if required and when records were deleted.	All three Trusts were content with the security features. All three Trusts agreed that the IC system maintained a log of everyone who accessed it, dates and times of access, actions performed by users, the addition of new records, a log of changes to records so that the previous data could be viewed if required. They did not know if it maintained a log of when records were deleted.
Speed and reliability	One trust reported the system to be fast when importing and editing data and for producing reports. One trust reported the system to be fast when importing and editing data but slower when producing reports. One trust felt it to be slow (but ok) when importing data, but fast for editing data and producing	One trust reported the system to be fast when importing and editing data and for producing reports. Two Trusts reported the system to be fast when importing and editing data and very fast for producing reports. However one of these reported it to be slow to close cases.

	ICE / Prism data from all three piloting Trusts	ICNet data from all three piloting Trusts
	reports.	
Speed and reliability	One trust experienced a few days when the system was not available but this was due to the laboratory interface being “turned off” (this was a trust issue).	One trust experienced a week when the system was not available due to the pathology system being down. Two Trusts experienced about half a day when the system was not available. This was due to the system being upgraded. All the Trusts had used the helpline.
Speed and reliability	On going support was provided with phone calls and regular site visits as agreed between the Trusts and company as part of the “aftercare” service.	On going support was provided with occasional phone calls for all three Trusts. Two Trusts requested more on-site visits and training.
Improvement on old system	Two Trusts were using a paper based/excel based system, one was using an access database. All three agreed that this system would be an improvement if a PAS link was created.	All three Trusts were using a paper based/excel based system and two agreed that this IC system was an improvement.
Outcome	All three Trusts are keeping the system. *“The system has huge potential and has received lots of support. We are currently putting a business case together for a PAS link*”	Two out of the three Trusts are keeping the system. *“The system is far more accurate with less duplication. We would like to keep the system and look at more development of other links, i.e. to PAS, pharmacy.”*

Alert organism surveillance: analysis and features (Table 4)
The findings in this table are subject to how the trust set up and used the system. It does not reflect on the full capability of the systems. The figures here are not scores but the number of Trusts out of three that gave the response 'yes', 'no', or 'not attempted'.

		ICE / Prism			ICNet		
Can interrogation of the IC database provide the following information?		Yes	No	Not attempted	Yes	No	Not attempted
All MRSA cases	Line listing	3			3		
	Totals	3			3		
MRSA cases acquired in hospital	Line listing	2		1	1		2
	Totals	2		1	1		2
MRSA cases linked to a particular outbreak	Line listing	1	1	1			3
	Totals	1	1	1			3
MRSA colonised patients	Line listing	2		1	1		2
	Totals	1		2	1		2
Significant MRSA infections	Line listing	2		1	2		1
	Totals	1		2	2		1
Treated MRSA infections	Line listing	1	1	1		3	
	Totals	1	1	1		3	
MRSA cases identified by pre-admission screening	Line listing	3			2	1	
	Totals	3			2	1	
Could the MRSA data be broken down to ward/unit level?	Line listing	2		1 *	3		
	Totals	2		1 *	3		
Could the MRSA data be broken down by speciality?	Line listing		1	2 *	3		
	Totals		1	2 *	3		
All *C. difficile* cases by ward	Line listing	2		1 *	3		
	Totals	2		1 *	3		
1st episode *C. difficile* cases	Line listing	1		2 *	2		1
	Totals	1		2 *	2		1
"relapsed" *C. difficile* cases	Line listing		1	2 *	1	1	1
	Totals		1	2 *	1	1	1
Infection with organisms with specific antibiotic resistance profile	Line listing	1		2		1	2
	Totals	1		2		1	2
All cases of "alert" infections currently in hospital. (NB: It is recognised that this might not be available without a PAS link unless the ICT manually enter admission/discharge dates)	Line listing		3 *		1	2 *	
	Totals		3 *		1	2 *	
Trend analysis for "alert organisms"	Graph	2			3		

	ICE / Prism			ICNet		
Can interrogation of the IC database provide the following information?	Yes	No	Not attempted	Yes	No	Not attempted
Table	1	1		3		
Can duplicate isolates be excluded from graphical/tabular reports?			3	1		2
Maintains list of “active” patients being followed up by ICT	1		2	3		
Can such a list be broken down by current patient location?	1		2	3		
Can such a list be broken down by speciality?	1		2	3		
Maintains “active” patient list for individual ICT members			3	1		2
Patients can be promoted to and demoted from the active list by the ICT	1		2	3		
Patients can be manually entered on the active list when no organism based record has been transferred from the laboratory system			3	2	1	
Date stamped progress notes can be added to patient records	2		1	3		
ICT follow up can be scheduled in a task list or calendar			3	1		2
A task list can be maintained for one or more ICT members			3	1		2
A calendar (schedule) can be maintained for one or more ICT members			3	1		2
Antibiotic therapy can be recorded in the patient record	2		1	3 **		
MRSA eradication therapy can be recorded in the patient record.	2		1	3 **		
Isolation requirements can be entered in the patient record	2		1	3		
Isolation history can be recorded (with location details)	1	1	1	3		
Wound management details can be recorded	2		1	3 **		
Advice issued to patient/family can be recorded	2		1	3 **		

(*only with a PAS link or manual data entry)
(**free text)

Summary of Findings

- All of the Trusts required agreement from senior management and the various department heads for participation in the project. In three out of the nine Trusts, a formal process was followed involving presentation at the IM&T Board.

- Five out of the nine Trusts required a loan or new server for the software to run on, but none required new PCs.

- All of the Trusts developed a project team. However, in some Trusts this was an informal group and therefore some actions were difficult to progress due to lack of senior management involvement.

- All the systems were subject to backups and met the requirements of the trust policies on data security by using passwords and having audit facilities.

- In general, all the companies were found to be professional and took in the needs, views and constraints of the trust staff. Where relationships broke down (each company has had this problem) there was an unexpected difficulty and it was felt by one side or the other that commitment or understanding was lacking.

- Training was provided to all nine Trusts. The three ICNet sites felt that the training was fit for purpose. The ICE sites found the training lacked structure and did not meet their requirements. The company is reviewing its training. The EpiQuest sites found the informal on-site training to lack structure and did not meet their requirements. The formal training for this product is two days off-site - none of the sites were able to provide staff for this formal training off-site.

- Configuration and interfacing caused the main problems for a variety of reasons, including lack of staff time, poor communication between the trust staff and the company, problems with getting the systems to “talk” to each other and lack of a PAS link.

- EpiQuest had difficulties at the LIMS interfacing stage, in part due to trust staff shortages and communication issues. EpiQuest is still working in partnership with two of the three trusts at the time of writing. To date, training has been ad hoc, found to lack structure and not fit for purpose. To benefit from the system, each trust requires more formal training (two days off-site). Two out of the three Trusts would not recommend the software or the company at this stage, but are continuing to work with the company and this view may change. The third trust is not continuing with the software or the company.

- ICE had difficulties interfacing with the LIMS in all its Trusts - one trust’s difficulties were in networking the software across the trust and in the other two Trusts there were some difficulties with code recognition across the LIMS/ICE interface. The training was found to be lacking structure and not fit for purpose. However, was reviewed by the company and being changed. All three Trusts would recommend the company and the software, but not without reservation.

- ICNet has installed in all three of its Trusts, but requires more work on configuration in one of the Trusts. Its training was fit for purpose. However, one trust criticised the approach to trust staff. Two Trusts would recommend the

software and one trust would recommend the company. The third trust would not recommend the company and did not wish to comment on the software due to an incomplete evaluation.

- As of the 31 March 2005, seven out of the nine pilot Trusts had a working system, six had had sufficient time and training to complete the evaluation. Five out of the six Trusts agreed that the IC system they were piloting was an improvement on their previous system.

Conclusions

This is a limited implementation review based on three sites per system, interfacing with the laboratory information management system (LIMS) only. However, our experience from this limited number of installations is that this created more work than any of the Trusts anticipated and that getting systems installed and working correctly was much more difficult and more time consuming for laboratory and IT staff than expected.

The key advice from this interim report for Trusts considering an IC system is to enquire if their laboratory system can be linked to the IC system. The Trusts themselves then need to ensure that the installation has the support of executives and managers, and good local IT skills and support.

Eight out of the nine Trusts have had delays. As of the 31 March 2005, seven out of the nine pilot Trusts had a working system, six had had sufficient time and training to complete the evaluation. Five out of the six Trusts agreed that the IC system they were piloting was an improvement on their previous system. As of the 31 May 2005, seven out of the nine Trusts were keeping the IC software that they piloted, depending on successful funding bids and development of the IC system in reference to the EpiQuest sites. This includes two EpiQuest sites, all three ICE sites, and two ICNet sites.

The installation went smoothly where installations had a high level of IT support and the IC system was well matched to the LIMS. Many of the Trusts did not have this level of support, particularly in local IT input. Staffing issues, particularly the high level of turnover of infection control nurses, exacerbated this. The installation lead times and configuration processes have been lengthy. This continues in two Trusts and still requires work in four others.

EpiQuest has installed and configured in one of its Trusts and is still currently configuring in the other two Trusts. More training is required. At the end of the project, the one trust where the software was installed and configured decided not to continue with the company or software and reverted back to its old method. The other two Trusts are continuing to work with the company to complete interfacing and configuration.

ICE have installed in all three of their Trusts, but require more work on configuration in one of the Trusts. All three Trusts are keeping the system assuming that their funding bids are approved.

ICNet installed the system in all three of their Trusts, but needed to undertake more work on configuration in one of the trusts at the time of writing. Two out of the three Trusts are keeping the system, assuming that their funding bids are approved. The third trust is reverting back to its original method.

Pervading IT environment

As IT progresses in the NHS, it is important to note external factors that may influence how infection control software solutions are implemented in the future.

The NHS Connecting for Health (formerly the National Programme for IT in the NHS (NPfIT)) could have an impact on how infection control software solutions are implemented in the future. NHS Connecting for Health will drastically alter hospital trust information systems, including pathology systems. This will need to be considered when examining optimum system solutions for the management of infection control.

It is also possible that the electronic Government Interoperability Format (eGiF) could have an impact on future software systems because the key policies associated with eGIF are:

- Alignment with the Internet: the universal adoption of common specifications used on the Internet and World Wide Web for all public sector information systems.
- Adoption of XML as the primary standard for data integration and presentation tools for all public sector systems.
- Adoption of the browser as the key interface; all public sector information systems are to be accessible through browser-based technology; other interfaces are permitted but only in addition to browser-based ones.
- Adherence to eGIF is mandated throughout the public sector.

Recommendations

1. Trusts should review each system to ensure that the system they choose is the most compatible for their LIMS, working practices and IT competence.

2. The Trusts need to ensure that a good project team is established and that this has the backing and involvement of senior management to ensure that staff are provided with support and time for installation and training.

3. The project team needs to work closely with the company to establish a contract plan in advance so that all parties know when and how much time will be required by staff for installation, configuration and training.

4. The working practice of the infection control team needs to be taken into consideration when reviewing an IC system, or when talking to Trusts currently using one of the IC systems, as the usability of the systems is somewhat dependent upon this.

5. A Patient Administration System link will enhance all the systems and should be considered when developing a business case for such systems.

6. Trusts should take into account external factors that may influence infection control software in the future, such as NHS Connecting for Health.

7. Compliance with the electronic Government Interoperability Framework (e-GiF) is mandatory for public sector developments involving IT systems (new and/or legacy) contributing towards e-service delivery. As part of this pilot project, we have received statements from all three suppliers regarding e-GiF compliance, which are included in Appendix 2. The Project Board therefore recommends that this

mandatory requirement be taken into consideration when selecting an Infection Control System.

8. The ICIT/IAE Board recommends, based on this evaluation, that the systems supplied by ICE and ICNet are fit for purpose as defined by the user requirement documentation provided by the ASEPTIC project. This recommendation is subject to appropriate consideration of the proceeding recommendations i.e. individual Trusts may have additional requirements to that defined in the user requirement document. In this circumstance the system supplied by ICE and ICNet may have additional functionality that would enhance site specific practices.

Glossary

Term	Definition
ADT	Admissions Discharges and Transfers
APEX	A Laboratory Information Management System
ASEPTIC	A Systems Evaluation Project for Infection Control
C. difficile	Clostridium difficile
EDS	A Laboratory Information Management System
eGiF	electronic Government Interoperability Framework
EpiQuest	One of the three suppliers involved in the evaluation
ESBL	Extended-Spectrum-Beta-Lactamases
GRE	Glycopeptide-Resistant Enterococci
Group A Strep	Streptococcus pyogenes or simply group A streptococcus
HCAI	Healthcare Associated Infections
HPA	Health Protection Agency
IC Software	Infection Control Software
ICE	One of the three systems involved in the evaluation, supplied by Prism
ICIT/IAE	Infection Control IT Implementation and Evaluation
ICN	Infection Control Nurse
ICNet	One of the three suppliers involved in the evaluation
ICT	Infection Control Team
IM&T	Information Management & Technology
IT	Information Technology
Lablink+	Interface tool between laboratory and surveillance systems
LARS	Local and Regional Services division of the HPA
LIMS	Laboratory Information Management System
MRSA	Methicillin-Resistant *Staphylococcus aureus*
NHS Connecting for Health	Formerly referred to as NPfIT
NPfIT	National Programme for IT
PAS	Patient Administration System
PC	Personal Computer
Prism	Supplier of ICE Software
SHEA	The Society for Healthcare Epidemiology of America
TB	Tuberculosis
trust	Acute NHS Hospital trust
URD	User Requirements Documentation
XML	Extensible Markup Language

Appendix 1

Project Board Meeting the Infection Control IT/Implementation and Evaluation (ICIT/IAE) Project

Dr Andrew Pearson (Chair) – Project Board, Consultant Epidemiologist CDSC, CfI

Professor Mike Catchpole – Head of Information & Knowledge Management, IKM

Andrew Chronias – Head of Information and Technology, CfI

Shaun Hanratty – Senior Project Manager, LaRS, Divisional

Malcolm Holliday – Microbiology Laboratory Manager, NHS Trust

Dr Vivien Hollyoaks – Regional Director, North East

Dr Melanie Jones – Epidemiological Scientist, HPA South West

Dr Deirdre Lewis – Regional Epidemiologist, HPA South West

Dr James Nash – Lead Microbiologist, Ashford FW&E

Dr Mike Painter – Regional Epidemiologist, LaRS, Divisional

Alison Peevor – Infection Control Nurse, South Tees, NHS Trust

Karen Shaw – Health Protection HCAI Project Nurse, South East

Sally Wellsteed – Team Leaser, Infection Control, DH

Meg Wiseman – Operations Manager, HCAI. CfI

Appendix 2
Company Contact Details

EpiQuest Europe limited
Unit 11
Harvard Industrial Estate
Kimbolton
PE28 0NJ

Tel: 01480 862081

Until 31/12/05 are:

Prism Risk Management Ltd
26 High Street
Corsham
Wiltshire
SN13 0HB

Tel: 01249 712158
Mobile: 07900 495086
Email: jim@infectioncontrolenterprise.co.uk
website: www.infectioncontrolenterprise.com

from 01/01/06

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E-mail : info@icnet.org.uk
Website : www.icnet.org.uk

Appendix 3
Evaluation questionnaire

For Trusts
ICIT/IAE Project Evaluation

About the evaluation and its process:

The first phase of the evaluation process will be a questionnaire survey for each participating trust. A second phase may be required towards the end of the project, and this may take the form of structured interviews.

There are three parts to the questionnaire:

1. Installation and implementation
2. Communication and professional style of software suppliers
3. Delivery of the three principal requirements:
    a. alert organism reporting
    b. detection of outbreaks
    c. case management

The suppliers will have their own questionnaire to complete and will be given sight of blank versions of parts 1 and 3 of the trust questionnaire.

Timescale for completion:

The questionnaire is being distributed now so that Trusts are aware of the evaluation criteria. However, it will not be possible to answer various sections of the questionnaire until the relevant phase of the project has been reached in each trust. For example, Part 1 can only be completed once installation and implementation has been concluded and some of the questions in Part 3 can only be answered once staff have developed enough expertise to undertake the functions under evaluation. (See instructions for questionnaire completion overleaf).

Confidentiality:

The questionnaire is a confidential document not to be shared with suppliers or others outside the trust.

All responses will be treated in confidence, and will not be shared with the software suppliers. Information derived from the questionnaire will not be attributed to individuals or to particular Trusts in the evaluation report.

The evaluation report will be circulated prior to publication for comments and project members will have the chance to respond to any issues raised with in the report.

Please see instructions for questionnaire completion overleaf

Each participating trust is requested to:

1. Complete **one** questionnaire response that should be an agreed consensus view for the trust.

2. Complete each section of the questionnaire as the relevant point in the project is reached.

3. Ensure that **all** staff members involved in the project contribute to the relevant sections.

4. Where there is no consensus view, please indicate the majority view but provide on a separate sheet the different views expressed and attribute these to the relevant staff group (e.g. ICD, ICT, IT).

5. In addition to completing the tick boxes, please supply any additional relevant comments on separate sheets.

6. Ensure that any sheets containing additional information are clearly marked as follows:

    a. trust name
    b. Supplier name
    c. The question number to which the comments relate.

7. Revisit the questionnaire over time particularly if there are any changes in view. These changes should be detailed on a separate sheet indicating what has changed and why this change has occurred.

8. The completed questionnaire should be returned to …….by …….(date) at the latest.

Queries:

Should you have any problems filling in the questionnaire or require clarification of any kind please e-mail your query to …… .

Name of hospital: _____

Name of trust:

Type of system:	EpiQuest	ICEnterprise	ICNet	(please type Y)

Laboratory Information Management System: _____

Date system was installed: _____

Date system became operational: _____

PART 1 – INSTALLATION & IMPLEMENTATION

Installation

1. Have you required any additional Hardware (Servers, PCs, Mobile Devices, Communication) to operate the IC system?

Additional hardware	**Yes**	**No**	**Desirable**	**Number required**
• Servers				
• PCs				
• Mobile devices				
• Comms equipment				

2. What operating system is the IC system running on at the server and client?

Operating system	**Server**	**PC**
• Windows 98		
• Windows NT		
• Windows 2000		
• Windows XP		
• Windows ME		
• Windows 2003		
• Unix		
• Other (please state)		

3. Have there been any special requirements/changes (networking, hardware configuration etc.) required to operate the IC system?

	Yes	**No**
4. Was installation of the IC system delayed? If yes please indicate the number of days and the reason why.		

5. Any additional information on Installation: (i.e.: Hospital Policies, IT Issues, Lack of Resources etc.)

Configuration	**Yes**	**No**

6.	Is the IC system networked?	
7.	Does operation of the IC system require administrative rights to either the Network or Client machines?	
8.	If the answer to the previous question was yes, did this conflict with trust IT policies or practice?	
9.	Is the IC system able to be configured/adjusted for local practices and procedures?	
10.	Are users or local administrators able to set additional alert organisms?	
11.	Are users or local administrators able to add additional data items?	

12. Any additional information on Configuration:

Contingency and Security	**Yes**	**No**
13. Is the IC system subject to regular backups?		
14. Is this carried out within normal trust backup routines?		
15. Is the IC system unavailable during backup, if so for how long?		
16. Is the IC system password protected?		
17. Are there differential levels of security access to ensure that data is available on a need to know basis?		

18. Any additional information on Contingency and Security:

Interfacing	**Yes**	**No**
19. Has the IC system been linked to your Laboratory Information Management System (LIMS)?		
If yes, please state the manner in which this has been achieved (please tick which applies)		
• An export from the LIMS in a format specified by the supplier		
• An export from the LIMS in any consistent format		
• Direct interface between the LIMS and the IC system (the IC system accesses data from the LIMS without the need for file exchange)		
• Other (please specify)		

20. Please indicate the statement or statements which best describe the manner in which the interface was achieved	
• Very little requirement from the host trust team, the IC system provider was able to make use of existing routine outputs	
• Very little requirement from the host trust team, the IC system provider was able to configure the LIMS output themselves or commissioned the LIMS provider	
• Some involvement from the host trust team to indicate the local LIMS configuration, otherwise the IC system provider carried out the work	

- The local trust team contributed substantially to the interface in order to adhere to the IC system needs
- Other (please specify)

	Yes	No
21. Were there any delays in producing an interface between your LIMS and the IC system?		

If Yes please indicate the number of days and the reason why:

22. Please estimate the amount of time expended by any trust staff to interface the IC system

	Yes	No
23. Are Data items required for the IC system to be directly mapped across from the LIMS?		
In particular: Organism code		
Specimen type		
24. Are codes from the LIMS able to be translated to a common coding system (Read or Snomed CT)?		
25. Does data carried across from the LIMS have to be edited or enhanced within the IC system in order to achieve consistent data for infection control management?		

PART 1 COMPLETE - PLEASE GO TO PART 2

PART 2 – COMMUNICATION AND PROFESSIONALISM

For questions that are posed as a statement, please tick the box that indicates the extent to which you agree with the statement and expand your answer in free text in the "comments" section using additional sheets if necessary.

About the software company

26. The trust's first impression of the company was that they were highly professional

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

27. The trust's first impression of the company's professionalism changed over time

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

28. The trust's first impression of the company was that they communicated effectively

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

29. The trust's first impression of the company's communication style changed over time

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

	Yes	No
30. Did the company identify to the trust who from the company was their main point of contact and how they could be contacted?		

31. The company contact was never available to the trust

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

32. Specifically relating to this evaluation project, the company introduced their product to the trust in a very satisfactory way e.g. they provided a pre-pilot acceptance meeting/demonstration

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

33. The information given to the trust by the company about its product's capabilities was borne out in practice

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

34. The company communicated well with relevant individuals in the trust

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

35. The company acknowledged and took into account the views, needs and constraints of the relevant individuals/departments in the trust

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

36. The company was sufficiently flexible in its demands

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

37. The company was sufficiently customer focussed

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

38. The company put the trust in touch with other Trusts using their software

Strongly agree	Agree	Disagree	Strongly disagree

Comments:

	Yes	No
39. Would the trust recommend the company to other Trusts? The company The software		

	Yes	No
40. Does the trust have any other general comments about the company?		

If Yes, please specify:

About the trust

	Yes	No
41. Were the management of the trust aware of the IC teams involvement in the project?		

	Yes	No
42. If Yes were they fully supportive?		

	Yes	No
43. Did this (yes or no) cause any problems during the project?		

Comments

	Yes	No
44. Did the trust's participation in this evaluation project have to go through a FORMAL review or approval process within the trust?		

If Yes,

a) What had to be submitted and to whom/what?

b) How long did the formal review/approval process take (days/weeks)?

c) Who was involved in the researching/writing/presenting of the necessary work for this FORMAL review/approval process – and to what extent? – Please complete the table

Name	Job title	Type of input	Man hours

If NO FORMAL PROCESS was required:

a) How was the trust's agreement for participation in this evaluation project achieved?

	Yes	No
b) In retrospect, would/should the trust have done it differently?		

If Yes, please specify:

	Yes	No
45. Did the trust identify to the software company who from the trust was their main point of contact and how they could be contacted?		

	Yes	No
46. Did the trust have an identified "project lead"?		

If Yes, please specify the name and job title of that person:

If No, in retrospect would this have been helpful?	Yes	No

47. Did the trust have an identified "project team"?

	Yes	No

If Yes

a) Who was involved and for what purpose? – Please complete the table below.

Name	Title	Purpose

b) Did the team meet and produce minutes/notes with attributed actions?	Yes	No

If NO PROJECT TEAM was established

c) How was the necessary work taken forward in the trust?

Please specify:

d) In retrospect, would/should the trust have done it differently?	Yes	No

If Yes, please specify:

48. Does the trust have any other general comments about the trust's involvement in this evaluation project?

	Yes	No

If Yes, please specify:

About the installation

49. At the outset, the company supplied sufficient information to the trust so that the trust fully understood what was needed from it

Strongly agree	Agree	Disagree	Strongly disagree

Comments

50. At the outset, the company sought sufficient information from the trust so that the company fully understood the trust's laboratory system and the requirement for interfacing their product with it

Strongly agree	Agree	Disagree	Strongly disagree

Comments

	Yes	No
51. Was the trust able to provide all the requested information about its laboratory's system to the company?		

If No, please specify why not:

52. Specifically in relation to the installation of the software and its linkage to the laboratory system only:

a) Who from the trust was involved to do what, and to what extent was their time required in order to work out/configure the system and to achieve successful installation of the software? – Please complete the table below.

Name	Job title	Type of input	Man hours

b) These staff were available to complete any required work with out delay to the project

Strongly agree	Agree	Disagree	Strongly disagree

c) The company contributed effectively to this work

Strongly agree	Agree	Disagree	Strongly disagree

Comments

	Yes	No
53. Was the installation held up by any problems?		

If Yes, what was/were the problem(s) and how far did it/they delay the installation?

	Yes	No
54. Does the trust have any other comments about its input in relation to the installation of the software?		

If Yes, please specify:

About the training

	Yes	No
55. The company provided user documentation for its product		

56. The user documentation provided was fit for purpose

Strongly agree	Agree	Disagree	Strongly disagree

Comments

	Yes	No
57. The company provided training for its product		

58. The training provided was fit for purpose

Strongly agree	Agree	Disagree	Strongly disagree

Comments

59. How many training sessions were required by staff to be able to use the system? |

60. How many training session were held in total? |

61. How many staff were trained in a session? |

62. Were the staff always available for the:

For full planned session	For part of the session and able to rejoin another group	For non of the session which had to be rescheduled

Comments (i.e. were any new staff recruited during project and required additional training sessions)

	Yes	No
63. Does the trust have any other comments about the user documentation provided by the company? If Yes, please specify:		

PART 2 COMPLETE - PLEASE GO TO PART 3. Part 3 to be completed in the new year.

That is the end of parts 1 and 2 of the evaluation questionnaire, thank you. Please add any additional sheets that you feel are necessary.
Completed by:

Please sign:
Date:

PART 3 – ALERT ORGANISM SURVEILLANCE

64. Does the IC system include patients on more than one hospital site?

Yes	No

If YES, please indicate which of the following features are available:

Feature	Yes *and* tested	No	Don't Know	Available but *not* tested
Full access to the IC database from multiple sites or locations				
IC database can be used simultaneously by users at different locations				
Analysis of "alert organisms" can be grouped by hospital site				
Case management tools can provide site based lists of patients needing ICT follow up				

Importation of data from your laboratory system

65. Please tick to indicate which of the following import strategies has been used in your pilot site:

Scope of import from Lab system	From hospital patients	From community patients	From hospital & community patients
Your normal range of "alert organism" results from the Lab system.			
All relevant positive microbiology results			
All relevant microbiology results			

66. Please tick to indicate whether it has been possible to import the following categories of "alert organism" data into your IC database. Where relevant, please indicate why data have not been imported.

Alert organism or condition	Data uploaded successfully ?		If "NO", why not?		
	Yes	No	IC database unable to import data	Lab system unable to export in required format	Export not attempted
MRSA +ve cases					
MRSA +ve screens					
MRSA -ve screens					
Other "resistant" organism e.g. ESBL Kelbsiella					
C. difficile cases					
GRE cases					
Serology based report					
Other 2 (specify)					

Other 3 (specify)					
Other 1 (specify)					

	Yes	No
67. Have any problems been experienced with the importing of data into the IC system?		

If YES, please give details:

	Yes	No	Don't know	Not attempted
68. Were antibiotic sensitivity results imported successfully?				

Alert Organism/Condition: Manual data-entry

69. Has the IC database allowed manual data-entry of the following information?

Alert information	Yes	No	Don't know	Not attempted
Entry of cases not normally contained on the lab system e.g. clinically diagnosed TB				
Current /updated patient location with dates				
Surgical wound information				
Operative details - type of procedure				
Operative details - surgeon(s)				
Operative details - dates of procedure				

Alert Organism/Condition: Analysis

70. Can interrogation of the IC database provide the following information?

Analysis required (within specified date range)		Yes	No	Don't know	Not applicable*
All MRSA cases	Line listing				
	Totals				
MRSA cases acquired in hospital	Line listing				
	Totals				
MRSA cases linked to a particular outbreak	Line listing				
	Totals				
MRSA colonised patients	Line listing				
	Totals				
Significant MRSA infections	Line listing				
	Totals				
Treated MRSA infections	Line listing				
	Totals				
MRSA cases identified by pre-	Line listing				

admission screening	Totals				
Could the MRSA data be broken down to ward/unit level?	Line listing				
	Totals				
Could the MRSA data be broken down by speciality?	Line listing				
	Totals				
All *C. difficile* cases by ward	Line listing				
	Totals				
1st episode *C. difficile* cases	Line listing				
	Totals				
"relapsed" *C. difficile* cases	Line listing				
	Totals				
Cases of organisms with specific antibiotic resistance profile	Line listing				
	Totals				
All cases of "alert" infections currently in hospital. (NB: It is recognised that this might not be available without a PAS link unless the ICT manually enter admission/discharge dates)	Line listing				
	Totals				
Trend analysis for "alert organisms"	Graph				
	Table				
Can duplicate isolates be excluded from graphical/tabular reports?					

* Not applicable = no cases/infections during the time period under review

71. Can the IC software produce the following information to assist with production of DH mandatory reports?
(NB: It is recognised that many sites may find it more logical to generate some or all of this information from their laboratory system)

	Source	**Yes**	**No**	**Don't know**	**Not applicable***
All positive significant blood cultures – quarterly	Hospital				
	Community				
S.aureus & MRSA positive blood cultures – quarterly	Hospital				
	Community				
GRE positive blood cultures – quarterly	Hospital				
	Community				
C. difficile totals – quarterly	Hospital				
	Community				

* Not applicable = no cases/infections during the time period under review or laboratory system used for this

72. Please rate the performance of the IC software in providing analysis of "alert organisms" for the infection control team:

Very Satisfactory	**Satisfactory**	**Unsatisfactory but useful**	**Unsatisfactory, *not* useful**

73. Please list any key features required for "alert organism" analysis that are missing:

Case Management – (i.e. the ability to help the infection control team manage infected patients)

74. Please tick to indicate which of the following features were available in the IC database:

Feature	Yes *and* tested	No	Don't know	Available but *not* tested
Maintains list of "active" patients being followed up by ICT				
Can such a list be broken down by current patient location?				
Can such a list be broken down by speciality?				
Maintains "active" patient list for individual ICT members				
Patients can be promoted to and demoted from the active list by the ICT				
Patients can be manually entered on the active list when no organism based record has been transferred from the Lab. system				
Date stamped progress notes can be added to patient records				
ICT follow up can be scheduled in a task list or calendar				
A task list can be maintained for one or more ICT members				
A calendar (schedule) can be maintained for one or more ICT members				
Antibiotic therapy can be recorded in the patient record				
MRSA eradication therapy can be recorded in the patient record.				
Isolation requirements can be entered in the patient record				
Isolation history can be recorded (with location details)				
Wound management details can be recorded				
Advice issued to patient/family can be recorded				

75. Please rate the performance of the IC software in providing "Case Management" tools for the ICT:

Very Satisfactory	Satisfactory	Unsatisfactory but useful	Unsatisfactory, *not* useful

76. Please list key features required to support case management by the infection control team that are missing:

Yes No

77. Have you tried to export any data from the system in a standard format e.g. Excel?

If YES was this successful?

If NO please give details:

	Yes	No
78. Have you had any concerns about the system with regards to security?		

If Yes please give details

	Yes	No	Don't Know
79. Did the system maintain a log of everyone who accessed it?			

	Yes	No	Don't Know
80. Did the system maintain a log of dates and times when users accessed it?			

	Yes	No	Don't Know
81. Did the system maintain a log of actions performed by users?			

	Yes	No	Don't Know
82. Did the system maintain a log of when new records were added?			

	Yes	No	Don't Know
83. Did the system maintain a log of when existing records were deleted?			

	Yes	No	Don't Know
84. Did the system maintain a log of changes to records so that the previous data could be viewed if required?			

Speed and Reliability

85. How would you assess the speed of the system when performing these operations:

operations	**Fast! Fantastic**	**Seems fast**	**Slow but OK**	**Sluggish**
Importing data				
Editing data				
Producing reports				

	Yes	No
86. Have there been times when the system was non-operational		

If YES please give details on next page

Number of occasions when the system was down	

What were the reasons for this?

How much time was lost?

87. How much training did your staff have before starting to use the system?

< half a day	**1 day**	**2 – 3 days**	**1 week**	**Less than 1 week**

88. How much support have they needed since then?

none	**Occasional phone call**	**Lots of calls**	**More training**	**On-site visits**	**Constant help**

	Yes	**No**	**Don't Know**
89. Were you using another system before this?			

If Yes please give details

If YES is your new system..

Far better	**An improvement**	**No real difference**	**Not as good**	**Far worse**

Please make any other comments you have on the system:

That is the end of the evaluation questionnaire, thank you. Please add any additional sheets that you feel are necessary.

Completed by: Designation:

Date:

Please return it to:

Appendix 4
Electronic Government Interoperability Framework (e-GiF) statements.

EpiQuest Europe Limited

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Confirmation of compliance to e-GIF and ICIT/IAE in all respects.

Specifically:

We can confirm that our browser interfaces do not contravene the e-GIF policies and associated specifications for e-Services access set out in e-GIF version 6

All browsers and e-mail clients accessing NHSmail services support 128 bit SSL encryption

The messaging system conforms to NHS eSMTP messaging specification

The system supports the NHS specification for e-mail client access

The interface to the DTS Client meet the requirements in the current versions of the DTS Functional Specification and the DTS File Interface specification

All systems accessing the NHS Directory Service conform to LDAPv3

When transferring hypertext all of our systems conform to HTTP/1.1 and support upgrading to TLS

The system conforms to HTTP/1.1 when transferring files

All equipment to be connected conforms to the requirements of IEEE 802.3.

All firewalls are accredited to ITSEC E3 or CC (Common Criteria) EAL4

The system conforms to IEEE 802.11b and supports 104/128 bit WEP

Furthermore, I can confirm that we meet the newer requirements for NPFIT.

Best regards

Paul Mustoe.
EpiQuest Europe Ltd – Making Time for Prevention

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ICE and e-GIF

Overview
ICE uses common internet and network standards and is considered by the Repatriation General Hospital to be e-GIF compliant.

ICE and Interconnectivity
There are two components to the ICE system. A smart client runs on a local workstation and a thin client is accessed through a browser. Both the smart and thin clients conform to the e-GIF standards for interconnectivity and network transport.

The thin client is fully HTTP/1.1 compliant and supports SSL transport security. The smart client supports TCP and currently operates on IP v4 networks, but in theory supports IP v6.

ICE and Data Integration
XML: XML as defined by W3C is used extensively internally within ICE. The ICE interface engine is also able to send, receive and translate XML based messages.

XSL: XSL is used within the ICE interface engine to transform and manipulate information an conforms to the W3C specification.

UML: UML is used to model the ICE database. A graphical data model and web data dictionary is distributed as part of the ICE product as an end user reference tool.

XMI: The ICE data model is available to sites in XMI format for importing into other metadata and modeling tools. It can also be provided in other interchange standards such as a Business Objects Universe for easy end user interpretation and reporting.

UTF-8: ICE messaging supports 8 bit UTF-8 character encoding.

Encryption: Encryption is available within ICE at the client/server protocol level through standard SQL Server client tools. 128-bit Rindael encryption scheme is used internally for system passwords.

Encryption is available on the web components via SSL through MS Internet Information Server.

ICE interface messages can be encrypted using a variety of algorithms such as DES, Blowfish, RSA and many others.

ICE and e-Health
Health Level 7 v3: Electronic Data Interchange (EDI) capabilities of ICE fully support HL7 message formats. Currently the main version in use is version 2.3.x however HL7 v3 messaging is currently available through ICE interfaces and will expand as vendor implement v3 message capabilities.

NHS Data Dictionary: The NHS Data Dictionary (version 3) defines data standards related to patients and care activity. The model is designed in a generic fashion to support a wide variety of data needs. The ICE data model easily maps to the "care activity for a patient at a service point"[1] model of the NHS Data Dictionary.
SNOMED-CT: ICE does not force a particular coding standard to be used but rather supports the implementers coding standard of choice. SNOMED-CT is fully supported but not supplied as standard with the system.

ICE and Accessibility/Usability
One of the most important design elements with ICE is the usability of the system. ICE development has always involved a user-centered approach. Common user interface standards are implemented for seamless user operation between ICE and other Microsoft® Windows® applications.

Summary
e-GIF and technical details associated with compliance to the standard are currently not comprehensive. It is considered that the ICE product does not specifically contravene any of the e-GIF requirements outlined in the current Technical Standards Catalogue v6.2. The compliance of the ICE system will be reassessed regularly as new details of the e-GIF requirements emerge.

[1] NHS, "NHS Data Dictionary", http://www.nhsia.nhs.uk/datastandards/pages/dd/index.asp (accessed June 2005)

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The Directors,
ICNet Ltd
Dell Centre
Painswick
Near Stroud
Gloucestershire
GL6 6SQ

17 June 20005

Dear Sirs,
You have asked us, as a Sponsor of the e-GIF Accreditation Authority and an e-GIF accredited organization, to review your e-GIF compliance self-assessment form, dated 16 June 2005 completed by Katie Belton, Director of ICNet Ltd, as it relates to the ICNet software version 3.6.

There is only one area in the questionaire where ICNet has correctly stated non-compliance and that is section 11 - question 1 where ICNet state that their software requires a 5th generation browser such as Microsoft Internet Explorer 5. In view of the fact that "Connecting for Health" national program has entered into a global NHS contract to provide unlimted number of copies of Microsoft 5th Generation Browsers to all desktops within NHS - and the ICNet product is only supplied to NHS organisations we suggest that this question is irrelevant and does not impact compliance.

We are of the opinion that the answers given are accurate and lead us to recommend that ICnet version 3,6 should be regarded as fully e-GIF compliant.

Yours Sincerely

Tim Benson
Director

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