

Report on:

Effective and efficient healthcare management support for eHealth investment

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About *Financing eHealth*

The Financing eHealth study was commissioned by DG INFSO and Media, unit ICT for Health, with the aim to assess different financing opportunities against the financing needs of eHealth investment. The overriding goal is to provide assistance to Member States and the European Commission in their efforts to meet the eHealth Action Plan objective of supporting and boosting investment in eHealth.

Full project title

Assessment of financing opportunities available to Member States to support and boost investment in eHealth

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This report is deliverable D4.1 of the Financing eHealth study. It addresses organisational, managerial, and resourcing issues impacting on the sustainability of successful eHealth investments and sheds light on the overall decision-making and change management processes associated with eHealth investments. The focus of the argument is on reasons for eHealth not to take off. This has been identified as a fruitful way towards identifying actions that will boost investment in the future.

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1 Introduction

This report on support in effective and efficient healthcare management for eHealth investment provides an overview of organisational, managerial, and resourcing issues that impact on the sustainability of successful eHealth investments and sheds light on the overall decision-making and change management processes associated with eHealth investments. The focus of the argument is on why eHealth does not take off. It is a fruitful way to identify actions that will boost investment in the future.

Information sources for the report are face-to-face interviews, telephone interviews, documents in the public domain and other EC studies, including:

- eHealth IMPACT: Study on economic and productivity impact of eHealth - developing a context-adaptive method of evaluation for eHealth, including validation at 10 sites - covering the whole spectrum of eHealth applications and services¹
- EHR IMPACT: Study on the socio-economic impact of interoperable electronic health record and ePrescribing systems²
- Good eHealth: Study of best practice across Europe in providing innovative eHealth-related services³
- eHealth ERA: Towards the establishment of a European eHealth research area - coordination of Member State innovation-oriented eHealth RTD as the basis for a common roadmap and joint RTD activities, thereby establishing an effective ERA⁴
- Other reports and the two international workshops associated with the Financing eHealth study⁵.

The first workshop was an expert workshop on “Innovative approaches to financing eHealth solutions” held at the World of Health IT conference, 25 October 2007, Vienna, Austria, provided initial input to the study. The second expert workshop, on “Procuring for health benefits: critical factors for beneficial deployment of innovative eHealth and telemedicine services” held at the World of Health IT conference, 06 November 2008, Bella Center, Copenhagen, Denmark, reinforced the conclusions from and added some new insights to other field work.

Information collected for the study has identified good and weak practices in eHealth investment. Both offer insights into opportunities and actions to boost eHealth investment.

¹ www.ehealth-impact.org

² www.ehr-impact.eu

³ www.good-ehealth.org

⁴ www.ehealth-era.org

⁵ Financing eHealth, D2.2: Report on financing opportunities available to Member States to support and boost investment in eHealth; D1.3: Report on conceptual framework, healthcare and eHealth investment context and challenges; D3.1: Report on options and methods for obtaining value added among Member States in the context of eHealth investments; www.financing-ehealth.eu

The next section offers an overview of the political context of eHealth investments, focusing on the role of allocating budgets to eHealth. Chapter 3 deals with issues determining sustainability of eHealth investments, addressing the perspective of all eHealth investment planners, including politicians and managers. Chapter 4 is devoted to a more hands-on support for healthcare managers, highlighting the skills and knowledge identified as critical, but often scarce.

2 Political context of eHealth investments

2.1 Healthcare finance

Investment and healthcare finance have two main perspectives: the statutory health services system in each Member State, and the finance models for individual healthcare provider organisations (HPO) within it. The latter links to the reimbursement models to which we return in Section 3.6.

The national perspective sets the overall financing model for healthcare. Two main models are the Bismark model, essentially social insurance to reimburse citizens or HPOs, and the Beveridge model, essentially financed by the State. In practice, healthcare systems in the EU tend to operate a mix of systems and include the opportunity for citizens to pay directly or partly with mechanisms such as supplementary payments and co-payments. The arrangements in each Member State rely on their own methodologies for operating these healthcare financing models.

Along with these financing models for the provision of healthcare come models to finance investment in change, such as providing new assets and eHealth. These also vary between Member States, and for eHealth the variation is wide. This study's report D2.2⁶ describes the arrangements for eHealth research and investment. **Boosting eHealth investment by increasing the finance available in each Member State will require financing initiatives reflecting the different healthcare financing models and health system goals.**

2.2 eHealth spending decisions

A holy grail of eHealth financing seems to be the answer to the question how much money should be set aside for eHealth investment? A frequent answer for some Member States seems to be about 4% over some five years of total annual expenditure on healthcare⁷; broadly double the current levels. Unfortunately, life is not this simple. **How much to spend is the wrong question and conveys an inappropriate perspective. A better question to ask is what should the money be spent on?** The answer depends on the benefits and net benefits that can be realised over time, relative to the opportunity cost of foregoing other healthcare investment, such as extra staff, new drugs and new facilities. In this context, boosting eHealth investment requires opportunities for effective eHealth that offers relative net benefits. **If the investment is worth it, providing the**

⁶ Financing eHealth, D2.2: Report on financing opportunities available to Member States to support and boost investment in eHealth www.financing-ehealth.eu

⁷ NHS Funding and Reform: the Wanless Report House of Commons Library UK Research Paper 02/30 3 May 2002

required finance becomes a supporting priority. This theme emerged clearly from various sources used for the study as a pragmatic response, rather than a theoretical economic stance.

The question to establish the amount of money needed should be how much net benefit can eHealth deliver⁸? Then followed by: when will net benefits be realised⁹? This leads to the third question, what are the risks that the net benefit may not be realised? From an economic point of view, these risks need a price tag and incorporating into the net benefit over time estimates. The precondition for this, however, is a realistic assessment of the risks¹⁰.

Comparisons of the eHealth answers to those questions with the equivalent answers for other investment possibilities are then possible. Where these answers show that the potential net benefit from eHealth is better than other healthcare investments, eHealth wins the finance available. **Finance should not be available for eHealth where it does not show a better net benefit than other types of competing healthcare investment.**

This is consistent with Fisher's separation theorem¹¹ that the objective of a firm will be to maximise its present value. Applying this to healthcare means that HPOs will invest in initiatives that improve their performance in achieving their healthcare goals, such as improving quality, access and efficiency. Many different types of investment can help to achieve this, such as new drugs, new facilities and new equipment, as well as eHealth, or a combination of these. Some projects will offer better value than others in improving the performance of HPOs. These projects will attract finance, and the lower value projects rejected.

Fisher proposes two arrangements to achieve this resource optimisation level. One is keeping the firm's investment decision independent of the preferences of the owner. In healthcare, this can include state agencies. The other is ensuring that investment decisions are independent of the financing decision. The second theme is directly relevant for this study. It proposes that **increasing finance for eHealth will not necessarily boost investment. What will be the potential and confidence that eHealth will add enough value** to the investing organisation, and so be worth the increased spending and the loss of value from projects that are denied finance, referred to as opportunity cost. In essence, an economic case for eHealth should estimate the costs and benefits over time. Where these are sufficient compared to all proposed healthcare investments, then finance can be allocated to the eHealth project.

This multi-faceted approach may help to boost eHealth investment. It is consistent with a view from the field work that **an inappropriate approach is to provide a big bag of money for eHealth, then decide how to spend it.** This is contrary to the separation theorem and is unlikely to lead to long-term sustainable deployment. Of course, baseline R&D activities must be exempt from this generalisation, as their outcomes are by definition less well defined. The claim rather supports the emphasis on a sound strategic

⁸ Cf. Section 3.1

⁹ Cf. Section 3.2

¹⁰ Cf. Section 3.3

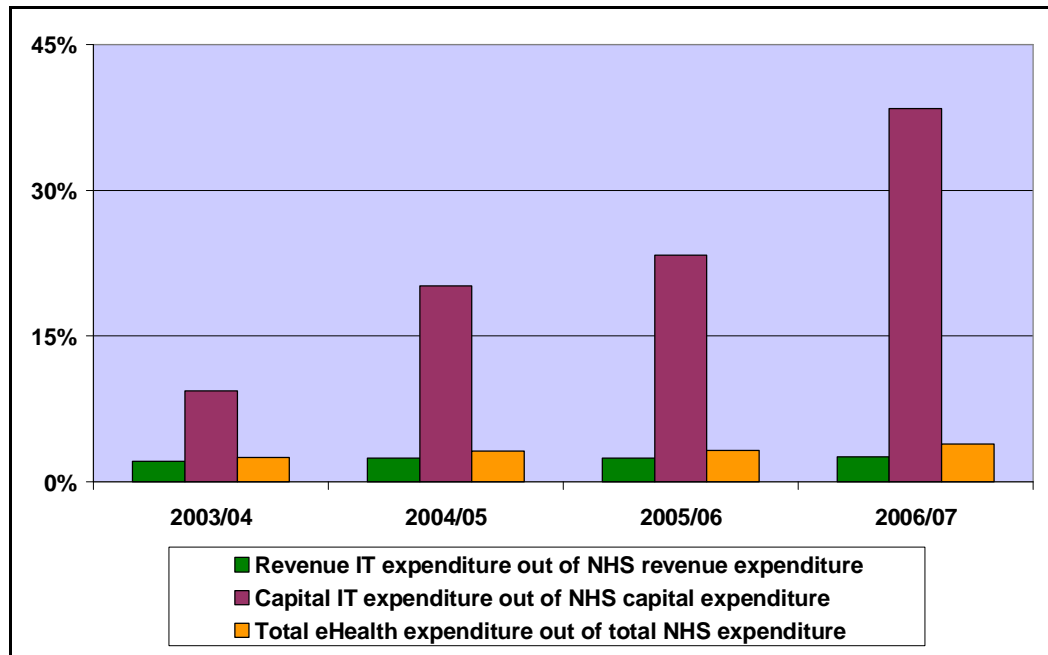
¹¹ Irving Fisher, 1930, *Theory of Interest*, Chapters 6 to 8

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approach towards deployment of eHealth rather than on more or less arbitrary spending levels.

An example is from England, where large national budgets in excess of £6 billion were devoted to part of the NHS National Programme for IT (NPFIT). Spending numbers released in 2007 by England’s Connecting for Health (CfH) for the NHS in England showed that the NPFIT budget of over £6 billion pounds over more than one year, the equivalent of about 7% of a recent total annual spending in the NHS, had not converted into the expected boost for eHealth investment. The percentage of annual ICT spending increased from about 2% in 2002/03 to about 2.6% of NHS revenue expenditure in 2006/07, a span of five years. The share of the NHS capital spending has increased over the same period from about 9% to about 38% of total capital expenditure; a position that seems unlikely to be sustainable as the total capital spending is broadly static, so spending on other types of capital investment was squeezed to provide the increased eHealth finance. Exhibits 1 and 2 show the position.

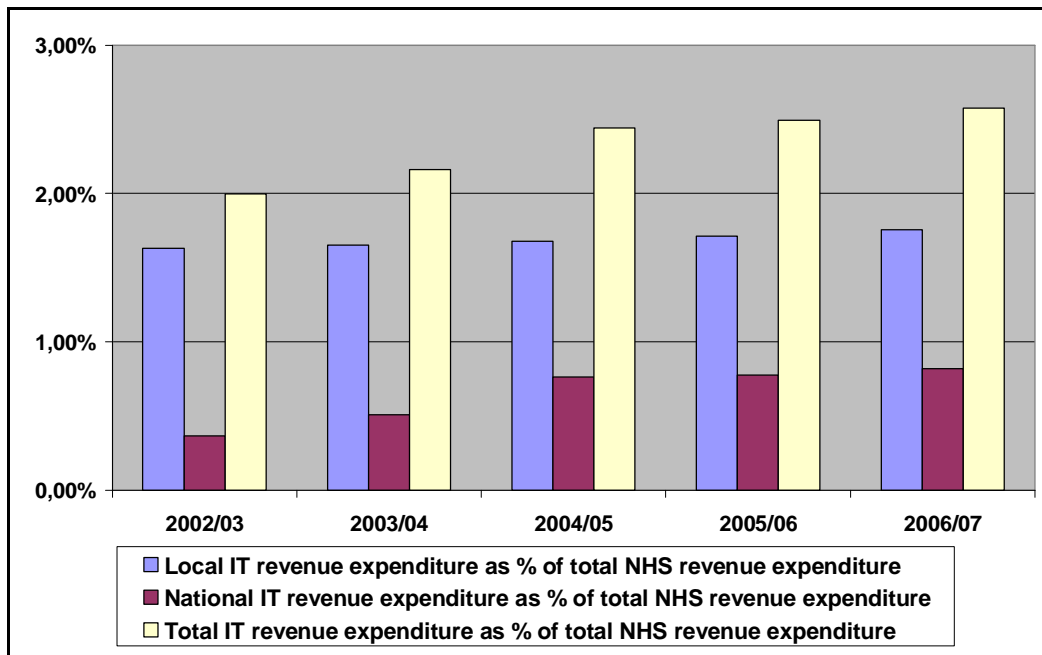
Exhibit 1: NHS England - ICT expenditure as a share of total finance available



Source: Based on Connecting for Health (CfH) numbers, 2007

Exhibit 1 shows the large increase in capital expenditure on eHealth in the NHS in England over four years. It has grown from about 9% of the total NHS capital expenditure to about 38%. However, this large expansion in capital finance has not reflected to the same degree in annual eHealth expenditure.

Exhibit 2: NHS England - eHealth investment as share of total revenue expenditure



Source: Based on Connecting for Health (CfH) numbers, 2007

Exhibit 2 shows that local annual spending on eHealth by HPOs has been stable as a percentage of annual revenue expenditure. The percentage spent nationally has increased slightly, giving a combined total of annual eHealth spending that seems to be broadly stable at about 2.5% of total annual expenditure. A slow uptake scenario was that ICT spending would double by 2007/08¹², but this seems unlikely to happen, with a shortfall of some 30%. The trends indicate that at the 2006/07 growth rate, will take about ten years to double the 2% 2002/03 percentage. These expenditure numbers are consistent with interview comments that finance is not the constraint and a big bag of money is not a solution to boosting eHealth finance. There is; something else that drives the eHealth investment rate. One problem, experienced among others by CfH, is that big bags of money are not easily managed and spent without the fundamentals for large-scale investments being in place.

Whilst generalisations across EU Member States are not always reliable, the numbers illustrate the view of many interviewees that increasing the finance available for eHealth does not automatically, or necessarily, lead to a significant, sustained investment in eHealth. Something else is required. Interviewees have expressed these items as pre-requisites. They include the issues addressed in the rest of this report. The skills and knowledge needed to see eHealth investments through to success were identified as the most critical factor in boosting eHealth investments.

¹² NHS Funding and Reform: the Wanless Report House of Commons Library UK Research Paper 02/30 3 May 2002

3 Issues determining sustainability of eHealth investments

3.1 Costs and benefits – common misunderstandings

Managing the extremely wide reach of eHealth relies on segmentation of effort and expertise. As a result, comprehensive, complete financing arrangements are not always in place, but tend to link to explicit, overt activities. This is evident in national eHealth strategies that allocate finance for national activities, leaving HPOs to set up their own arrangements¹³.

HPOs can exhibit a similar phenomenon. For example, finance for contracts with ICT suppliers is explicit, but there is little or no finance allocated specifically to the time of healthcare professionals needed for activities such as engagement, setting information requirements and refining solutions after testing. These types of partial arrangements reflect the two main components of eHealth finance; extra and reallocated finance. Extra costs are usually made available, yet reallocated resources, such as time reallocations, are often understated. In a clinical setting, eHealth directly affects the performance of healthcare professionals, where information activities exceed more than 20% of healthcare professionals' time¹⁴. This is especially significant where staff can account for some three-quarters of all spending in HPOs.

Activities such as setting ICT contracts with suppliers, project management, and training need extra finance to support increased spending. Working across healthcare and clinical activities to advance **eHealth projects tend to rely on healthcare professionals and other healthcare workers reallocating their time to eHealth** and away from other activities. Finance for these resources is within organisations' existing budgets and critical to successful eHealth. **Identifying and planning this part of finance for eHealth is seldom completed.** Examples of the activities in each type of finance are provided in Exhibit 3. In practice, finance for each of these can be a mix of extra and reallocated finance, so Exhibit 3 shows the main, but not the only types of financing for the respective activities.

¹³ Financing eHealth, D2.2: Report on financing opportunities available to Member States to support and boost investment in eHealth www.financing-ehealth.eu

¹⁴ Robert Bosman, Emmy Rood, Heleen Oudemans-van Straaten, Johan Van der Spoel, Johannus Wester, Durk Zandstra, *Intensive care information system reduces documentation time of the nurses after cardiothoracic surgery*, Intensive Care Medicine Volume 29 Number 1 January 2003 <http://dx.org/10.1007/s00134-002-1542-9>.

Exhibit 3: Examples of activities financed by extra and reallocated finance

eHealth Activity	Extra Finance	Reallocated Finance
Engagement with healthcare professionals		X
Consultation with users		X
Project management	X	
Business case development	X	X
Application design	X	
Application development	X	
Testing	X	X
Setting up contracts with ICT suppliers	X	
Procurement		X
Legal advice on procurement	X	
Trainers	X	
Training time for users		X
Implementation	X	X
Organisational change		X
Benefits realisation		X

Source: © TanJent / empirica 2008

A related theme is the search for financial savings as part of eHealth financing. Savings include improvements in daily cash flows. These are often a relatively small percentage of total economic benefits, and may take several years to achieve. However, some eHealth investments can provide the information needed to optimise the cash flow.

Benefits from eHealth have three components. Financial savings arise from direct improvements in cash flow, such as those resulting from better data used to increase billing, or reductions in outgoings by reduced stock holding and consumption of drugs. These financial savings range from 0% to over 50% of benefits, but are mostly concentrated towards the bottom end of the range. The other two types of benefits are redeployed resources and intangible benefits, described as non-financial. Redeployed resources usually arise from time-savings that are individually minimal, but occur with a high frequency, creating a significant value. The challenge is to manage the reallocation of time in a way improving productivity and thus converting this redeployed resource into financial benefit. Intangible benefits include mainly reductions in exposure to risk of avoidable errors and consequent complaints and law suits.

Preliminary findings from the EC's EHR IMPACT¹⁵ study show that an average ratio of extra finance to redeployed resource, to support investment costs over an eHealth investment cycle, is about 55:45 for EHRs. Extra finance from benefits is an average of about 20% of all benefits. The result is a brake on performance. Without utilising the 50% redeployed resources, the benefits cannot cover the financial requirements of the investment. Some 30% of the benefits are intangible and cannot be converted into finance of any kind. Reallocating from existing activities is more demanding to identify and realise than exploiting extra finance. It can extend into many different budgets in HPOs, and the larger the scale of the eHealth investment, the more the reallocated finance web becomes more complex and extensive, and so more difficult to manage and sustain.

When the cash flow of the initial eHealth investment hump is included¹⁶, the impact on cash flow is usually negative over a ten-year period: **eHealth is usually a net investment, with a negative financial return.** Where the cash generated is a significant proportion of the investment, the investment often bundles clinical and administrative/managerial components with the latter being responsible for the generation, or saving, of extra cash.

The challenge is to ensure that the total investment matches an appropriate total economic benefit. In this respect, it is important to treat eHealth investment in the same way as other new investments in healthcare, such as new drugs and surgical techniques. It should not be a means of saving money and improving overall cash flow, but an investment in better healthcare. This conclusion is also supported by a recent report by the US Congressional Budget Office¹⁷.

Sustainable eHealth investment requires that all decision takers and financial stakeholders are clear about the distinction between economic benefits and financial savings, and the impact of each eHealth investment on future cash flows when decisions are taken.

Cases where the financial returns are sufficient to repay for the investment tend to be an exception featuring a very specific situation. This is when advanced eHealth applications are implemented alongside basic solutions improving administrative processes and general management. Such basic solutions are already in place in many HPOs, with the financial savings long utilised. Thus, the scope for such bundling of investments is limited, and more likely to be found where eHealth systems replace paper systems rather than legally IT systems.

3.2 Timescales for eHealth

When the economic case for an eHealth investment is in place, a range of appropriate sources, such as borrowed funds, external funds, or funds generated internally, can combine to finance eHealth investment¹⁸. These financing arrangements must reflect two

¹⁵ www.ehr-impact.eu

¹⁶ Cf. Section 3.2

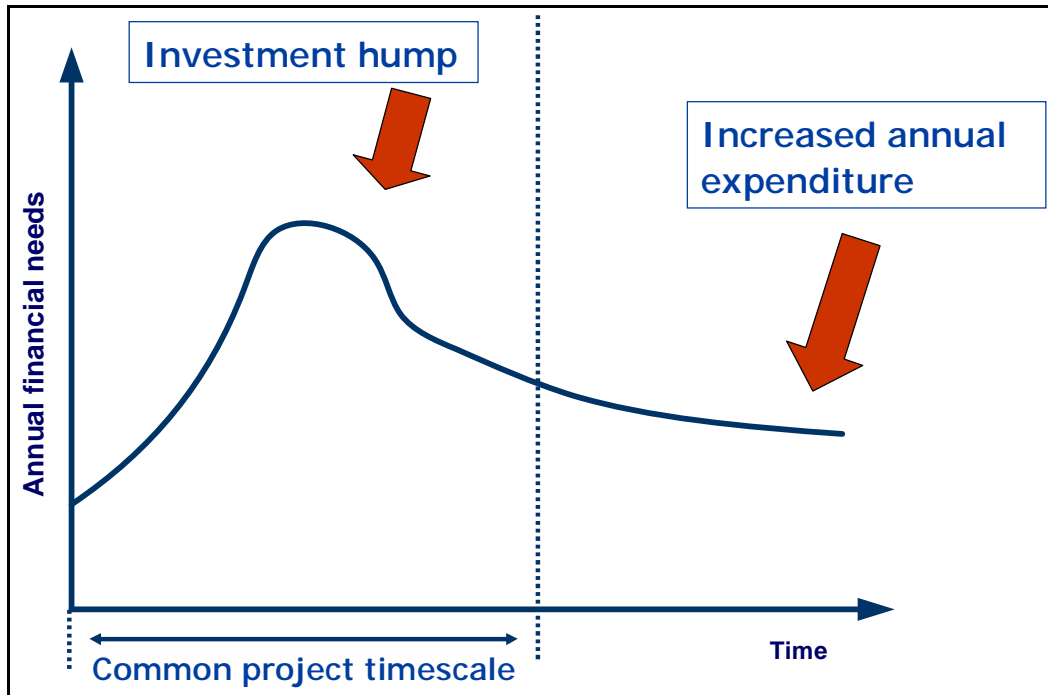
¹⁷ Congress of the United States, Congressional Budget Office, "Evidence on the Costs and Benefits of Health Information Technology", Pub. No. 2976, May 2008

¹⁸ Financing eHealth, D2.2: Report on financing opportunities available to Member States to support and boost investment in eHealth www.financing-ehealth.eu

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general features of eHealth investment, as illustrated in Exhibit 4 below. One is the finance needed for the investment hump in the earlier years. The other is the finance for the increased recurring annual expenditure from eHealth; a feature that is common in eHealth.

Exhibit 4: Illustrative financing needs curve of eHealth investments



Source: © empirica / TanJent 2006

Project management for some eHealth projects focuses mainly on deploying and managing the resources during the design, development and implementation stages, and possibly the initial stages of operation. This timescale can be too short for sustainable eHealth investment. It may fit an ICT project, but seldom provides the time required for the activities needed to realise net benefits; typically, about four years on average and at least eight years for EHRs. **The appropriate timescales extend well beyond the business and financial planning of most national health agencies and HPOs and can present financing challenges for eHealth.**

Most of the extra finance needed is in the earlier years of the lifecycle to finance the investment hump, which includes costs for engagement, design, development, and contracts with ICT suppliers. This usually fits into the shorter, project management timescale, which is often set to reflect either the implementation of the new ICT contract as the end of the project, or the financial planning horizon of the organisation. These are seldom appropriate conditions for eHealth financing which aims to support long-term realisation of benefits.

Instead, **the eHealth investment lifecycle should be set by the time needed to realise the required net benefit**, the ultimate objective. This will enable the management and productive utilisation of all the reallocated resources, as part of change lifecycle. For large-scale eHealth investment that includes several HPOs, this is crucial. Excluding the potential to realise and exploit redeployed resources with a timescale that

is too short, omits the vast majority of finance from management action and scrutiny, and so leaves it to chance.

A whole lifecycle model also improves the realism of the affordability arrangements. **Relying on sustained, reallocated time of busy healthcare professionals without their explicit consent may not be realistic.** An example is the eHealth investment in training stages, especially after implementation. It may not be practical for doctors and nurses to reallocate time away from clinical activities on the scale required for success. A solution may require extra finance for locum or temporary staff to cover. If the extra finance needed is unaffordable, the eHealth investment plan should include an ingenious, affordable solution.

For national and regional eHealth investments, it is essential that lifecycles and timescales used by Member States' health entities and HPOs are consistent. It is not essential that they are the same, but there must be some congruence. Activities that must be integrated include: financing timescales and requirements; design and development timescales; implementation dates and sequences and the time to realise net benefits. Disharmony disrupts financing arrangements.

Another relevant feature of eHealth is its scale. **Step-by-step, slow burn eHealth investment builds continuously from relatively small scale successes.** Large parts of the experience is transferable to other parts of HPOs, other communities and other HPOs and can form platforms for more sophisticated eHealth solutions in the future. It means that the resulting eHealth at any point in time will not be the same across Member States. Some communities and HPOs may be further ahead than others. This is likely to be a permanent condition as new technologies for eHealth continue to emerge and need testing and trialling before extended availability and use. Telehealth, with its expanding range of technologies and applications, as well as impact on clinical and working practices, is an example. Investment differences between communities and HPOs will be prevalent in Member States and different continuous investment between locations may be a regular feature. Sustained finance is essential in these settings. Pump-priming finance on its own will seldom be sufficient to achieve a level of operation where new healthcare models optimise the potential net benefits.

These scenarios deal with eHealth pioneering and roll out simultaneously, together with the required continuous organisational changes needed to optimise both benefits and net benefits. This reveals an important feature of eHealth investment: its time horizons to reach a net benefit can exceed four years and can exceed eight years for more complex investment such as EPRs. Financing in this context exceeds the time scales of the financial and business plans of most HPOs, creating a planning mismatch. Member States and HPOs have to recognise that eHealth investment can commit finance well beyond their normal planning horizons.

3.3 Risks of eHealth

Like all investments, eHealth carries inherent risks. For those who need to be convinced, a claim is that 74% of all IT projects in 2008 failed; the same percentage as in 1980¹⁹. Failure includes budget overruns and missed deadlines. About 28% fail completely. It seems that **over the last 28 years, skills and knowledge of risk have ossified.**

Like all investments, as complexity and scale increase, so do the scope, probabilities and costs of risk. **Plans for eHealth investment seldom evaluate the potential of risk realistically. The result is no recognition of risks as costs, no mitigation and no respective financial provision. This in turn leads to understated costs and overstated benefits, which is not a good foundation to boost eHealth investment.**

Some eHealth investment plans include potential general benefits, but have limited, or no, plans to realise them. The goal is mainly to contain the costs of eHealth. At the other extreme, financial benefits can be overstated. Some claims for economic benefits are confused with, and presented as, financial savings. They are not the same, and this discredits the overall eHealth investment case. As already discussed, economic benefits and net benefits over time can be substantial, but they usually require additional finance; cash savings are seldom sufficient to finance eHealth investment²⁰. Another approach is to invest in process change to secure the benefits, and hopefully net benefits, usually in parallel to ICT implementation. Process changes are far from easy and require behavioural changes among a sometimes large number of people, so carry increased risks. So, what needs to be in place to identify measure and mitigate risk?

First, there are over 80 recognised good practices for eHealth investment, the most important of which are discussed in this report. The extent to which an eHealth investment includes and complies with these is a good start to identifying risks. Many large-scale eHealth investments do not have enough good practices in place, and sometimes have a massive gap. Excessive optimism, reinforced by remoteness, reinforces this lack of reality, so increases risk. Risk mitigation improves with compliance with all recognised good practices.

Second, the probability of adverse events occurring needs to be, but is difficult to assess. **Research on risk exposure and probabilities in the context of eHealth is extremely limited.** Probabilities used in business cases tend to be understated compared to the small number of identified probabilities that exceed 50% of both total costs and total benefits. More research on this theme will be very valuable, as proven in the knowledge of risk in building projects. The limited knowledge in HPOs of risk probabilities of eHealth investment matches an equivalent knowledge gap in ICT suppliers and national health agencies in Member States. Weak risk mitigation usually inhibits efforts to boost investment.

Engagement with users and other stakeholders is another high-risk activity. Where it is not successful, the effect can inhibit eHealth activities for many years. Where it is

¹⁹ Tranfield, D., and Braganza, A., Business Leadership of Technological Change, Chartered Management Institute, British Computer Society, The Change Leadership Network, London 2007 ISBN 0-85946-470-9

²⁰ www.ehealth-impact.org; www.ehr-impact.eu

successful, **eHealth investors tend to apologise for the extended timescales, understating the significant reduction in risk by pursuing effective collaboration and engagement, especially with healthcare professionals.** Also, eHealth that relies on a step-by-step, or slow burn, approach to implementation tends to offer more scope to succeed than big bang models. Important features in these successful cases are that:

- Availability of finance is often not a constraint
- The slow burn approach offers a project structure that inherently mitigates risks from the outset
- It lays a foundation for continuous eHealth investment.

However, rapid implementation across whole sites can succeed, such as in specialised hospitals with good leadership and management of the combination of ICT and organisational change. The three requirements above still apply.

Comparing this slow-burn approach to large-scale, big bang eHealth investments shows the relative risks. **Large-scale big bang eHealth carries increased risks of isolation and disconnection from benefits and net benefits.** Risks of large-scale eHealth investments increase because the scale itself creates complexities that are inherently more risky. Large-scale eHealth investment is harder to stop rapidly or change when required and its increased remoteness makes effective engagement more difficult to achieve. These features translate into an increased requirement for additional finance. As **risk is a cost needing finance**, large-scale, big bang projects are more financially demanding than small-scale, slow burn eHealth investment models. However, this does not mean that slow-burn eHealth is risk free. Their longer timescale carries an inherent risk. The interesting phenomenon is when large-scale big bang eHealth initiatives suffer from risk exposure and their timescales stretch to and equivalent for slow-burn eHealth. Then, the risk exposure of large-scale, big bang increases exponentially.

An example of the impact of risk in large-scale projects is illustrated by the following: “in 2003...established a clear vision for electronic patient records systems. Four years later, however, the descriptions of the scope and capability of planned DCR [*detailed clinical records*] systems offered by officials and suppliers were vague and inconsistent”²¹. Information from these types of assessments of eHealth projects provides excellent material about the risks, their values, their probabilities and ways to mitigate them. When financing arrangements for eHealth reflect these themes, it supports robust investment, helps to mitigate risks and lays the foundation to expand the finance available.

Large-scale, big bang eHealth investment is a relative term. For a Member State, it can include EPR and EHR projects for all citizens. However, some Member States aim to achieve this by relying on a series of small-scale, lower risk investments. Similarly, some HPOs have eHealth investments that are large-scale in concept, but pursued in a series of small, manageable steps, which can increase the opportunities to manage and mitigate risks by designing and constructing lower risk eHealth projects.

²¹ *Electronic Patient Records Sixth Report of Session 2006-07 Volume 1* Health Committee House of Commons UK

These differences in risk are critical in boosting eHealth investment. In any investment, the people who have the money want to know that the people who want the money can manage their exposure to risk. eHealth is no different.

3.4 General strategic fit

All eHealth investment should have a sound fit to the organisation's strategic goals for health and healthcare. Many Member States, HPOs and ICT suppliers have clear statements of the strategic fit of eHealth, and they are not necessarily the same. Member States have perspectives of their populations and the need to meet increasing demand and improve healthcare quality. eHealth can be one strand alongside several other strategic initiatives. HPOs can adopt a similar perspective but also have to deal with the requirements of organisational change to realise benefits and have to pursue affordable strategies. ICT suppliers have eHealth strategies that may emphasise the ICT components of eHealth, such as communications capacity, architecture and functionality, and so can become isolated from other components of healthcare strategies.

eHealth strategies can often be articulated in high-level documents and generalised vocabulary. An example is eHealth that improves healthcare quality and the performance of HPOs. Whilst this may be correct, it does not show how eHealth fits into the whole strategic picture. Many other initiatives, such as using new drugs, can improve quality and performance. Patients can sometimes understand this better than eHealth strategies. eHealth investments may take several years to come to fruition, have no direct impact on patients, and are derived from ICT solutions that are tainted with historical reputations for not delivering in full, in budget and on time.

As detailed eHealth decisions and activities move down national organisations responsible for statutory healthcare provision, and down into health service provider organisations, eHealth can become a specialised, parallel and isolated activity disengaged from other healthcare priorities. Sometimes, these healthcare goals become secondary to the urgency of implementing information systems on time and on budget, and with a simultaneous reduction in the priority for benefits realisation. Evidence from the US shows that top priorities for hospital managers are "project on time and budget" and "happy top management", well before successful improvement of clinical outcomes²². Many experts see this as a parallel universe to healthcare professionals and managers, and a position that has to be corrected in order to boost eHealth investment.

Where this strategic misfit occurs, financing eHealth can also become detached from the eHealth effort, increasing the risks of cost over-runs and constraints on eHealth resources that disrupt the investment. Finance managers, consulted for the study, were not aware of the strategic impact, costs, benefits, risks, and financing of eHealth. This alone has significant implications of relying on financial measures alone to boost eHealth investment.

The strategic fit is especially important for more complex eHealth that requires a considerable long-term investment in design and development, such as comprehensive national EPRs and EHRs. These types of investment tend to be set in a national context

²² Survey by HIMSS Analytics, presented by Dave Garets, World of Health IT Conference and Exhibition, October 2006, Geneva, Switzerland

and so are inherently more remote and isolated from healthcare professionals and other stakeholders when compared to the equivalent smaller-scale eHealth investment of HPOs. HPOs' eHealth investment can also be remote and isolated from general healthcare strategy, and for all types of organisations, **the challenge is to ensure that eHealth investment has, and sustains, a direct link with mainstream strategic goals for health and healthcare.** The more remote and isolated the eHealth activity, the more difficult it is to achieve, and to sustain a match to the timescales, priorities, resources and finance of HPOs.

eHealth dealing extensively with technical aspects of health and healthcare information and information systems, rather than the direct needs of users and other beneficiaries, exacerbates the challenges of integrated investment and finance. These arcane eHealth investments can often be pre-requisites to national scale initiatives, so set a demanding context to achieve a strategic and financing fit. Investments in existing proprietary eHealth applications, such as PACS, are less constrained, and have different impacts, so have a relatively simple strategic and financing model. In between these are eHealth investments such as telemedicine, telehealth and telecare. They are developed and increasing in scope, but often need considerable changes in working practices across healthcare value chains, across several HPOs, and that needs long time-scales.

ICT suppliers in this context bring their specific ICT and health informatics expertise to eHealth investment. Their roles are critical components of eHealth projects, but the strategic fit of their activities is not always clear, and not easy to make clear. Their contributions can range from direct supplier to partners in design and development. Across this wide divide, their direct role in benefits realisation is usually limited, as this is the direct responsibility of HPOs. **It is essential that boundaries between ICT suppliers' and HPOs roles are explicit to achieve effective assignment and management of eHealth finance.**

Strategic fit and integration of eHealth is required for effective financing to help to maximise financial flexibility, and so overall value and impact. In scenarios where eHealth can offer increased potential, entities will want the opportunity to reallocate finance from other initiatives to boost finance for eHealth. Where eHealth shows reducing value, entities will want the option to defer financial transfers, or transfer finance from eHealth to boost finance for other initiatives. Effective strategic planning and programme management are two way to support this.

Clarity about the type and nature of eHealth investment is essential in dealing with financing arrangements and other enabling activities. **Achieving a strategic fit for eHealth depends on the type and scale of eHealth and the number and type of actors, especially national bodies, HPOs, ICT suppliers and stakeholders.**

3.5 eHealth procurement

Effective procurement can help to reduce costs and so enable existing finance to support more eHealth. Examples are healthcare agencies and HPOs that can combine into consortia to procure proven, proprietary products, such as PACS. In this setting, buyers and suppliers should know the potential benefits and risks. Joint and aggregated procurement may be less effective where complex products, such as EHRs, need developing to match Member States' specific health informatics requirements.

In the more centrally managed healthcare systems and markets, such as Scandinavia and the UK, joint procurement may be more feasible than in distributed healthcare markets, such as France and Germany. In these healthcare systems, aggregated procurement may be more viable. Some Member States in Eastern Europe are redesigning and redeveloping their healthcare systems and markets. In these cases, a move towards increased joint procurement should underpin arrangements for information and information sharing.

Expanding joint and aggregated procurement within Member States and between Member States are parallel initiatives. The EC has set in train many eHealth research projects that may have cost more if each Member State had pursued its own course. An example is the Pre-Commercial Procurement of Innovation²³ that supports the procurement of research and development services before eHealth products are commercially available, and where the benefits do not accrue exclusively to the contracting authority.

Financial benefits from appropriate joint and aggregated procurement can be considerable, and increase the impact of available eHealth finance. It is feasible for price reductions of proprietary ICT solutions to exceed 50%. Reduced prices are possible for a wide range of items, including health cards, secure networks, licences, and hardware.

Public private partnerships (PPP) have been fashionable over recent years. There are many PPP models, including private finance initiatives (PFI), joint ventures and outsourcing. Probably the most significant and well-publicised PPP is the UK's National Programme for IT (NPfIT) for the NHS in England, run by Connecting for Health (CfH) with a combined value of over £6billion. It includes long-term contractual relationships with several ICT suppliers to achieve successful innovation and investment initiatives. An aim of PPP is to share or transfer appropriate risks with private sector partners in exchange for a spending regime that transfers some the purchaser's costs into the future. Some capital and non-recurring costs transfer to private partners, who can then increase their annual prices to reflect their costs. This is an advantage where capital finance is scarce and annual revenue finance is plentiful. However, PPP is not a cast-iron deal. Partners can cancel PPPs, as experienced by CfH in 2008. Disruption, waste and abortive expenditure from increased risk can be considerable in these circumstances.

When Fujitsu, one of CfH's main contractors as a local service provider, pulled out of the contract in 2007, PPP was tested for its reality. CfH claims that PPP enabled it to mitigate its exposure to risks by transferring risks to ICT suppliers. This seems to exclude the abortive costs of CfH and many HPOs who can no longer proceed as planned, but have to find another supplier at new costs. The risk of the cancelled contract is recognised by the UK's Audit Commission, reported as in "this uncertain situation, the National Programme for IT in the NHS remains a key risk" for strategic health authorities (SHA), which should "reassess the risks associated with the termination of the Fujitsu contract and develop and implement an appropriate action plan"²⁴.

²³ Pre-Commercial Procurement the Missing Link in the European Innovation Cycle, EC DG Information Society and Media

http://ec.europa.eu/information_society/tl/research/key_docs/documents/procurement.pdf

²⁴ E-Health Insider

http://www.e-health-insider.com/news/4285/auditors_warn_of_npfirisk_to_southern_shas

The new International Accounting Standard (IAS) 17, for leases, has disrupted the value of some PPPs, especially PFIs, by introducing the principle of treating most leases as assets, requiring disclosure in balance sheets, contrary to one of the advantages. This could have implications where leases are part of hardware procurement. Simple tests for PPPs as a financing model are: do they offer real financing advantages and are they sustainable over the whole investment lifecycle.

As described above, finance for PPPs can be a major part of the extra finance needed for eHealth, but not always the major part of the total finance needed over the whole investment lifecycle. Whichever procurement model is used, the goal is to procure the ICT and eHealth that is needed, and from the right supplier. This can be a very challenging goal when regarding an important consideration for eHealth procurement raised during some interviews. ICT suppliers are involved in more procurement than the HPOs and healthcare agencies they deal with. Consequently, ICT suppliers will be more experienced. Addressing this imbalance is important in maximising the eHealth finance available.

Another concern, made clear at the workshop on procurement in Copenhagen²⁵, is that there is still a mismatch between supply and demand for eHealth systems and tools. Experts reported of **repeated occasions in which ICT suppliers were not in the position to supply the solutions needed for benefit realisation**, leaving investors with the task to develop rather than procure. At the same time, **requirements are not always set effectively by procurers, making the life of ICT vendors more difficult**. For some eHealth projects, about 80% of requirements are in a range that includes requirements “Not defined”²⁶. There is a need for much more development in this area.

3.6 Reimbursement and business models

Some types of eHealth investment, such as telehealth, can change the healthcare business model and create new types of services and protocols that can supplement, and even replace existing, traditional services. Creating new, appropriate reimbursements for these new services is part of eHealth financing. The importance of new reimbursement models lies in securing finance for long-term recurring costs.

There is a view that financing arrangements, including new reimbursement models, should be in place before procurement for such new services begins²⁷. However, the reality is more subtle. New reimbursements are only required at the implementation stage, so timing should aim for this. At the same time, designing new reimbursements is a complex and time-consuming endeavour and may take several years to complete. Third party payers and HPOs should begin the reimbursement design as part of the telehealth

²⁵ Expert workshop on “Procuring for health benefits: critical factors for beneficial deployment of innovative eHealth and telemedicine services” held at the World of Health IT conference, 06 November 2008, Bella Center, Copenhagen, Denmark; see www.financing-ehealth.eu

²⁶ Expert workshop on “Procuring for health benefits: critical factors for beneficial deployment of innovative eHealth and telemedicine services” held at the World of Health IT conference, 06 November 2008, Bella Center, Copenhagen, Denmark; see www.financing-ehealth.eu

²⁷ Expert workshop on “Procuring for health benefits: critical factors for beneficial deployment of innovative eHealth and telemedicine services” held at the World of Health IT conference, 06 November 2008, Bella Center, Copenhagen, Denmark; see www.financing-ehealth.eu

business case. This is before procurement, but not with the aim of having the reimbursement in place at that stage.

An important consideration in reimbursement is the different impacts of benefits and savings. Benefits are an economic concept that can justify an eHealth investment. They can include improvements in patients' experience, satisfaction and confidence; better patient safety; expanded access to healthcare for citizens; improve utilisation of resources by HPOs; time savings that cannot easily be redeployed; and future costs avoided. For eHealth investment, where these economic benefits exceed costs, eHealth can be worth pursuing. As stated earlier, financial savings may not generate enough extra finance for new reimbursement models, so the design task is very demanding. Information needed includes:

- How much does the new service cost to provide, including the cost of capital?
- How will new reimbursements reflect the take up of the new services and the impact on fixed and semi-fixed costs absorption?
- Will the users of the new service be reimbursed, or the HPOs providing the new service?
- If users are reimbursed, how should the money flow to the HPOs that carry the cost?
- What are the double running costs of traditional and eHealth-based services, and for how long?
- How much cash can be transferred from traditional services and when?
- When should new reimbursements begin and the traditional reimbursement stop?

Answers to these questions link directly to a recurring theme in many eHealth investments: who pays, and who benefits? Many eHealth investments require significant investment by HPOs, and offer significant benefits for other stakeholders, such as citizens and third party payers. Similarly, one type of HPO, such as a primary care centre may benefit from an investment by an HPO providing hospital services. eHealth finance, including reimbursements, should provide incentives to eHealth investors across the whole healthcare value system and be able to link these to appropriate contributions from stakeholders who benefit. It means that **reimbursement models have to be more responsive to continuous change, which is not just an eHealth matter.**

4 Skills & knowledge needed to boost investment in eHealth

Many interviewees identified the **need to improve managerial knowledge of eHealth in dealing with eHealth investment**, and bring it up to the level of other types of healthcare investment, such as new drugs, new techniques, extra staff and new hospitals. This issue links to **a skills gap identified in the specifics of the eHealth domain in all Member States that impedes progress.** Taken together, these show the need to invest in developing eHealth skills and knowledge for leaders, executives, healthcare

professionals, general managers, departmental managers and ICT teams; in essence, all types of managers and eventual users.

It may be surprising that interviewees did not identify current or planned financial provisions as constraints on eHealth investment. Instead, they **identified shortfalls in the real resources for eHealth as:**

- **Significant lack of skills and capabilities in the workforce to deal with all the eHealth requirements**
- **Limited view of the potential of eHealth by many healthcare professionals, executives and managers leading to narrowly defined eHealth investment plans.**

Only limited financing opportunities are available to fix these shortfalls. If they are not fixed, they will be a continuous constraint on boosting eHealth investment. The phenomenon seems to prevail in some parts of the USA where the EHR take up by physicians has increased from 26% in 2006 to 30% in 2008²⁸. The top two inhibitors identified were cost and lack of interest; the latter offering a parallel factor consistent with the two factors reported above by the Financing eHealth interviewees.

Success stories of eHealth are an essential source for this knowledge, and they need to reach these people to support their activities in boosting eHealth investment. This reveals a chicken and egg conundrum: successful eHealth promotes eHealth investment skills and knowledge, but achieving successful eHealth investment needs the same expertise in advance. Something must break into this cycle, and it is a combination of knowledge and tools. This chapter draws attention to the main skills and knowledge themes.

4.1 What is eHealth?

First, there is **some confusion about the concept of eHealth. It has become an overused term with many meanings.** It can mean a single ICT application, or several ICT applications, or ICT applications with organisational change. Terms such as EPRs and EHRs can have the same or different meanings. ePrescribing can mean the electronic transmission of prescriptions from GPs to pharmacies, or access to a decision support system that can help to prevent inappropriate prescribing and improve patients safety. Terms such as telehealth, telecare and telemedicine are also being used interchangeably. Interoperability can be so complex, that it may be better to wait until someone else finds a solution before committing large sums of cash to eHealth. Other areas, such as PACS, are more consistent in their definitions. These definitions are dealt with in other EC reports on eHealth²⁹. It is beyond the scope of the Financing eHealth project to attempt to create a dictionary of eHealth definitions and functionality, but it is essential that information about eHealth is clear, consistent and easy for healthcare staff to understand alongside the mountains of other information that they have to deal with each day.

Similarly, it is not always clear what is included in an eHealth investment, and so what is being financed and for how long. The definition of eHealth used for the Financing eHealth

²⁸ HIMSS Analytics www.himssanalytics.org

²⁹ See conceptual reports to the following studies: www.financing-ehealth.eu; www.ehr-impact.eu

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project includes both ICT and organisational change, because they can have different financing requirements and realising net benefits relies on both factors. Financing eHealth investment over time requires additional cash and resources, especially healthcare professionals' time, reallocated from routine healthcare activities.

Dealing with information comprises over 20% of healthcare resources and activities, so **an eHealth definition that includes both ICT and organisational change is essential for managers.**

4.2 Managing the variables in eHealth

Perhaps **the most important requirement for leaders, executives and eHealth stakeholders is to be able to deal with eHealth investment as an integrated part of all healthcare investment.** This is consistent with the EIB healthcare investment policy where eHealth should be part of a healthcare development or initiative, and not be an investment on its own. Integration requires all types of managers to know:

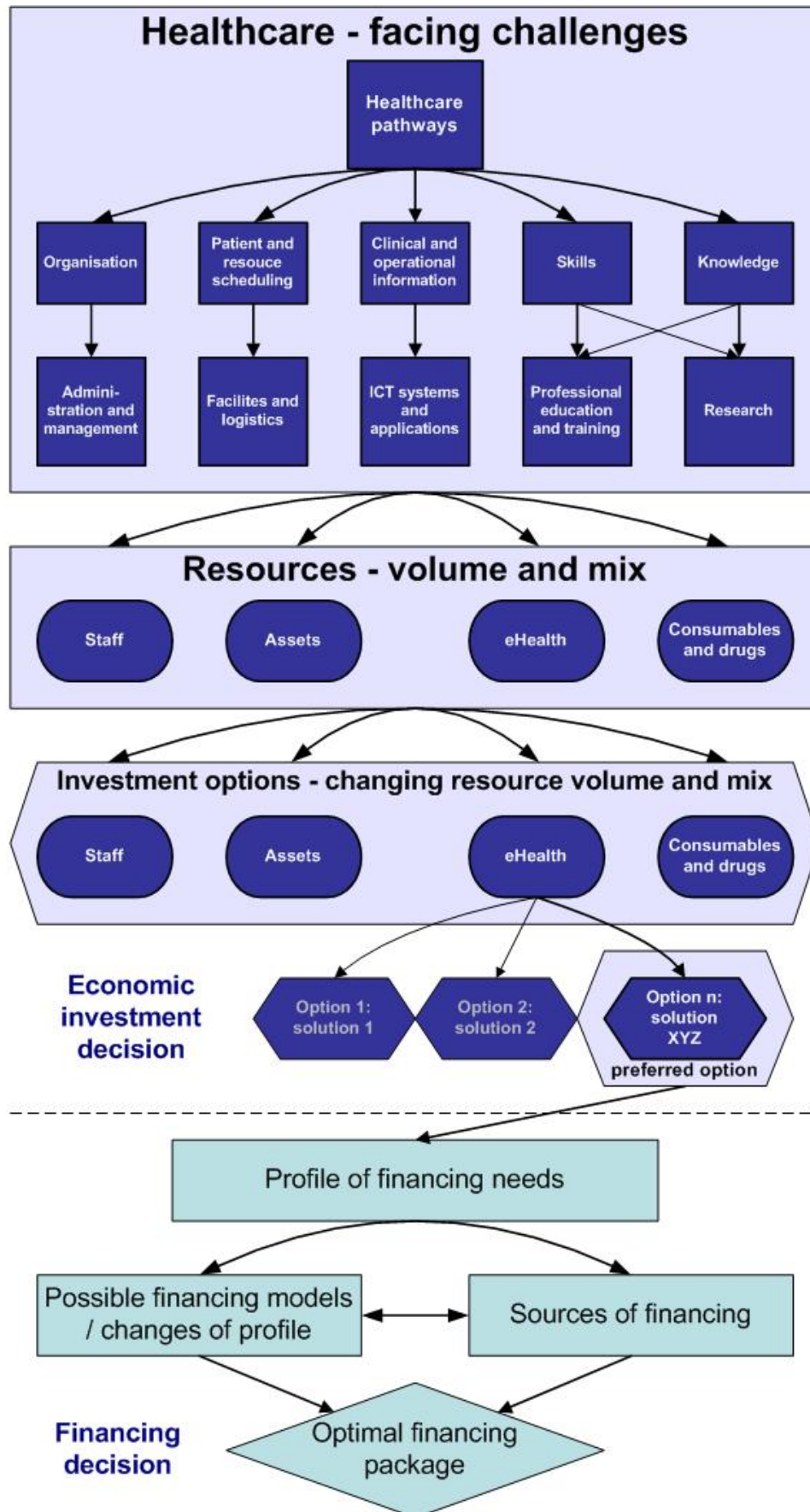
- The different types of impacts of various types of eHealth
- How to realise net benefits over time
- How long these investments take to realise net benefits
- How to manage and mitigate risks
- How to deal with each eHealth project as part of a programme of healthcare investments
- How to sustain eHealth investment as new opportunities become available
- The sustainable, comprehensive financial and affordability requirements over the longer-term
- How to integrate eHealth with other healthcare investments.

Two methodologies are required: one to support decision taking, the other to support investment management after decisions.

4.2.1 Taking investment decisions

Decision taking requires a comparison of the opportunity costs of all proposed investments. eHealth has to be measured alongside its competing options. A model like the one shown in Exhibit 5 helps.

Exhibit 5: The process of economic and financing decisions



Assessing different investment options

Executives and managers need to understand and compare the costs, benefits and net benefits over time of a range of potential projects, then select those with the best economic returns to be financed from the amount money available. Strategy and planning systems should already be in place in most healthcare systems to deal with decisions to invest in new healthcare resources, such as new drugs, extra doctors and nurses and new facilities. Proposals for eHealth investment need to be set alongside these, so executives manage all proposed investments together, and select the best opportunities. In many cases, **the best investments include a combination of conventional resources and eHealth.**

However, eHealth can be an arcane world. **Managers need the capability to produce comparable economic assessments of each possible project. Executives need the capabilities to challenge these constructively and either change the proposals or agree them.** Information about economic and financial performance of comparable eHealth already in place in other organisations offers a valuable knowledge base for these reviews. The management support proposed above should fill this gap and help to improve executives' eHealth decisions.

Good methodologies for assessment of eHealth investment decisions are readily available but do not seem to be used effectively or fully. Two examples are the Treasury Green Book³⁰ in the UK and the WiBe³¹ in Germany. These are not investment models, but set out rigorous principles. Using them requires managers to adopt an approach of an open mind that seeks a good decision. They are not a set of hurdles to navigate through to justify a previously preferred option.

A first step towards sound, realistic investment decisions is recognising that **planning processes need developing, because realistic eHealth investment decisions usually have longer timescales than other types of healthcare investment.** Business and financial planning horizons for HPOs are often about three to five years ahead, which compares to an average of about four years for eHealth net benefits and well short of the net benefit timescales of EHRs of about seven to beyond ten years. **Planning eHealth on shorter-term horizons of less than five years leads managers to focus on the investment in costs, which then become detached from the investment needed to realise benefits.** It also creates pressure for eHealth to deliver on **unrealistically short timescales, resulting in increased risk and optimism, weak business cases, and so weak decisions.**

Optimism bias

Optimism bias is a common feature of all investment plans, so eHealth is no exception. It distorts financing requirements and impairs financial sustainability. Eradication is essential. A weak eHealth business case full of optimism bias:

³⁰ HM Treasury, "The Green Book, Appraisal and Evaluation in Central Government. Treasury Guidance", London: TSO, 2003; <http://greenbook.treasury.gov.uk/>

³¹ WiBe 4.1. Recommendations on Economic Efficiency Assessments in the German Federal Administration, in Particular with Regard to the Use of Information Technology, 2007, based on the version 4.0, 2004.

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- Has time scales too short and unrealistic
- Has estimated costs that are too low
- Omits some costs, especially costs of organisational change
- Makes absurdly excessive claims of the benefits that can be achieved over unrealistic timescales
- Includes useless assessments of risks, their and probabilities and costs
- Excludes risks from costs, resulting in understated costs
- Overemphasises costs to the detriment of benefits or net benefits
- Oversimplifies requirements for engagement with healthcare professionals
- Focuses on systems implementation instead of step-by-step gains by users
- Overstates the short-term need for change management in parallel with ICT implementation
- Understates the longer-term for change management when users can change organically with the right support from ICT staff
- Confuses economic benefits with financial savings, which are usually small, except in rare, specific circumstances
- Understates the need for extra finance needed to achieve the net benefits.

These provide a simple schedule of themes for managers to avoid in eHealth business cases. The challenge is to provide them with the information about good and bad eHealth performance needed for a sound assessment that supports effective programme and project management.

Value for money and affordability

Cost benefit assessments and forecasts show the potential for value for money, or lack of it. Cost benefit assessments include the main data needed for financial assessments and forecasts. After adjusting these financial forecasts for items such as depreciation, amortisation and transfer payments such as VAT to fit the standards of annual financial statements and balance sheets, they provide the foundation for affordability requirements. **It is essential that eHealth investment plans offer value for money and are affordable**, and passing both tests often needs adjustments to proposals that improve one position and disrupt the other. Eventually, affordability becomes the most dominant, so two recommendations are:

- Begin the affordability assessment at the outset of decision taking so that complex iterations with value for money is not left until the end stages
- **Ensure that meeting affordability requirements does not diminish a positive value for money** so the eventual eHealth investment becomes unviable or unsuccessful.

Financial planning

Effective financial planning may be difficult to ensure. Several discussions with healthcare finance professionals and some of their professional bodies show a lack of knowledge, understanding of eHealth, its risks and the priority that they assign to the topic. This needs changing. **Finance managers need to understand the value and impact of eHealth, so they can extend and develop financial planning to deal with eHealth investment timescales.** Their role in risk management is also critical so they can mitigate an adverse impact on their organisation's financial performance.

4.2.2 Supporting investment management after decisions

After the decisions, attention switches to managing progress and taking appropriate action. A core of successful delivery is a strong, independent and impartial programme office and team with the goal to achieve successful change³². Every eHealth project in the organisation should be within its scope so that the programme is the aggregation of all eHealth investment. This will enable a frequent and regular review of all eHealth projects on the same time intervals and drifting projects stopped or deferred so that their resources and finance are available to transfer to eHealth investment that offers better net benefits.

Accountability and reporting by the programme office for eHealth should integrate with the equivalent arrangements for other investment programmes. Executives can then have routine reports on progress, or lack of it, and take corrective and fine-tuning action in the context of all healthcare investment. Again, drifting projects can be stopped or deferred so that their resources and finance are available to transfer to investment that offers better net benefits. Where this process builds on weak business cases and decisions, good programme and project management for eHealth investment is compromised. Unsurprisingly, risk increases.

Realising net benefits – the role of engagement

Benefits depend on several factors being in place. They include effective:

- Engagement with users and stakeholders
- Requirement setting
- ICT functionality
- ICT usability
- ICT utilisation
- Change of clinical and working practices.

Leaving aside the ICT themes, **achieving successful engagement and change are essential skills for managers.** Engagement is working with users and stakeholders so they can participate in the design, development, requirements and constraints of eHealth. Doctors and other healthcare professionals are always important stakeholders in eHealth,

³² Tranfield, D., and Braganza, A., Business Leadership of Technological Change, Chartered Management Institute, British Computer Society, The Change Leadership Network, London 2007 ISBN 0-85946-470-9

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so their engagement from the outset is essential. Engagement provides them with a role to participate in eHealth investment as part of the team. **Dealing with positions, propositions, concerns and requirements distinguishes engagement from consultation.** Executives and managers can ignore advice and views provided through consultation. In engagement, dealing with advice and views is essential in order to gain subsequent commitment to changes in clinical and working practices that realise the benefits from eHealth.

Changing clinical and working practices is usually essential to realise the benefits from eHealth. The timing of the activity is critical. Engagement should have laid a foundation. From this, successful eHealth projects³³ show that change management is effective after healthcare professionals have achieved a reasonable level of utilisation. Starting before this has two drawbacks. One, the benefits are potential, not tangible. Two, it creates **two sets of changes: ICT use and new practices to be implemented simultaneously, which can be too much to cope with successfully.** Managers need to design and apply their change projects in this context.

Many eHealth benefits are relatively small amounts of time savings for large numbers of healthcare professionals and other healthcare workers. Redeploying these liberated resources individually is not practical. They need grouping to form large blocks of resources that can offer more potential for redeployment. However, this is still very demanding. It requires effective engagement between managers and healthcare professionals to succeed and builds from the initial engagement required at the start of eHealth investment.

The role of executives, especially the chief executive, includes creating an appropriate culture for regular reviews. Features include:

- Create transformational value rather than just implement ICT projects
- Build capability for continuous change
- Create a climate of open communication
- Manage confidence and risk
- Build personal capability and learning about ICT³⁴.

Whilst simultaneously developing the positives, executives must avoid the negatives. The top ten reasons for failure are:

- Inadequately trained or inexperienced project managers
- Expectations not set or managed
- Poor leadership at all levels
- Requirements not adequately identified, documented and tracked
- Poor plans and planning processes

³³ www.ehealth-impact.org; www.ehr-impact.eu

³⁴ Tranfield, D., and Braganza, A., Business Leadership of Technological Change, Chartered Management Institute, British Computer Society, The Change Leadership Network, London 2007 ISBN 0-85946-470-9

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- Poor estimates of effort required
- Cultural and ethical misalignment
- Misalignment of project teams and organisation it serves
- Inadequate or misused methods
- Inadequate communication, including progress tracking and reporting³⁵.

4.3 Developing health ICT staff

ICT staff in healthcare are a scarce and underdeveloped resource. Effective eHealth investment requires them to work as part of multi-disciplinary healthcare teams and engage effectively with each person at design and development, requirements, implementation and operational stages of eHealth investment. Generally, ICT staff are the only ones who know about ICT functionality in an eHealth investment. Often this is not about the whole functionality, so they often need more time and resources so they can acquire more and comprehensive knowledge. This will be **critical for their colleagues who are healthcare professionals to exploit the full functionality of the eHealth system**; a common requirement for realising net benefits and achieving a return on the eHealth investment.

An additional role for ICT staff, a combined role of change manager and trainer, is part of some successful eHealth investments. This new role involves supporting healthcare professionals, managers, and other healthcare workers during implementation and beyond. This ensures that functionality matches needs and helps users to develop their knowledge of functionality, and so maximise the potential of the eHealth investment. This role for ICT staff above their pure technical role may be a difference between success and failure, so they need to be equipped to work in this extended way; an extensive personal development programme.

4.4 Managing risk

Financing eHealth interviewees suggested that many politicians involved in health and healthcare seem to be comfortable in dealing with the risks of eHealth investment. However, some executives and high-level managers in healthcare may be risk averse, and so may inhibit eHealth investment. Two factors may explain this. One is a tendency to be risk averse to anything, the other is to be **risk averse due to a lack of knowledge**; it is this latter feature that needs to be addressed. Understated probabilities and values of risk in eHealth investment are common when they are usually considerable. This applies especially for EHRs, where the estimated risk-adjusted cost may exceed 100% of the planned investment costs at the initial planning stages. Executives and managers need information about the scale and probabilities of eHealth risks, and need to know how to use this to adjust and test investment plans for the effect.

Sometimes, detailed risk assessments, by focusing on the trees, may lose sight of the wood. Estimates of the financial costs of risks may be between about 0.4% and 2.6% of

³⁵ Winters, F., *The Top Ten Reasons Projects Fail 2002 to 2004* www.gannthead.com; and McBusted, B. Mittelsdorf, Singapore Project Management Institute <http://www.pmi.org/calendarimg/68/SPMI%20PMP%20Focus%20Gp%20May%2026%20-%20McBusted.ppt>

an HPO's total annual turnover³⁶. This compares with a suggested goal to increase eHealth investment from about 2% to 4% of turnover; an increase that the unmitigated cost of risk could exceed. On this scale, **the financial costs of risk can exceed the extra finance generated from an eHealth investment**. Unmitigated risk represents a significant estimated cost that must be mitigated and avoided. **Executives and managers can use this range of 0.4% to 2.6% to test the risk-adjusted cost of eHealth investments**. If the risk impact is below this range, it may be a weak assessment. If it exceeds 2.6% of annual revenue, then beware; either the risk-adjustment is wild, or the proposed investment is a bad idea.

Interviewees identified mitigation measures included the abilities to:

- Stop an eHealth investment at a low cost
- Manage suppliers and their sub-contractors actively and effectively
- Replace suppliers at a low cost
- Design low risk eHealth investments from the outset, such as slow burn, step-by-step projects
- Set requirements accurately and fully
- Train and retain scarce health ICT staff
- Engage with healthcare professionals effectively and fully.

These are some of the measures essential to mitigate risk. They are not the only ones. The challenge in supporting managers in risk mitigation is that **limited information is available about the types of risks, their values and their probabilities in eHealth**. The paucity of information is clear when compared to the equivalent knowledge in the construction industry³⁷. However, risk management methodologies are available³⁸ and executives and managers should use them.

4.5 Creating an information culture

Healthcare professionals, executives and managers with an information and eHealth culture are essential for successful eHealth investment. Several different types of information and eHealth cultures prevail in healthcare, dependant mainly on the degree of exposure to information as a resource. The Oliver phenomenon, from the Charles Dickens novel *Oliver Twist*, is at the more mature end of the culture spectrum. Here, **healthcare professionals and managers want more information from more eHealth investment. This culture increases the chances of successful eHealth investment**, and is a priority for additional finance. It can take about twelve years or more to achieve this level of managerial attitude. Its prevalence depends on continuous successful eHealth investment that meets people's needs and motivates them.

Currently, extensive resistance to change with a few pioneers prevails, but not many eHealth supporters stand at the other end of the spectrum. There are several causes,

³⁶ Private research TanJent Consultancy UK 2007 to 2008

³⁷ Office of Government Commerce (OGC), Construction projects A manager's Checklist, Crown Copyright 2007, <http://www.ogc.gov.uk/documents/CP0071AEManagersChecklist.pdf>

³⁸ ICT Standards and Guidelines on Risk Tools and Techniques: www.osmar.gov.lb

such as **experiences of botched eHealth; lack of, or inappropriate engagement; silo organisations with weak teamwork; inappropriate people in highly skilled eHealth roles; inability to recruit, train and retain the skilled people needed; and the wrong kind of leadership.** These cultural conditions need changing before allocating finance to eHealth investment. The risk of failure is too high.

It is unrealistic to expect organisations' cultures to switch across the full length of a continuum. Instead, they change gradually, especially in healthcare. Exhibit 6 is a model with nine stages:

Exhibit 6: TanJent nine-level eHealth development and culture wall

Level	Clinical Culture						
9	Healthcare Transformers, Innovators and Informators					Leaders	
8	Healthcare Transformers	eHealth Specifiers	eHealth D&T	MDT	Professional Teams as Users	Individual Users	Leaders
7	eHealth Specifiers	eHealth D&T	MDT	Professional Teams as Users	Individual Users	Leaders	Resisters
6	eHealth Demanders and Takers (D&T) – Oliver's	MDT	Professional Teams as Users	Individual Users	Leaders	Resisters	
5	Multi-disciplinary Teams (MDT) Users	Professional Teams as Users	Individual Users	Leaders	Resisters		
4	Professional Teams as Users	Individual Users	Leaders	Resisters			
3	Individual Users	Supporters	Leaders	Resisters			
2	Supporters	Pioneers	Resisters				
1	Pioneers	Resisters					

Source © TanJent Consultancy / empirica 2008

Before financing eHealth, an assessment should be made of the eHealth culture. HPOs and other organisations with people who are at levels one and two may only be capable of dealing with relatively small scale, low impact eHealth investment. HPOs at level five and above should be able to succeed with sophisticated high impact eHealth; but an assumption that this culture is always compliant is a naive idea. Effective engagement is still required for all types of organisational cultures.

4.6 Procurement expertise

Some discussion partners highlighted differences in procurement expertise between HPOs and national healthcare agencies and ICT suppliers. Put simply, ICT suppliers are more skilled. Several strands of skills need to be developed. For such significant procurements, direct engagement of chief executives, other executives and non-executives of HPOs and equivalents is essential. **Procurement staff need inherent knowledge of the specifications that will allow the procured systems to meet the procuring organisation's needs. They also need direct knowledge of risk transfer**

and sharing, as illusions often prevail. In practice, HPOs can seldom afford the cost of increasing the rewards to suppliers, needed to transfer risks. **Arrangements for payment deduction for penalties also need to be realistic.** For example, it is not sensible for a penalty deduction to be below the cost to the ICT supplier of fixing the performance. In this case, the penalty is an incentive not to fix it.

Whilst there is a need for longer-term partnerships, **contracts should be in small manageable steps, with performance linked to payments.** This is critical for eHealth investments of larger scope that needs design, developing and testing. Payments for each step should provide enough finance for ICT suppliers to succeed. Where ICT suppliers rely on sub-contractors, HPOs must have a right to oversee the sub-contractors performance.

Finally, **HPOs must be able to cancel contracts with minimal cost and disruption.** This is relatively easier at the stages before implementation. From implementation onwards, it can be, and usually is, a mess. HPOs should use this as a break point to reset contracts based on destruction testing that proves the ICT component of eHealth before going past this point.

5 Summary and conclusion

The themes explored in this report combine into the often-misquoted aphorism of Benjamin Franklin “By failing to prepare, you are preparing to fail”. The eHealth skills and knowledge of healthcare and ICT suppliers’ staff is the most important resource to expand in order to achieving more success stories and help to boost eHealth investment.

Taking into account the political context in which investments are made is the first step in successful preparation. Boosting eHealth investment by increasing the finance available in each Member State will require financing initiatives reflecting the different healthcare financing models and health system goals. A sobering conclusion of the study is that just increasing finance for eHealth will not necessarily boost investment. How much to spend is the wrong question and conveys an inappropriate perspective. A better question to ask is what should the money be spent on?

What will boost investment is the potential and confidence that eHealth will add enough value. If an investment is worth it, providing the required finance becomes a supporting priority. Finance should not be made available for eHealth where it does not show a better net benefit than other types of competing investment.

The issues determining sustainability of eHealth investments are:

- Economic and financial costs and benefits
- Timescales
- Risks
- General strategic fit
- eHealth procurement
- Reimbursement and business models.

D4.1: Management support for eHealth investment

The first issue relates to the often uncomfortable truth that eHealth is usually a net investment, with a negative financial return. While large proportions of costs are extra financial burden to investors, benefits are often bundled into pockets of liberated resources and intangible categories. These benefits have a considerable value, but not always one that translates into extra cash. Sustainable eHealth investment requires ensuring that all decision takers and financial stakeholders are clear about the distinction between economic benefits and financial savings.

The appropriate timescales for sustainable eHealth investments extend well beyond the business and financial planning of most national health agencies and HPOs, and can thus present financing challenges for eHealth. Nevertheless, the eHealth investment lifecycle should be set by the time needed to realise the required net benefit. In this context, an important observation is that step-by-step, slow burn eHealth investments build continuously from relatively small scale successes. For national and regional eHealth investments, it is essential that lifecycles and timescales used by Member States' health entities and HPOs are consistent.

Another commonly neglected factor is risk. Successful eHealth investors tend to apologise for the extended timescales, understating the significant reduction in risk by pursuing effective collaboration and engagement, especially with healthcare professionals. Plans for eHealth investment seldom evaluate the potential of risk realistically. The result is no recognition of risks as costs, no mitigation and no respective financial provision. This in turn leads to understated costs and overstated benefits, which is not a good foundation to boost eHealth investment. Large-scale big bang eHealth carries increased risks of isolation and disconnection from benefits and net benefits. In this respect, it is also acknowledged that research on risk exposure and probabilities in the context of eHealth is extremely limited, exacerbating the challenges to potential eHealth investors.

The fourth critical issue in effective and efficient eHealth investments is the general strategic fit. The challenge is to ensure that eHealth investment has, and sustains, a direct link with mainstream strategic goals for health and healthcare. Achieving a strategic fit for eHealth depends on the type and scale of eHealth and the number and type of actors, especially national bodies, HPOs, ICT suppliers and stakeholders.

Once a decision to invest has been made, procurement comes high on the priority list. In this context, it is argued that financial benefits from appropriate joint and aggregated procurement can be considerable. However, the topic reveals another uncomfortable reality: there are repeated occasions in which ICT suppliers were not in the position to supply the solutions needed for benefit realisation. At the same time, requirements are not always set effectively by procurers, making the life of ICT vendors more difficult. This again underlines the importance to invest in specific eHealth skills and knowledge among the wider healthcare and ICT communities.

A simultaneous task for investors, starting with or even before procurement, is to secure the recurring financing of the eHealth services, systems and tools. This involves sound business planning and in some cases augmentations in healthcare services reimbursement models. An observation in this respect is that reimbursement arrangements have to become more responsive to continuous change, which is not just an eHealth matter.

D4.1: Management support for eHealth investment

The Financing eHealth study set out to discover how to support and boost sustainable investment in eHealth. In the process, study identified a skills gap in managerial knowledge of dealing with eHealth investment and the specifics of the eHealth domain in general. This skills gap seems to be the most significant factor that impedes progress. Identified shortfalls in the real resources for eHealth are:

- Significant lack of skills and capabilities in the workforce to deal with all eHealth requirements
- Limited view of the potential of eHealth by many healthcare professionals, executives and managers, leading to narrowly defined eHealth investment plans.

While there are sources of financing individual eHealth projects, only limited financing opportunities are available to fix these shortfalls.

The knowledge gap includes some confusion about the concept of eHealth. It has become an overused term with many meanings. An eHealth definition that includes both ICT and organisational change is essential for managers. Focusing on ICT alone is the wrong starting point.

The next step for healthcare and eHealth managers is to learn how to take the best investment decisions and how to see eHealth investments through to success. The most important requirement for leaders, executives and eHealth stakeholders is to be able to deal with eHealth investment as an integrated part of all healthcare investment. Two methodologies are required: one to support decision taking, the other to support investment management after decisions.

On the decision side, managers need the capability to produce comparable economic assessments of each possible project. Executives need the capabilities to challenge these constructively and either change the proposals or agree them. The best investments often include a combination of conventional resources and eHealth, with realistic eHealth investment plans usually having longer timescales than other types of healthcare investment.

Planning eHealth on shorter-term horizons of less than five years leads managers to focus on the investment in costs, which then become detached from the investment needed to realise benefits. Optimism bias is a common feature of all investment plans, so eHealth is no exception. Unrealistically short timescales result in increased risk and optimism, weak business cases, and so weak decisions.

Finance managers need to understand the value and impact of eHealth, so they can extend and develop financial planning to deal with eHealth investment timescales. It is also essential that eHealth investment plans offer value for money and are affordable. A critical point is to ensure that meeting affordability requirements does not diminish a positive value for money.

Once the investment decision is taken, factors facilitating long-term sustainability need to be put in place. Achieving successful engagement and change are essential skills for managers. A subtle distinction to draw attention to that engagement, unlike consultation, deals with positions, propositions, concerns and requirements of stakeholders. Engagement facilitates success; consultation does not increase chances considerably. A note of caution regarding change is about the timing of different changes. Often, two sets

D4.1: Management support for eHealth investment

of changes are required: ICT use and new practices. If implemented simultaneously, there is a risk that it becomes too much to cope with successfully.

Further skills gaps were identified in the ability of healthcare professionals to exploit the full functionality of eHealth systems. This calls for an additional role for ICT staff, a combined role of change manager and trainer, as part of successful eHealth investments.

Along with the already highlighted insufficiencies related to research on the types of risks, their values and their probabilities in eHealth, managers at different levels tend to be risk averse due to a lack of knowledge about eHealth in general. This aversion to risk is not necessarily unwise, given that the financial costs of risk can exceed the extra finance generated from an eHealth investment. Executives and managers can use a range of 0.4% to 2.6% of total annual turnover to test the risk-adjusted cost of eHealth investments.

Mitigating risk and increasing the chances of success from the outset can be facilitated by creating an information culture. This is a situation in which healthcare professionals and managers want more information from more eHealth investment. These cultural conditions involving experiences of botched eHealth; lack of, or inappropriate engagement; silo organisations with weak teamwork; inappropriate people in highly skilled eHealth roles; inability to recruit, train and retain the skilled people needed; and the wrong kind of leadership need changing before allocating finance to eHealth investment.

Last but not least, procurement staff need inherent knowledge of the specifications that will allow the procured systems and services to meet the procuring organisation's needs. They also need direct knowledge of risk transfer and sharing, as illusions often prevail. Procurement contracts should be set into small manageable steps, with performance linked to payments. Alongside this, realistic arrangements for payment deduction for penalties need to be in place, providing incentives to fix problems instead of paying penalties without fixing.

This overview of organisational, managerial, and resourcing issues impacting on the sustainability of successful eHealth investments supports the requirement to adjust public eHealth finance along the following three lines:

- Developing and retaining the eHealth skills and knowledge of healthcare professionals, executives and managers, so they can engage effectively
- Developing and retaining eHealth skills and capabilities of ICT specialists, so they can address users' needs better
- Direct eHealth investment in projects, so that the number of success stories increases, feeding back into the pool of skills, knowledge, and experience.

The scope of eHealth investment exacerbates these challenges. As a combination of ICT and organisational change, the complexity of eHealth investment is considerable, and this wider definition of eHealth in the context of resourcing ensures that all the critical factors are included in the financing arrangements. The European Investment Bank (EIB) goes further than this as its current policy is to finance eHealth investment only where it is part of the resources of new, developed health services. This approach has much to commend it.

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