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An Assessment of the State of Readiness

and

A Suggested Approach to Evaluating 'Information for Health'

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1 MANAGEMENT SUMMARY

1.1 Introduction

1.1.1 The reviewer, working with the Implementation Review section of the Information Policy Unit, was invited to comment on the state of readiness within the NHS to implement the Information for Health strategy and to develop a methodology for evaluating the progress of the strategy.

1.1.2 The methodology was to meet the “evaluation” recommendations made in the National Audit Office (NAO) report HC 371 (1998-99) into the Information Management and Technology (IM&T) strategies of the NHS Executive. It was stressed that the NAO report makes great play on continuous evaluation of progress.

1.1.3 During the period of 21st September to 14th October 1999, the reviewer met with and/or interviewed 26 individuals and groups. He read 20 of the initial Local Implementation Strategies (iLIS), the 8 Regional Heads of Information reports on their Region’s iLIS, the National Audit Office report, and an array of guidances and other documents.

1.1.4 In terms of a preliminary assessment of the ‘state of readiness’ of the NHS to implement Information for Health, twenty (20) of the March 1999 initial Local Implementation Strategies (iLIS) were read and scored using 11 critical progress markers. Given that the maximum score was 33, the average score for the twenty iLIS was 15.0 with the lowest score being a 4 while the highest was a 26. One should note that 7 of the 20 iLIS were well above the mid point of 16.5. It should also be pointed out, there are some very well thought out iLIS, including some who have agreed to fully integrate their LIS and Health Improvement Programme plans.

1.1.5 One would fully expect that when the full Local Implementation Strategies arrive in March 2000, each local health community will be able to say that some progress has been made. Equally important, one would hope that the lessons learnt from those who are more advanced can be transferred, and accepted by those who are perhaps struggling.

1.1.6 Although the remit did not explicitly request an opinion of what the greatest risks facing the strategy were, it seems only natural that one should be given none the less. The reviewer’s assessment of the three greatest risks to the strategy - in order of importance are: the Internet and its implications on NHSnet and GPnet; human resources as manifested by a serious deficiency in health informatics skills; and priorities, or more explicitly the lack of them.
1.1.7 Evaluation is a value-laden concept that can take on many meanings. Classically, evaluation is seen as the process of determining the worth of something. The process of evaluation can be either quantitative or qualitative. Qualitative methods examine the dynamics of a process rather than its static characteristics. They help understand the meaning and context of the phenomena studied and the particular events and processes that make up these phenomena over time, in real-life, natural settings.

1.1.8 The traditional approaches to evaluation are well known, and are dominated by economic analysis. Less well known are the more recent approaches to evaluation of benchmarking and the Balanced Scorecard. The Kaplan and Norton Balanced Scorecard (BSC) is a means to evaluate corporate performance from four different perspectives: the financial perspective, the internal business process perspective, the customer perspective, and the learning and growth perspective. The BSC recognizes that you cannot drive an automobile by solely relying on the rear-view mirror. Kaplan and Norton compare their approach for managing a company to that of pilots viewing assorted instrument panels in an aeroplane cockpit: both have a need to monitor multiple aspects of their working environment.

1.1.9 Many methods and techniques have been suggested to evaluate the investments made in IM&T. These methods tend to take either an organisational or sociotechnical viewpoint as to whether an information system is deemed successful. The sociotechnical viewpoint asserts that when examining how work is actually accomplished in companies, communication and collaboration between groups of people is the norm.

1.1.10 Traditional evaluation methods focus on well-known financial measures such as the return on investment (ROI) and the payback period. These methods are best suited to measure the value of simple IT applications, such as transaction processing and office automation systems. Unfortunately, evaluation methods that rely solely on financial measures are not as well suited for newer generations of IM&T applications. Newer IT applications typically seek to provide a wide range of benefits, including many that are intangible in nature.

1.1.11 The conundrum of measuring the IM&T function is that:
- efficiency (doing things right) is easier to measure than effectiveness (doing the right things)
- new systems are intended to change difficult to measure actions
- strategic systems elude measurement
- infrastructure investments cannot be cost justified on a ROI basis
An Assessment of the State of Readiness and a Suggested Approach to Evaluating Information for Health

1.1.12 As with any infrastructure, IT infrastructure does not provide direct business performance. Rather it enables other systems that do yield business benefits. IT infrastructure is strikingly similar to other public infrastructures such as roads, hospitals, sewers, schools, etc. They are all long term and require large investments. They enable business activity by users that would otherwise not be economically feasible. They are difficult to cost-justify in advance.

1.1.13 A four-stage evaluation process is being recommended for the next 26 months. Stages 1 and 2 are intended to establish a baseline and measure progress from that baseline by May 2000. Part of Stage 2 is to refine/review the 36 targets and 86 action items in the strategy by: defining each one explicitly, collapsing them, identifying a measure for each revised target, and linking each refined/revised target to one or more of the strategy's objectives. In addition, stage 2 includes establishing priorities and defining dependencies between the targets.

1.1.14 Stage 3 is intended to start in March 2001 and will set a new baseline which is based on local 'plans' which are to include national and local targets and resource expenditures as opposed to local 'strategies'.

1.1.15 It is being recommended that Stage 4 be the introduction of an IM&T Balanced Scorecard for Information for Health. It is suggested that it not be introduced until 2001 as it requires a certain degree of preparation and commitment and there are other more pressing needs that should be addressed beforehand.
AN ASSESSMENT OF THE STATE OF READINESS AND A SUGGESTED APPROACH TO EVALUATING INFORMATION FOR HEALTH
2 BACKGROUND

2.1 Introduction

2.1.1 When it was announced in September 1998, the strategy was acclaimed, both within the UK and abroad, as visionary, appropriate and relevant to the needs of the NHS. It was seen as a solid attempt to connect key national health policies with the capabilities of modern information (computers and communications) technologies. Most saw the strategy as an honest and pragmatic attempt to build upon the work of the early 1990s. Reviewers commented on the apparent desire to learn from the success and failures of that period and put together a new information management approach throughout the entire NHS - one which had already been proven successful in a few NHS organisational settings. What few criticisms there were centred around the vaguely worded targets, an aggressive timetable and the challenges to be faced around "changing the culture" which would be critical to success.

2.1.2 In the summer of 1998, this reviewer along with three other external agencies commented on various aspects of the Information for Health strategy and in particular on the direction of travel set out in the strategy.

2.1.3 In the spring of 1999, this reviewer was invited to give an external assessment of the state of readiness and assist in the development of an evaluation methodology for the strategy.

2.1.4 The reviewer, working with the Implementation Review section of the Information Policy Unit, was to comment on the state of readiness within the NHS to implement the strategy and to develop a methodology for evaluating the progress of the strategy.

2.1.5 The methodology was to meet the "evaluation" recommendations made in the NAO report HC 371 (1998-99) into the IM&T strategies of the NHS Executive. It was stressed that the NAO report makes great play on continuous evaluation of progress. It was also pointed out that Her Majesty's Treasury had a particular interest in how the strategy was to be evaluated.

2.2 Process

2.2.1 Upon his arrival, the senior staff within the Information Policy Unit drew up a list of individuals to be interviewed, and identified documents to be read.

2.2.2 During the period of 21st September to 14th October 1999, the reviewer met with and/or interviewed 26 individuals and groups (Annex A). Not everyone on the original list could be seen due to the short period of time available and scheduling conflicts.
2.2.3 In terms of reading, the reviewer read 20 of the initial Local Implementation Strategies (iLIS), the 8 Regional Heads of Information reports on their Regions iLIS, the National Audit Office report and an array of guidances and other documents.

2.2.4 In addition, the reviewer had a number of informal conversations, most of them with individuals in the NHS Executive at Quarry House, Leeds.

2.2.5 Upon reflection, it was unfortunate that the interview list did not include senior clinicians at the Policy Board level who apparently were important supporters during the development of the strategy; more clinicians on the ground including GPs; and representatives of the supplier community. It was also unfortunate that the reviewer was not directed, nor did he have the time, to assess the education and training initiative.

2.3 Assumptions

2.3.1 Based on the remit, the discussions with Information Policy Unit officials and others, and the content of key documents, the reviewer concluded that what was desired was:

- A long term and high-level evaluation methodology as individual projects each have a business case, which includes an evaluation plan as well as a progress assessment as part of normal project management.

- A formative evaluation in order to foster organisational learning.

- An uncomplicated method that would generate findings quickly and provide swift feedback.

- A commentary on the state of readiness in the NHS - excluding whether or not the NHS would be ready for Y2K.
3 PRELIMINARY ASSESSMENT OF THE STATE OF READINESS

3.1 Assessment Process

3.1.1 Twenty (20) initial Local Implementation Strategies (iLIS) were read and scored using 11 critical progress markers (an earlier version of Annex B).

3.1.2 Each marker was given a grade of 3, 2, 1 or 0; a '3' meant the iLIS documented evidence of having the given marker well in hand while a '0' indicated there was little or no evidence. A '2' was closer to being fine while a '1' was closer to being weak. There was no middle ground.

3.1.3 Someone within the Information Policy Unit chose half of the iLIS (3 that were considered good, 4 seen as being medium in quality and 3 of the poorer ones). The remainder were chosen as a result of the reviewer asking to see specific iLIS - some of which he had been advised were the better ones.

3.1.4 In the end, the distribution of the twenty iLIS reviewed was as shown in Table 1.

Table 1 - iLIS Distribution

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<table>
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<tbody>
<tr>
<td>West Midlands</td>
<td>6</td>
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<tr>
<td>North Yorkshire</td>
<td>3</td>
</tr>
<tr>
<td>Northwest</td>
<td>3</td>
</tr>
<tr>
<td>Eastern</td>
<td>2</td>
</tr>
<tr>
<td>London</td>
<td>2</td>
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<tr>
<td>South West</td>
<td>2</td>
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<tr>
<td>South East</td>
<td>1</td>
</tr>
<tr>
<td>Trent</td>
<td>1</td>
</tr>
</tbody>
</table>

3.1.5 Given that the maximum score was 33, the average score for the twenty iLIS was 15.0 with the lowest score being a 4 while the highest was a 26 (Annex C). One should note that 7 of the 20 iLIS were well above the mid point of 16.5. It should also be pointed out, there are some very well thought out iLIS, including some who have agreed to fully integrate their LIS with Health Improvement Programme plans.

3.1.6 The numbers themselves should only be taken as 'guides' rather than absolutes. The wide variety of approaches used to complete the iLIS requires a degree of judgement as to what score should be given. As well, the 0-3 scale has mathematical weaknesses, but by having no mid point it forces those scoring to decide whether the marker is generally positive or generally negative.
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3.1.7 Perhaps the greatest value in the method is in identifying the individual 0's and 1's within the iLIS - these reflect the areas within the local health community, which are at risk.

3.1.8 In terms of the 11 progress markers, the average scores were as shown in Table 2.

<table>
<thead>
<tr>
<th>Table 2 - Average scores</th>
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<tbody>
<tr>
<td>Technical Infrastructure</td>
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<tr>
<td>Local Vision</td>
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<tr>
<td>Human Resource Infrastructure</td>
</tr>
<tr>
<td>Health Improvement Programme</td>
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<tr>
<td>LIS Program Board Chair</td>
</tr>
<tr>
<td>Modernization Funds</td>
</tr>
<tr>
<td>Stakeholder Involvement</td>
</tr>
<tr>
<td>Investment Strategy</td>
</tr>
<tr>
<td>Project Management Leadership</td>
</tr>
<tr>
<td>Information Management</td>
</tr>
<tr>
<td>Clinician Involvement</td>
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</tbody>
</table>

3.1.9 The above is not surprising given that the iLIS authors had very little time to complete their work - the guidance did not come out until late November and in some areas was missing important definitions. More importantly, the authors were working in a very new arena, i.e. the need to develop new partnerships with a wide array of stakeholders, many of whom who had not worked together before. There is abundant evidence in the management literature that mergers, alliances, partnerships, take-overs, etc. are very difficult and very time-consuming processes. Some have reported it can take up to 18 months to develop relationships to a point where decision making in a collaborative manner can begin. In March of 1999, it appears as if some of the iLIS were written with little involvement of the stakeholders and that it was a ‘tick in the box’ exercise.

3.1.10 The proof in the pudding will be the degree to which progress has been made since March 1999. It is widely acknowledged that not everyone is as ready, willing, or able to proceed at the same pace. One would fully expect that when the full Local Implementation Strategies arrive in March 2000, each local health community would be able to say that some progress has been made. Equally important, one would hope that the lessons learnt from those who are more advanced can be transferred, and accepted by those who are perhaps struggling.
4 IMPENDING RISKS TO THE INFORMATION FOR HEALTH STRATEGY

"The task of transferring information technology (IT) in large, complex divisionalized organizations reliant on highly professional workers such as doctors presents a particularly difficult challenge".

Soughton et al

4.1 Introduction

4.1.1 Although the remit did not explicitly request an opinion of what the greatest risks facing the strategy were, it seems only natural that one should be given none the less. Based on the interviews (Annex A) and the many documents read, the following is the reviewer’s assessment of the three greatest risks to the strategy – in order of importance:

4.2 Risk # 1 - The Internet

4.2.1 The reliability and performance problems (availability, response time, etc.) being experienced with NHSnet, coupled with the lack of a comprehensive directory for NHS e-mail is engendering a lack of confidence amongst many current users and potential new ones - particularly GPs.

4.2.2 The Internet’s explosive growth (as a result of its ease of use and increasing functionality and security) coupled with the delays in rolling out GPnet means that an increasing number of localities are not waiting and are using commercially available Internet Service Providers.

4.2.3 GPs do not see NHSnet as reliant, resilient or robust and are now using the Internet to send messages between themselves and to/from clinicians in hospitals; undoubtedly these will, if they have not already, contain clinical information which may not be encrypted and secure.

4.2.4 Furthermore I did not get a sense that the many GP systems suppliers are adapting to the new way of doing business and appear focused on old, inward looking platforms.

4.2.5 There doesn't appear to be any consistent view on what the GP desktop should look like or should do, let alone whether or not it should be standardised.
4.2.6 There is an urgent need to review the fundamental approaches to the NHSnet infrastructure; Internet-based electronic health record systems are beginning to emerge. Web-based servers, SMTP, clinical data repositories, data warehouses, XML, and e-commerce/EDI applications are evolving approaches being adopted by other healthcare organizations around the world.

4.2.7 It is not clear if the approaches being used in the Scottish Health Service are being carefully monitored. They appear to have certain aspects of NHSnet under control.

4.2.8 The December 1999 target of "connecting all computerised GP practices to NHSnet", notwithstanding the press release announcing a delay in achieving it, is by far the most tangible and visible of the Phase 1 targets, and there is a very strong political will to see this happen.

4.2.9 The reforms in The New NHS hinge very heavily on primary care and GPs are at the forefront of primary care.

4.2.10 The comment was made to the reviewer that this project (NHSnet) has the makings of another Wessex if it is not quickly resolved.

4.3 Risk #2 - Human Resources

4.3.1 The strategy clearly recognizes the critical role intellectual resources will play. This reviewer's August 1998 commentary stressed this point.

"In a number places, the strategy acknowledges the scarcity of intellectual resources and experienced personnel. It will be important to carefully manage the shortage of competent personnel and the problems that will result. Skilled people will be needed at all levels. It is not only this reviewer who is uncertain about "the adequacy of specialist IM&T staff resources available to support implementation of this strategy...". It is should be noted that it is not only the skill level of IM&T staff who should be assessed. The more informatics-literate the clinicians and GPs are the quicker implementation will proceed. Equally important will be the knowledge and skill levels of the managers at all levels. This is particularly so in situations where teamwork and cooperation are needed to achieve goals. It is encouraging to see that the strategy recognizes this and stresses its importance. The challenge will be to assure that the resources necessary to be successful in this arena are made available and protected".

4.3.2 A review of 20 initial Local Implementation Strategies (iLIS) confirms the fears that there is a severe shortage of skilled health informatics personnel. There was also little indication in most of the iLIS reviewed as to how these will be addressed, whether it be through hiring (difficult due to non-competitive wage rates) or joint education and training initiatives via local Health Informatics services.
4.3.3 As put by one of the interviewees, the major barrier to the implementing Information for Health is one of ‘capability and capacity’.

4.3.4 There is varying degrees of awareness of the critical need to educate and train clinicians and managers (including senior ones) as part of the cultural change management agenda.

4.3.5 There appears to be a heavy dependency on using management consultants throughout the Service, which in itself is not bad, as long as knowledge is being transferred so that local expertise is built up; however it is not clear whether or not this is happening.

4.3.6 The reviewer did not have time to study the Education and Training initiative, which was underway at the time of the review. He did however hear more than once that if it is conducted in the fashion of a similar initiative of the previous strategy then it will not solve the fundamental problems.

4.4 Risk #3 - Priorities

4.4.1 The issues of “who does what and when” manifest themselves in a number of ways, including NHS initiatives, the information agenda and Primary Care Group priorities.

*NHS initiatives*

4.4.2 The reviewer was overwhelmed by how much is going on in the NHS. In his opinion, it is significantly more than what he observed in the 1994-1997 time period.

4.4.3 Annex D contains a list of twenty initiatives ranging from Primary Care Groups, HIMPs, PCIPs, to NICE, HAZs, and NHS Direct - and the list is likely to be incomplete. As a result the pressure on those “on the ground” to cope with what has been termed “initiative overload” must be very very real.

4.4.4 Those trying to do their day-to-day jobs looking after patients in times when demand continues to exceed supply (hence the waiting list phenomena) are also regularly having to cope with the pressures brought on by the explosion of knowledge about medical science including new procedures, drugs and technologies. Such is the case with health care providers and managers the world over.

4.4.5 In the United Kingdom, these same providers and managers have additional pressures they must try to absorb and internalise including:

- A new political philosophy and terminology which encourages collaboration rather than competition, sharing vs. individual efforts, accountability vs. autonomy, evidence-based vs.
The creation of Primary Care Groups, let alone the emerging Primary Care Trusts, which is reshaping the control of resources and sources of power.

Impending re-configurations of NHS Trusts and Health Authorities

Having to work more closely with Social Services

Emerging services such as NHS Direct, walk-in centres, etc. etc.

4.4.6 In such circumstances where there are so many changes going on simultaneously, it is natural for many people to revert to concentrating on short-term pressures and leave the other pressures for some later time.

Information Agenda

4.4.7 On top of all this there is an information strategy which has 8 objectives, 36 targets and 86 action items, many of which carry the burden of local effort. It does not help that there is very little sense as to which ones are more important than others.

4.4.8 The psychology literature is quite clear - information overload leads to dysfunctional behaviour in human beings. We should not be surprised that in such circumstances we observe:

- Omission - failing to process some of the information
- Error - processing information incorrectly
- Queuing - delaying in peak loads in the hope of catching up during the lulls
- Filtering - neglecting to process certain types of information, according to some scheme of priorities
- Approximation - cutting categories of discrimination (a blanket and non-precise way of responding)
- Escaping from the task
4.4.9 In this reviewer's humble opinion, there appears to be a genuine need to for someone to say "no" or at least "not now".

*Primary Care Group Priorities*

4.4.10 Experiences in the UK with the internal market and fundholding - as well as that of other countries in terms of creating Regional Health Authorities - has shown that for the first few years, new Boards are primarily concerned with financial matters. The new Primary Care Groups and Primary Care Trusts are not likely to be any different.

4.4.11 There is a risk that financial priorities and pressures will override efforts and investments to the clinical and quality side of the operation, which is of course what the strategy is all about.

**4.5 Other Risks**

4.5.1 In addition to the top three issues highlighted above, there are a variety of lesser risks, as described below.

*Funding*

4.5.2 The uncertainty as to whether or not the funds from the government's Modernisation Fund will be provided on a recurrent basis is definitely a delaying factor - more so for some than others. It is difficult, if not impossible, to develop a multi-year plan if the revenue stream is at best annual.

4.5.3 There is also a need to more accurately and consistently define where the financial baseline is, i.e., what are the existing spends on IM&T in the local health communities. This will be particularly important if the concerns expressed about the risk of using Modernisation Fund monies to replace existing spends are valid.

4.5.4 There appears to be continuing uncertainty as to the degree to which the strategy will be rolled out locally - based on local priorities as opposed to central guidances, appraisal processes, and release of funds.

4.5.5 If funding of infrastructure is going to depend on a classic business case being approved, one can expect that a number of the targets are going to have to be pushed back.
4.5.6 Some means of balancing the distribution of Modernisation Funds between a per capita equity formula and a proven ability to spend wisely should be found. There appears to be some resentment that Modernisation Funds are guaranteed - regardless of willingness or ability to use them properly. In this respect, the lessons from the Resource Management Initiative of the late '80s may be worth reviewing.

Change

4.5.7 The impending reconfiguration of a number of Trusts and Health Authorities will likely:

- create new complexities as boundaries change and various stakeholders move in and out of new arrangements - a particularly difficult problem when neighbouring community's boundaries are not co-terminus.

- see LIS leaders/authors disappearing. This is particularly significant since it does not generally appear that the LIS project management leadership is built on a solid team of 2-3 individuals.

4.5.8 The creation of Health Informatics Services will not come easily in many local health communities. There is a strong sense of protectionism, which is both understandable, and in some cases justifiable. A few impressive success stories should smooth the ways for those reluctant to release their IM&T staff to work on collaborative initiatives.

Culture

4.5.9 With the pressure to determine value for money, there is an impending danger of focusing on the "tangibles" and only paying lip service to the cultural changes required for long term success.

4.5.10 The scarce organisational resource is not information; it is organisational attention. Given the array of initiatives previously mentioned and the ever-present short-term pressures, it appears as though the information agenda is not on the radar screen of a number of the local health communities.

4.5.11 There appears to be a need to more clearly explain to the service what all this has to do with helping patients and how all the pieces fit together.

4.5.12 There also appears to be an assumption that people will willingly share information - once the technology is put into place. The work of Davenport and others suggests otherwise.
**Roles**

4.5.13 The fuzziness of the role and responsibilities of the Information Policy Unit, NHS Information Authority, NHS Executive Regional Offices and Health Authorities, particularly when it comes to implementation, should be clarified so that the dreaded 'buck passing' does not occur - a distinct possibility when there are so many players involved.

4.5.14 The authority of the LIS Management Boards appears to vary - some appear to be only advisory with final decisions resting with individual organisation Boards - a process that has inherent inefficiencies and delays built into it.

4.5.15 There appears to be uncertainty as to who should be out 'beating the drum' and actively promoting the strategy throughout the NHS.

4.5.16 The fact that it took a rather long time to establish the Information Policy Unit and NHS Information Authority has not instilled confidence in the NHS that the Centre is ready to move quickly.

4.5.17 There has also been a concern expressed that the Centre is expending too much of its effort to responding to the concerns of HM Treasury, the National Audit Office and others which is taking away vital resources and energy from supporting the information needs of the NHS.

**Suppliers**

4.5.18 If all Trusts are to have level 3 Electronic Patient Record Systems by 2005, there is an assumption that the vendor community has the capability to install systems at a rate of 50-60 sites per year.

4.5.19 The same applies, perhaps even more seriously, to the vendor community supporting GP practices and the emerging Primary Care Groups and PCTs.

4.5.20 The NHS has been a minefield for many IT companies, and this is particularly true for large multinationals. Apparently over 20 companies, at least 6 of them being world-class players, have come and gone from the NHS market in the last 8 years.

4.5.21 The old ways, in which organisations' justify investments, procure solutions and contract implementations needs to be reviewed - they will not work in the evolving world of partnerships, alliances and virtual communities.
Electronic Health Record

4.5.22 The uncertainty as to what it is, what it will contain, and more importantly where it will reside will likely continue until a few demonstrator sites are up and running - hopefully in a research and development mode.

4.5.23 It will be important to remain sensitive to where local health communities are in their implementation of information systems and the many pressures they are facing. Everyone is not ready or able to move on this particular agenda. Those who are should be given a reasonable degree of scope to experiment.

4.5.24 The clinical data repository - enterprise wide model of all data is one place is an approach being used in a number of American Integrated Delivery System organizations. The virtual Internet-based electronic patient record is a quite different approach that has favour in other circles.

Internet-based, personal health care records have to the potential to profoundly influence the delivery of health care in the 21st century by changing the loci and ownership of the record from one that is distributed amongst the various health care providers a patient has seen in his lifetime to one with a single source that is accessible from anywhere in the world and under the shared ownership and control of the patient and his provider(s).

http://www.informatics-review.com/thoughts/personal.htm
5 EVALUATION: THE WHY AND THE WHERFORE

"Not everything that can be measured is important, and not everything that is important can be measured."

Albert Einstein

5.1 Introduction

5.1.1 Evaluation is a value-laden concept that can take on many meanings. Classically, evaluation is seen as the process of determining the worth of something. It entails obtaining information for use in judging the worth of a program, product, procedure or objective. It may also entail determining the potential utility of alternative approaches designed to obtain specific objectives.

5.2 Quantitative vs. Qualitative Methods

5.2.1 The process of evaluation can be either quantitative or qualitative. Quantitative methods apply when selected features of the technology, the organization, the user, or the information needs are treated as independent, objective, and discrete entities and are unchanging over the course of the study.

5.2.2 Qualitative methods examine the dynamics of a process rather than its static characteristics. They help understand the meaning and context of the phenomena studied and the particular events and processes that make up these phenomena over time, in real-life, natural settings.

5.2.3 Qualitative methods entail the systematic and detailed study of individuals in natural settings. They use data in the form of words (rather than numbers) found in transcripts of open-ended interviews, written observational descriptions of activities and conversations, and documents. The goal is to understand phenomena from the points of view of the participants and the particular social and institutional context.

5.2.4 As Information Management & Technology (IM&T) is about real people in real jobs in real worlds, qualitative methods offer a number of advantages in terms of:

- understanding how users perceive and evaluate a system
- understanding the influence of social & cultural context on system use
investigating casual processes

providing information that can be used to improve a system under development

providing information to decision makers

5.2.5 It is useful to distinguish between two categories of IM&T performance evaluation: a) the short-term cost-benefit evaluation that is commonly applied to individual projects, and b) the longer-term perspective relevant to both IT applications and the IM&T function as a whole. Many of the business value measures fall into the latter category. IM&T is complementary with organisational characteristics and processes, and therefore IT investments will not produce significant improvements if they are undertaken in isolation.

**Formative vs. Summative Evaluations**

5.2.6 Formative evaluations attempt to improve, to understand strengths in order to amplify them, or to isolate weaknesses in order to mend them.

5.2.7 Summative evaluations attempt to assess concrete achievement, perhaps as part of a process of acknowledgement or giving awards.

5.2.8 Each has their place, though in the context of organisational learning, formative evaluations are fundamentally more powerful in the long term. The differences between the two approaches are summarized in Table 3 below.

**Table 3 - Formative vs. Summative approaches**

<table>
<thead>
<tr>
<th>Formative</th>
<th>Summative</th>
</tr>
</thead>
<tbody>
<tr>
<td>primarily prospective</td>
<td>primarily retrospective</td>
</tr>
<tr>
<td>analyse strengths and weaknesses towards improving</td>
<td>document achievement</td>
</tr>
<tr>
<td>develop habits</td>
<td>document habits</td>
</tr>
<tr>
<td>shape direction of professional development</td>
<td>show results of such forays</td>
</tr>
<tr>
<td>opportunity to reflect on meaning of past achievements</td>
<td>evidence of regular formative evaluation</td>
</tr>
<tr>
<td>feedback</td>
<td>evidence</td>
</tr>
</tbody>
</table>
5.3 Approaches to Evaluation

5.3.1 The traditional approaches to evaluation are well known, namely:

- Economic Analysis
- Cost Benefit Analysis
- Cost Effectiveness Analysis
- Cost Utility Analysis
- Pre and Post Survey Methods
- Case Control Methods
- Randomised Clinical Trials
- Cohort/Time Series Studies
- Experimental Research Methods
- Mathematical and Computer Simulation Modelling
- Network Analysis
- Multi-modal Methods

5.3.2 Less well known are the more recent approaches to evaluation of Benchmarking and the Balanced Scorecard.

5.4 Benchmarking

5.4.1 Benchmarking is all about finding and adapting "Dantotsu" (Best of the Best). It is the continuous, systematic search and implementation of best practices which leads to superior performance. It provides the opportunity to review and compare practices against agreed performance measures and criteria in internal and external settings. Benchmarking attempts to overcome the “not invented here” syndrome.
5.4.2 Benchmarking can be applied across a range of service delivery, management and professional processes at strategic as well as operational levels. The goal is to contribute to the development of better practice and innovation, through the encouragement of benchmarking initiatives. Instead of spending a tremendous amount of money testing different technologies and approaches, any department can use benchmarking to understand how others have used them to their advantage. As put by one author, “To beat the rest, learn from the best”.

5.5 The Balanced Scorecard

5.5.1 Robert Kaplan of Harvard University and David Norton, an American management consultant, developed the Balanced Scorecard (BSC) in 1992 as a means to evaluate corporate performance from four different perspectives: the financial perspective, the internal business process perspective, the customer perspective, and the learning and growth perspective. As put by one commentator, the BSC recognizes that you cannot drive an automobile by solely relying on the rear-view mirror.

5.5.2 Kaplan and Norton compare their approach for managing a company to that of pilots viewing assorted instrument panels in an aeroplane cockpit: both have a need to monitor multiple aspects of their working environment. In their view, measurement is a prerequisite to management. They are fond of saying, “If you can't measure it, you can't manage it”.

Figure 1 - The Four Perspectives in a Balanced Scorecard

<table>
<thead>
<tr>
<th>Customer perspective</th>
<th>Financial perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>(value-adding view)</td>
<td>(shareholders' view)</td>
</tr>
<tr>
<td><strong>Mission</strong></td>
<td></td>
</tr>
<tr>
<td>to achieve our vision, by delivering value to our customers</td>
<td>to succeed financially, by delivering value to our shareholders</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal perspective</th>
<th>Learning and growth perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>(process-based view)</td>
<td>(future view)</td>
</tr>
<tr>
<td><strong>Mission</strong></td>
<td></td>
</tr>
<tr>
<td>to satisfy our shareholders and customers by promoting efficiency and effectiveness in our business processes</td>
<td>to achieve our vision, by sustaining our innovation and change capabilities, through continuous improvement and preparation for future challenges</td>
</tr>
</tbody>
</table>

5.5.3 Many people think of measurement as a tool to control behaviour and to evaluate past performance. The measures on a Balanced Scorecard, however, should be used as the cornerstone of a management system that communicates strategy, aligns individuals and teams to the strategy, establishes long-term strategic targets, aligns initiatives, allocates long- and short-term resources, and, finally, provides feedback and learning about the strategy.
5.5.4 Traditional financial accounting measures (such as the ROI and payback period) offer a narrow and incomplete picture of business performance, and a reliance on such data hinders the creation of future business value. As a result, financial measures should be supplemented with additional ones that reflect customer satisfaction, internal business processes, and the ability to learn and grow. The BSC is designed to complement financial measures of past performance with measures of the drivers of future performance.

5.5.5 Financial performance measures create barriers, often hidden, to executing strategies and achieving competitiveness and profitability. For example, to achieve improved manufacturing efficiency, an organization might be tempted to build excess inventories to avoid potential volume variances reported by traditional cost accounting systems. Similarly, to reduce headcount and organization might use contract employees or outside vendors to comply with budgetary reductions on departmental payroll costs. To obtain lower material cost and to eliminate purchase price variances, an organization might select lower-priced suppliers.

5.5.6 The intent of a BSC is to keep score of a set of items that maintain a balance between short- and long-term objectives, between financial and non-financial measures, between lagging and leading indicators, and between internal and external performance perspectives.

5.5.7 The BSC is more than a measurement system. It can be used to:

- clarify and gain consensus about strategy
- communicate strategy throughout the organization
- align department and personal goals to the strategy
- link strategic objectives to long-term targets and annual budgets
- perform periodic reviews and obtain feedback to learn about and improve strategy

5.5.8 A properly constructed BSC should articulate the mission of the business based on a series of cause-effect relationships derived from the strategy.

5.5.9 As pointed out in Gordon, in the BSC methodology, a management team at any level selects a limited set of performance indicators in each quadrant that are meaningful to them.

- The process of selecting and agreeing on measures forces the management team to define what is strategically important to it.
- Forcing the management team to choose measures from each perspective obliges it to consider their objectives from every viewpoint, not just with the typical financial basis.
Limiting the number of allowable measures in each perspective obliges managers to focus their strategic vision and identify the handful of most critical indicators.

The relationships between the measures encourage managers to form strategies that positively influence all quadrants or, where this is not possible, to explicitly choose the trade-offs they must make between different objectives.

Understanding trends and the interrelationships between variables is particularly important when an action has one set of consequences locally and a very different set of consequences in another part of the system, or when obvious interventions produce non-obvious outcomes.

5.5.10 The BSC becomes less of a diagnostic control system for flagging up abnormal activities and more of an interactive control system for providing signals to the organisation about management objectives, stimulating debate and activating organisational learning.

5.5.11 As Gordon reported, managers who have used the BSC report that it helps their teams develop a common understanding of their goals and strategies. The iterative development process keeps important issues, as defined by the management teams, on their agenda facilitating discussion about strategic direction and potential action plans. It also elicits ongoing discussion about the relative importance of different indicators, programs and disciplines, and the mechanisms for interpreting and using the data.

5.5.12 The use of measurement as a language helps translate complex and frequently nebulous concepts into a more precise form that promotes consensus among senior executives. Having a shared vision initiates the strategic learning process because it defines, in clear and operational terms, the results that the organization, as a team, is attempting to achieve. Beyond the shared vision, the scorecard enables a common model of performance to be shared by the organization.

"Unless individuals and the organization can learn from experience and develop better systems and recognize better information quality, then it is unlikely that the measurement of outcome will serve any useful purpose."

Ballatine et al
6 METHODOLOGY OPTIONS FOR EVALUATING IM&T

"Predicting organisational changes resulting from IT requires an understanding of the dynamic social and political processes that occur within organizations as well as the characteristics of individuals, work groups and the technology."

Anderson, Aydin, and Jay

6.1 Introduction

6.1.1 Many methods and techniques have been suggested over the years to evaluate the investments made in IM&T. These methods tend to take either an organisational or sociotechnical viewpoint as to whether an information system is deemed successful. What is critical is that one’s viewpoint influences one’s selection of success measures.

6.2 Organisational Viewpoint

6.2.1 The organisational viewpoint is based on a hierarchical systems perspective. It presumes a rational, explicit view of an information system. It views an organization as a complex set of interacting subsystems designed to provide a product or service to a customer in such a fashion as to achieve the organization’s mission. To be effective, an evaluation from this perspective requires clearly defining work processes and information flows. The dependent variables would include dimensions such as quality and content of the information provided by the system. The principal focus is the quality of the interface and the information provided to aid the worker in the accomplishment of his/her task.

6.3 Sociotechnical Viewpoint

6.3.1 The sociotechnical viewpoint, also referred to as activity-oriented thinking, examines work by looking at the range of activities, communication practices, co-ordination, and relationships beyond the documented methods and procedures. It recognizes that workers have psychological, physical, and higher order cognitive needs and therefore, their own distinct goals and aspirations are separate from the goals of the organization.
6.3.2 The sociotechnical viewpoint asserts that when examining how work is actually accomplished in companies, communication and collaboration between groups of people is the norm; work is accomplished in a social, collaborative way. In contrast, the organisational viewpoint presupposes a mechanistic perspective of people operating with standardized procedures and information flows assumes that people have the expertise needed to accomplish tasks.

6.3.3 The sociotechnical viewpoint realises that exceptions to normal processing do occur, and that learning and adaptation are necessary to complete many tasks. It realises that solving many types of problems in organizations requires teamwork and collaboration dependent variables would include dimensions such as the quality of worklife of the individual and the extent to which the information systems support the worker in how they actually accomplish their work.

6.3.4 It should be noted that the majority of existing IS success instruments do not contain an assessment of the quality of work life of the individual. The forthcoming NHS Electronic Patient Record evaluation study is an exception as it does include assessing life and work impacts.

6.4 Traditional Methods

6.4.1 Traditional methods focus on well-known financial measures, such as the return on investment (ROI), net present value (NPV), the internal rate of return (IRR), and the payback period. These methods are best suited to measure the value of simple IT applications, such as transaction processing and office automation systems.

6.4.2 Unfortunately, evaluation methods that rely solely on financial measures are not as well suited for newer generations of IM&T applications. Newer IT applications typically seek to provide a wide range of benefits, including many that are intangible in nature (e.g. it is difficult to quantify the full value of a decision support system or a knowledge-based system).

6.4.3 There is a large and growing body of research devoted to measuring use and diffusion of computer technologies. As Gordon points out, there is also a body of literature devoted specifically to evaluations of healthcare information systems in general and electronic patient records in particular. Much of this work is devoted to understanding the changes that automation will bring to clinical processes and the factors that influence clinician acceptance of technology enabled change. This work provides very valuable insight into specific aspects of an EPR implementation, but does not advance a broader, unifying framework for analysing the success of say an electronic patient record project holistically.

6.4.4 While these trends point to a broader acceptance of performance measurement within IM&T, none has given rise to a framework for ensuring that IM&T performance is measured, managed in a balanced, integrated way and its impact is measured.
6.5 **Benchmarking**

6.5.1 As previously discussed, benchmarking to other companies in the industry or even to other economies around the world may provide useful insights. However, differences that are identified should be interpreted with care, since they may be due to company-specific factors. A critical attitude towards these figures is necessary even if a number or a percentage is at the same level as the industry average.

6.6 **Information Economics**

6.6.1 Information economics seeks to account for a wider scope of IM&T benefits, by including less tangible items such as improved customer service or a higher degree of competitiveness. It also prescribes that the benefits and risks be separated into two domains, a business domain and a technological domain, and that each domain be evaluated separately.

6.6.2 As Martinsons explains, the information economics method is a scoring technique whereby value and risk categories are attributed a numerical score between zero and five.

- For a value category, “0” would signify “no positive contribution” while a “5” would represent a “large positive contribution”.

- For a risk category, “0” would mean “no risk” while a “5” would signal a “large risk”. Each of these categories is assigned a weight.

- By adding the weighted scores of the value categories and subtracting the weighted scores of the risk categories, one can calculate the total score of each project.

- The value of the information economics method lies with the fact that the scores are assigned by all parties involved.

- End-users score risks and values in the corporate domain, while IM&T specialists score IM&T related categories.

- This way, the business contribution of the project can be assessed jointly, and a consensus reached on the evaluation of a specific project.

6.6.3 Most value and risk categories associated with information economics are quite unambiguous, for example.

- Business strategic risk and IM&T strategic risk refer to the degree of risk in terms of how well the company and the IM&T function, respectively, succeed in achieving their strategic objectives.
- Definitional uncertainty indicates the degree of risk in terms of how clearly the functional requirements and specifications have been agreed upon.

- Technical uncertainty relates to the risk associated with dependence on immature, "bleeding edge" technologies.

- Operational risk (or business organization risk) and IM&T service delivery risk reflect the degree of risk in terms of how well the company and the IM&T function, respectively, will be able to adapt to the changes invoked by the project.

6.6.4 The principles of information economics are clearly useful in determining the business value of IT project or the IM&T function as a whole. However, even the two domains of information economics fail to fully capture the range of business benefits offered by contemporary IM&T applications. Measuring and evaluating IM&T from multiple perspectives and in assorted ways is helpful to assess its efficiency, effectiveness and transformative potential, both at present and in the future.

6.6.5 As a result, it may be appropriate to use a balanced scorecard to measure and evaluate IM&T.

"Clinical information systems are a different kind of intervention from drugs, and techniques used to evaluate drugs (particularly randomised controlled trials) are not always appropriate".

Heathfield et al
7 THE REALITIES ABOUT EVALUATING IM&T

"Healthcare CIOs are frustrated by the lack of metrics available in the industry to measure the effectiveness of IT in their organizations".

Gartner Group

7.1 Introduction

7.1.1 As IM&T budgets have climbed exponentially, organisations are starting to pay much greater attention to understanding and maximising business value from IT projects.

7.1.2 As the resource commitments to IM&T continue to escalate, the following types of questions are being asked more frequently than ever before:

- Is the investment in IM&T really worthwhile?
- Is the IM&T application we implemented a success?
- Is our IM&T function productive and effective?

7.1.3 There are lingering difficulties in trying to determine the value of IM&T applications as well as performance in the IM&T area. Managers have found it difficult to demonstrate tangible returns on the resources expended to plan, develop, implement and operate IT systems.

7.1.4 IT systems have been shown to enhance value in ways that are not captured by conventional input-output accounting methods. For example, since effectiveness ("doing the right things") and innovation ("doing new things") can not be readily quantified in terms of traditional outputs, these improvements are not reflected in economic efficiency statistics.

7.1.5 Value is a much broader concept than benefits, and IM&T projects can generate business value in many ways. Data's utility is much more subjective than that of any other resource. While data may be viewed as a commodity, asset or resource, information is derived from the qualitative use of data and involves value judgements.
7.1.6 The factors influencing evaluation of IM&T are many and include:

- the external environment of the organization
- the internal environment of the organization
- the system's users
- the system development environment and staff
- the management and operational environment of the system
- the nature of the system including the data processed
- patterns of utilization
- organisational impacts
- social impacts

7.1.7 The conundrum of measuring the IM&T function is that:

- efficiency (doing things right) is easier to measure than effectiveness (doing the right things)
- new systems are intended to change difficult to measure actions
- strategic systems elude measurement
- infrastructure investments cannot be cost justified on a ROI basis

7.1.8 As documented in the reviewer's August 1998 commentary,

"As with any infrastructure, IT infrastructure does not provide direct business performance. Rather it enables other systems that do yield business benefits. IT infrastructure is strikingly similar to other public infrastructures such as roads, hospitals, sewers, schools, etc. They are all long term and require large investments. They enable business activity by users that would otherwise not be economically feasible. They are difficult to cost-justify in advance as well as to show benefits in hindsight. They require a delicate investment balance - too little investment leads to duplication, incompatibility, and suboptimal use while too much discourages user investment and involvement and may result in unused capacity."

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7.1.9 A number of authors have found that the productivity paradox (the huge overall investment in computer and telecommunication technologies does not appear to have significantly raised economic productivity or corporate profits) may stem from the tendency to automate existing ways of doing work. Very few organisations have redesigned their business processes in order to realise the full potential of modern IM&T. Those that have are reaping the benefits from their technology investments.

7.1.10 Some of those who are reaping benefits are health care organizations. The American-based Davies CPR Recognition Program recognizes exemplary CPR implementation achievements. The program acknowledges that creating a computer-based patient record (CPR) system is a complex, long-term undertaking, with many challenges and no absolute models of success. The Program provides a set of components to help providers achieve incremental progress by leveraging successes, learning from failures, and continually improving.

7.1.11 When studying the commonalities of the Davies Award winners, Metzger et al found that "Because of the strategic importance assigned to information management, the CPR systems generally have not been subjected to classical cost-benefit or return-on-investment analyses. (The practice in these organizations is consistent with findings from recent surveys of CIOs in health care.). Value has not been assumed; however, and project sponsors have had to justify CPR initiatives. Davies winners to date have built upon a series of demonstrated successes, justifying each new phase of CPR expansion based on its value to the care process”.

“Given the complex interrelationships between computer systems and their organisational environments, there is no one best method of evaluation.”

Anderson et al
AN ASSESSMENT OF THE STATE OF READINESS AND A SUGGESTED APPROACH TO EVALUATING INFORMATION FOR HEALTH
8  EVALUATING INFORMATION FOR HEALTH

8.1  Introduction

8.1.1  This final chapter sets out a suggested approach to the evaluation of *Information for Health*. It is based on the assumption that is desired is:

- A long term and high-level evaluation methodology as individual projects each have a business case, which includes an evaluation plan as well as a progress assessment as part of normal project management.

- A formative evaluation in order to foster organisational learning.

- An uncomplicated method that would generate findings quickly and provide swift feedback.
8.2 **Stage 1: State of Readiness Baseline (November - December 1999)**

**Part I:** Scoring the initial Local Implementation Strategies  

**Purpose:** Set the baseline as to what the State of Readiness was as of March 1999.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1    | The 8 Regional Heads of Information (RHIs) should come together and agree 8-10 critical (most important) progress markers and the wording to be used for a score of '3' to be achieved. It would be wise to include senior staff from the NHSIA and Information Policy Unit in this process. Before doing so, they are advised to score 3-4 iLIS using the form in Annex B. That form is intended to be a starting piece. It reveals the reviewer's opinion of the top 11 markers - ranked in importance. These markers may not be the most appropriate ones. Note that the 11 markers suggested by the reviewer do not include, rightly or wrongly:  
  - Confidentiality/Caldicott  
  - Data Accreditation  
  - Education and Training  
  - EPR or EHR  
  - Health Informatics Services  
  - Information for Patients and Public  
  - National Electronic Health Library  
  - NHS Direct  |
| 2    | In selecting their 8-10 key progress markers, the RHIs will have to satisfy themselves that the information about the markers will indeed be in the full Local Implementation Strategies (fLIS) as the same set of markers will be used in the next stage. |
| 3    | The RHIs should then score the iLIS from their own patch and should also score at least one from each of the other 7 Regions. It would be beneficial if the same "others" from each Region were used in order to facilitate comparison and organisational learning. |
| 4    | A facilitator should then come together with the RHIs to compare notes and adjust the scoring of individual iLIS if need be. |
| 5    | The results from the 100 iLIS should be tabulated in order that regional and national averages can be produced. |
| 6    | The Information Policy Unit should confirm that the top 5-6 iLIS are on the IPU Web site and that all the authors have access to them in this manner. |
| 7    | Each iLIS author and the stakeholder Chief Executives should be notified of their score (and the framework used) and how their local health community compares to the regional and national averages. |
**Part II: Target Definitions**

**Purpose:** Refine/revise the targets and action items in the strategy.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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</thead>
</table>
| 1    | It is suggested that the Information Policy Unit, with the active involvement of the NHS Information Authority which has implementation responsibility for national infrastructure projects, should conclude the work that is currently underway. It is recommended that they should:  
   (a) Reaffirm the 'initiative overload' stress that those "on the ground" are under.  
   (b) Document  
      • the accomplishments to-date as there have been a number of them (and hopefully surviving Y2K will be one of them)  
      • how the world has changed since the strategy was written in mid-1998. It is the Information Policy Unit's mandate to continually reflect on whether the strategy is proceeding as expected: whether the competitive, market, and technological environments are still consistent with the assumptions made when the strategic plan was formulated; and whether adequate resources are continuing to be committed to achieving the strategic plan. Concurrently with this on going environmental scan, it would seem appropriate for the Information Policy Unit to support those responsible for implementation and buffer them from the political whims of the day.  
   (c) Decide on what objectives to use (the NAO thinks there are 6; others think there are 8).  
   (d) Refine/revise the targets and action items in the strategy by:  
      • defining each one explicitly (e.g. what does it mean 'complete essential infrastructure')  
      • collapsing them (there are a number which should be listed together under one target with one or more milestones)  
      • identifying a measure for each revised target, being careful not to select measures which create dysfunctional behaviour and lead to 'performance perversity'  
      • linking each revised target to one or more of the 6/8 objectives |
| 2    | Establish priorities as some targets are more important than others. In the reviewer's mind, the primary care related targets would seem to have more importance given the thrust of The New NHS policy paper. Others might view the 'information for the public' agenda as being the most important while yet others may consider EPR-related activities the highest priority. |
| 3    | Define dependencies between the targets by producing a critical path which when completed can then be converted to a pictorially more simple Gantt Chart which reflects new dated milestones - say on a quarterly time frame. It could also be converted into a road map of sorts. |
| 4    | Inform the service of the changes so that the authors of the full Local Implementation Strategies (fLIS) can revise their plans and timetables accordingly. |
8.3 Stage 2: Progress From The Baseline (January - May 2000)

**Part I:** Scoring the full Local Implementation Strategies

**Purpose:** Identify and celebrate the progress made in the first year and learn from the leading communities.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The RHIs should come together and to review the RIMTAG/99/128 - Development of Full Local Implementation Strategies and other similar Regional Office documents. One common document should then be produced and distributed to all the fLIS authors to assist them. Thought should be given to circulating a 'model' fLIS.</td>
</tr>
<tr>
<td>2</td>
<td>As part of their fLIS submission, each author should score their fLIS using the same framework as used by the RHIs to score the iLIS.</td>
</tr>
<tr>
<td>3</td>
<td>The RHIs should score their own fLIS as well.</td>
</tr>
<tr>
<td>4</td>
<td>An independent third party, perhaps a representative(s) of the academic community, should score all 100 fLIS.</td>
</tr>
<tr>
<td>5</td>
<td>Each RHI should meet with their fLIS authors, preferably as a group, to compare the 3 scores for each fLIS and agree to a final score for each fLIS. No one should expect the fLIS to be perfect. What should be sought however, is that progress is being made. If not, actions must follow.</td>
</tr>
<tr>
<td>6</td>
<td>The results from the 100 fLIS should be tabulated and regional and national averages produced along with the averages from the earlier scoring of the iLIS.</td>
</tr>
<tr>
<td>7</td>
<td>Each fLIS author, and their organisational chief execs, should be notified of their score and the regional and national averages along with their &quot;progress&quot; score, i.e. the difference between their iLIS and fLIS. It is important that progress be recognized, particularly for those local health communities who view the process as a coherent, ongoing exercise.</td>
</tr>
<tr>
<td>8</td>
<td>The top 10 fLISs should be identified. The 10 authors should be brought together, rather than conducting individual site reviews. The focus of this special meeting should be to identify their 'commonalties' - what are the 4-5 factors they have in common which permit them to be more advanced in their strategy development. The approach should be similar to the previously mentioned Davies award winners.</td>
</tr>
<tr>
<td>9</td>
<td>The findings of this commonalties review should be disseminated to all LIS authors and the stakeholder Chief Executives as part of the organisational learning process.</td>
</tr>
</tbody>
</table>
### Part II: Skills Inventory

**Purpose:** Identify the areas of greatest need in terms of Health Informatics skills.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prior to the fLIS being submitted, the Information Policy Unit, NHSIA and RHIs should develop, if this has not already been done, a common set of definitions for health informatics personnel. If meaningful comparisons are to be made, a consistent definition of what is meant by manager, analyst, programmer, etc. is needed. If effective action planning for the areas of greatest need is to occur there is a similar requirement to consistently define what is meant by project management, network implementation, strategic planning, procurement, training, security, etc.</td>
</tr>
<tr>
<td>2</td>
<td>Any new data collection framework on health informatics personnel also needs to take into account that some organisations have outsourcing and facilities management agreements.</td>
</tr>
<tr>
<td>3</td>
<td>The fLIS authors should be informed do that they can uniformly submit this important information.</td>
</tr>
</tbody>
</table>
8.4 Stage 3: Local Information Plans Baseline (July - December 2000)

Part I: Baseline for Local Plans

Purpose: To develop a baseline for future monitoring and evaluation of local information plans (vs. strategies) which take into targets, budgets and outcomes.

NB: This methodology assumes that local implementation authors will be expected to produce a progress report and an updated plan in March of each year.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A selection of fLIS authors and RHIs should come together to develop a new scoring framework of no more than 9-10 critical progress markers. Rather than focusing on strategies, this framework should be based on “Location Implementation Plans (LIP)” and should be restricted to 4-6 local targets and 2-4 national targets.</td>
</tr>
<tr>
<td>2</td>
<td>Each marker will need to reflect the ‘refined’ national and key local targets, the latter which may include activities which are not explicitly mentioned in Information for Health but which undoubtedly can be related to one of the 6 (or 8) objectives in IfH.</td>
</tr>
</tbody>
</table>
| 3    | The scoring for each marker could be as follows:  
   - 3 = target will be met and expenditures will not exceed budget  
   - 2 = good chance target will be met within budget  
   - 1 = unlikely target will be met within budget  
   - 0 = target will not be met and/or expenditures will exceed budget allocation |
| 4    | The proposed framework should be distributed and agreed by all RHIs and the majority of LIP authors. |
| 5    | In March 2001, each author should be asked to score where they are in terms of implementing their plans based on the new framework. A brief statement of rationale should accompany all ‘2’s and ‘3’s while a brief statement as to what is going to be done to resolve the situation should accompany all ‘0’ and ‘1’s. |
| 6    | The RHIs should score the plans of their authors as well; an independent third party should score all of the plans. |
| 7    | A facilitator should meet with the RHI and their authors, again preferably as a group, to compare the three sets of scores and adjust scoring if need be. |
| 8    | The RHI and the authors with ‘0’s and ‘1’s should then individually meet to agree the course of action to achieve the targets. |
| 9    | The results from the 100 LIPs should be tabulated and regional and national averages produced. |
| 10   | Each LIP author, and the Chief Executives of their local health community, should be notified of their score and the regional and national averages. |
| 11   | This process should be repeated each year and the success stories of those who are accomplishing a great deal shared with the rest of the Service. |
Part II: External evaluation

Purpose: Summative independent assessments of progress.

It is recommended that academic community be invited to become involved in the on-going evaluation of the strategy. There is a wealth of qualified and respected researchers in British universities. These individuals are undoubtedly aware of the evaluations of the Resource Management Initiative, the EPR/CWS, the Wales studies, and others from which to build on.

Many of these individuals recognize that IT systems are embedded in social systems with different people, institutions and settings and that understanding that casual mechanisms are context specific. Many will also point out that there is a need to recognize and make explicit issues concerning the advocacy of the evaluators and the effects of funding sources on evaluation objectivity, while others will argue that there is a need for ongoing summaries and syntheses, which can be widely distributed and easily understood.

Some will suggest the use of quick, very focused, investigations vs. long multi-modal studies.

There is a need to document, based on on-site interviews and observations, actual examples of work on the ground (verifiable anecdotes). There is much to be gained to identify why different communities have different outcomes and best practice lessons.

Such studies could be targeted to leading (and trailing?) health communities or they could be done on the basis of a random sampling of sites. Another approach is to establish a rotation schedule where every local health community is visited to see how it is doing. Short but effective surveys (e-mail is becoming a much more common vehicle) will also have a role to play in a process of on-going independent evaluation of the strategy.

What is perhaps most important is that the evaluation studies be short and quick in order to provide expedient feedback to the Service.
### 8.5 Stage 4: An IM&T Balanced Scorecard for Information for Health (Jan - Dec 2001)

8.5.1 Building an IM&T Balanced Scorecard for Information for Health (IfH) is not a simple process but it is one, which if pursued will repeat many benefits. The following is an approach, based on the work of Martinsons, that could be followed.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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</table>
| **1** | Create an awareness for the concept of the Balanced Scorecard (BSC)  
- This should be done at all levels, beginning with the NHS executive, through to chief executives of NHS organisations, senior IM&T executives at the national level, and senior IM&T managers at the local level.  
- There is an abundance of excellent literature and texts available as well as companies which provide instructional materials and support (e.g. [www.sas.com/offices/europe/uk/solutions/bsc.html](http://www.sas.com/offices/europe/uk/solutions/bsc.html)) |
| **2** | Collect and analyze key data.  
- Review the New NHS strategy and initiatives and the Information for Health strategy; specific objectives and goals related to the NHS and IM&T strategy; traditional metrics already in use for IM&T performance measurement; and potential metrics related to the four balanced IS scorecard perspectives.  
- **It is essential to have a common understanding of the NHS strategy and the IM&T strategy, and have well-defined specific goals related to each before developing the Balanced Scorecard.** Such a scorecard need not dictate the relative emphasis that should be placed on the four perspectives, but will likely be useful to remind both NHS senior managers and IM&T managers that these different perspectives do exist.  
- It should be recognized that a strategy is a set of assumptions about cause and effect. If cause-and-effect relationships are not adequately reflected in the BSC, it will not translate and communicate the NHS's vision and strategy. These cause-and-effect relationships can involve several or all four of the perspectives in the BSC framework. For example, better staff skills (future readiness perspective) will reduce the frequency of errors in an application (internal operations perspective). An application with fewer errors will be more likely to meet end-user expectations (user orientation perspective). This in turn will enhance the support of core business processes (business value perspective). |
Review, and if necessary clarify even further, the NHS-specific objectives and the goals of the IM&T function from each of the four perspectives.

- It is recommended that this be done at multiple levels. Initially the senior IM&T executives (Director of Planning from NHS Executive, Head of Information Policy, Chief Executive of the NHS Information Authority, Regional Heads of Information) should agree to the objectives and metrics of the four perspectives. Later this entire process should be repeated at the next level where the "executives" in this case are the LIS Authors and local health community chief execs. Finally, the process can and should be applied at the organization level, were the 'executives' are the Boards of the NHS organisation.

- The metrics included in the BSC should be quantifiable, easy to understand, and ones for which data can be collected and analyzed in a cost-effective manner. Good measures are:
  - **Clear and understandable**: everyone who uses them interprets each measure the same way.
  - **Timely**: Data is provided when needed for decisions and action.
  - **Credible**: Reported values are believable and verifiable.
  - **Economical to maintain**: The measures are easy to obtain, process, and display.
  - **Related to a standard**: Each measure has a meaningful standard to allow comparison to industry averages and world-class levels of performance.

The act of translating vision or strategy into measurable objectives forces specificity. It helps to surface and resolve those hidden disagreements that often get buffed when the strategy remains abstract, only to return at some later date to haunt everyone.

- It should be recognized that certain attributes, such as the quality of decision-making, do not have metrics that can be measured directly in quantitative terms. In such cases, it will be important to relate these attributes to other ones that can be quantified, like the perceived effectiveness of a manager or clinician, as rated by others on a predetermined scale.
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| **4** | Develop a preliminary Balanced Scorecard based on the objectives and goals of the NHS.  
- A well-built BSC will include an appropriate mix of **outcome measures** and **performance drivers**. Outcome measures like data auditors' productivity (number of audits per person per month) without performance drivers like staff education (number of educational days per person) do not communicate how the outcomes are to be achieved. Furthermore, performance drivers without outcome measures may enable the achievement of short-term operational improvements, but will fail to reveal whether the operational improvements have been translated into enhanced financial and quality performance.  
- An IM&T function may invest significantly in staff training in order to improve employee productivity. If, however, there is no outcome measure for employee productivity, it will be difficult for IM&T management to determine whether its strategy has been effective.  
- Outcome measures are more or less generic (user satisfaction, productivity, employee satisfaction), but performance drivers should be NHS-specific and should be based on the particular strategy that is being pursued.  
- The ultimate aim of a BSC should be to support the management of IM&T performance in a manner that improves the overall financial and quality outcomes of the NHS.  
- **It is important to continuously keep in mind the fact that measurements are not enough, since they must be used and acted upon by management.** The balanced scorecard is not only an operational tool; it can also be the foundation for a strategic management system.  
- Figure 2 is a sample of what an IM&T Balanced Scorecard for IfH might look like. |

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| **5** | Receive comments and feedback on the BSC from management, and revise it accordingly.  
- In the first instance, the ‘management’ would be the LIS authors and their chief execs from the 100 local health communities. In the second stage, the ‘management’ would the senior staff from the array of NHS organisations in the local health community and finally when rolled out to the third level, the ‘management’ would consist of the managers and clinicians within each NHS organisation.  
- A BSC is essentially non-prescriptive, since all organizations are unique and management will weight different measures accordingly during its decision making. The tools must, however, be supported by mutually reinforcing practices.Existing practices may need to change and it is the cultural characteristics of the NHS that will determine its receptiveness to change. This NHS distinctiveness or uniqueness will influence both the format of outputs and the way that they are used. |
| 6   | Achieve a consensus on the balanced IS scorecard that will be used.  
|     | The pioneering organizations that have applied the balanced scorecard to their IM&T  
|     | function have reported several common errors must that be avoided when  
|     | implementing this concept, namely:  
|     | - failure to include specific long-term objectives  
|     | - failure to relate key measures to performance drivers by means of cause-and-  
|     | effect relationships  
|     | - failure to communicate the contents of, and rationale for the BSC.  
|     | A BSC can easily become part of the operational-level management system rather than  
|     | serving as the foundation for a strategic management system. One must be aware of the  
|     | importance of specific long-term objectives, particularly related to the future readiness  
|     | perspective. With a continuing emphasis on short-term goals, the performance  
|     | objectives are unlikely to represent much of a change from "business as usual".  
| 7   | Communicate both the scorecard and its underlying rationale to all stakeholders.  
|     | - Communicate, communicate, communicate - can it ever be said often enough.  
|     | - Draft versions of the BSC have to be widely circulated - not just to two or three  
|     | members of the top management team and the senior IM&T manager/chief  
|     | information officer. The IM&T staff must be told about the scorecard's content and  
|     | rationale, otherwise they will have little enthusiasm for a commitment to the concept.  
|     | - Explicit cause-and-effect relationships need to be identified before a BSC is  
|     | implemented. It is critical not only to relate performance drivers to the performance  
|     | measures in each key area, but also to consider how each of the performance drivers will  
|     | significantly improve one or more key measures of performance.  
|     | - As an example, if system availability, responsiveness to user requests, and timely  
|     | delivery of new IT applications are agreed to be performance drivers for user  
|     | satisfaction, then the management team must specify how the performance in these  
|     | three areas would be improved. The how in this case might include the development  
|     | of employee skills, the adoption of new development tools, and/or the employment of  
|     | better project management methods.  
|     | - Obviously, specifying such relationships is much easier said than done. Initially, these  
|     | impacts must be done subjectively and qualitatively. But just getting managers to think  
|     | regularly and systematically about the implied linkages in their strategy will be an  
|     | improvement over the exclusive focus in most management review systems on  
|     | operational-level processes.  
|     | - The individual performance objectives and appraisal criteria for the IM&T staff has to  
|     | be linked directly to the BSC and firmly integrating it into the NHS's performance  
|     | management system. Scorecard templates and results that are communicated to  
|     | employees using electronic mail or bulletin board can motivate their efforts and reward  
|     | them for meeting targets. |
**Figure 2 - Example BSC**

**Four Possible Perspectives in a IM&T Balanced Scorecard for IfH**

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Mission</th>
<th>Key Question</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| **User perspective** (clinician's view) | To deliver value-adding products and services to clinicians | Are the products and services provided by the IM&T function fulfilling the needs of the clinical community? | - establish good relationships with the user community  
- satisfy end-users |
| **Business value perspective** (NHS management's view) | To contribute to the value of the NHS | Is the IM&T function accomplishing its goals and contributing value to the NHS as a whole? | - ensure that proposed IM&T projects provide business value to the NHS  
- control IM&T costs |
| **Internal operations perspective** (process-based view) | deliver IM&T products and services in an efficient and effective manner | Does the IM&T function create, deliver and maintain its products and services in an efficient manner? | - anticipate and influence requests from end-users and management  
- provide cost-effective training that satisfies end-users  
- effectively manage IM&T-related problems that arise |
| **Future readiness perspective** (innovation and learning view) | deliver continuous improvement and prepare for future challenges | Is the IM&T function improving its products and services, and preparing for potential changes and challenges? | - anticipate and prepare for IM&T-related problems that could arise  
- continuous upgrading of IM&T skills through training and development  
- conduct cost-effective research into emerging technologies and their suitability for the NHS |
8.6 Conclusion

8.6.1 The BSC will allow managers to see the positive and negative impacts of IT applications and IM&T activities on the factors that are important to the NHS as a whole.

8.6.2 The value of the BSC rises if it is used to coordinate a wide range of IM&T management processes, such as individual and team goal-setting, performance appraisal and rewards for IM&T personnel, resource allocation, and feedback-based learning. The management of both IM&T people and projects are likely to benefit from a systematic framework based on goals and measures that are agreed upon in advance.

"Today's organizations operate in turbulent environments, and senior managers need feedback about more complicated strategies. The planned strategy, though initiated with the best of intentions and with the best available information and knowledge, may no longer be appropriate or valid for contemporary conditions. The metaphor is closer to sailing in a highly competitive race under changing weather and sea conditions, rather than steering an isolated ship through a stable environment to a destination. In a sailboat race, a chain of command still exists. But the captain must constantly monitor the environment and often respond tactically and strategically to shifts in competitors' behavior, team and boat capabilities, wind conditions, and water current. And the captain must receive information from a myriad of sources such as personal observation, instrumentation and measurements, and, especially, the advice of tacticians on the boat who also survey conditions and devise plans".

Kaplan and Norton
# INTERVIEWEES

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<tr>
<th>Date</th>
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<th>Organization</th>
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<td>Sep-21</td>
<td>Peter Drury</td>
<td>Head of Information Policy</td>
<td>NHS Executive IPU</td>
<td>Quarry House (QH)</td>
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<td>John Farenden</td>
<td>Director, Secta Consulting</td>
<td>NHS Executive IPU</td>
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<tr>
<td>Sep-27</td>
<td>Bill McCarthy</td>
<td>Assistant Director of Finance</td>
<td>NHS Executive</td>
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<td>Alan Angilley</td>
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<td>Jeremy Thorp</td>
<td>Head of Information</td>
<td>NHS Southwest Region</td>
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<td>Sep-29</td>
<td>Janette Webb</td>
<td>Head of IM&amp;T</td>
<td>Warrington Hospital Trust</td>
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<tr>
<td></td>
<td>Mr. Paul Sherry</td>
<td>Orthopedic surgeon</td>
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<td>Steve Nicholson</td>
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<td>Ray Tunnicliff</td>
<td>Director, IM&amp;T</td>
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<td>Head, Health Informatics Unit</td>
<td>University of Manchester</td>
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<td>Courtney Smith</td>
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<td>NHS Information Authority</td>
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<td>Lesley Hannam</td>
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<td>Alasdair Liddell</td>
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</table>
ANNEX B

SUGGESTED SCORING METRICS

<table>
<thead>
<tr>
<th>Critical Progress Markers (ranked)</th>
<th>(the presence of 0's and 1's is a signal of impending risks)</th>
</tr>
</thead>
</table>
| 1 Local Vision                    | 3 = clear local vision, identification of local issues and barriers  
                                        2 = closer to being very good  
                                        1 = closer to being weak  
                                        0 = superficial local vision, simply a restating of national vision |
| 2 LIS Programme Board             | 3 = a Chief Executive is chair, membership IS not IM&T dominated  
                                        0 = chair is unknown, a junior staff member or a management consultant |
| 3 Project Management Leadership   | 3 = experienced project manager in a full time post, someone who will move the agenda forward, minimal dependency on management consultants  
                                        0 = little or no local project management capability, heavy/complete dependence on consultants |
| 4 Human Resource Infrastructure   | 3 = comprehensive assessment of IM&T personnel types, skill levels, etc.  
                                        0 = little or no sense of IM&T human resources in the community |
| 5 Clinical Initiative Linkages    | 3 = explicit linkage of IM&T to support HIMP and Clinical Governance  
                                        0 = little or no connection of the iLIS to local clinical initiatives |
| 6 Supporting GPs &PCG/Ts          | 3 = appreciation of the requirements of GPs and the new PCGs  
                                        0 = little awareness of the importance of GP & PCG requirements |
| 7 Clinician Involvement           | 3 = representatives of clinicians (GPs, hospital consultants, nurses, pharmacists, etc.) actively involved  
                                        0 = little or no clinician participation |
| 8 Stakeholder Involvement         | 3 = all stakeholders (HA, Trust, PCG s, etc.) actively involved, particularly at Board level, including social services  
                                        0 = little or no stakeholder involvement in preparing the LIS |
| 9 Investment Strategy            | 3 = evidence of using multiple revenue sources; clearly established priorities for Modernisation Funds  
                                        0 = no mechanisms in place |
| 10 Technical Infrastructure       | 3 = thorough understanding of the types, costs, standards (e.g. RFA level) and plans for all IT systems  
                                        0 = little or sense of the IT systems and current expenditures in the local health community |
| 11 Information Management        | 3 = established process in place to address data quality issues at all levels  
                                        0 = little or no evidence of addressing the need to maximize data quality |
## SCORING 20 INITIAL LOCAL IMPLEMENTATION STRATEGIES (AN EARLIER VERSION OF ANNEX B)

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ANNEX D

NATIONAL INITIATIVES

Booked admission pilots
Clinical Governance
Collecting Health Data from General Practice
Commission for Health Improvement
FHS Exeter System
Health Action Zones
Health Improvement Programmes
Joint Investment Plans
MIQUEST
National Framework for Assessing Performance
National Institute for Clinical Excellence
National Patient Survey
National Service Frameworks
NHS Direct
Primary Care Groups and Primary Care Trusts
Primary Care Investment Plans
PRODIGY
Service and Financial Frameworks
Walk-in centres
SELECTED REFERENCES


