MOMENTUM

European Momentum for Mainstreaming Telemedicine Deployment in Daily Practice

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Deliverable 3.4
Personalised Blueprint for telemedicine deployment: validated and tested version

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Abstract

This report is the abbreviated, validated and tested version of the MOMENTUM Blueprint. Its main focus is on the 18 critical success factors for telemedicine deployment defined by MOMENTUM. Telemedicine doers need to bear these factors in mind when scaling up their services and deploying them into routine care. The report provides a validation and testing of the consolidation of the work undertaken by MOMENTUM's consortium, and specifically by the four special interest groups, so as to present it as a consistent and coherent whole. The critical success factors are presented according to a shamrock structure: they are organised in four groups: background context, and three other groupings related to people, planning and running the service. The underlying indicators are now embedded in the description of the critical success factor to which they belong. A short set of guidelines describes the entire MOMENTUM-TREAT process, which takes which takes eight working weeks. The process provides the means for telemedicine doers to involve their stakeholders in assessing whether their deployment initiative can be scaled up.

Key Word List

Blueprint, business plan, champion, change management, compelling need, decision-makers, doers, eHealth, financing, healthcare professionals, large-scale deployment, legal and security experts, legislation, legal and security guidelines, legal and security risk assessment, management, market, MOMENTUM-TREAT, organisational implementation, patients, patient-centred, primary client, privacy awareness, procurement, readiness, resources, routine care, scale-up, security, stakeholders, strategy, survey, technical infrastructure, technology, telemedicine, telemedicine service, toolkit, training, TREAT, workshop.

Change History

01	23 January 2014
02	28 January 2014
03	29 January 2014
1.0	30 January 2014

Version Changes

01	A revised and edited version of D3.2 "Towards a Personalised Blueprint" of 2 December 2014, considerably reduced in length.
02	Document edited on the basis of further validation (comments and suggestions) from the MOMENTUM EXCO members. First level of quality control applied.
03	Further revision of grammar, syntax and expression. Formatting checked. Overall quality control.
1.0	Final touch and approval

Statement of originality

This deliverable is an abbreviated and validated version of the consolidated blueprint. In it, acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both. The consolidated text was based on work undertaken in five of MOMENTUM's deliverables, D4.2-7.2 and D3.2, where the unabridged original descriptions of the critical success factors were presented.

Consensus statement

MOMENTUM has used a consensus-building approach as stipulated in its Description of Work, Part B (p29). It has worked on a consensus basis not only "**to create a sustainable network of telemedicine champions in European telemedicine – including 'doers', policy makers and industry**" (as stated on page 28 of the Description of Work, Part B) but also to agree on the content of all its deliverables including this one.

The blueprint's main contents were developed as a result of the work of MOMENTUM's special interest groups and the network's wider orbit of organisations. Its contents – particularly the 18 critical success factors – were tested at a wide range of presentations made at public events undertaken to fine-tune the initiative's outcomes.

This test phase culminated in two experiences. The first was an in-depth workshop held in Kristiansand, Norway, on 27 October 2014, reported on in MOMENTUM deliverables D3.3 and in Annex 1 to D3.4. The second was discussion on the critical success factors that took place at a final fourth workshop held in Brussels, Belgium on 26 November 2014. Inputs from these two events have influenced the precise form and content of this report.

Abbreviations and terminology

This glossary of abbreviations and terminology covers only the abbreviations and terminology used in this deliverable.

Abbreviation	Name in full and, where appropriate, definition
CSF	Critical Success Factor (for telemedicine deployment).
CSFs	Critical Success Factors (for telemedicine deployment).
DICOM	Digital Imaging and Communication in Medicine.
EHTEL	European Health Telematics Association.
EXCO	Executive Committee.
HL7	Health Level Seven. HL7 is the global authority on standards for interoperability of health information technology.
HTTP	Hypertext transfer protocol.
ICT	Information and communication technology.
ICT PSP	ICT Policy Support Programme.
IT	Information technology.
MAST	Model for ASsessment of Telemedicine.
PII	Personally Identifiable Information.
SNOMED	Systematized Nomenclature of Medicine.
Telemedicine	Practicing medicine at a distance. Telemedicine can be classified into three types – telediagnosis, telemonitoring and teleconsultation. It is anticipated that the blueprint outcomes can be applied to all three forms of telemedicine.
TREAT	Telemedicine Readiness Self-Assessment Tool.
USA	United States of America.

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Executive summary

This document is the result of the collaborative work of the MOMENTUM thematic network.

This report is the validated and tested version of the MOMENTUM Blueprint.

The blueprint has two purposes: it is a holistic European reference document for developing a telemedicine service framework, and it is a toolkit for capacity-building among telemedicine doers.

First, the background and purpose of MOMENTUM is outlined and an overview of the 18 critical success factors is presented.

Next, the concept of the critical success factors is defined, and the content and meaning of each of them are explained briefly. The critical success factors are laid out in four subgroups according to their content:

- Context
- People
- Plan
- Run.

The presentation of each critical success factor is followed in turn by a relevant set of performance indicators. These indicators can be used by telemedicine doers to test out how important each critical success factor is to their specific deployment circumstances. There are 51 indicators in total. Each critical success factor has between 1-6 indicators associated with it.

A list of all 51 indicators follows. The indicators are statements which telemedicine doers use to rate their telemedicine deployment initiative on a scale from 1 to 5. The overall scaling indicates the degree of readiness of a telemedicine solution for large-scale deployment. The indicators are presented in the same order as the four subgroups of critical success factors (i.e., context, people, plan and run).

The final section of the report contains a step-by-step guide to using the toolkit. It describes a proposed timetable and an estimate of the resources needed to run the MOMENTUM-TREAT process, including doing a survey and organising a workshop.

There is no specific concluding section to this report. Ultimately, to summarise, it is good to use this blueprint as a kind of cookbook or set of guidelines for doing telemedicine scale-up.

Separately, Annex 1 to this document contains the workshop report from the Norwegian site where the MOMENTUM-TREAT process was tested. This annex describes the test site result and the comments from the test team, including their proposals for improvements to the toolkit and possible wider use of it.

What is the MOMENTUM blueprint?

The blueprint:

- **Shows how telemedicine can be scaled up throughout Europe**: Europe's healthcare systems are under pressure and require new ways of caring, and of producing and delivering treatments for diseases. Telemedicine deployment can help tackle a number of these current and future societal challenges.

- **Is a tool for telemedicine doers**: It is targeted at everyone who wants to deploy a telemedicine service into routine care and to scale up the service.

- **Lists telemedicine's critical success factors:** It provides a short description of the 18 critical success factors captured by MOMENTUM.

- **Helps telemedicine doers to progress with success**: The 18 critical success factors are at the foundation of a set of guidelines and indicators. They help doers to build action plans so that they can deploy telehealth successfully in routine care and on a large scale.

For more information on MOMENTUM

More information on MOMENTUM can be found at:
http://www.telemedicine-momentum.eu

More in-depth coverage of MOMENTUM's 18 critical success factors is available in the 2 December 2014 announcement of the consolidated blueprint at: http://telemedicine-momentum.eu/a-european-blueprint-for-the-deployment-of-telemedicine/.

1   Introduction

This document provides a holistic overview of MOMENTUM's European telemedicine service framework. Its strategic, organisational, legal and security, technological and market-related content provides a reference framework for how telemedicine doers can help move telemedicine into mainstream use in Europe.

1.1   Background to MOMENTUM

The strategic, organisational, legal and market value of telemedicine services is now being recognised by European institutions, national health and care authorities, and a growing number of national and regional health, care and clinical administrations.

In many situations, however, telemedicine has yet to gain its place in routine healthcare delivery. Significant roadblocks – strategic, organisational, legal and regulatory, technological and market-related – have been in place until recently. Where efforts have been driven by individual champions, the initiatives sometimes collapsed after the champion's departure. As a result, pilots and trials have tended to dominate the field.

MOMENTUM is a thematic network that has been committed to concentrating on the needs of telemedicine doers, a group that includes:
- Leaders in health or care authorities, hospital managers, clinicians or people involved in industry, such as entrepreneurs or business executives.
- All the people supporting the telemedicine doers, such as public administrators, and personnel in innovation agencies and support organisations.
- All people who are actively involved in doing and deploying telemedicine.

Working collaboratively and transparently over a three-year period, MOMENTUM has held consultations with stakeholders and the wider public to achieve three objectives, to:
- Foster stakeholder engagement and build consensus.
- Build and disseminate a repository of good practices.
- Develop a European telemedicine deployment blueprint.

MOMENTUM has focused on building stakeholder consensus around the key activities of how precisely deployment can take place effectively at scale, how good practices can be gathered together and disseminated, and how a personalised European telemedicine deployment blueprint can be developed. This document is the product of these three combined activities.

MOMENTUM has had three main aims and scope:
- First, its consortium has aimed to understand the kinds of challenges faced by telemedicine doers when they work to implement telemedicine successfully as a part of a routine service.
- Second, as a result, the initiative has identified 18 critical success factors needed to take telemedicine from a pilot phase towards large-scale deployment and thus integrate it into healthcare delivery systems. Scalability of telemedicine services from pilots to large-scale deployment includes a wide variety of factors; many of these are not technological. However, they often involve standardisation.

- Third, MOMENTUM has delivered tools and techniques that support this movement, including materials for a self-assessment process that determines an organisation's readiness to deploy telemedicine.

1.2   What is the MOMENTUM blueprint?

The blueprint:

- **Shows how telemedicine can be scaled up throughout Europe**: Europe's healthcare systems are under pressure and require new ways of caring, and of producing and delivering treatments for diseases. Telemedicine deployment can help tackle a number of these current and future societal challenges.

- **Is a tool for telemedicine doers**: It is targeted at everyone who wants to deploy a telemedicine service into routine care and to scale the service up.

- **Lists telemedicine's critical success factors:** It provides a short description of the 18 critical success factors captured by MOMENTUM.

- **Helps telemedicine doers to progress with success**: The 18 critical success factors are at the foundation of a set of guidelines and indicators. They help doers to build action plans so that they can deploy telehealth successfully in routine care and on a large scale.

1.3   From consolidation to validation and testing

MOMENTUM first developed a long description of its 18 critical success factors[1]. Now these factors have been tested with users, and abbreviated into a much shorter document.

The document has been shortened to make the blueprint into an easier read. This report maintains the description of each success factors, but the background detail and the examples are left out.

For those doers who need the full version of the original 18 critical success factors or an in-depth explanation of the background and the development of each success factor, please refer to the original document (i.e., the consolidated blueprint, D3.2), which is available on the MOMENTUM website. [2]

All the revisions that have taken place between the consolidated version of the blueprint and this validated and tested version are based on three sets of inputs. First, inputs from a test phase organised in Kristiansand, Norway, where the 18 success factors were checked out in the framework of a hospital site that is participating in the United4Health project[3]. Second, inputs from the fourth and final MOMENTUM workshop at the EHTEL Symposium held on 25/26 November 2014 in Brussels, Belgium, where the blueprint and the test phase

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[1] More in-depth coverage of MOMENTUM's 18 critical success factors is located on the MOMENTUM website. See http://telemedicine-momentum.eu/a-european-blueprint-for-the-deployment-of-telemedicine/

[2] See http://telemedicine-momentum.eu/a-european-blueprint-for-the-deployment-of-telemedicine/

[3] See http://united4health.eu/

results were presented and discussed with a large independent audience. Third, review and constructive criticism from the MOMENTUM consortium members.

In particular, the Norwegian Kristiansand test team suggested a change in the order of the success factors. They found it more appropriate to begin to work with a focus on those factors concerning the patient, and subsequently branch out into the other critical aspects of telemedicine deployment. At the EHTEL Symposium, the MOMENTUM consortium took this idea further. At this conference workshop session, the consortium presented a new structure called a shamrock. In this new shamrock structure, the success factors were divided into a core, a base (the stem) and three subgroups (the leaves).

This edition of the blueprint is organised in accordance with these suggestions, which have led to the following structure for the critical success factors:

- Context (which contains two factors)
- People (four factors)
- Plan (six factors)
- Run (i.e. running the initiative or service) (six factors).

The indicators associated with each critical success factor were also validated and tested by the Norwegian Kristiansand test team: they are included in this report.

This period of validation and testing has led to a set of step-by-step instructions (or guidelines) on how to apply the critical success factors and the associated MOMENTUM-TREAT model.

Hence, in developing its toolkit, MOMENTUM has had some success in creating a specific model and method that can assist with telemedicine scale-up.

1.4 Other activities that are complementary to MOMENTUM

To deploy telemedicine services into routine care means having to use a variety of tools and methods.

A number of other initiatives and activities are working on the same or similar domains to MOMENTUM. They already exist or are under development. Many are completely complementary to MOMENTUM, although each differs in its particular specific orientation. However, in all cases they indicate just how important is the topic of telemedicine deployment.

For example, the following initiatives can be examined in parallel with MOMENTUM:[4]

- High-level models that identify enablers of innovation and promote continuous learning about those enablers on the part of an organisation's strategic leadership (developed by the European Federation for Quality Management). The aspiration underlying this generic model is for European organisations to raise themselves to a level of excellence on the global stage.
- Guidelines on stakeholder engagement in analysing and understanding jointly the barriers to large-scale implementation of telemedicine solutions, put together by the

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[4] The literature behind these initiatives is cited in MOMENTUM's fuller critical success factor documentation. See http://telemedicine-momentum.eu/a-european-blueprint-for-the-deployment-of-telemedicine/.

Danish Centre for Telemedicine and Telehealthcare. This was an initiative which emerged from a European Commission co-financed project[5] called RICHARD, which was a regional ICT-based cluster for healthcare applications and research and development integration.[6]

- An implementation resource for telehealth commissioners, provider organisations and individuals that focuses on telecoaching, telemonitoring and teleconsultations for people with long-term conditions, that is to be updated on an on-going basis (written by England's Yorkshire & Humberside Health Innovation and Education Cluster).

- A toolkit that provides a structured approach to delivering the business objectives implicit in telemedicine (described by S. Brownsell and T. Ellis).

- A small pamphlet outlining the ten issues considered key to designing a telehealth service (published by the pharmaceutical company, Merck, Sharp & Dohme Ltd.).

- A collection of telemedicine case studies (collated by the healthcare organisation, COCIR).[7]

- A collection of telehealth testimonials collected by the Campaign for Telehealth in support of Integrated Care, an initiative of Brussels-based organisations started in 2011[8]. A wide range of organisations was involved in this initiative, and editorial support was provided by the information technology (IT) company, Intel[9].

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[5] When the word project is used, it often refers in this report to financed or co-financed projects run by either regional, national, European or international organisations. In the MOMENTUM-TREAT indicators - see e.g., Section 7 - the word project is again used, but in that context, often other terms such as service, initiative or venture may be more suitable. Alternatively, organisation or region might also be considered.

[6] See http://www.richardproject.eu/.

[7] COCIR [Sustainable Competence in Advancing Healthcare].

[8] See http://telemedicine-momentum.eu/testimonials/.

[9] The organisations included the International Association of Mutual Benefit Associations (AIM), the European Health Management Association (EHMA), the European Patients' Forum (EPF), COCIR [Sustainable Competence in Advancing Healthcare], the Continua Health Alliance, the European Health Telematics Association (EHTEL), and the European Hospital and Healthcare Federation (HOPE).

2 Overview of the 18 MOMENTUM critical success factors

This list provides an overview of all the MOMENTUM critical success factors.

The context

1) Ensure that there is cultural readiness for the telemedicine service.
2) Come to a consensus on the advantages of telemedicine in meeting compelling need(s).

People

3) Ensure leadership through a champion.
4) Involve healthcare professionals and decision-makers.
5) Put the patient at the centre of the service.
6) Ensure that the technology is user-friendly.

Plan

7) Pull together the resources needed for deployment.
8) Address the needs of the primary client(s).
9) Prepare and implement a business plan.
10) Prepare and implement a change management plan.
11) Assess the conditions under which the service is legal
12) Guarantee that the technology has the potential for scale-up.

Run

13) Identify and apply relevant legal and security guidelines.
14) Involve legal and security experts.
15) Ensure that telemedicine doers and users are privacy aware.
16)) Ensure that the appropriate information technology infrastructure and eHealth infrastructure are available.
17) Put in place the technology and processes needed to monitor the service.
18) Establish and maintain good procurement processes.

2.1 A working definition of critical success factors

The MOMENTUM consortium proposes a working definition for the notion of a critical success factor. It is:

- The term for an element that is necessary for an organisation or an initiative to achieve its mission.

- An element that is vital for a strategy to be successful.

- A factor that drives a strategy forward and makes or breaks the success of the strategy (hence, it is 'critical').

For telemedicine doers, the underlying aims behind examining critical success factors are that:

- They can create a common point of reference for the doers' deployment team to help direct and measure the success of the business or initiative.
- Using the factors as a common point of reference, everyone on the doers' team can be helped to know exactly what is most important.
- Having a general understanding of these factors helps people to do their own work in the right context and collaborate towards the same overall aims and goals.

The MOMENTUM team has elaborated these ideas on critical success factors for telemedicine doers from more general materials available from the University of Washington in the USA.[10]

2.2 An overview of how MOMENTUM has described its work

The purpose of the MOMENTUM project was to determine how to enable service deployment in the field of telemedicine/telehealth.

Four domains were covered by the consortium (see Figure 1 below):
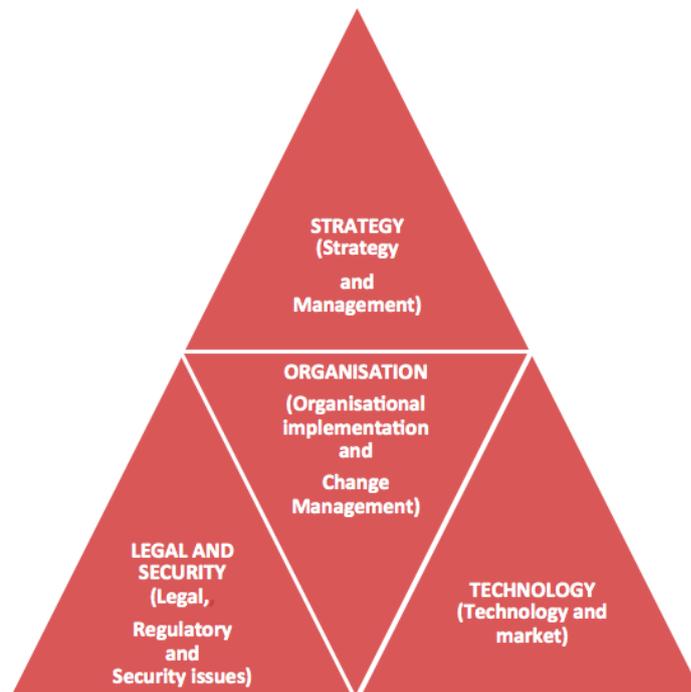
Figure 1: The MOMENTUM triangle

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[10] See https://depts.washington.edu/oei/resources/toolsTemplates/crit_success_factors.pdf

The shamrock diagram that follows (see Figure 2) illustrates each of the domains first shown in Figure 1 (strategy, organisation, legal and security, and technology and market) by using four colours to display its ideas (yellow, pale green, dark green and red):

- Strategy and management (yellow).
- Organisation and management (pale green).
- Legal and security (dark green).
- Technology and market (red).
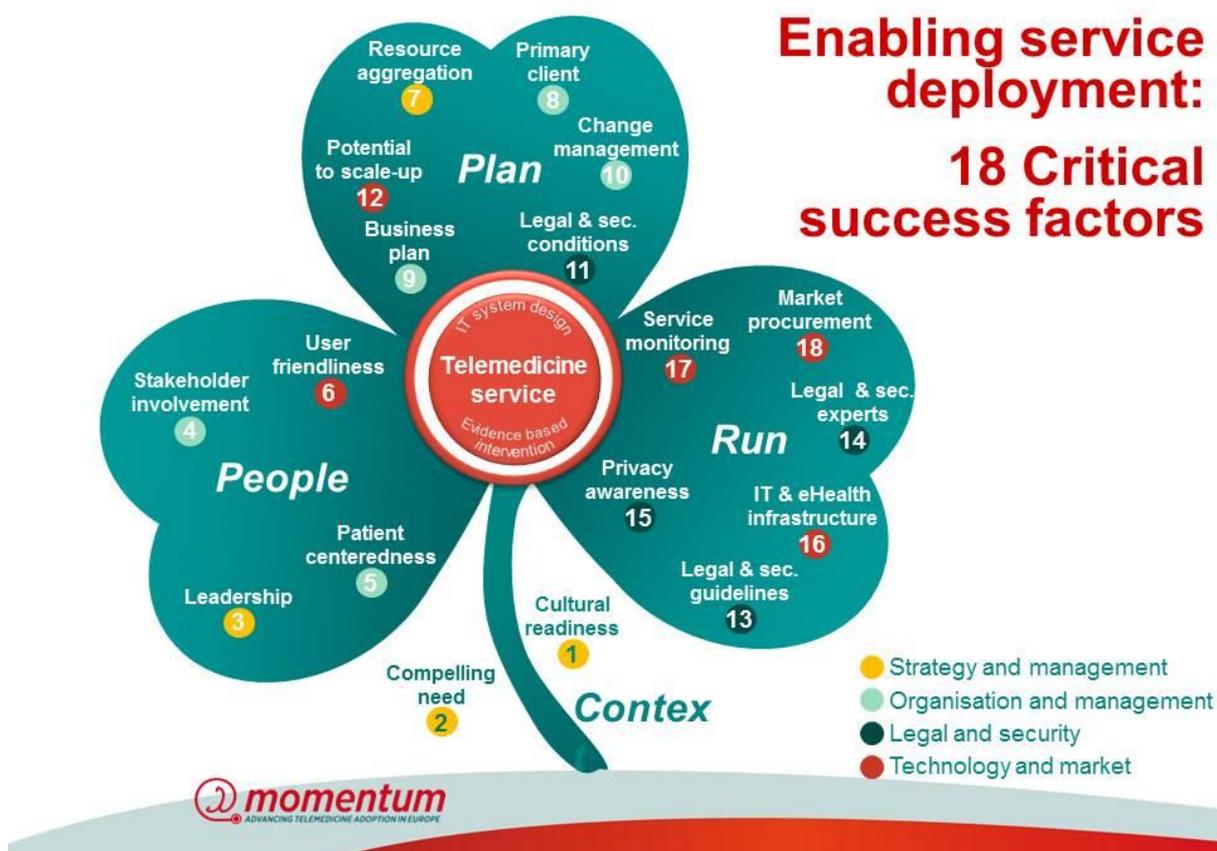
Figure 2: Enabling service deployment - 18 critical success factors

2.3 The shamrock model and its relation to the 18 critical success factors

At the centre of the shamrock model, there is a red core which identifies two prerequisites that are needed before larger-scale telemedicine service deployment can start. There is also a main stem that underpins the plant, accompanied by three important leaves (or fields).

2.3.1 Core and stem of the shamrock

At the heart of this shamrock lies a big red circle. In this circle, space is allotted to IT system design that is based on the need for evidence-based intervention. This circle symbolises the fact that – even before thinking about deployment – telemedicine doers need to have a service that is ready for deployment. It stipulates what the two main prerequisites should be.

Telemedicine doers should be aware that the MOMENTUM critical success factors will not necessarily help them with regard to these prerequisites. Rather, any support needed can be provided by other tools and methods, such as the Model for ASsessment of Telemedicine (MAST).[11]

At the stem of the shamrock lies the all-important issue of the context in which the specific telemedicine service is being designed and deployed, and its contextual attributes.

2.3.2   The leaves of the shamrock

Each of the other 16 critical success factors is displayed on the three leaves of the shamrock plant. The three leaves relate to people, plan and run. Run is used here in the sense of managing or operationalising the large-scale deployment of a telemedicine service.

These three areas – People, Plan and Run – move generally and logically from the strategic, managerial and organisational levels (i.e., planning and working with people) to more operational levels (running the initiative or service).

People contains a description of four critical success factors:

- Leadership.
- Stakeholder involvement.
- Patient-centeredness.
- User-friendliness.

Plan contains a description of six success factors. At the planning stage, the observations on legal and security conditions can already be read in close association with the factors related to legal and security guidelines and experts:

- Resource aggregation.
- Primary client.
- Business plan.
- Change management.
- Legal and security conditions.
- Potential for scale-up.

Run – which is about management and/or operationalisation – contains a description of a further six critical success factors. The factors described in this field constitute a mix of elements that relate to legal and security issues, and technology and market issues:

- Legal and security guidelines.
- Legal and security experts.
- Privacy awareness.
- IT and eHealth infrastructure.
- Service monitoring.
- Market procurement.

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[11] See http://www.renewinghealth.eu/documents/28946/396054/Model+for+Assessment+of+Telemedicine+MAST.pdf

In the four chapters that follow, there is a brief, step-by-step description of each of the 18 CSFs. They focus mostly on what the factor means and its characteristics.

2.4 Indicators

Each of the 18 critical success factors is described succinctly in Sections 3 to 6 that follow. This description is complemented by a list of performance indicators that help to measure how far the specific critical success factor is present in the telemedicine initiative that is under consideration. These indicators have been described in a generic way so as to be relevant to any given telemedicine initiative. As explained in Section 7, however, these generic indicators will have to be localised, i.e., adapted to the environment of the specific telemedicine initiative.

The indicators are phrased as statements. They can be used with telemedicine doers in the form of a survey or a questionnaire. The doers are then encouraged to state to what extent they agree with these statements or not.

The indicators were developed as part of MOMENTUM'S test phase that is described in its deliverable D3.3 which led to the development of the MOMENTUM-TREAT toolkit. The full account of the testing of the MOMENTUM-TREAT toolkit is enclosed in a separate document as Annex 1 to this report. In the annex, the indicators are presented in the same order as the list of critical success factors in Section 2 of this report.

As indicated earlier, a more in-depth coverage of each critical success factor is located on the MOMENTUM website. [12]

For ease of reference, Section 7 of this report contains a full list of the 51 indicators.

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[12] http://telemedicine-momentum.eu/.

3   Context

The first two critical success factors are those concerned with the context in which the specific telemedicine service is being designed and deployed, and its contextual attributes.

3.1   CSF 1: Ensure that there is cultural readiness for the telemedicine service

This critical success factor is about the issues surrounding the assessment of cultural readiness and the need to facilitate the changes that generate readiness. The need for cultural readiness is directly related to telemedicine deployment scale-up.

3.1.1   What cultural readiness means

Cultural readiness in a healthcare system or organisation has three components:

- A set of **beliefs and perceptions** that influence establishment of priorities.
- **Attitudes and norms** that affect behaviour including decisions, ideas and practices that determine how a person, organisation, society will respond to the environment.
- **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 ICT.

Characteristics: Healthcare professionals, including doctors, are ready to share clinical information with each other and with the patient i.e., among the stakeholders. There is therefore a level of trust as well as an openness of spirit, sense of cooperation, and a willingness to modify working habits.

- 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.
- There is an underpinning culture that embraces technology, that welcomes and even promotes change and innovation, and that shows openness to new ideas.
- For commercial services there is market readiness, i.e., the service provider can sell and commercialise the service.

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 can be less important.

The characteristics needed for cultural readiness involve the surrounding culture, the culture and level of trust of professional groups and their relationships with their clients, and – commercially – market readiness.

Another important factor related to cultural readiness is the self-image or self-perception of the organisation or system. Self-perception on the part of the initiative, service, project or even the champion as an innovator or a pioneer appears to be a very strong indicator of cultural readiness.

3.1.2 Indicators for measuring cultural readiness

- In my organisation/region doctors and other 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.

- In my organisation/region patients and providers (healthcare professionals) are ready to use ICT (e.g., computers, tablets, mobile phones).

- In my organisation/region financial and other incentives are aligned with the service to be deployed.

- In my organisation/region an underpinning culture embraces technology.

- In my organisation/region an underpinning culture welcomes and even promotes change, innovation and shows openness to new ideas.

3.2 CSF 2: Come to a consensus on the advantages of telemedicine in meeting compelling need(s)

Coming to a consensus on what these needs are is a process that involves people. A variety of stakeholders will be involved in deciding on and determining what the specific compelling needs for telemedicine deployment are in any given case.

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 face-to-face encounters and/or procedures that have to be performed physically. Many challenges can, however, be relieved by the use of technology.

3.2.1 What coming to a consensus on telemedicine meeting a compelling need means

This success factor is comprised of two major components. It is necessary to come to a general consensus about these two items:

- Identification of a compelling need (or needs) 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.

- Recognition and agreement that the telemedicine solution has clear and demonstrable advantages over all the other possible solutions to the compelling needs/problems.

Issues, 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.

- Able to successfully assist in cost-control or cost-reduction.

- Necessary to ensure the maintenance of basic principles and values.

- Mandated by law or by another outside authority.

3.2.2 Indicators for measuring coming to a consensus on telemedicine meeting a compelling need

- In my region/organisation there is general consensus on the current telemedicine solution being the best available solution for meeting a compelling need.
- The current telemedicine solution is the best available solution for meeting a compelling need.

4 People

The people-related critical success factors are all those that relate to managing people, involving those people who are interacting with the telemedicine service, putting people at the centre, and designing systems and equipment so that they are people-friendly.

4.1 CSF 3: Ensure leadership through a champion

It appears to be crucial to have a champion – or alternatively a team of champions – who believes in the importance and viability of the telemedicine service. This champion must be willing to invest considerable effort and energy in pushing the venture forward.

4.1.1 What leadership through a champion means

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: he or she 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.

Characteristics: A champion may be a person who:

- Is in a position of either authority or influence in the organisation or healthcare system.
- Can generate trust at all levels, both on the part of the leadership and at the level of the people who have to implement and use the service.
- Has relevant knowledge, 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.

4.1.2 Indicator for measuring leadership through a champion

- In my region/organisation there is one or several influential person(s) who take(s) on a leading role and leads the way towards deployment of the telemedicine solution tested in our project.

4.2 CSF 4: Involve healthcare professionals and decision-makers

These two sets of actors play the most important role in terms of the changes to be made to two aspects of the new telemedicine system or service. These changes are to: (1) the organisation, workflow and work structure, and (2) the economic components.

From a sociological perspective, the use of telemedicine implies a power shift for many of the actors involved, whether they are policy-makers/decision-makers, healthcare professionals, patients or their families.

4.2.1 What involving healthcare professionals and decision-makers means

This critical success factor includes actions that help healthcare professionals and decision-makers to:

- Collaborate in developing, and accept modifications in the usual way of delivering care as a result of a new service.

- Act as advocates for the innovation.

This critical factor deals with a larger group of healthcare professionals and decision-makers than does critical success factor 8 on meeting the needs of the primary client(s). This involvement occurs after the initial decision to implement the new telemedicine service or tool has been taken.

This process engages both healthcare professionals and decision-makers who are affected by any new telemedicine service and the technology associated with it. They can be involved with buying the technology concerned or providing the telemedicine service.

The following healthcare professionals and healthcare decision-maker groups can be highlighted.:

- Professionals (such as radiologists, pathologists and dermatologists) employed by the healthcare organisation which buys the technology.

- Professionals (such as radiologists, pathologists and dermatologists) employed by the healthcare organisation which provides the telemedicine service.

- Decision-makers (such as chief executive officers or chief information officers, and heads of department) in the healthcare organisation which buys the technology.

- Decision-makers (such as chief executive officers or chief information officers, and heads of department) in the healthcare organisation which provides the service.

Healthcare professionals are often not the decision-makers or the target for the telemedicine service implementation. However, they do need to be involved properly in the implementation process since they are often the informal organisational leaders and decision-makers in organisations.

The involvement of healthcare professionals as telemedicine system users is extremely important. Involving them can be highly beneficial, and sometimes critical, in gaining their acceptance and feedback. This helps make further improvements to the service.

On many occasions, the early involvement of healthcare professionals, including nursing staff, enables barriers to adoption to be properly addressed, and helps to avoid or reduce risks.

4.2.2 Indicators for measuring involving healthcare professionals and decision-makers

- Healthcare professionals have been involved in the development of the content of this project.

- Healthcare professionals have been involved in the development of the process and time schedule for this project.

- Decision-makers have been involved in the development of the content of this project.

- Decision-makers have been involved in the development of the process and time schedule for this project.

4.3   CSF 5: Put the patient at the centre of the service

Telemedicine services can benefit patients in two ways: through patient involvement in their own healthcare, and through the advantages it brings to their families, and their informal or formal carers.

Patients and their families are also a great resource in seeking to improve health services further. For example, patients can help to develop ('crowd source') ideas that will help to develop new initiatives that bring better levels of quality and performance.

4.3.1   What putting the patient at the centre of the service means

Putting the patient at the centre (or patient-centeredness) means developing the service while bearing the patients' perspective in mind.

Patient-centeredness is a strategy to improve the fit of services to patients´ actual needs.

An important part of the work performed by the developers of telemedicine services or tools is to ensure patient or citizen satisfaction.

4.3.2   Indicators for measuring putting the patient at the centre of the service

- In this project[13] the patients have been sufficiently involved in the development of the telemedicine solution.
- In this project telemedicine service is based on the patient´s needs.
- In this project enough information and training is provided for the patients in order for them to obtain the best results possible from using the telemedicine solution.

4.4   CSF 6: Ensure that the technology is user-friendly

User-friendliness has two objectives. On the one hand, it aims to make the technology easy to use by average users – whether they are health professionals or patients – without the need for a long learning curve or an extended training period. On the other hand, the technology has to be reliable both at the device and system levels.

4.4.1   What ensuring that the technology is user-friendly means

User-friendliness is a combination of attributes from both the technical and human dimensions. It helps users to learn about and adapt easily to a new technological environment. These attributes include simplicity, responsive design, and usability. Users adopt innovation easily when it is simple and easy-to-use.

From a technological perspective, the features of user-friendliness should ensure that technologies are fit for purpose, cost efficient, easy to understand, easy-to-use, and reliable for all telemedicine service users. The technologies described by MOMENTUM relate not only to end-user devices and their displays, but also to the whole system configuration.

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[13] The wording of these indicators tends to focus on use of the word project. However, in many telemedicine settings, words such as service or initiative or venture might prove to be more suitable. Alternatively, organisation or region might also be considered.

4.4.2 Indicators for measuring ensuring that technology is user-friendly

- The telemedicine technology used in our project is user-friendly for patients.
- The telemedicine technology used in our project is user-friendly for health professionals.
- The telemedicine technology used in our project does not need an extended training process prior to using it.

5 Plan

The plan-related critical success factors are all those that relate to setting up the necessary resources. This process involves deciding who the primary client is, putting in place and following a business plan, and ensuring that there are mechanisms underway for change management. Furthermore, the planning includes determining what the surrounding and appropriate legal and security conditions are, and setting out the plans so that the technology involved has the potential for scale-up. When planning determining what the legal and security conditions are, it can already be important to bear in mind the critical success factors related to legal and security experts and guidelines.

5.1 CSF 7: Pull together the resources needed for deployment

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 and above other solutions. Once the evidence is available, there is a high likelihood that the solution will be accepted and implemented in the specific environment or culture for which it is intended.

The core of the shamrock (see Figure 2) shows that resources are often made available as a result of gathering evidence that then enables the telemedicine doers to make a decisions to scale up.

This decision-making stage involves: designing the intervention, designing the supporting IT system, and assessing their potential impact. These three items – design; the supporting IT system; and impact assessment – are all prerequisites for scale-up.

5.1.1 What pulling together the resources needed for deployment means

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 made available:

- Financing
- People
- Information
- Time.

5.1.2 Indicators for measuring pulling together the resources needed for deployment

- In my region/organisation the financial resources needed for deployment of the telemedicine solution are available.
- In my region/organisation the IT competences needed for deployment of the telemedicine solution are available.
- In my region/organisation enough time for the training needed in order to implement the telemedicine solution is available.

5.2 CSF 8: Address the needs of the primary client(s)

The primary client is the key user that has clear incentives to set up and use the telemedicine service. The primary client can be seen as the ultimate owner of the problem or issue that is being addressed.

5.2.1 What addressing the needs of the primary client means

Primary clients are people, specialty groups or organisations that have clear incentives to set up, or contribute to setting up, the service, or design the tool. Primary clients can differ substantially in their characteristics. Their needs can also be wide-ranging.

The primary client is the initial main partner in implementing the telemedicine service or in designing the telemedicine tool.

Characteristics: Primary client(s) may be one or more of the following:

- The main partner who is active during the introduction of the service or the design of the telemedicine tool.
- A direct or indirect payer of the service, either through taxes, insurance or business incentives.
- People or groups whose requirements should be recognised by the telemedicine doer.

5.2.2 Indicators for measuring addressing the needs of the primary client

- The telemedicine solution addresses the needs of the primary client(s).
- The telemedicine solution is sufficiently adapted to the needs of the primary user(s).
- The telemedicine solution addresses the needs of the health sector.

Three example indicators follow (the second indicator is relevant to health care systems where municipalities have a role to play in health care and the third one is specifically relevant to the Norwegian setting):

Indicators for measuring aAddressing the needs of the health sector

- The telemedicine service addresses the needs for efficiency improvement and improvement of quality in the health sector.
- The telemedicine service is adapted to the need for cooperation between municipalities.
- The telemedicine service is adapted to the need of the health sector for interaction in with the principle of Best Efficient Level of Care.

5.3 CSF 9: Prepare and implement a business plan

The two critical success factors, 9 and 10, relating to business plans and change management plans, should be read in close relationship to each other.

5.3.1 What preparing and implementing a business plan means

A business plan is a written document which results from the careful analysis of available data. It describes the planned telemedicine service, its expected marketing or deployment strategy, and financial questions. It takes into account the appropriate reimbursement

scheme. It contains a cost and benefit analysis. It also includes a socio-economic analysis that quantifies the indirect social and economic impacts of the large-scale service deployment.

A business plan for the new telemedicine service has to be in place even when the service will be provided by a non-profit or a governmental organisation. In a business plan, it is particularly important to describe the paying customers, the revenue model, the customer value proposition and service levels, existing solutions, competitive advantage, any hurdles that need to be overcome, and the resources required.

5.3.2 Indicators for measuring preparing and implementing a business plan

- A business plan for the project has been developed.

- A business plan for the project has been implemented.

- The business plan has been approved by the relevant management level.

5.4 CSF 10: Prepare and implement a change management plan

Again, the two critical success factors, 9 and 10 relating to business plans and change management plans, should be read in close relationship with each other.

5.4.1 What preparing and implementing a change management plan means

Implementation of new technology into the daily routines of healthcare professionals always affects work habits and traditional care pathways. A change management plan enables healthcare professionals to understand these changes and accept innovation in their daily work. It also allows non-healthcare professionals, for example, personnel responsible for invoicing processes or data collection or data follow-up, to understand the organisational changes.

This critical success factor is therefore about preparing and implementing a change management plan to simplify and facilitate adaptation to any new telemedicine service.

A change management action plan may include a range of potential activities, such as:

- The preparation of a plan for each department affected by the deployment of telemedicine.

- An explanation of the reasons for the changes.

- The addition of extra resources during the transition phase.

- Support for the telemedicine service to be located in an appropriate position within an existing care pathway.

- Anticipation and counteraction of any challenges that prevent seamless implementation of the telemedicine service into the existing workflow.

- Identification of training and capacity-building needs.

- Development of a communications strategy and communication plan for in-house use as well as for public use. The plan should cover different communication channels such as emails, seminars, internal news as well as public news in the wider media.

There may even be a need for several change management plans, as they may be required to cover various phases of the implementation process.

In a change management plan, the maturity of the telemedicine service also has to be assessed. This will help to avoid the telemedicine service delivery process or tool production either falling back towards a pilot phase or ceasing real-life production.

As a result, the main modifications to routine care should be addressed by a change management plan that involves all relevant stakeholders, including healthcare professionals.

5.4.2   Indicators for measuring preparing and implementing a change management plan

- A change management plan for the project has been developed.
- A change management plan for the project has been implemented.
- A change management plan has been approved by the relevant management level.

5.5   CSF 11: Assess the conditions under which the service is legal

The purpose of this critical success factor is to ensure that any personnel involved in the telemedicine development process can be assured that they are providing a legal telemedicine solution.

5.5.1   What assessing the conditions under which the service is legal means

This critical success factor gives telemedicine doers an understanding of the degree of latitude they have to take action when developing a new telemedicine service.

Assessing the conditions under which the specific telemedicine service is legal is about finding out whether:

- The telemedicine service is regarded by the authorities as an appropriate way to offer healthcare services.
- The circumstances under which the telemedicine service is regarded as legal by carrying out what is called a legal risk assessment.
- The telemedicine service is covered by law or if it is not inhibited by law or by bodies with competence in the telemedicine field.
- The telemedicine service is in accordance with general requirements for best practice in medicine.

A legal risk assessment is a process that runs parallel to an information security risk assessment. Possible legal hindrances (risks) are identified, and measures are planned and then carried out so as to avoid risks and/or mitigate them. (See also critical success factor 14 on legal and security experts.)

5.5.2   Indicator for measuring assessing the conditions under which the service is legal

- Prior to the start of the project, we assessed the conditions under which the service is legal.

5.6 CSF 12: Guarantee that the technology has the potential for scale-up

Telemedicine doers have to take into account what actions are needed to make the leap from pilot to large-scale deployment in both technological and commercial terms. Scalability is related to a variety of factors. Among them is the degree of standardisation of the technical solution either as defined by market adoption or specified by a standardisation organisation.

5.6.1 What guaranteeing that the technology has the potential for scale-up means

From a technological standpoint, this critical success factor means considering that it may be important to extend the telemedicine service to a larger scale. The appropriate vendor(s) and the right technology or technologies therefore need to be chosen.

The potential for scale-up can be achieved by using either standard technologies or technologies that are similar and yet are produced/offered by a range of suppliers.

Failure to consider the potential for scale-up may work in the short term and on a small scale. However, it will probably cause bottlenecks at a later stage of deployment.

5.6.2 Indicators for measuring guaranteeing that the technology has the potential for scale-up

- We are fully aware of what it takes for the technology to be deployed on a large scale.
- In our region/organisation we are ready for large-scale deployment of the technology.
- The project will supply the documentation needed to ensure that there is a basis for large-scale deployment of the project.

6 Run

The management or operationally-related critical success factors under the title of 'run' (or running the service) are related to two areas of concern. These are first: the legal and security issues or the underpinning technology concerns that are key elements when preparing the operationalisation of large-scale telemedicine service deployment. These can be, for example, legal and security guidelines and having access to legal and security experts, and being aware of the privacy needs of patients in particular. The second set refers to IT and eHealth infrastructure, service monitoring and market procurement. The two critical success factors on legal and security guidelines, and experts, should already be read in close association with critical success factor 11 on the assessment of the conditions under which a telemedicine service is legal.

6.1 CSF 13: Identify and apply relevant legal and security guidelines

Since doers are relatively limited in their experiences with telemedicine as compared to their in-depth experiences with more traditional health services, the need for guidelines in the telemedicine field is crucial.

Guidelines that take into account legal and security aspects could guide doers in the appropriate direction(s), and help to make them feel more confident about developing and implementing new and sustainable services. For example, the American Telemedicine Association has produced many different forms of guidelines on how to handle various areas of telemedicine such as teledermatology, telepathology and telerehabilitation.[14]

The focus of this critical success factor is on guidelines concerning legal and security issues and not on clinical guidelines. There are other clinical guidelines available to telemedicine doers.

6.1.1 What identifying and applying relevant legal and security guidelines means

This critical success factor reminds telemedicine doers to look for useful relevant guidelines on legal and security matters.

Guidelines can be defined in various ways. First, they can be described as 'low level legislation', informal rules, or self-regulation mechanisms that can guide telemedicine doers on the process of telemedicine deployment and help them – as the World Health Organization says – to "*translate their duties into action*". Second, they can be described as 'soft law' or social customs and norms of a profession. Typically, guidelines are interpreted as a set of non-binding recommendations.

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[14] http://www.americantelemed.org/resources/telemedicine-practice-guidelines/telemedicine-practice-guidelines - .VMqgIFpv3dk

On this basis, there are at least three different types of guidelines:

- Non-binding international codes of practice.

- Operational national guidelines related to application of relevant legislation and regulations.

- Codes of conduct, which can also be developed within professional organisations.

Different domains have been covered by guidelines. MOMENTUM has concentrated on three different sets of guidelines. These cover particular jurisdictions, guidelines for specific professional groups, and guidelines that cover quality issues.

6.1.2 Indicators for measuring identifying and applying relevant legal and security guidelines

- The project is carried out in accordance with the relevant guidelines on legal matters.

- The project is carried out in accordance with the relevant guidelines on security matters.

6.2 CSF 14: Involve legal and security experts

This CSF is included to encourage involvement of people who can give advice and guidance on making sure that the telemedicine service under development is legally and securely implemented. This implies that any legal and security issues, including any ethical and privacy matters, must be scrutinised and taken care of when they are relevant by appropriate experts.

6.2.1 What involving legal and security experts means

This critical success factor incorporates involving and asking advice from legal and security experts when needed, to minimise the risk of experiencing legal and security problems when deploying a telemedicine service. Legal and security assessments include covering pertinent ethical and privacy considerations, among the telemedicine experts, the telemedicine doers and the healthcare personnel involved.

It is important to be aware of the skills and expertise that legal and security experts must have, and the tasks that they will undertake. Legal and security experts must be knowledgeable about regulations relevant to telemedicine at all levels, internationally, nationally, and locally, and must be aware that different queries may emerge at different stages of a development and implementation process. These experts are not necessarily experts on medicine. However, they do need to know the healthcare system intimately and be aware that telemedicine can provide healthcare in new and innovative ways. They must be informed that, as a rule, the general legislation in this field constitutes the basis for traditional health services being delivered in new ways.

The experts must be able to handle legal and security subjects as they arise during the whole process of planning, developing, and implementing a telemedicine service.

6.2.2 Indicators for measuring involving legal and security experts

- We have received advice on the project from legal experts.

- We have received advice on the project from experts on data security matters.

- In this project we are not experiencing any data security problems.

- I have confidence in the legality of this project.

- I have confidence in the security of this project.

6.3 CSF 15: Ensure that telemedicine doers and users are privacy aware

Privacy awareness training is an essential part of the development of a privacy aware organisational or company culture.

Depending of the type of service, privacy awareness training should be given to a wide range of end-users, including doers, healthcare workers, and patients.

Healthcare workers should certainly be expected to have the necessary knowledge in the privacy field. Training in privacy awareness should be offered to new doers and users when new services are adopted, and repeat or refresher training should be offered whenever health information systems are updated or maintained.

For telemedicine services where patients are directly involved (i.e., in doctor-to-patient services), privacy awareness training that is specially accommodated to the patients' needs should be offered to the patients. This approach fits with the notion of patients becoming more informed and more digitally literate.

6.3.1 What ensuring telemedicine doers and users are privacy aware means

Knowledge about appropriate practice when it comes to privacy and security behaviours can be termed privacy awareness. Such knowledge is based on ethical and legal principles and applies to developers during system design and implementation, as well as end-users during operational use.

Privacy awareness is related to privacy by design. It is therefore important to make sure that everyone who is involved maintains a high degree of privacy awareness and knows the regulations in the field and acts in accordance with them. These messages are important for people involved in the deployment of a telemedicine service, people using a service, or people handling health information.

Promoting privacy awareness can be achieved in three ways. Through:

- Transposing strategic attitudes into appropriate behaviours throughout the organisation.

- Developing a privacy aware company culture or organisational culture.

- Educating and training people and personnel.

Culture building is intended to make telemedicine doers, stakeholders, and end-users – including patients – aware of good practice. Security measures to ensure privacy must be prioritised even if their inclusion might occasionally be experienced as bothersome and

time-consuming. Privacy awareness and a good security culture can also be achieved and maintained through repeated training measures and steady educational reminders about these topics.

Training must introduce norms and basic principles for secure and privacy aware behaviour, illustrated by local guidelines, policies, and examples. Appropriate training and education could comprise the following themes:

- What is privacy and Personally Identifiable Information (PII).

- Privacy laws, policies, and principles.

- Roles and responsibilities in protecting privacy.

- Potential threats to privacy.

- Consequences of privacy violations.

- Protection of PII in different contexts and formats.

6.3.2 Indicator for measuring ensuring telemedicine doers and users are privacy aware

- In this project the telemedicine doers are aware of protecting the patients´ privacy in terms of health information and other information collected during the course of the pilot. (*)

(*) This indicator could be adapted to cover several other different types of users, e.g., healthcare workers and patients. It could also relate more specifically to privacy awareness.

6.4 CSF 16: Ensure that the appropriate information technology infrastructure and eHealth infrastructure are in place

This critical success factor describes the issues which ensure that the appropriate IT and eHealth infrastructures are available at the time of deployment and scale-up. The availability of these two infrastructures implies that the parties involved will be able to adopt the particular telemedicine service easily.

6.4.1 What ensuring that the appropriate IT and eHealth infrastructures are in place means

This critical success factor means ensuring that the appropriate IT infrastructures and eHealth infrastructures are available so that the telemedicine implementation can rely on these infrastructures from the initial deployment to the last stage of the scale-up phase.

The distinction between IT infrastructure, eHealth infrastructure and eHealth services such as telemedicine is represented in the model, called a Common Working Model, developed during the CALLIOPE project.[15]

IT infrastructure consists of all active elements in an IT operation. A typical IT infrastructure includes the following components: hardware, software, networks (including internet connection and security systems), and the IT staff responsible for network, hardware and software development and maintenance. Together, they all have the mission to supply

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[15] See http://www.calliope-network.eu.

access, storage and processing capacity to the telemedicine service users.

In the context of telemedicine, IT infrastructure is the set of industry-neutral infrastructure elements – available for all sectors – that supports the successful deployment and good functioning of new healthcare services.

eHealth infrastructure is a sector-specific subset of the IT infrastructure. It includes hardware, software or networks designed specifically for healthcare provision. For instance, they can be health information systems incorporate elements such as electronic health records or patient health records able to capture, store and distribute clinical data across different levels of care and among different health providers and patients.

The communication of health data may require interoperable health information systems that use clinical terminologies, codifications and data exchange standards such as DICOM, HL7 or SNOMED.

6.4.2 Indicators for measuring ensuring that the appropriate IT and eHealth infrastructures are in place

- We have ensured that the IT infrastructures needed are in place for deployment and large-scale implementation.

- We have ensured that the eHealth infrastructures needed are in place for deployment and large-scale implementation.

6.5 CSF 17: Put into place the technology and processes needed to monitor the service

This critical success factor describes the issues surrounding putting in place the necessary technology and processes to monitor the telemedicine service. The form of service monitoring explored here is technological in character.

6.5.1 What service monitoring means

Service monitoring guarantees that the telemedicine functions without excessive delay in routine use or technical interruption – with the exception of any interruptions scheduled for system maintenance. Service monitoring includes all activities needed to govern IT, such as maintenance plans, security issues, service continuity, a help desk, and access management.

Service monitoring may be provided either internally by the healthcare service provider or externally through a contractor.

A good quality technology monitoring service is particularly important to guarantee continuity of care and to avoid any loss of time on the part of clinicians.

It is also important to consider the needs of end-users through service monitoring as this will identify possible refinements to services that improve adoption and use.

Staff members who are involved in service monitoring are in a privileged situation in terms of being able to capture end-users' needs. Personnel responsible for maintenance and service monitoring have a tremendous opportunity to deal with, and register, the technical problems that any users may face when they are using telemedicine services.

6.5.2 Indicators for measuring service monitoring

- We have set up a system to monitor our telemedicine service ensure that it is running smoothly at all times.

- We have set up a system to solve any incident that may occur during the service.

- We have a system which supports the end-users in resolving any doubts that they might experience with the telemedicine solution.

6.6 CSF 18: Establish and maintain good procurement processes

This critical success factor describes the issues surrounding ensuring good procurement processes.

6.6.1 What establishing and maintaining good procurement processes means

Good procurement processes involve two main focus areas: content and process.

With regard to content, any service that is contracted out may be delivered with a wide range of quality variability. Unless these aspects are specified in the contract signed with telemedicine providers, the risk lies fully with the procurer. A good practice in procurement terms is to specify these aspects in a transparent, straightforward service level agreement to be signed by the contracting parties.

With regard to process, it is important to have a formal method of procurement for the purchase. This will act as a guarantee of the quality of the final output of the service as well as transparency and competition. The 2014 European directive on public procurement has ensured that procurement legislation has been set up.[16]

6.6.2 Indicators for measuring establishing and maintaining good procurement processes

- We have clear agreements regarding the quality of the deliveries provided by our vendors.

- We have clear agreements regarding the service level provided by **our** vendors.

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[16] See http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0024&from=EN.

7 List of indicators

For ease of use, this section contains a complete list of the 51 indicators already presented sequentially in Sections 3-6 in the context of each individual critical success factor.

7.1 Context

7.1.1 CSF 1. Ensure that there is cultural readiness for the telemedicine service

- In my organisation/region doctors and other 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.
- In my organisation/region patients and providers (healthcare professionals) are ready to use ICT (e.g., computers, tablets, mobile phones).
- In my organisation/region financial and other incentives are aligned with the service to be deployed.
- In my organisation/region an underpinning culture embraces technology.
- In my organisation/region an underpinning culture welcomes and even promotes change, innovation and shows openness to new ideas.

7.1.2 CSF 2. Come to a consensus on the advantages of telemedicine in meeting compelling need(s)

- In my region/organisation there is general consensus on the current telemedicine solution being the best available solution for meeting a compelling need.
- The current telemedicine solution is the best available solution for meeting a compelling need.

7.2 People

7.2.1 CSF 3. Ensure leadership through a champion

- In my region/organisation there is one or several influential person(s) who take(s) on a leading role and leads the way towards deployment of the telemedicine solution tested in our project.

7.2.2 CSF 4. Involve healthcare professionals and decision-makers

- Healthcare professionals have been involved in the development of the content of this project.
- Healthcare professionals have been involved in the development of the process and time schedule for this project.
- Decision-makers have been involved in the development of the content of this project.
- Decision-makers have been involved in the development of the process and time schedule for this project.

7.2.3 CSF 5. Put the patient at the centre of the service

- In this project[17] the patients have been sufficiently involved in the development of the telemedicine solution.
- In this project telemedicine service is based on the patient´s needs.
- In this project enough information and training is provided for the patients in order for them to obtain the best results possible from using the telemedicine solution.

7.2.4 CSF 6. Ensure that the technology is user-friendly

- The telemedicine technology used in our project is user-friendly for patients.
- The telemedicine technology used in our project is user-friendly for health professionals.
- The telemedicine technology used in our project does not need an extended training process prior to using it.

7.3 Plan

7.3.1 CSF 7. Pull together the resources needed for deployment

- In my region/organisation the financial resources needed for deployment of the telemedicine solution are available.
- In my region/organisation the IT competences needed for deployment of the telemedicine solution are available.
- In my region/organisation enough time for the training needed in order to implement the telemedicine solution is available.

7.3.2 CSF 8. Address the needs of the primary client(s)

- The telemedicine solution addresses the needs of the primary clients.
- The telemedicine solution is sufficiently adapted to the needs of the primary users.
- The telemedicine solution addresses the needs of the health sector.

Three example indicators follow (the second indicator is relevant to health care systems where municipalities have a role to play in health care and the third one is specifically relevant to the Norwegian setting).

Indicators for measuring addressing the needs of the health sector

- The telemedicine service addresses the needs for efficiency improvement and improvement of quality in the health sector.
- The telemedicine service is adapted to the need for cooperation between municipalities.
- The telemedicine service is adapted to the need of the health sector for interaction in with the principle of Best Efficient Level of Care.

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[17] The wording of these indicators tends to focus on use of the word project. However, in many telemedicine settings, words such as service or initiative or venture might prove to be more suitable. Alternatively, organisation or region might also be considered.

7.3.3 CSF 9. Prepare and implement a business plan

- A business plan for the project has been developed.
- A business plan for the project has been implemented.
- The business plan has been approved by the relevant management level.

7.3.4 CSF 10. Prepare and implement a change management plan

- A change management plan for the project has been developed.
- A change management plan for the project has been implemented.
- A change management plan has been approved by the relevant management level.

7.3.5 CSF 11. Assess the conditions under which the service is legal

- Prior to the start of the project, we assessed the conditions under which the service is legal.

7.3.6 CSF 12. Guarantee that the technology has the potential for scale-up

- We are fully aware of what it takes for the technology to be deployed on a large scale.
- In our region/organisation we are ready for large-scale deployment of the technology.
- The project will supply the documentation needed to ensure that there is a basis for large-scale deployment of the project.

7.4 Run

7.4.1 CSF 13. Identify and apply relevant legal and security guidelines

- The project is carried out in accordance with the relevant guidelines on legal matters.
- The project is carried out in accordance with the relevant guidelines on security matters.

7.4.2 CSF 14. Involve legal and security experts

- We have received advice on the project from legal experts.
- We have received advice on the project from experts on data security matters.
- In this project we are not experiencing any data security problems.
- I have confidence in the legality of this project.
- I have confidence in the security of this project.

7.4.3 CSF 15. Ensure that telemedicine doers and users are privacy aware

- In this project the telemedicine doers are aware of protecting the patients´ privacy in terms of health information and other information collected during the course of the pilot.

7.4.4 CSF 16. Ensure that the information technology infrastructure and eHealth infrastructure are available

- We have ensured that the IT infrastructures needed are in place for deployment and large-scale implementation.

- We have ensured that the eHealth infrastructures needed are in place for deployment and large-scale implementation.

7.4.5 CSF 17. Put in place the technology and processes needed to monitor the service

- We have set up a system to monitor our telemedicine service ensure that it is running smoothly at all times.
- We have set up a system to solve any incident that may occur during the service.
- We have a system which supports the end-users in resolving any doubts that they might experience with the telemedicine solution.

7.4.6 CSF 18. Establish and maintain good procurement processes

- We have clear agreements regarding the quality of the deliveries provided by our vendors.
- We have clear agreements regarding the service level provided by our vendors.

8 A self-assessment toolkit for applying the Blueprint

The MOMENTUM Blueprint is a set of guidelines laid out in the form of a document. In order to make the blueprint more practical and applicable for telemedicine doers, it has been combined with a self-assessment tool named the Telemedicine Readiness Self-Assessment Tool (TREAT). This toolkit enables telemedicine doers and decision-makers to use the MOMENTUM critical success factors and underlying indicators to discover whether a telemedicine service is ready or not for large-scale deployment.

TREAT was originally developed by the Danish health authority, RSD, and the IT company, CISCO, as a tool for measuring the degree of readiness for large-scale deployment of a telemedicine solution. TREAT remains under the joint ownership of CISCO and RSD, but has been given authorisation to be used widely in other settings, initiatives and projects, provided due acknowledgement is given to CISCO and RSD.

The MOMENTUM-TREAT toolkit has been tested in a United4Health[18] project setting in Kristiansand, Norway. A report of this testing exercise can be found in Annex 1 to this report.

As background, it is worth noting that the United4Health is a European project that is partially funded under the ICT Policy Support Programme (ICT PSP) as part of the Competitiveness and Innovation Programme by the European Commission. The ambition of United4Health is to validate and strengthen the evidence for chronic disease management to be conducted through telehealth solutions, especially in terms of the effectiveness, cost-efficiency, and transferability of the implementation of the services. United4Health focuses on indicators which, in the framework of the Renewing Health[19] project, have proven valuable for evaluating these aspects.[20]

The practical use of this toolkit is described step-by-step in the following sub-sections. First, there is a description of the toolkit in relation to MOMENTUM. Next, observations about what types of projects or initiatives are suitable for using the toolkit follow. Details about who should participate in the process, and the steps in the process itself are described. Finally, an example of a timetable for the MOMENTUM-TREAT process that spans eight working weeks has also been included.

8.1 When should the MOMENTUM-TREAT toolkit be used?

In principle, the MOMENTUM-TREAT toolkit can be applied to most types of telemedicine initiatives, but the timing of the application is important. The toolkit is meant to be applied after a pilot initiative or project has run its course. The pilot must have come far enough for everyone involved to have gained enough experience about telemedicine, and for them to have formed a solid opinion of what telemedicine means in their particular case. Since the main point of the MOMENTUM-TREAT process is to decide whether or not a telemedicine service is ready for large-scale deployment, the toolkit use must ideally take place before a

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[18] See http://united4health.eu/.

[19] See http://www.renewinghealth.eu/.

[20] See http://united4health.eu/.

deployment decision is made. Thus, the results from using the toolkit can contribute to successful decision-making.

In addition, the Norwegian, Kristiansand test team suggested that the MOMENTUM-TREAT toolkit might be useful at earlier stages of a pilot process. The team members thought that the tool could be useful in a variety of other settings. They suggested that it could be used at the beginning of an initiative as a framework for designing the project phases; during the course of an initiative to ensure that it is running according to plan or to be aware of risk factors. They also indicated that the toolkit might be used more than once at different stages of telemedicine deployment. These ideas have, however, yet to be tested in an actual setting.

8.2   Who should participate in the MOMENTUM-TREAT process and when?

Ideally all stakeholders who have actively participated in a telemedicine pilot should be asked to contribute to the MOMENTUM-TREAT survey. Representatives should be present in the procedure from all levels of the initiative from the steering committee to the health professionals who work with the telemedicine applications on a daily basis. Different professions, organisational and geographical affiliations should be reflected as well.

When using a well-functioning on-line survey tool, adding extra respondents to answer the survey may require a little extra effort, but should nevertheless add a substantial amount of useful information to the process.

8.3   The process

The steps in the procedure of setting up the MOMENTUM-TREAT process are described below within the framework of a suggested eight-week timetable.

The first step in the process is to prepare the online survey. This can be done by using SurveyXact which is a commercially available online survey tool[21]. The survey and its responses are handled electronically.

The members of the team who tested this tool in Kristiansand, Norway, in November 2014 were satisfied with SurveyXact as it was easy-to-use, it allowed them to monitor the incoming answers during the survey phase, and provided very clear graphic representations of the results.

Any other on-line survey tool can, however, also be used. Other ways of running an online survey are feasible. There is a host of online survey tools commercially available which will work well with the MOMENTUM-TREAT indicator statements. Organisations and telemedicine sites may also have suitable internal survey tools of their own. The most important qualities needed for such a tool are its ease-of-use and an option that provides clear graphical presentations of the results.

In some cases, if the sample of respondents is small enough, the survey can also be handled physically on paper.

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[21] See http://www.surveyxact.com/.

8.3.1 Running the MOMENTUM-TREAT process

The MOMENTUM-TREAT toolkit consists of a total of 18 critical success factors. Each critical success factor is accompanied by a number of underlying statements about performance – these are called indicators. These statements reveal whether or not the critical success factor is present in a particular telemedicine setting. (Please refer to Section 7 for a complete list of indicators.)

Not all critical success factors and not all indicators are relevant for all telemedicine projects. The doers in each project or initiative can select those critical success factors and underlying statements that they find to be most useful.

The toolkit also permits the users to add a number of critical success factors of their own to the list, in the event that they observe areas in their telemedicine service which are not covered by the existing 18 factors. Room for local adaptation is necessary. This is because European health sectors have different structures; regions, municipalities and organisations may be organised in various ways; and reimbursement systems, legal systems and cultural aspects also vary.

All indicators are presented the same way in the MOMENTUM-TREAT survey. The response to each statement is set up using a five-point Likert scale ranging from "Agree" to "Disagree". Each of the five Likert points is assigned an individual colour, ranging from green (agree), to yellow (neutral), to red (disagree). The Norwegian test team also suggested adding an option for the answer "I don´t know".

The current two remaining Likert points, two and four, have been given the colours light green and orange, respectively.

This whole colour scheme is based on traffic light imagery. The traffic light images enable the users to develop very clear graphic representations of the results to the online survey.

When the survey is set up using the chosen online survey tool, the survey respondents should be given about two working weeks' deadline to respond to the online survey. This period is long enough for most people to find a timeslot to examine the statements and select their preferred ones, but short enough to prevent the survey document from being forgotten in their email inbox.

After the survey period, the team running the (online or paper) survey should estimate whether it has received sufficient answers, whether the period for responding should be extended, and therefore whether reminders should be sent to those respondents who have not yet completed the survey.

After the survey is completed, the team analyses the data and uses the results of the analysis as the basis for preparing the associated workshop. Tips on who should attend the workshop are implicitly included in sub-section 8.2 (above).

For each set of statements relating to each critical success factor, the responses reveal the percentage of participants to the survey who consider the critical success factor to be present in the setting.

On the basis of the analysed results, the team members set up the themes for discussions and the workshop team work. Typically, the topics which need the most work are the ones

which turn out to be primarily red and orange, since these are the areas which are not considered to be ready for large-scale deployment.

On the day of the workshop, the results are presented to the participants in a slide show, and the main topics for the group discussions are introduced.

8.4   Timetable for the process

This sub-section describes all the actions that are needed to prepare and run the workshop, based on an eight-week time horizon from the beginning of planning to the circulation of the results after the workshop has been held. The intended outcome is to get the site ready to work on any missing or less well developed critical success factors, and strengthen its large-scale deployment action plan.

Week 1

- Set up the survey. This includes setting up some initial questions relating to the respondent's profession, role in the project, and primary place of employment. For each of these, a choice of relevant and mutually exclusive categories should be set up. Subsequently appropriate performance indicators from the MOMENTUM-TREAT list of critical success factors should be chosen, and further indicators added if necessary. The indicators are then fed into the chosen online survey tool.
- Decide who should be included (this is often everyone who is a member of the telemedicine pilot exercise).
- Decide how many completed survey responses are necessary for the process.
- Send out an explanatory letter to project participants about the future process.

Week 2

- Send out the online survey with a two-week deadline for submission. When using an online survey tool, the materials may consist of just an explanatory e-mail and a link to the actual tool.

Week 3

- Monitor the responses to the survey as they are submitted.
- Start discussing where to focus the content of the workshop and the outcomes that should be achieved.

Week 4

- Estimate whether or not enough responses have been submitted. If not, send out a reminder with a one-week submission deadline.
- If possible, send out invitations for the workshop. The recommendation is for no less than 12 and no more than 15 participants at any single workshop. The choice of participants for the workshop should include personnel from all levels of the projects and a number of different professions and organisations.
- Decide on the number of MOMENTUM-TREAT workshops to be held (i.e., if the telemedicine initiative is a particularly large one). Sub-group discussions can also be held within a single workshop. The eventual number of workshops or sub-group work obviously depends on the resources available.

Weeks 5 and 6

- Analyse the results of the survey responses and decide where most focus is needed in the workshop.
- Write up a short report to be given to all respondents prior to the workshop, outlining the main results of the survey exercise.
- Decide whether the report should be forwarded to all participants, or only those who will attend the workshop.
- Decide whether the results should be made publically available on the project website or other relevant online site.
- Prepare the workshop, and include a PowerPoint presentation of the results of the survey.
- Prepare topics for team work to be undertaken during the workshop. The topics should be chosen on the basis of the results of the survey. The scope of the team work is to reach a common understanding of the state of readiness of the telemedicine initiative for further deployment. The discussions will therefore often be based on those indicators which indicate a lack of readiness, i.e., where many answers lie in the "Disagree" and "Completely Disagree" categories. Since each telemedicine deployment case is different, the team should always estimate the importance of each indicator to its project, and treat them accordingly during the workshop.

Week 7

- Run the workshop.

- Base the agenda on the results of the survey.

- Start with a plenary session in which the results relating to each indicator presented. This presentation should be very short since everyone attending the workshop will already have been intensively involved in the telemedicine deployment process to date.

An example agenda for a workshop could be laid out like this:

1. Presentation of the telemedicine solution being tested.

2. General introduction of the MOMENTUM-TREAT toolkit.

3. Presentation of survey results.

4. Group work based on the results of the survey. (**)

5. Plenary discussions of the group work. (***)

6. Conclusions. These will be based around a discussion or a decision on "The degree to which our organisation/region/country is ready for large-scale deployment of the telemedicine solution".

7. Next step: Agree on any further work to be done.

(** and ***) Steps 4 and 5 can be repeated depending on the number of topics to be discussed.

Week 8

- Write a report based on the results of the workshop. The report must provide an overall picture of the degree of readiness for large-scale deployment of the telemedicine solution being tested, which critical success factors are present, and which ones need further development. There is no set standard template for the report. The extent and the structure of the report depend on local requirements.
- Give the report to the participants at this stage.
- Give the report to the decision-makers whose job it is to decide whether to go ahead with the large-scale deployment of the telemedicine solution.
- If relevant make the report publically available on the initiative's website or other relevant online site.

8.4.1 Requirements for the workshop venue and personnel

The workshop is not particularly demanding when it comes to venue requirements. However, a few basics should be in place:

- A meeting room that is large enough for plenary sessions and with basic audio-visual equipment for presentations.

- A number of smaller rooms for teamwork sessions (or a plenary room that is sufficiently large to permit break-out groups to operate comfortably in different parts of the room).

- A selection of flip overs, Post-It pads and markers and/or pens and pencils for practical group work.

- A computer for each group to prepare their presentations.

The MOMENTUM-TREAT process can be run by two dedicated people, and possibly a third who would set up the online survey. In the test phase held in Kristiansand, Norway, the test team consisted of two people. In addition to them, a third person prepared the online survey: that person fed the statements chosen and adapted by the test team into the survey tool.

In addition, two people from the RSD team at Odense, Denmark, were ready to assist by answering any questions posed to them by the test site and by giving advice on any practical matters concerned with the test phase.