



MOMENTUM

European Momentum for Mainstreaming Telemedicine Deployment in Daily
Practice
(Grant Agreement No 297320)

Deliverable *D4.2*

Report on *SIG 1* – "Strategy and management"

*"Strategy and management report for the blueprint
validated by 'doers' and stakeholders"*

Version 10

Work Package:	WP4 SIG on telemedicine strategy and management
Version & Date:	v10, 8 September 2014
Deliverable type:	Report
Distribution Status:	Public
Authors:	<i>Rachelle Kaye, Andrea Pavlickova</i>
Reviewed by:	<i>Ellen K. Christiansen, Eva Henriksen, Marc Lange, Tino Marti, Peeter Ross, Michael Strübin, Diane Whitehouse (including reviews of case descriptions)</i>
Approved by:	<i>Marc Lange, Michael Strübin</i>
Filename:	D4_2_MOMENTUM_SIG1_v10

Abstract

This report examines four strategic factors that are critical for the initiation of a telemedicine service and its successful expansion into routine care delivery. The aim of this report is to define these critical success factors, describe their objectives and to illustrate the arguments relevant to them by describing some concrete evidence-based examples that give an account of their implications. This work has been done by MOMENTUM's special interest group on strategy and management by examining 30 telemedicine services in Europe that have successfully moved out of the pilot phase into either small-scale or large-scale deployment or have been integrated into routine care delivery. Through the analysis of these cases, it becomes clear that these four strategic

factors are critical to achieving the goal of integration into routine care. Namely, these are the cultural readiness of the setting; having a champion; agreeing on the advantages of telemedicine in meeting a compelling need; and acquiring the resources needed for deployment. Through the application of these critical success factors to seven service descriptions (called cases here), the report highlights success stories about and lessons learned on how the barriers to telemedicine implementation can be overcome.

Key Word List

Champion, compelling need, cultural readiness, innovation, large-scale deployment, resources, routine care, strategy, telemedicine, telemedicine service.

Note on the seven telemedicine cases

Six of the telemedicine cases described in this deliverable can be located on the MOMENTUM website, called service descriptions, under six countries (Israel, Italy, the Netherlands, Norway, Sweden, and Spain): <http://telemedicine-momentum.eu/europe/>. A short description of each of the cases (including the Germany Patientenhilfe case) is also included in deliverable D3.2.

Version History

01	14 July 2014.
02	31 July 2014
03	18 August 2014
04	24 August 2014
05	28 August 2014
06	29 August 2014
07	29 August 2014
08	1 September 2014
09	4 September 2014
10	8 September 2014

Version Changes

- 01** Initial version subject to first review.
- 02** Review by Diane Whitehouse - some modifications accepted.
- 03** Modifications made by Andrea Pavlickova and Rachelle Kaye; comments made by various case owners on the wording related to the cases.
- 04** Modifications made by Rachelle Kaye and Diane Whitehouse.
- 05** Comments made by Diane Whitehouse.
- 06** Modifications made by Andrea Pavlickova and Rachelle Kaye; abstract; keyword list; table of contents; and executive summary added.
- 07** Small modifications made by Diane Whitehouse following request of Rachelle Kaye.
- 08** Review by Marc Lange.
- 09** Final revision of language and presentation of the manuscript by Diane Whitehouse, bearing in mind changes made by Marc Lange and final comments by Rachelle Kaye.
- 10** Quality review by Michael Strübin

Statement of originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Table of Contents

Table of Contents.....	ii
Executive summary.....	iii
1 Introduction.....	1
2 Assure that there is cultural readiness for the telemedicine service	3
3 Ensure leadership through a champion.....	11
4 Come to a consensus on the advantages of telemedicine in meeting compelling need(s).....	18
5 Pull together the resources needed for deployment	25
6 Observations or concerns	33
7 Bibliography.....	35

Executive summary

The economic and financial crisis, ageing of the population, and the increasing number of people with chronic diseases, have highlighted the urgent need for reforms that promote service redesign and new ways of working, increase efficiency and create innovative new solutions to deliver care in Europe. Telemedicine, the practice of medicine at a distance, has been perceived as an opportunity to support people and give them greater choice and confidence in their care, enable safer, effective and more personalised care and help generate efficiencies in clinical decision-making. However, there is still a considerable level of resistance to the implementation of telemedicine solutions either at the level of the individual patient, the organisation or policies. As a result, most telemedicine initiatives are still at a piloting phase or are deployed at small scale. There is therefore a need to provide guidance on how to overcome this resistance and implement these initiatives successfully in routine care delivery.

This report describes the strategic factors that are critical to helping telemedicine make the transition from the pilot phase to large-scale deployment. Its primary objective is to define the critical elements that drive the strategy forward, describe their objectives and purpose, and identify the prior conditions needed to underpin the factors. The report also provides an illustration of the various critical success factors by using different examples of successful integration of telemedicine solutions into routine care.

Through the analysis of 30 telemedicine services in Europe that have been implemented on a large scale or actually integrated into routine care, four strategic critical success factors for the initiation and continuous support of the service have been identified:

- Assure that there is a cultural readiness for the telemedicine service.
- Ensure leadership through a champion.
- Coming to a consensus on the advantages of telemedicine in meeting compelling need(s).
- Pull together the resources needed for deployment.

The report highlights three findings. First, the application of these critical success factors to seven selected cases supports the importance of these strategic factors in ensuring the implementation of long-term sustainable telemedicine solutions, despite significant differences among the cases. As a result, telemedicine doers must be aware of these differences and of the setting when applying each critical success factor. Second is the interdependence of critical success factors. There is clearly a close interrelationship and overlap among all four strategic factors. This interdependence is in particular noticeable with regard to the resources needed for deployment. On the one hand, resources can always be generated if the other three critical factors are present. On the other hand, resources often cannot be generated without a degree of cultural readiness, leadership (a champion), and a compelling need. Third, these four strategic critical success factors for telemedicine deployment seem to be relevant, or even identical to, critical elements for the deployment of any other type of innovation.

The findings of the report are intended to provide a useful tool for telemedicine doers. The description of the main characteristics of the critical success factors, their background conditions, and illustrations of these factors in concrete evidence-based cases may help telemedicine doers to progress successfully with the implementation of telemedicine

services into routine care. The lessons learned from the seven success stories (or cases) described will bring an added value to the existing European initiatives and policies that are encouraging the development of telemedicine and information and communication technology solutions. Examples include the Communication from the Commission (2008) on Telemedicine for the Benefit of Patients, Healthcare Systems and Society, eHealth Action Plan 2012-2020 and the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA).

1 Introduction

Telemedicine means the provision of a medical service in a situation where the clinician and the patient are not involved in a face-to-face encounter, but rather a 'virtual' encounter that is mediated by a medium such as a telephone, fax machine, email, text message or video conference.

Telemedicine can be classified into three types:

1. Telediagnosis – whereby the patient undergoes some type of diagnostic examination, but the professional interpretation of the results of the examination are done at a distance. Thus the results of the x-ray, ultrasound, computed tomography, magnetic resonance image, electrocardiogram, or Holter examination are sent digitally from the diagnostic device to a (health) professional who interprets them, determines the diagnosis, and sends his or her interpretation/diagnosis digitally to the referring physician/diagnostic clinic.
2. Telemonitoring – whereby results from devices that are measuring the patients' vital signs are followed by a professional monitoring centre, a clinician, or even a website so as to enable on-going monitoring of the patient's condition. As a rule, the recipient of the transmitted data uses clinical guidelines to identify any aberrations from what is considered normal for that patient (by using either embedded algorithms, written guidelines or professional knowledge). This monitoring or management-by-exception generates a response which can be either an alert or a contact between the clinician and the patient or a form of online guidance given to the patient.
3. Teleconsultation – refers to a virtual visit or dialogue that occurs in place of a physical encounter. There are two common types of teleconsultation:
 - Between a clinician and a patient.
 - Between two or more clinicians.

Projects for testing or for implementing each of these forms of telemedicine usually come about as the result of some level of perceived need or value that is combined with an opportunity to access resources to carry out the project. As a rule, such initiatives are accompanied by a level of assessment. This assessment feeds into the decision-making process that occurs at the end of the "project period" about whether to continue to operate the service, expand it, or integrate it into routine healthcare delivery. Many of the same factors that originally influenced the decision to undertake the telemedicine project also play a critical role in the decision to continue to operate the service and to expand it to large-scale deployment as a part of routine service delivery.

In the cases studied in the framework of the MOMENTUM project, these four strategic factors appear to be critical to the successful transition from pilot project to large-scale deployment. They are deserving of special attention:

- Cultural readiness.

- A champion who mobilises support and gains the backing of key leaders and decision makers.
- Consensus on the advantages of telemedicine in meeting the compelling needs.
- The ability to put together the resources needed for deployment and on-going operation of the service.

2 Assure that there is cultural readiness for the telemedicine service

This section of the report describes the issues surrounding the assessment of cultural readiness and the need to facilitate changes that generate it. The need for cultural readiness is directly related to telemedicine deployment scale-up.

2.1 What this critical success factor is

Cultural readiness in a healthcare system or organisation has three components: beliefs and perceptions; attitudes and norms that affect behaviour; and values and current needs. Therefore, cultural readiness is a set of beliefs and perceptions that influence establishment of priorities; attitudes that affect behaviour including decisions, ideas and practices that determine how a person, organisation, society will respond to the environment; and values and current needs that determine whether telemedicine will be viewed positively or negatively, and will be embraced, rejected or just ignored. Cultural readiness applies both to telemedicine generally and to the modification of care processes, particularly those supported by health information and communication technology (ICT).

The characteristics of cultural readiness for telemedicine include:

- Doctors and healthcare professionals are ready to share clinical information with each other and with the patient i.e., there is a level of trust among all the stakeholders.¹
- Patients and providers (healthcare professionals) are ready to use ICT (e.g., computers, tablets, mobile phones).
- Financial and other incentives are aligned with the service to be deployed.
- An underpinning culture embraces technology.
- An underpinning culture welcomes and even promotes change, innovation and shows an openness to new ideas.
- For commercial services – market readiness.

The characteristics of cultural readiness range over such fields as the surrounding culture, the culture and level of trust of professional groups and their relationships with their clients, and – commercially – market readiness.

¹ This success factor is relevant in both provider-provider services and provider-patient services. However, in a provider-provider service, the willingness to share information with the patient is less important.

2.2 Objectives

Cultural readiness is a critical success factor because, without it, the adoption of a telemedicine service will not occur. This requires that the telemedicine doer actively addresses this issue, in order to verify that the stakeholders concerned (including individuals, professional groups and or organisations) are open to the value and benefits of telemedicine, and can be convinced to adopt it.

To take on board this critical factor, a telemedicine doer will need to:

- Assess the level of cultural readiness in the system or organisation for developing and/or deploying the specific telemedicine service.
- Determine what steps can be taken to either
 - (i) facilitate or stimulate cultural readiness, or
 - (ii) increase and strengthen the level of cultural readiness for telemedicine deployment.

Steps to facilitate cultural readiness may include such actions or activities as the training of healthcare personnel, and including two types of awareness-raising activities – the first, awareness in society as a whole, and the second which is more focused directly on telemedicine-relevant groups such as clinicians and patients.

2.3 The context surrounding the success factor

The issues surrounding cultural readiness are the social, political and technological context in a particular country, region, city or organisation. Cultural readiness will also be influenced by whether the environment where telemedicine will be deployed is public or private sector, and whether the organisation concerned is a public service or a commercial enterprise (in which case the focus may be more about the readiness of the market).

2.4 First thoughts on pre-requisites underlying the success factor

Pre-requisites underlying cultural readiness may include:

- The absence of legislation or political action that would impede, prevent, or act as a really significant barrier to telemedicine deployment.
- Sufficient flexibility or freedom in the system for leaders to make and implement necessary decisions.
- Awareness in society as a whole of the added value and convenience of using technology to support healthcare.

This initial notion of pre-requisites will be explored further in deliverable D3.2, and the validation process of the critical success factors (e.g., also D3.3 and D3.4).

2.5 Illustration of this critical success factor from the Maccabi case

The importance of cultural readiness is evident in the Maccabi case. Maccabi was one of the first healthcare organisations internationally to implement the use of electronic medical records. It now has a central medical record system that is used by all healthcare providers: as a result, all Maccabi doctors, nurses, and other healthcare professionals document every encounter with the patient on a central platform which then is accessible to all of them. An embedded decision support system provides patient-specific alerts and reminders, as appropriate, to each provider. Maccabi was also one of the early adopters of telemedicine, internationally. The organisation offers a full array of telediagnostic, telehealth and telecare services.

The expanding use of telemedicine is an integral part of Maccabi's strategic vision. Maccabi's strategy is to provide care to its members at any time in any place where the insured member is located and needs access to services.

Maccabi is situated in the larger culture of a country (i.e., Israel) that welcomes, promotes and rewards innovation. Almost all Maccabi's clinicians and patients are comfortable with telemedicine in its many forms, including gaining access to medical information on mobile devices.

2.6 Illustration of this critical success factor from the RxEye case

The RxEye service is a disruptive service that aims to provide new business processes in the medical imaging domain, particularly in terms of image reporting. A pre-requisite for this kind of change is the acceptance of market rules in healthcare. The need for the acceptance of market rules in healthcare in turn requires cultural readiness on the side of the various parties in the healthcare value chain to be open to the purchasing of a commercial reporting service. The current situation in most countries is not favourable to the trading of imaging services. Most healthcare providers, including radiologists, are still not willing to open up their reporting procedures to bidding processes. Thus, the relative lack of cultural readiness of the healthcare sector is a critical factor in terms of whether this specific form of service can progress further. In the RxEye case, the lack of cultural readiness hinders the potential of the service to grow further.

2.7 Illustration of this critical success factor from the Teledialysis case

In general, technology use in Norwegian healthcare is considered useful.

NST,² the organisation which has assisted this hospital in the establishment of this service, is a department in a university hospital. Maybe due to this fact, video conferencing was generally well known in the hospital and already widely used prior to the specific service being introduced. Together with the identification of the compelling need (see the third critical success factor discussed in deliverable D4.2), this general openness to technology and video conferencing specifically, constituted the necessary cultural readiness for the telemedicine service to be introduced.

Both patients and local health personnel wanted to have this service. As a result of it, they would feel secure that the service was being supervised by the most highly qualified health professionals. This provision of the service by highly qualified professionals would, in turn, strengthen their confidence in the quality of the service. It made both patients and local health professionals feel safer. Patients and health professionals were also comfortable with the idea of using teleconferencing, particularly as it saved travel.

2.8 Illustration of this critical success factor from the ITHACA case

Badalonia Serveis Assistencials (BSA) has been a pioneer organisation in Catalonia, Spain, when it comes to health technology and information systems innovation. Initiating innovation and welcoming innovation are crucial aspects of cultural readiness. Specifically for ITHACA, this readiness was particularly strong inside the executive team and also in some clinical departments.

2.9 Illustration of this critical success factor from the KSYOS case

The Dutch KSYOS service, which provides expert teleconsultation among clinicians – and is therefore a provider-provider service – emerged as a result both of the vision of its initiator and the readiness of the market. KSYOS checked out the cultural readiness towards teleconsultation before starting the service. Since the service was a frontrunner, at the beginning of the process there was only support from innovators among health workers, health institutions and health insurers: this is why KSYOS focussed initially on this group of innovators. By using its Health Management Practice model, KSYOS gradually collected evidence of the quality and efficiency-improving potential

² NST is the Norwegian Centre for Integrated Care and Telemedicine.

of teleconsultation with the use of an increasing numbers of health workers involved. This initial level of cultural readiness was strengthened, when designing the service, by three notions: by putting the doctor at the centre of the service and not the patient; by focusing on getting all the relevant people on board; and by translating the vision and mission into a business plan.

2.10 Illustration of this critical success factor from the Cardio Online Europe case

Both patients and the regional, Puglia, 118 (emergency) service have been happy to use the Cardio Online Europe telecardiology system because its prompt cardiological response provides a valid form of support both for the patients and for any medical decision that needs to be made. For example, in its first month of activity, from 11 October 2004 onwards, 601 electrocardiograms were recorded. Today, Cardio Online Europe receives more than 10,000 electrocardiograms a month.

The early foundation of the Cardio Online Europe service, a decade ago, is indicative of the fact that telemedicine is viewed positively and is embraced by all its service users, including the company's employees. The aim of Cardio Online Europe is, however, not to limit itself to expansion to only one region, but to extend the same service to other Italian regions when policy-makers and cardiologists agree that this should be done.

This ambition is an indication of the cultural readiness for this service: it reflects the support and acceptance of the service, the value attributed to the service, and the conviction that policymakers and cardiologists can be brought on board.

2.11 Lessons learned on cultural readiness from the cases

The lessons that can be learned from the above cases seem to be:

1. Cultural readiness for telemedicine can be at least partially achieved by promoting other aspects of health ICT, such as electronic medical records (Maccabi, ITHACA).
2. The inclusion of technological innovation in general and telemedicine in specific in the strategic vision of an organisation or system is a powerful force for cultural readiness (Maccabi, ITHACA).
3. The expectation of "reward" from the external environment is also an important factor in cultural readiness (Maccabi).
4. RxEye appears to be a telemedicine service that succeeds despite only limited cultural readiness. Hence the entrepreneurs who initiated it were

"culturally ready" (they were able to perceive the lack of radiologists as an opportunity to provide an innovative solution to a compelling need). However, the service is still struggling to grow, ostensibly because of limited cultural readiness in the potential client population.

5. A technology-friendly environment with widespread use of the particular telemedicine technology for other purposes, as is the case with videoconferencing in the Norwegian Teledialysis case, is indicative of cultural readiness in terms of both the environment and also for this specific type of solution.
6. The pioneering spirit of the organisation, and the value it places on innovation, is an important factor in cultural readiness (ITHACA).
7. In some senses, KSYOS is reminiscent of RxEye insofar as the "cultural readiness" at the initial stage of the endeavour was really at the level of the initiator of the service rather than it being either an environment or an organisation that was culturally ready. The KSYOS case is a good example of how a "doer" goes about creating cultural readiness. The KSYOS doer did this in several steps. First he created the "service" as a research project in which he was able to produce evidence of the quality and efficiency-improving potential of the teleconsultation solution. He then focused his attention on a small group of innovators whom he converted to his cause. Gradually, he increased the number of health workers, health institutions and health insurers involved. He also designed the service by placing the doctors (the clients of the service) at the centre, as they would otherwise potentially have been the most resistant partners to this change. Only after he had achieved a significant level of acceptance did the innovator then turn the service into a "business". It is significant that, even today, the telemedicine doer in this case still markets KSYOS as a healthcare provider and not as a technology service.
8. Cardio Online Europe started small and apparently found a welcome home in Puglia which was a region in Italy that was ready to try out the solution. In terms of bearing in mind cultural readiness and how it can change over time, this is a service that has grown gradually. It proved itself initially at the level of small-scale deployment. Then it generated evidence of success that has enabled it to expand to large-scale deployment.

2.12 Overall analysis on cultural readiness from the cases

From an overall point of view, the cases described here demonstrate the following insights into cultural readiness:

1. Cultural readiness is multifaceted and exhibits itself in very different ways in different places. From the doer's perspective, this would imply that there is no simple formula or uniform set of circumstances that indicate the presence or absence of cultural readiness. Instead, a doer needs to be sensitive to the unique nuances in each situation. This context awareness will help to determine where to focus first to get the process going or what values need to be emphasised for the person, the service and its rationale to gain acceptance. Being aware of the phasing or scaling of the initiative is therefore important.
2. An important factor in cultural readiness is the compelling need for a solution. Identifying and creating an awareness of a compelling need forms part of cultural readiness since it points to a willingness to do things differently in the service or organisation because the way things are done today is not working.
3. Another important factor in cultural readiness is the self-image or self-perception of an organisation or system. Self-perception on the part of the initiative, project or even the champion as an innovator or a pioneer would appear to be a very strong indicator of cultural readiness. This is particularly the case when it is perceived positively by the external environment, as is seen in the cases of both ITHACA and Maccabi.
4. Cultural readiness can be created, or at the very least facilitated, and may well be more of a process than a "state of being".

2.13 Further relevant discussion

Literature about the diffusion of innovation could be pertinent in explaining associations between telemedicine growth and deployment; the association with cultural readiness (i.e., values, beliefs and needs); and the background contextual, managerial and organisational matters. In the future, literature on the diffusion of innovation might be usefully explored, and exploited, in much greater detail by people wanting to scale-up telemedicine deployment.

In the diffusion of innovation literature, the rate of diffusion of an innovation is significantly determined by the degree of compatibility of the innovation with the values, beliefs, past history and current needs of individuals involved (Berwick, 2003).

Another cluster of influences on the rate of diffusion of innovations has to do with the contextual and managerial factors within an organisation or social system that either encourage and support the acceptance of innovation or

discourage and impede innovation. As such, particular organisations may be nurturing environments for innovation (Ibid p. 1972).

The importance of this background information is that the telemedicine doer needs to assess the degree of “openness” and “readiness” at the two levels: first, at the level of the individuals who will be key to the implementation and deployment of the telemedicine service and, second, at the level of the organisation or system to determine whether it will provide a nurturing and supportive environment as a whole.

3 Ensure leadership through a champion

This section of the report describes the issues surrounding ensuring leadership through a champion.

3.1 What this critical success factor is

A champion is a person who is committed to the telemedicine idea or initiative or service. The person may have a considerable range of qualities and competences which are described here. The person is willing to put himself/herself “on the line” i.e., to be open to considerable risk to make the service happen; has the ability to enlist others to the cause; can secure the commitment of the leadership of the organisation or the system; and has the ability to mobilise resources to make the initiative happen, including other people who can act as more operational leaders.

The background characteristics of a champion include being a person who:

- Is either in a position of authority or influence in his/her organisation or healthcare system.
- Can generate trust at all levels – both on the part of the leadership and at the level of those people who have to implement and use the service.
- Has relevant knowledge, and has contacts and relationships with like-minded people wherever they are located geographically.
- Has credibility or a “track-record”.
- Can create the conditions for continuity and ensure good management at the various critical stages of the initiative.

3.2 Objectives

Leadership that takes place through a champion is a critical success factor because, by taking care of championing the cause, the telemedicine doer will have a resource in place who will make the service happen; who will deal with all the relevant obstacles; who will resolve all the issues emerging from the deployment process; and who will provide all the stakeholders concerned with a reference point or contact point, hence creating trust in the process.

To ensure that a champion is in place, the telemedicine doer:

- Needs to determine whether s/he has the necessary characteristics himself/herself, and can and does want to take on the role of champion.

- If s/he comes to the conclusion that s/he cannot be the champion himself/herself, then the objective will be to identify and locate appropriate candidates who can act as such champions. Thus, the person concerned will need to enlist other people to the cause.

3.3 The context surrounding the success factor

The need for a champion is relevant in any context whether it is at the international, national, regional healthcare system level or organisational level. The characteristics of a successful champion will be determined by the particular context of telemedicine deployment. For example, if the telemedicine doer is to be a champion at the systems level, s/he needs to be "known" outside the particular organisation more publicly (i.e., recognised as having a mandate) and accepted. If the champion is to work at an organisational level, it is probably sufficient that s/he is known inside the organisation, or at least known by the leadership/decision-makers in the organisation. If the telemedicine service to be deployed is a provider-provider system, it might be important that the champion is a doctor or a healthcare professional. If the context is a commercial one, i.e. the telemedicine service is being established as a commercial business, then the champion is likely to be an entrepreneur.

3.4 First thoughts on pre-requisites underlying the success factor

Pre-requisites underlying the success of the champion may include:

- Cultural "readiness" in the system for telemedicine. Early studies on factors affecting diffusion of innovation among health professionals suggests that when a group's norms favour an innovation, opinion leaders are likely to be pioneers whereas, if the norms and the innovation are in conflict, the pioneer is often an individual who is marginal to the group (Becker, 1970).

3.5 Illustration of this critical success factor from the Maccabi case

In Maccabi, the person who championed the service came from outside the organisation. However, the champion has a long history of collaboration with Maccabi as a result of the various roles he has played in the Israeli healthcare system (from twice being Director General of the Ministry of Health, to being the Chief Executive Officer of one of Israel's largest public hospitals, to his current role as founder of the Gertner Institute). He is now director of the Institute's Division of Health and Society, which is currently co-funding the

Maccabi telemedicine centre. The champion has influence, is well respected, and he brought both key operational people and some of the financing to two initiatives: the original Maccabi pilot project, and the currently functioning telemedicine centre.

Although the centre is operated by Maccabi and for Maccabi patients, the champion continues to be the guiding light on the part of the centre and uses it as a basis for developing and testing further innovative new services.

3.6 Illustration of this critical success factor from the RxEye case

The RxEye service was planned and deployed by two individuals who clearly believed in the medical imaging brokering service. They established the company and started the service. Finding customers for the service still remains – to quite a large extent – an activity that is dependent on the relations built by the founders of the company. Thus, in this sense, these two individuals were themselves the champions of the particular cause.

3.7 Illustration of this critical success factor from the Teledialysis case

The initiator of the Norwegian teledialysis service was a department, or a team of individuals, rather than an individual – it was the nephrology department at a specialist healthcare hospital in the region. There were several champions at different levels, inside and outside the renal unit/nephrology department:

- The head of the medical department at the hospital (who is a doctor) believed in telemedicine and related ideas and made the required resources available.
- The head nurse at the renal unit at the hospital recognised the need and motivated the staff and the patients.
- The project manager at NST (who is a technologist) was very responsive to the clinicians’ wishes and was good at facilitating the realisation of their visions.

3.8 Illustration of this critical success factor from the ITHACA case

The clinical lead in Badalonia Serveis Assistencials (BSA) pushed for the implementation of this service and led it. A pharmaceutical firm, Novartis, was also a strong partner in the initiative. The company not only championed the launch of the service but also brought resources to the initiative. In the case of ITHACA, it would be misleading to say that there was one champion who was

responsible for successful adoption by the organisation. It was rather a champion management team that made it possible. The team is a multidisciplinary one that combines a set of skills and knowledge from clinicians, managers and IT staff.

3.9 Illustration of this critical success factor from the KSYOS case

The champion in the KSYOS service was the founder of the service. He began the service as a research and development project, and then championed the expansion of the project into a teleconsultation business in the field of dermatology. He is clearly an entrepreneurial champion and has continued to expand the service to include additional teleconsultation services.

In general, KSYOS has ensured leadership, starting with itself as an innovative healthcare institution that has taken the risk to invest and focus on its own formulated vision and mission translated into a business plan. However, this leadership is limited. (In order to scale up a telemedicine solution and include it in routine care, leadership at the policy level is crucial to establish the necessary conditions for telemedicine deployment, e.g. legal, medical or financial.)

3.10 Illustration of this critical success factor from the Cardio Online Europe case

There is no relevant information available from the Cardio Online Europe case.

3.11 Lessons learned on ensuring leadership through a champion from the cases

The five cases illustrate that this critical success factor can be categorised in three ways:

1. A champion can be external to the specific organisation that is deploying the service, albeit if he or she may be a member of the overall healthcare system of which the organisation is a part (Maccabi).
2. Champions can also operate in teams. In a team of champions, the function of championing does not fall on the shoulders of a single individual. Rather, the functions are spread, with each member of the team bringing some different quality but still being essential to the championship activities of the team (Teledialysis and ITHACA).
3. A champion can be an entrepreneur: in which case, in effect, the champion and the doer are one (e.g., RxEye and KSYOS).

In reviewing these cases, it can be noted that there is a tendency, in a number of cases, to talk about “champion teams”. In most organisations, however, as a rule, the process begins with one champion who really wants to push forward an idea or an innovation. In order to succeed, he or she immediately starts recruiting partners and creates a team with which to work. This is an essential step to “socialising” the telemedicine idea within the organisation.

There are also some elements that cut across the above three groupings of external individual, team-based champions and entrepreneur:

1. In two of the cases (Maccabi and ITHACA), the champion (or a member of the championship team) brought significant financial – and perhaps other important – resources to the deployment of the service. This support continues today.
2. In these same two cases (Maccabi and ITHACA), it is significant to note that the champion who possesses the resources is external to the organisation that is responsible for deploying the service.
3. Two of the services (Teledialysis and KSYOS) are teleconsultation services that take place among professionals. In both cases the champion (or the head of the championship team) is a clinician who is a specialist in the particular medical specialty that is at the heart of the new teleconsultation service. While RxEye shows certain other similarities with Teledialysis and KSYOS, it does not fit into quite the same category because, although it facilitates a service between professionals, it is really a brokering service between professionals and the institutions that need their services. Thus, in RxEye, the actual profession or specialty of the broker was not really relevant.
4. The credibility of the champion appears to be more critical in the three public service cases (Maccabi, Teledialysis, and ITHACA) than in two of the commercial cases (RxEye and KSYOS).
5. In two of the commercial services, the utility of the service itself appears to be more important than the credibility of the champion him/herself.

3.12 Overall analysis on ensuring leadership through a champion from the cases

The cases support the importance of a champion or champions as a critical success factor in the large-scale deployment of a telemedicine service. It appears to be crucial to have a champion who believes in the

importance/viability of the service and is willing to invest considerable effort and energy in pushing the venture forward. At the same time, the differences in the types of various champions call into question some of the characteristics of a champion. In terms of a champion's attributes, does he or she really have to be in a position of authority? This characteristic would appear to be more important in services which are public in character than in a commercial service. Is the ability to generate trust really a critical characteristic of a successful champion? Or is it enough that the champion be sufficiently credible so as to offer or promote a service that has fairly easily demonstrable merits?

3.13 Further relevant discussion

The recognition of the need for a champion in order to promote the implementation of innovation is not only accepted but is taken for granted in almost every organisation that places value on innovation.

A quick internet search reveals the existence of many articles, both academic and commercial, along with advertisements on training courses to develop "champions". One such course defines an "Innovation Champion" as a manager or professional who has the expertise, credibility and self-confidence to guide and coach others in helping to build innovation capabilities in the organisation. It is asserted that: "*Champions are critical to the success of innovation inside organizations. Every organization needs individuals who are focused on innovation and the ever-changing environment in which we conduct business.*"³

This assertion is supported by academic articles such as Howell and Boies (2004) in *Leadership Quarterly* on a study that examined the role that champions play in the generation and promotion of ideas in the innovation process. The study found that champions demonstrated more enthusiastic support for new ideas, tied the innovation to a greater variety of positive organisational outcomes, and used informal selling processes more often during the idea promotion (Howell & Boies, 2004).

Another article, by Ted Buswick (1990) in the *Training & Development Journal*, asserts that: "*The champion is the driving force for getting a technology investigated or implemented. Usually, he or she is either a person with exceptional skills in the technology who also has the zeal and persuasive powers to convince others, or someone near the top of the company who recognizes that new technology is essential to staying competitive, and whose*

³ From an Internet advertisement on a customisable Champion Development Programme <http://www.desai.com/our-services/INNOVATION-CHAMPION-DEVELOPMENT-outline/tabid/89221/Default.aspx>, last accessed on 31 July 2014.

advice will be interpreted as orders." Buswick lists ten characteristics of the successful champion: expertise, credibility, planning skills, networking skills, sensitivity, objectivity, tenacity, decisiveness, assertiveness, and confidence (Buswick, 1990).

The findings regarding the importance of champions and their characteristics in the cases studied in the MOMENTUM project are consistent with the concepts laid out in the literature.

4 Come to a consensus on the advantages of telemedicine in meeting compelling need(s)

This section of the report describes the issues surrounding coming to a consensus on the advantages of telemedicine in meeting a compelling need or needs.

4.1 What this critical success factor is

This success factor is comprised of two major components:

- Identification of a compelling need (or needs) – about which there is general consensus – that must be addressed. A compelling need is a sufficiently high level “problem”, such as a shortage of healthcare professionals, a limitation in other important resources or a high level of preventable morbidity or mortality, for which a telemedicine service can supply a solution.⁴
- Recognition and agreement that the telemedicine solution has clear and demonstrable advantages over all other solutions to the compelling needs/problems.

Issues or needs or problems are compelling when the solutions to them are:

- Essential to the values and underlying *raison d'être* of the healthcare system or organisation.
- Essential to the accomplishment of the organisation or system's mission.
- Essential to the management of the organisation or the system.
- Necessary to ensure the maintenance of basic principles and values.
- Mandated under law or another outside authority.

Examples of compelling needs for telemedicine services are:

- Demographic and epidemiological characteristics of the population i.e., aging or experiencing chronic conditions or unduly high preventable morbidity and/or mortality that create a demand for service support.
- Limited resources, either financial and/or human, to meet the demand created by the target population.
- Limitations or constraints in access to the kind of care that meets people's needs.
- The need for care that is appropriate and at the requisite level of quality.

⁴ Other examples are described in greater detail below.

- The need for services that provide care at a sufficient level of efficiency and effectiveness so that it is economically viable, sustainable and affordable.

Examples of the types of advantages that a telemedicine service is thought to demonstrate over other potential solutions are that it is:

- More effective because it achieves better clinical outcomes.
- Easier to implement.
- Costs less, at least in the long run.
- Makes a more efficient use of scarce human/professional resources.
- Reaches a significantly larger population.
- Creates better access to the service.

4.2 Objectives

Creating a consensus about the advantages of telemedicine in meeting a compelling need or needs is a critical success factor because, by taking care of this, a telemedicine doer will:

- Be fully aware of what the compelling need or needs are that can be effectively addressed by telemedicine in all their aspects and implications.
- Take steps to assure that the critical stakeholders are aware of and perceive the compelling need(s) with all of their permutations.
- Highlight those problems or situations in the system or the organisation (or that are external to the system or organisation) that constitute a compelling need (or needs). As a result, stating these problems or situations can be used as part of the rationale and justification for developing and/or implementing the service.
- Identify and delineate the unique advantages of the telemedicine service over all other potential alternative services/solutions that can/may address the compelling need(s) and determine the main characteristics of the telemedicine service as well as the orientation for any patient inclusion and exclusion criteria.
- Use the "compelling need(s)" that have been identified and the advantages of telemedicine to demonstrate benefit in order to enlist a champion, persuade leadership about the need for support through telemedicine, and mobilise resources.

Creating a consensus around these compelling needs is key.

4.3 The context surrounding the success factor

The advantages of a telemedicine solution over alternative solutions can be relevant either at an organisational level or at a health system level.

From a contextual point of view, while the type of health system (i.e., whether Bismarckian or Beveridgean) is probably not significant in dealing with this success factor, the level of centralisation or decentralisation of the system may be.

Geographical distances may be an important contextual factor. Such distances contribute to the level and acuity of the compelling need.

The exact nature of the advantages of telemedicine and its benefits will be different (and even significantly different) for services that are provider-provider or provider-patient oriented. For example, the compelling need that lies behind the provider-provider service of teleradiology may be an acute shortage of radiologists. The advantages of a telemedicine solution in this case are that it (i) not only resolves the radiologist shortage problem but it also, due to digitalisation of the radiological image, (ii) improves the quality of the diagnosis, (iii) saves money by eliminating the need for film, and (iv) improves the timeliness of the transmission of the interpretation to the referring doctor and the patient.

Compelling needs that encourage telemedicine provider-patient services are often long patient queues or acute access challenges in certain geographic settings. These problems can be rectified through the provision of teleconferencing or other telemedicine solutions that enable patients to receive care in a more timely fashion and reduce the need for travel without increasing the number of clinicians/human resources.

4.4 First thoughts on pre-requisites underlying the success factor

With this critical success factor, the pre-requisites are:

- The visibility of the compelling need or the ability to make it visible, i.e., identifying it and making other relevant people aware of it. There needs to be a requisite level of awareness and consensus among critical stakeholders and decision-makers that the need(s) are actual, and that they are sufficiently acute and compelling so as to require a solution.
- The visibility of the benefits of the solutions to the various stakeholders or the ability to make them visible, and the ability of the critical stakeholders to understand the advantages of the telemedicine solution relative to the alternatives.

4.5 Illustration of this critical success factor from the Maccabi case

The compelling needs in the Maccabi case are several: the rapid growth of chronic illnesses (predominant among the elderly population, many of whose members have mobility limitations), coupled with a shortage of clinical personnel and very tight budget constraints. These three factors generated the pressures necessary to find a more efficient, high quality and cost-effective solution to healthcare provision. They created a fertile ground for the implementation of the champion's vision. The proposed telemedicine service is a 24/7 multidisciplinary telemedicine centre with high level professional nurses at its core, who use computerised clinical protocols and interact proactively with the patient and his/her family via videoconference and integrate the care across all caregivers. This solution was perceived as having a distinct advantage over other alternatives.

4.6 Illustration of this critical success factor from the RxEye case

Overall in RxEye, the demand for imaging and image reporting in the medical field is increasing on both the supply side and the demand side. On the supply side, the two compelling needs in the RxEye case are: first, the increasing number of radiology and pathology examinations; and second, the lack of radiologists and pathologists who are able to report on such exams. On the demand side, the compelling need comes from the customers (for instance, a hospital board or the Chief Executive Officer of a reporting company who are looking for more efficient service provider). The advantage of this service is that it provides a cost-effective and timely solution to providing interpretation of the imaging exams without necessitating an increase in the number of radiologists and pathologists.

4.7 Illustration of this critical success factor from the Teledialysis case

For the Teledialysis Service in Norway, the compelling need for a solution to provide a high-quality dialysis service to small local hospitals was for a safe service and high-quality service. The advantage and unique benefit of the teledialysis service is that it meets these needs with the added benefit of reducing both travel time and costs for patients and doctors.

4.8 Illustration of this critical success factor from the ITHACA case

In ITHACA, the compelling need was clearly a clinical need: high blood pressure. The increasing number of patients with chronic hypertension and improvement in quality, and the need to reduce costs and increase satisfaction

were the main compelling needs behind this service. The ITHACA programme now meets these needs in an efficient and cost-effective manner. The design of ITHACA made it possible to monitor patients with high blood pressure as well as educate them in healthy behavioural habits through different services provided at a distance. As a result, a reduction in service utilisation was observed while quality indicators improved. The unique advantages of the programme are two: it is strongly supported by a strategic partner – Novartis – including its financial support; this programme forms part of the Catalan national strategic plan.

4.9 Illustration of this critical success factor from the Patientenhilfe case

One can infer from the impact statements that support the Patientenhilfe case that the compelling need that drove the development of this service and its success is the increasing number of hospital admissions and deaths from chronic diseases that, with appropriate monitoring and early detection, could be avoided.

4.10 Illustration of this critical success factor from the KSYOS case

KSYOS is a teleconsultation service which began by offering teledermatology services. The compelling needs were: a very high proportion of referrals from the general practitioners to the dermatologists; long response times from the dermatology consultants; long wait times on the part of the patients waiting for a diagnosis; high costs for consultations; and the need for better cooperation between general practitioners and dermatologists. The service had clear benefits for all parties insofar as it provided a rapid, cost-effective and user-friendly solution to address these problems.

4.11 Illustration of this critical success factor from the Cardio Online Europe case

The compelling need in the Cardio On Line Europe service was to reduce mortality from heart failure by increasing the efficiency of the emergency services. This was done by making sure that patients with chest pains are taken to the appropriate hospital, and that treatment has already started while the patient is en route to the hospital, i.e., within the so-called golden hour.

4.12 Lessons learned on coming to a consensus on the advantages in telemedicine in meeting a critical need(s) from the cases

In all seven of the cases there was a clearly defined problem or need that had attributes that were specifically amenable to telemedicine. Examples include a

shortage of resources, timeliness, and distance from the provision of the services, or some combination of these factors.

In Maccabi, the problems were a growing shortage of clinical personnel, tight budgets and the burden that having many chronically ill patients places on these resources. In RxEye there was a shortage of radiologists which created a timeliness problem in terms of obtaining professional interpretations of the radiological images. In Teledialysis there was also a limited number of experts, coupled with long geographic distances between the patients’ place of residence, the community hospitals that were to provide them with dialysis services locally, and the “expert” centres. In ITHACA, there was a need to reduce costs (thereby, place a limit on the resources) and improve quality by providing a timely service that would prevent an additional burden on limited resources. In the Patientenhilfe service, there was also a need to reduce avoidable expenditures (i.e., hospitalisation of patients) by creating a more efficient and timely process of care. In KSYOS, the timeliness of expert consultation was the primary driver. In Cardio Online Europe, the problem was a combination of timeliness and distance which resulted in preventable mortality.

The core problems of timeliness and distance could conceivably have been resolved in each of these cases by significantly increasing the resources and, along with them, expenditures. The distinct advantage of telemedicine is that it uses technology to overcome time and distance challenges without straining significantly already limited human resources.

4.13 Overall analysis on coming to a consensus on the advantages in telemedicine in meeting a critical need(s) from the cases

Clearly, not all of the current problems inherent in the delivery of healthcare services can be solved by telemedicine. There are still many healthcare services that require a face-to-face encounter and/or a procedure that has to be performed physically. However, there is one clear conclusion from the seven MOMENTUM cases explored in depth to date with regard to this particular critical success factor in terms of the deployment of telemedicine: it is that the needs that telemedicine can meet or the problems that it faces *have* to be problems/needs that telemedicine can solve, and can solve with better outcomes (e.g., quality, cost effectiveness, and patient and clinician satisfaction) than any other option.

4.14 Further relevant discussion

The perception of compelling need and the unique advantages of the solution over other alternatives is an important element in the process of adoption and diffusion of innovation, as evidenced by the relevant literature. For example, in his article on disseminating innovations in healthcare, Don Berwick points out that the *“first and most powerful [factor] is the perceived benefit of the change. Individuals are most likely to adopt an innovation if they think it can help.”* (Berwick, 2003, p. 1969). The clear assumption here is that there is an underlying problem or need that the innovation purports to address.

This is closely aligned with the concept of “relative advantage”. Meeting a perceived need is a necessary but not sufficient factor for the innovation – in this case, the telemedicine service – to succeed. Rather, the telemedicine service must have a distinct advantage over other alternative solutions that address the same need.

5 Pull together the resources needed for deployment

This section of the report describes the issues surrounding putting together the resources needed for deployment.

5.1 What this critical success factor is

Resources refer to the means needed to develop and deploy the telemedicine service and to ensure its sustainability.

There are essentially four major types of resources that need to be available: financing; people (or human resources); information; and time. Each of these issues is explained in more detail below:

- Financing at a sufficient level to develop and support the deployment of the service. Financing may include grants, investments subsidies, or income from the sale of services.
- People (i.e., human resources) who have specific attributes and expertise (ideas, concepts and know-how) and are in appropriate positions and/or people with potential who can achieve the requisite level of know-how after appropriate training.
- Information, for example, on (i) what is going on politically, socially, organisationally, technologically, and (ii) in terms of business and, in a more focused way, on (iii) the problems and needs that can be addressed by the telemedicine service.
- Time can mean having the time to undertake the initiative needed, at the right time or making time available for the critical people involved, e.g., by establishing priorities, setting deadlines, and applying appropriate phasing and staging.

5.2 Objectives

Pulling together the resources needed for deployment is a critical success factor because, by taking care of this issue, a telemedicine doer will be able to both take into consideration key constraints that can have a major impact on the deployment plan of the services and assess the deployment feasibility.

To pull together the resources needed for deployment the telemedicine doer will have to consider the following elements:

- Identify the necessary resources for the successful deployment and sustainability of the initiative and the development of plans to mobilise these resources.

- Develop schemes which provide the resources that support the long-term sustainability of the service. This may include enabling the service user to access the telemedicine service, by i) making changes in the care system – including regulatory change where needed, such as inclusion of the service in the public basket of service in the case of users who are patients or ii) providing reimbursement for providers/clinicians who will be expected to provide the telemedicine service to their patients or to use it in a provider to provider context.
- Obtain or aggregate the means and resources to implement the service at each stage of its development into large-scale deployment and integration into routine services. This aggregation includes all of the resources needed: financial, human, technology, know-how and equipment.

5.3 The context surrounding the success factor

In terms of this critical success factor, the context can be located either at the system level or organisational level. This is a success factor that is relevant for both provider-provider and provider-patient services. There may be significant differences in the nature and source of resources depending on whether the service is a public or private one or is part of a public-private partnership.

The regulatory context⁵ is important in terms of pulling resources together for at least three reasons:

- Regulatory recognition of telemedicine as a legitimate method for delivery of healthcare services supports the decision to dedicate time and people to developing such services.
- Generally, financing schemes for healthcare are endorsed by the legal/regulatory framework for the financing of healthcare. In many countries, telemedicine is not included in these schemes. This is not only a financing issue in its own right, but also a value issue that determines priorities for service development and delivery. In other words, there needs to be recognition at the policy level of the advantages of telemedicine over other alternative solutions as well as an acceptance of the legitimacy of services provided “virtually” as opposed to a face-to-face physical encounter.
- Reimbursement systems in most countries are subject to regulation or a consequence of regulation and are only adapted to traditional healthcare that is based on face-to-face contact between the provider and the

⁵ Further discussion on notions relating to the legal context are provided in deliverable D6.2.

patient. Any change in this situation may have implications for how remuneration and patient fees are organised. This type of change requires regulatory support.

In addition, an up-coming challenge involves regulating devices used by patients at home, including technical and quality standards and financing.

5.4 First thoughts on pre-requisites underlying the success factor

A number of pre-requisites underlie this success factor:

- The actual availability of resources.
- Cultural readiness, compelling need, the right organisational setting, and supportive leadership.
- Recognition of the need for the service and perceived benefit of the service over other alternatives.
- Telemedicine-based healthcare must be considered a legitimate option for healthcare delivery with legal standing.

5.5 Illustration of this critical success factor from the Maccabi case

All four of the aspects of pulling together the needed resources are evident in the Maccabi case.

- Financing – The Gertner Institute put up about 50% of the financing for the first three years of operation and provided the physical location and equipment for the call centre. The remaining 50% of the financing came out of a budget that was meant to be dedicated to the continuing development of eHealth and telemedicine in Maccabi. Due to the persuasiveness of the champion, this particular project received priority above other projects.
- People – Another very critical element in terms of this case was that Maccabi already had a nurses call centre that was used mainly for routine advice and after-hours care. Maccabi therefore had nurses available who knew how to work with computerised clinical guidelines (they are often called protocols). A major asset was a nurse who headed up the pilot project that preceded the establishment of the telemedicine centre – she worked on a telemonitoring project for patients with severe congestive heart failure. She enthusiastically took on herself the task of implementing and managing the telemedicine centre. As a result, she was able to recruit high quality nurses to staff the centre. A strategic decision in terms of human resources made by Maccabi was to employ

the nurses in the telemedicine centre on a half-time basis, enabling them to work for the other half of their time in another clinical service in Maccabi. This half-time approach was very important in preventing burn out on the part of the staff.⁶

- Information – The awareness that telemedicine is receiving international attention as a potential solution to increasing service needs was important information. The availability of this information was coupled with a situation in which Maccabi experienced shrinking resources. Information was also critical to the design of the programme and the process: the information needed was on the needs of the population, and on the availability of the requisite infrastructure (internet access, for example) within the target population.
- Prioritisation/time – Because this initiative received priority within Maccabi, the time of key people, including clinicians, information technology staff and management, was made available and was dedicated to setting up and running the telephone centre.

5.6 Illustration of this critical success factor from the RxEye case

Once the RxEye service was aimed at attracting customers by showing the increasing efficiency and effectiveness of medical imaging reporting, the resources for the service were described in detail in the company's business plan. As a critical success factor, therefore, because the financial resources were already accounted for in advance, pulling together the resources needed for deployment did not constitute a major challenge in initiating the service.

However, the availability of human resources, such as radiologists willing and able to perform the interpretation of the imaging tests, was a critical resource. Personnel (i.e., human resources) are indirectly needed on the customer side to integrate the RxEye platform with the local information system and to upload referrals and images to the portal. This required only minor changes in the local reporting process.

5.7 Illustration of this critical success factor from the Teledialysis case

In the initial phase of the Norwegian Teledialysis service, the hospital renal ward allocated the appropriate professional personnel to the service.

However, equipment, devices and the project leader were financed through

⁶ This kind of challenge may be important in relation to other telephone centre telemedicine-related services. It also bears some similarities to issues relating to workflow (see, for example, in deliverable D5.2).

project funds. Teledialysis is now a routine service publicly financed through the specialist healthcare hospital's ordinary budget. The personnel working on it are nurses in local hospitals/healthcare centres and nephrologists and nurses in the specialist healthcare hospital that provides the videoconferencing service.

5.8 Illustration of this critical success factor from the ITHACA case

In the ITHACA programme, staging of the service and its developing maturity are important. Two different aspects need to be distinguished: deployment and sustainability.

In the deployment phase, the interest of three partners: BSA as the host health organisation, Novartis (the pharmaceutical company) as promoter, and Indra were aligned. Novartis secured sufficient resources to enable a successful deployment. External funding was made available by Novartis, which continues to finance the service. BSA provides the clinicians and the professional staff that operate the programme.

As far as sustainability is concerned, financial commitment in the long run has not yet been agreed. Currently, there is no guarantee that there are enough resources to continue with the programme. This fact underlines the importance of identifying resources for the successful deployment and sustainability of the initiative and planning how to mobilise these resources. The level of dependency on external support should also be considered.

5.9 Illustration of this critical success factor from the Patientenhilfe case

The German Patientenhilfe Service offered by ALERE is a commercially-sold service that is making a profit. At the current time, it is sustained by its income from sales of the service. MOMENTUM has no information about how the service was started and who made the initial investment.

5.10 Illustration of this critical success factor from the KSYOS case

KSYOS started as a research foundation in 2001, set up by its director, Leonard Witkamp, who is a dermatologist by background. In the early stages of its business model, KSYOS thus depended heavily on research grants. The service is now being sold commercially in the Netherlands and is therefore financially sustained by income derived from sales of the service. KSYOS has focused on public-private cooperation, thus benefiting from public trust and private flexibility.

5.11 Illustration of this critical success factor from the Cardio Online Europe case

In the Puglia Cardio OnLine Europe case study, it appears that the service was – and continues to be – financed and operated by the Puglia region in Italy as an integral part of its Emergency Services System.

5.12 Lessons learned on putting together the resources needed for deployment from the cases

Resources needed for deployment need to be subdivided into two categories:

- Initial investment for initial deployment of the service.
- Resources for the on-going operation/deployment of the service.

In four of the seven cases [Maccabi, Teledialysis, ITHACA, and KSYOS] there is explicit reference to “start-up” resources (consisting of either funding and/or people); in RxEye and Cardio Online Europe these resources are implicit. It would also be safe to assume that there was an initial investment to start up Patientenhilfe. Interestingly, in the four cases for which there is explicit information, the initial financial resources were – in some form or another – research/project funding. Instead, in RxEye and Patientenhilfe, the resources may very well have been a business investment (perhaps by the entrepreneur(s) themselves). In Cardio Online Europe, it is implied that the funding came from the Puglia Region itself.

The more crucial issue for scale-up, large-scale deployment and integration of the service into routine care are the resources to be available for the on-going operation/deployment of the service. In this aspect, there would seem to be a significant difference between those services that are “public” services and those that are commercial:

- In the commercial services, once the clients are convinced that the service is useful and beneficial to them, on-going sustainable financing depends on the entrepreneur’s ability to sell the service at a viable fee to a sufficient number of clients. Continuity involves satisfying customers and growing a business.
- In the case of the “public services”, resources for on-going operation and integration into routine service delivery is more of a challenge. It involves convincing the powers-that-be (which are often external to the deploying organisation or body) that there is return-on-investment, cost effectiveness and cost benefit that results from the continuing deployment of the service. In the Maccabi case, the service will continue so long as it is possible to demonstrate that it achieves greater benefit

and, at the very least, costs no more than the alternative. In fact, the service replaces to a large degree the alternative. The Norwegians, in the Teledialysis case, are apparently satisfied that this benefit has already been demonstrated, as is Cardio Online. However, the long-range sustainability of ITHACA is far from assured.

5.13 Overall analysis on putting together the resources needed for deployment from the cases

That the ability to put together the resources needed for on-going large-scale deployment is a critical success factor is well demonstrated by all of the cases. However, resources, and especially financing, is clearly either a result, a consequence, or a dependent variable⁷ relative to the other critical success factors. A service cannot be deployed in a sustainable way without resources. Yet resources are generally only forthcoming after a viable solution to a compelling need has clearly demonstrated its benefits and advantages over other solutions, and there is a high likelihood of it being accepted and implemented in the specific environment/culture for which it is intended.

5.14 Further relevant discussion

The Australian Department of Industry is leading work to foster innovation in the Australian Public Service (APS). It has created a website to help public servants develop and apply innovative solutions.⁸ This website addresses the issue of resources for innovation, which are of course wider in their remit than the more confined domain of telemedicine deployment.

The resources needed to develop and implement a new idea are key variables in establishing a business case and gaining approval for the case. Lack of resources can be a significant barrier to innovation when it means trying to justify extra expenditure in the face of expectations about efficiency. However, there are often existing resources that can be applied to a good idea. Thus, this fourth critical success factor – putting together the resources for deployment – is focused on the *gap* between the resources that are needed and the resources that already exist.

⁷ A dependent variable is an item that depends on other factors. For example, for a student obtaining a particular score in a test or an examination could be a dependent variable (dependent on other factors). This is because the score could change depending on several factors, such as how much the student studied, how much sleep the student got the night before taking the test, or even how hungry the student was when taking the test. Usually, when a relationship is being sought for between two items, one is trying to find out what makes the dependent variable *change* in the way that it does.

⁸ <http://www.apsc.gov.au> (last accessed on 31 July 2014).

The APS website describes financial resources as "the budget allocations to develop and implement [your] idea". The APS also identifies a number of other resources. One is similar to the people/human resources aspect noted by MOMENTUM. The APS does not mention either information or time as resources. It does, however, focus much more on technical, administrative and operational resources:

- **Technical resources** consist of functional expertise, system expertise, and domain expertise.
- **Administrative resources** consist of the know-how to manage planning, organisational issues, staff relations and leadership, negotiating, project management and communications.
- **Operational resources** are investments in space, equipment and systems.
- **Human resources** consist of the number and types of staff required.

The APS notes that the amount and types of resources depend on the sophistication of the idea and the nature of the problem that the initiative is facing. Having a balance of skills and experience is just as important as depth of expertise in particular areas. Exactly which skills and experience are important can only be determined on a case-by-case basis. The overriding premise is that the circumstances of the idea dictate the resources needed to implement the initiative. A champion should also make a serious and frank assessment of his or her own personal skills and experience compared with what the idea may require.

As APS says there is a difference among the criticality of resources; it is important to distinguish to what extent the resources needed are critical or strategic: *"If you have control over the right mix of resources, then you are in a position to implement your idea. Resources represent the fundamental building blocks of your business case. Not all resources, however, are strategically important. While **common** resources, such as office space, are necessary to carry out most normal day-to-day activities, it is critical resources, such as key technical expertise, that matter most in evaluating the feasibility of your idea."*

These arguments are consistent with what has been learned in the MOMENTUM project. These observations on innovation may be particularly important, illuminating and valuable to the telemedicine doer.

6 Observations or concerns

The seven cases reviewed in this report clearly support the importance of the four strategic critical success factors: cultural readiness, a champion, coming to a consensus on the advantages of telemedicine as a solution to the compelling need(s), and pulling together the necessary resources. This support for the critical success factors has been clearly demonstrated despite significant differences among the cases. These differences indicate that there are nuances in each of the success factors and that the telemedicine doer must be sensitive to these differences in his or her specific situation in order to succeed.

While the two further issues of assessment and proof of return-on-investment have not been singled out as separate critical success factors, they are clearly implicit in the third critical success factor. In terms of creating a consensus with regard to the compelling need(s), there needs to be some level of evidence that the telemedicine solution provides a significantly greater benefit than any alternatives.

Two further issues may be of importance to telemedicine deployment at-scale.

- The interdependence of critical success factors, and the way in which generating resources may be dependent on the presence of other critical success factors.
- The identification of the way in which critical success factors relevant to telemedicine deployment fit within the wider setting of facilitating innovation. In other words, this is about the extent to which the critical success factors for telemedicine are similar to, or even identical to, critical success factors for the deployment of any type of innovation.

In a presentation on the Scottish Experience in Telehealth Deployment during the MOMENTUM workshop held at the eHealth Forum in Athens Greece in May 2014, Dr. Stuart Anderson from the University of Edinburgh noted that, from a strategic and management perspective, defining success carefully is a good idea. In particular, he made the following three observations:

- Needs, resources and solutions are not independent and they are critical.
- There is clearly a close interrelationship and overlap among all of the critical success factors in all of the domains, but this is particularly so in the strategy and management field. Indeed, if any one of the four critical strategic and management critical success factors – cultural readiness, a champion, a compelling need(s) or adequate resources – are missing, large-scale deployment would be very unlikely to occur, if not impossible.

- This interdependence among critical success factors is particularly noticeable with regards to resources, since resources can always be generated if the other three factors are present. On the one hand, if three of the factors are present i.e., there is cultural readiness, a compelling need and clear benefit, and someone (a champion) “crusades” for the cause, the likelihood of being able to persuade organisational leadership, government, or some other funding agency, to invest money and people in the initiative is very high. On the other hand, resources often cannot be generated without the other three factors being available. As such, resources are really a consequence – albeit absolutely necessary, but never a cause – of telemedicine deployment going ahead.

7 Bibliography

Becker, M.H (1970), "Factors Affecting Diffusion of Innovations Among Health Professionals". A.J.P.H. Vol 60, No. 2 February 1970 294-303.

Berwick, Don (2003) "Disseminating Innovations in HealthCare", JAMA April 16, 2003, Vol 289, no. 15, p. 1969.

Buswick, Ted (1990) "Champions of Technology Innovation", Training & Development Journal, Vol 44, No.2 February 1990.

Howell, J.M., Boies, K. (2004) "Champions of Technological Innovation: The Influence of Contextual Knowledge, Role Orientation, Idea Generation, and Idea Promotion on Champion Emergence", Leadership Quarterly, 15(1): 123-143.