BLUEPRINT

DIGITAL TRANSFORMATION OF HEALTH AND CARE FOR THE AGEING SOCIETY

Strategic Vision Developed by Stakeholders

Discussed at the

European Summit on Digital Innovation for Active & Healthy Ageing

Brussels, 5-8 December 2016

v. 15 January 2017

Disclaimer: This background document has been produced on the basis of input from stakeholders,

. This document does not in any way constitute a formal position, proposal or commitment by the European Commission.

About the Blueprint

In December 2015 at the 4th Conference of Partners of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA), European Commissioner Günther Oettinger (Digital Economy and Society) outlined how digital innovation, enabled by a functioning Digital Single Market, can transform demographic change into an opportunity for Europe's economy and society.

Commissioner Oettinger invited all stakeholders to work together with the European Commission in the development of a blueprint, a "shared vision" on how innovation enabled by a Digital Single Market can transform Europe's ageing society in the 21st century and contribute to the European Silver Economy (keynote speech - 9th December 2015).

Recognising that a shared vision is essential to mobilise investment and guarantee the commitment of all actors to this digital transformation of health and care for the ageing society, several industrial players, regional authorities, professional organisations and multi-stakeholder platforms such as the EIP on AHA have accepted the invitation from Commissioner Oettinger and agreed to start working in an initial draft of this blueprint.

This shared vision was presented and discussed at the second European Summit on Innovation for Active and Healthy Ageing (5-8 December 2016). This flagship event was organised by the European Commission in partnership with the European Parliament and the Committee of the Regions. It brought together over 1200 participants engaged in developing, investing in and deploying digital innovation for active and healthy ageing.

Table of Contents

Executive Summary 4

1. Why we need a Blueprint 8

2. Connecting dots: A complex and evolving landscape 9

3. Objectives of the Blueprint 11

4. Road to 2018 Goals 12

5. The Shared Vision 13

5.1. The Maxims 13

5.2. Defining a common language and metrics 13

5.3. Connecting the various funding instruments 14

5.4. Understanding "demand for" and "supply of" innovation 16

6. Priority areas of intervention (High Socio-Economic Returns) 18

7. Identifying Transformation Enablers 19

7.1. Workforce Training and Skills Development 19

7.2. User-generated data-driven economic models. 20

7.3. Organisational and Change Management Models 21

7.4. Citizen Empowerment and health literacy 22

7.5 Standards & regulation 24

7.6. Other incentives to transformation 26

7.7. Alignment of financial instruments and funding mechanisms 27

8. How the Blueprint will Work 28

9. List of Initial Champions* 29

Executive Summary

Demographic change is a globally recognised and well documented societal challenge. The rising demand for health, social and informal care services due to the ageing population and a growing burden of chronic diseases, is estimated to increase health and care expenditure on average by 1-2% of GDP until 2060, at a time of constrained public resources for health and social care. The expected shortage of labour supply in caring services is estimated to reach 20 million by 2025.

There is a clear need for configuring more sustainable models for health and care delivery in the EU, as part of a process of health Innovation, where the ongoing structural reforms that aim at increasing the effectiveness and resilience of health and care systems. To address the challenge of demographic change and patients' unmet needs, health and social care systems are looking at disruptive innovation[1] to deliver new treatments and effective care at an affordable cost in areas where patients' needs are high. In many cases, the absence of a coordinated approach to health and social care reforms combined with a lack of participation by citizens, patients, carers and healthcare professionals in the design, implementation and evaluation of the reforms in care systems as well as with "siloed" approaches to innovation hinder the ability of realising a triple win: better quality of care for our populations, more sustainable and more efficient health and care delivery systems, and creation of economic growth and jobs in Europe.

Better care coordination is increasingly accepted as a precondition to the long-term sustainability of our healthcare systems. Lack of care coordination between primary, community, hospital, special care, social care, the patient and his/her family is detrimental to the quality of care, the effectiveness of care systems, to care personalisation and efficiency, as well as care outcomes and to patient safety. Patients, carers and healthcare professionals should be placed at the centre of healthcare innovation and policy reforms. This implies supporting people to lead healthy lives and in being engaged in the management of their conditions and risk factors, in adhering to treatments and in having a voice in care decisions[2].

Better care coordination or "integrated care" does not evolve naturally and still requires a fundamental transformation of care delivery mechanisms: a shift in focus from acute, hospital-based care to early prevention, population management, community and home-based care; a much stronger participation of citizens in their own care process; more recognition, support and participation of carers and healthcare professionals; new roles, skills and responsibilities for care professionals; new patient pathways ensuring the cooperation among care actors and timely follow up of patients; new governance models between payers, providers and consumers of care that incentivise co-delivery of care and results (including performance-based payment models), supported by innovative technologies.

[1] Expert panel on effective ways of investing in health (EXPH). "Disruptive Innovation – Considerations for health and health care in Europe", opinion approved on 29 October 2015.
http://ec.europa.eu/health/expert_panel/sites/expertpanel/files/012_disruptive_innovation_en.pdf

[2] In line with the WHO global strategy on people-centred and integrated health services under consultation since March 2015 (see here: http://www.who.int/servicedeliverysafety/areas/people-centred-care/global-strategy/en/)

But it is not only about the integration of health, social care and support services. Better coordination and targeting services also encompasses local and regional planning and organisation (in urban and rural areas) around schools, workplaces, public spaces, proximity services etc. They all play a fundamental role in care coordination especially if there is a coherent strategy that cuts across prevention and education, early detection of symptoms, behaviour and informal care support.

Quality of life for all EU citizens, but especially for the growing number of older EU citizens, and those living with chronic conditions, is determined in large part by the extent to which the physical and social environment of their daily lives supports autonomy, independent living, social connectivity and meaningful social participation. The transition needed to make this happen requires more than just multi-sectorial cooperation between many public sector and private sector actors, as well as third sector organisations. It also requires authorities at all levels from the local to EU-level to trade in traditional, '*siloed*', top-down approaches to policy development and service provision for facilitative, distributed models that put self-organisation and empowerment of citizens in the driving seat for social transformation. Digital innovation needs to be urgently deployed at required scale to support this change on Health Innovation and help unlock the potential of technology to address societal needs.

Digital innovations, if designed purposefully and implemented on the basis of cost-effective criteria, can contribute to improving the effectiveness, accessibility and resilience of health systems. They can provide tools to support the modernisation of health and social care systems and their adaptation to the challenges mentioned above. They can facilitate the implementation of new care models as part of health systems reforms, together with the related organisational changes in care delivery, financing modalities or workforce skills.

The 2014 Communication from the European Commission on "effective, accessible and resilient health systems" and the Annual Growth Survey 2016 stress how digital innovations can improve integration of care through up to date information channels and deliver more targeted, personalised, effective and efficient healthcare, reducing errors and length of hospitalisation.

Tackling the Digital Innovation challenges that need to be surmounted to achieve success in Health Innovation by integrating health and social care and promoting social transformation will do more than just contain cost and staffing levels and provide growth opportunities in sectors directly linked to these issues. Digital transformation is not an end in itself and should support human workforce to deliver more efficiently. It must be seen also as a driver to make face to face care more widely accessible for those who need it, when they need it. Success will also stimulate sustainable employment and job market participation for both informal carers and for citizens themselves, opening up avenues for investment and employment elsewhere.

This journey of care delivery transformation in Europe is just at the beginning, and the underlying digital health technologies that will support the transformation of health and care need to be purposefully designed, developed, and must demonstrate cost-effectiveness potential so that they can ultimately

reach market maturity and wide acceptance that is particularly affected by regulatory, workforce and organisational challenges.

Another important challenge for scaling up such transformation lies in collating the vast array of care and non-care related data and paper-based records, turn them into a usable format, combining structured and unstructured data, and turn the data into actionable insights. But this is only the first step. Once health and other patient-related data are digitized, sharing and communicating the information across the care continuum is the next hurdle. Until this happens and becomes more commonplace supported by Health Information Exchange (HIE), Electronic Health and Care Records (EHR), population health management, mobile health and analytics, any hope of achieving integrated care at scale is bound to be difficult. Sharing appropriate information which is understandable is at the core of successful integrated care provision.

Unless the European Union effectively aligns innovation, economic and industrial policies with health and social care policies and with users' and patients' needs, to create a joined-up comprehensive and multi-sectoral response to demographic change and new disease patterns, thus ensuring fiscal sustainability and access to good quality care services, our social and economic models as well as the quality of life of our population are at risk. This is a crucial point we need to address.

At the same time Europe (much as the rest of the world) is going through a digital revolution, where services and product industries are facing a process of digitisation in order to adapt to consumer and user demand. Semantics, data analytics, robotics, drones, artificial intelligence, gamification, cloud, smart-homes, cities and communities, internet of things (IoT), 3D printing and wearable technologies are all opening new windows to the data-economy, disrupting and shifting the way we access, interact with, and use products and services in transport, education, entertainment as well as health, care or wellbeing.

Digital innovation can support Europe's response to some of the major challenges ahead. It has the potential to ensure that the ageing population as well as the population-at-large remain independent and active in society, can receive coordinated care and enjoy living longer in their homes in particular in remote and rural areas, while increasing efficiency of health and social care systems and supporting new (and vibrant) sectors of our economy.

Digital innovation also has the potential to help informal carers maintain an active and productive life while caring for their dependent relatives. Innovative Digital Health solutions facilitate and support healthier lifestyles and empower citizens to manage their health conditions, whilst enabling the development of a dynamic data economy. Advanced dynamic data access interfaces, digital social connectivity and peer-to-peer solutions, and sophisticated, real time policy support instruments can help drive the social transformation needed to build not just sustainable health care systems but sustainable inclusive societies from the bottom up. Co-creative ICT-based design and development approaches will allow key supply sectors like the construction industry to work more effectively with institutional and private clients to integrate smart home and IoT-technologies into safe, supportive living environments for all.

Innovation is not exclusively about new technologies, but also about the structure of the care delivery, processes, services, financing, pricing and workforce skills. And in coordinating health and social care, a mix of all these innovation elements is required to, firstly, implement a new solution – a new "model" - successfully, and secondly, to get real benefits from it. Taken together, provided that they meet the needs and expectations of healthcare professionals, patients and carers, respecting the importance of human contact, not replacing it but complementing it, notably in terms of quality and personalisation, the innovation elements mentioned above and their combination, can become game-changers that will transform our lives and the way we provide or receive health, care and social services.

Our industry in Europe has unique competitive strengths, scientific and research excellence in several economic sectors related to health and social care as well as digital technology. But Europe needs to become faster in the translation of ideas and valid technology into economically viable solutions, which can be scaled up in the daily health and social care routine practice. Europe needs also to seek alignment in demand-side and supply-side innovation policies to establish a stronger industry competitiveness and support market growth.

1. Why we need a Blueprint

The unprecedented change that is occurring in our society represents as much an opportunity as a challenge. The digital transformation that the world is experiencing in the uptake of digital health technology, solutions and services can drive a triple win for Europe; Better Quality of Care for citizens, more efficient and effective health and care delivery systems, and competitiveness (including new economic opportunities, jobs and investment).

This triple opportunity can only be seized if we overcome barriers to scaling up innovation in digital health and connected care and positioning these enablers within a wider, comprehensive and co-ordinated programme of change. These barriers result predominantly from dispersed initiatives and stakeholders, lacking critical mass and alignment on costs and benefits, dominance of data-silos and lack of interoperability that inhibits the sharing of information, failure to adopt suitable approaches to innovation and clinical validation, fragmented markets across the EU and across the spectrum of services covering the care continuum.

In recent times, these barriers have been exacerbated by the financial crisis. The overwhelming evidence acknowledging that today's care systems are becoming unsustainable, has not been sufficient to shift public policies towards large scale deployment, of innovative and more cost-effective solutions. Furthermore, it is clear that existing market solutions are still largely under-exploited. To seize the opportunity and accelerate the uptake of digital health and care innovation at scale, the EU must develop a coherent vision shared amongst industry, policy makers, innovators, investors, professionals and user communities. A vision that clearly identifies particular user and market needs in the health and social care sector, that aggregates actions to overcome fragmentation and that defines joint strategies to maximise the benefits for the citizen, the health and social care delivery systems and the economy.

The Blueprint actions are also designed to stimulate investment (public and private) in this market for digital health, connected care and wellbeing products and services. A market that can make an even greater contribution to economic growth, jobs and investment in Europe, and contribute to its competitiveness on the international scene. This vision must be developed through a unique, open, collaborative and dynamic set of resources and tools, co-created with a number of "champions"; organisations who agree that a new shared European vision is needed to transform and bring together professional and informal health and social care for an ageing population. A vision that is shared by citizens, public authorities (at national, regional, local and EU level), industry and entrepreneurs, civil society, health and social care organisations and academia. A vision that enshrines the actions and priorities to support mainstreaming of innovation as a response to demographic changes and the evolving health and social care needs of Europe's population.

This shared vision is the essence of the Blueprint, and this Blueprint is an important contributor to the priorities of the European Commission, notably on developing a Digital Union and the Digital Single Market (DSM) also for health and connected care services. Bringing down barriers that will unlock the opportunities of a digital single market for professional and informal health and social care services.

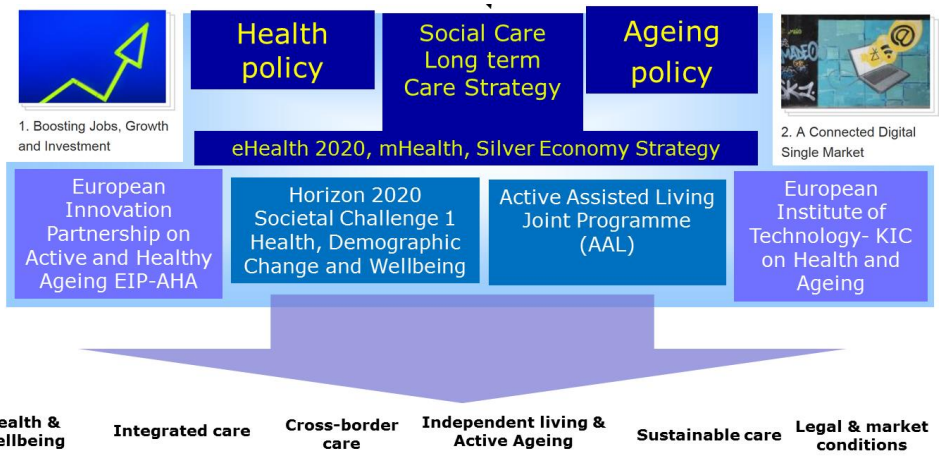
2. Connecting dots: A complex and evolving landscape

The Blueprint is a means to "**connect the dots**" of a very complex landscape on digital health and social care and active and healthy ageing. The Blueprint can create an overarching "political vision" that is aligned with the major priorities of the Juncker Commission (notably on promoting Economic Growth and Jobs, and realising the Digital Single Market).

This vision is a necessary pre-requisite to set a clear political agenda across the European Union and harness resources to act, particularly as results are not likely to come overnight and fall within short-term political cycles at regional, national and European levels. The Blueprint will serve as a mechanism to raise awareness about the potential of better care coordination amongst the large community of relevant stakeholders, including users. The Blueprint will also rely on some of the important methodology tools currently available (*especially those originated by the EIP-AHA partners*) to assess their readiness to integrate services supported by digital services.

Current activities of DG CNECT targeting digital innovation for health and social care in ageing well include research and innovation under Horizon 2020-Societal Challenge 1 (550€M), the Active and Assisted Living Programme with Member States, the new EIT-KIC on healthy living and active ageing, the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) co-managed with DG SANTE and DG RTD, the eHealth Action Plan, the Joint Programming Initiative with Member States on More Years –Better Lives and the EU Silver Economy strategy.

Examples of EU initiatives



Other EU activities and priorities that are relevant and can benefit from further synergy include IoT, micro-nano systems, Smart Homes and mobility, Big Data, Inclusion, Industry 4.0 and Robotics. Technology platform of construction industries (DG GROW), medical devices (DG GROW), health technology assessment, cross border care and performance of health systems (DG SANTE), long term care and labour inclusion (DG EMPL), smart specialisation strategies (DG REGIO), innovation for health and ageing (DG RTD, JRC).

Whilst these diverse initiatives are important and complementary, there is a lack of overarching strategy as to how some of these initiatives can interact and create stronger synergies amongst themselves. A coherent vision will also require a new model for linking up different EU initiatives, with clear industry commitments as well as Member States and Regional strategies.

3. Objectives of the Blueprint

In defining a shared vision by major stakeholders (including industry, national, regional policy makers, finance, user organisations and research) for future transformation of health, social and informal care, the Blueprint will set out a long-term shared vision based on a set of Maxims (principles) and a common language.

These will inform the overall "**direction of travel**" of existing and future EU, national, regional and local initiatives on health and care innovation, (including active and healthy ageing, independent living and integrated care) in the coming 3-5 years and beyond. It will identify, stimulate and aggregate investment tools and commitments towards the goals and priorities identified in the Blueprint. Finally, it will provide a necessary background document that can be used for awareness raising activities.

For example, there is a need to establish an overarching re-design programme for integrated care, which can derive the learnings of ongoing and completed pilots and implementation experiences, and create an evidence-based roadmap for concerted actions by a diversity of stakeholders.

Given the diversity of initiatives at EU, regional, national and local level and by industry, that relate to the digital transformation of professional and informal health and social care, the Blueprint will "**connect the dots"** between policy, health governance and R&I, between demand and supply, across health, social care and wellbeing, across technology, solutions and services platform (e.g. data). It will support the development of a broader and more compelling political vision on digital innovation for ageing well and the silver economy that will strengthen the societal dimension of the Digital Single Market and the digital society portfolio of the European Commission.

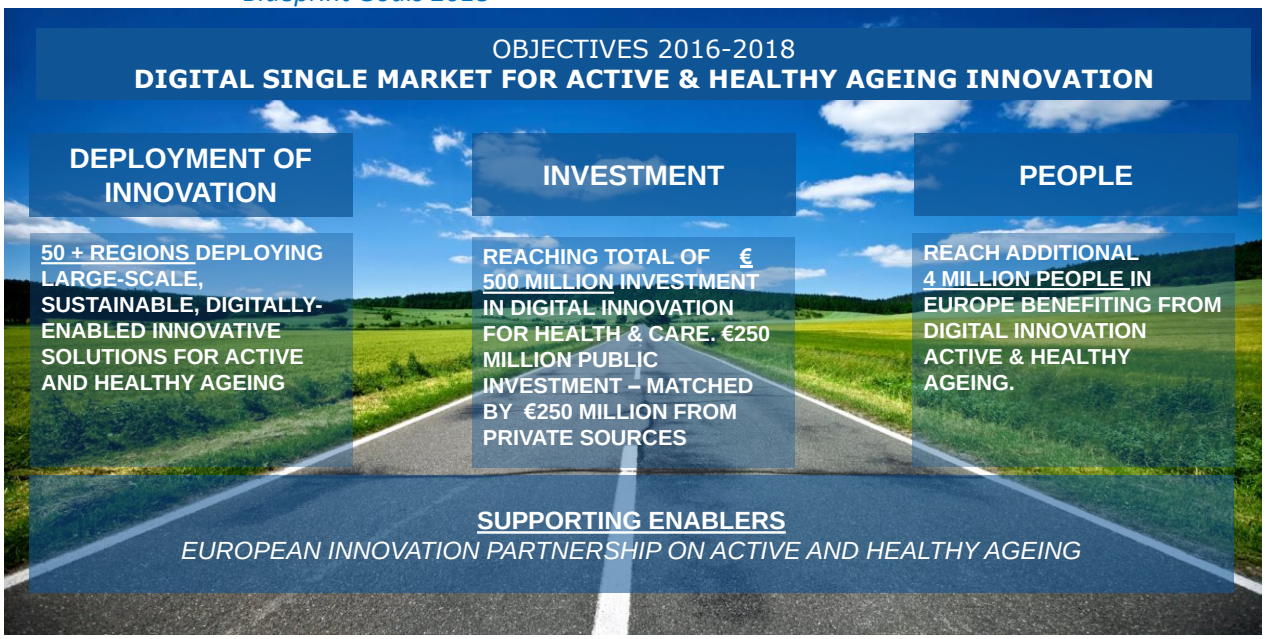
The Blueprint will also contribute to the establishment of a "**common innovation language**", establishing common assessment methodologies and providing evidence for large scale deployment. The Blueprint is building on the availability of shared and widely recognised impact assessment tools for innovation in health and active and healthy ageing such as MAFEIP.. MAFEIP has already been adopted by the partners and Reference Sites of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA). The Blueprint will bring together a comprehensive set of resources of proven innovation practices in active and healthy ageing (Innovative Practices Repository of the EIP on AHA), which can be replicated across Europe and help to scale up deployment of proven innovation more rapidly and at larger scale across Europe.

4. Road to 2018 Goals

Large scale and cost-effective deployment of digital innovation for professional and informal health and social care can lead to a **Triple Win for Europe**: Improve the health and quality of life of citizens; Support the long-term sustainability and efficiency of health and social care systems; Enhance the competitiveness of EU industry creating economic growth opportunities and jobs in the Silver Economy.

In developing a blueprint, the champions agree a common vision with shared goals for the next 3-5 years and beyond, including industry, public authorities, regulatory bodies, care providers, voluntary sector and investors. These goals support the European Commission's priorities including the creation of a Digital Single Market of innovative solutions for health and connected care, that will attract public and private investment and that can create growth and jobs in Europe's digital economy. It also provides an important dimension to the Digital Single Market – the societal dimension, and calls for the integration of digital innovation in daily clinical, health, social and informal care practices.

Blueprint Goals 2018



The 2018 goals include reaching 50 + regions investing in the implementation / deployment of large scale digital-enabled solutions for health and care of its citizens. Supported by a total investment envelope of € 500 Million of private and public investment and reaching an additional 4 Million citizens (actual beneficiaries of innovative services).

5. The Shared Vision

"Create a European environment that stimulates innovative healthcare and social entrepreneurs, leverages demand side investments in innovative technology, solutions and services for active and healthy ageing and rewards competitiveness. We will strive to promote cost-effective digital health innovation in public services, improving inclusion and thereby contributing to the sustainability of health and social care systems. We will ensure that through our actions, we will contribute to citizens remaining active and valued contributors to society and we will stimulate creation of new jobs and growth within the Digital Single Market and the European Silver Economy."

5.1. The Maxims

The Maxims are the fundamental principles that underpin this shared vision. They are the foundations for the Blueprint objectives and are shared by all "Champions".

- ***People are at the heart of the transformation***
  Innovative digital health and care solutions constitute a means to achieve an end. Successful health and social care delivery relies on communication and relationships to bring about the coordination of care and quality for the person / patient /user/consumer experience. Accommodating the needs and preferences of the individual must be at the heart of digital innovation. Digital innovation can enable, improve, support, augment, empower - but will not replace - human communication and relationships. High Tech vs. High Touch should not be seen as opposing goals: we need to use our Tech to grow our Touch.

- ***Quantify and Qualify Outcomes (results rather than intentions)***
  The ability to spread and accelerate transformation of health and social care delivery is enriched by the care recipient's experience – ***that must be seen as part of the evaluation process*** – and also supported by a robust evidence-base that expresses in terms of measurable outcomes the return on investments dedicated to implementing innovative digital solutions and the associated changes to care delivery. We must allow technology-enabled solutions to support the disruptive Health and care Innovation, and not measure their impact solely within the constraints of the existing health and care processes.

- ***Demographic change constitutes a major opportunity for new jobs, economic growth and enhanced competitiveness***.
  The "Silver Economy" (SE) covers new market opportunities arising from public and consumer expenditures related to the needs and demands of the growing population 50+. The DSM can provide the enabling regulatory conditions for the European industry to become a global leader in this sector.

5.2. Defining a common language and metrics

In order to capture the socio-economic value of digital innovation investments – health, social care, active ageing and inclusion, there is a need to define a common nomenclature and methodology to measure and quantify desired outcomes. The Monitoring and Assessment Framework of

the European Innovation Partnership on Active and Healthy Ageing[3] is in a central position to establish itself as the recognised nomenclature and methodology that will enable the establishment of this "common language" to measure the impact of digital interventions in digital health and care.

To safeguard the universal comparability of assessments and evaluations in the domain of digital health care the common language must include measurements in a multitude of critical domains Including:

- Comparable data for clinical decisions, including metrics but also clinical endpoints
- Personalized data allowing more focused interventions
- Evidence for Clinical Practice Guidelines (CPG)
- Data to better understand current unmet needs
- Data to evaluate patient engagement (capabilities and willingness)
- Meaningful data for patients
- Benchmark data for policy makers to evaluate value of interventions Patient Reported Outcomes – with a strong focus on quality of life – should likewise be part of this common language.

The **Blueprint champions** commit to continue working together in the use and further development of MAFEIP as the reference tool to measure the socio-economic impact of interventions in digital health and care, whilst building on existing **business models**.

The evidence-base to support decisions to invest in digital innovation for health and ageing builds, among others, on the EIP on AHA repository of Innovative Practices[4] available to all and used by a wide range of partners and other stakeholders.

Joining EU activities, such as the EIP on AHA and other networks, participating to international projects represent the gateway to multiagency partnerships connecting funding instruments at the local-regional, national and international levels. Integrating the societal dimension that is grounded in the richness of EU diversity in this vision brings the potential of large scale and sustainable development at the same time stimulating cohesion

5.3. Connecting the various funding instruments

The Blueprint champions commit to supporting and strengthening this evidence-base with results of their own interventions through the EIP on AHA repository of innovative practices.

At present, very few projects funded by national and EU R&I programmes are truly multi-department, multi-disease related; multi-technology enabled and comprehensively cover all facets of a care redesign program. R&I projects remain limited in their impact by focussing exclusively on a specific use case, a specific care pathway, and a specific technology. It is

[3] MAFEIP Monitoring and Assessment Framework of the EIP on AHA can be found here: http://is.jrc.ec.europa.eu/pages/TFS/MAFEIP.html
[4] The Repository of Innovative Practices of the EIP on AHA can be found here: https://ec.europa.eu/eip/ageing/repository_en

also the case that some of the most exciting arguments for integrated care require an established interoperability framework – including interoperability of multiple providers and complex datasets.

Learnings from ongoing projects are to be the basis for new projects, ultimately encouraging multi-agency partnerships across health and social care to facilitate the necessary transformation.

Subsequently, this would lead to larger scale implementation and exploitation of integrated care programs and projects, and support experience sharing in daily routine practice of digital health solutions.

The transformation needed in comprehensively redesigning the care process is so fundamental that a sustained multi-year, multi-disciplinary research program is required, across different funding instruments.

Digital Health technology, solutions and services become too complex to develop alone and to be adopted. This calls for an all-inclusive innovation ecosystem with all value chain stakeholders, including small and large industry players, universities, health and care providers, informal carers and patients. Those involved in this ecosystem need a common language and acceptance of principles of interoperability.

5.4. Understanding "demand for" and "supply of" innovation

There is a need to understand what drives demand for innovative solutions in health and social care. Demand that comes from public authorities, health and social care organisations, payers and insurers, care home managers, tax-payers, healthcare professionals, patients and informal carers etc. A better understanding of demand drivers, types of technology / solutions / services to meet specific 'needs' will enable the champions to align their instruments to foster the development of solutions in key priority areas.

A European regional mapping of investment commitments by public and private authorities is developed within the network of the EIP on AHA Reference Sites. As part of the creation of this mapping, the Blueprint champions will work together to identify national and regional organisations (public procurers, public and private health and care organisations, payers etc.) that are investing in large scale deployment of innovative solutions for health and care (2016-2018) with details on "type of solutions required", "amount of investment", "timeframe for investment" and "citizens impacted".

We need to understand better and stimulate more demand-side innovation (e.g. health and social care providers, regional authorities, insurance organisations etc.) in order to ensure that the innovation is adoptable. Reaching a critical scale of demand for digital innovation will yield a higher return for investments.

Different mechanisms should be envisaged. Public authorities may promote innovations by directing private & public demand through regulation. They might also re-enforce complementary measures, in particular measures advancing information regarding and awareness of new technologies as well as the promotion of required complementary skills.

The rate of change for digital innovation evolving faster than policy making it requires that governments anticipate market developments and future demand by strengthening the dialogue with market players and enabling information sharing between private parties.

Smart procurements matter in this respect. There are multiple channels through which public demand for and procurement of innovative products can spur innovation.

The adequate instruments to incentivize demand for innovation in health and care solutions can include instruments such as public procurement of innovation (PPI - for procurement of innovative products and services) or pre-commercial procurement (PCP). PPI initiatives that involve regions and public authorities from the demand-side, entrepreneurs, SMEs and industry players from the supply-side, along-side end users, are engines that can accelerate the introduction of digital innovation in the EU market at large scale.

But in addition to mechanisms already in place (at early stage), further consideration can be given to other mechanisms that could effectively stimulate demand for innovation beyond R&I funding.

These include **tax policy instruments** (tax breaks or reduced rates) for investments in the implementation of ICT-enabled services for health and care provision. It can also include the development of new models for **clinical evaluation and evidential outcomes** that are conducive to a fast-changing digital world. In addition, **standard setting and the regulatory frameworks** applicable in areas such as the free flow of data, cloud computing and privacy can affect demand and market outcomes. The regulatory approach pursued in these areas can lead to either customer / user trust (and thus acceleration of the diffusion of innovation) or distrust / uncertainty (further market fragmentation, less investment in innovation and stagnation in the creation of value from new products and services).

Beyond the demand side aspects of innovation, supply side matters too. Innovation policy and instruments are fragmented in Europe, between the European Commission and the national authorities, but also amongst the several DGs or Ministries in charge. There are so many different programs for the funding of innovation that companies wishing to receive funding may have problems in realizing where to go and for which line of budget to apply.

European funding policies should re-enforce already existing regional or local projects. Aiming at reducing current complexity and fragmentation, strong alignment in industrial innovation policy in the field of digital health should be emphasized in Europe and across EU Members States. The principle of speak European, act local should prevail.

In addition, despite the efforts deployed over recent years, we still need to enable a more effective technology transfer between universities and industry in Europe. As cooperation has become more important than competition as a key driver for innovation, cooperation networks and innovation platforms should be encouraged.

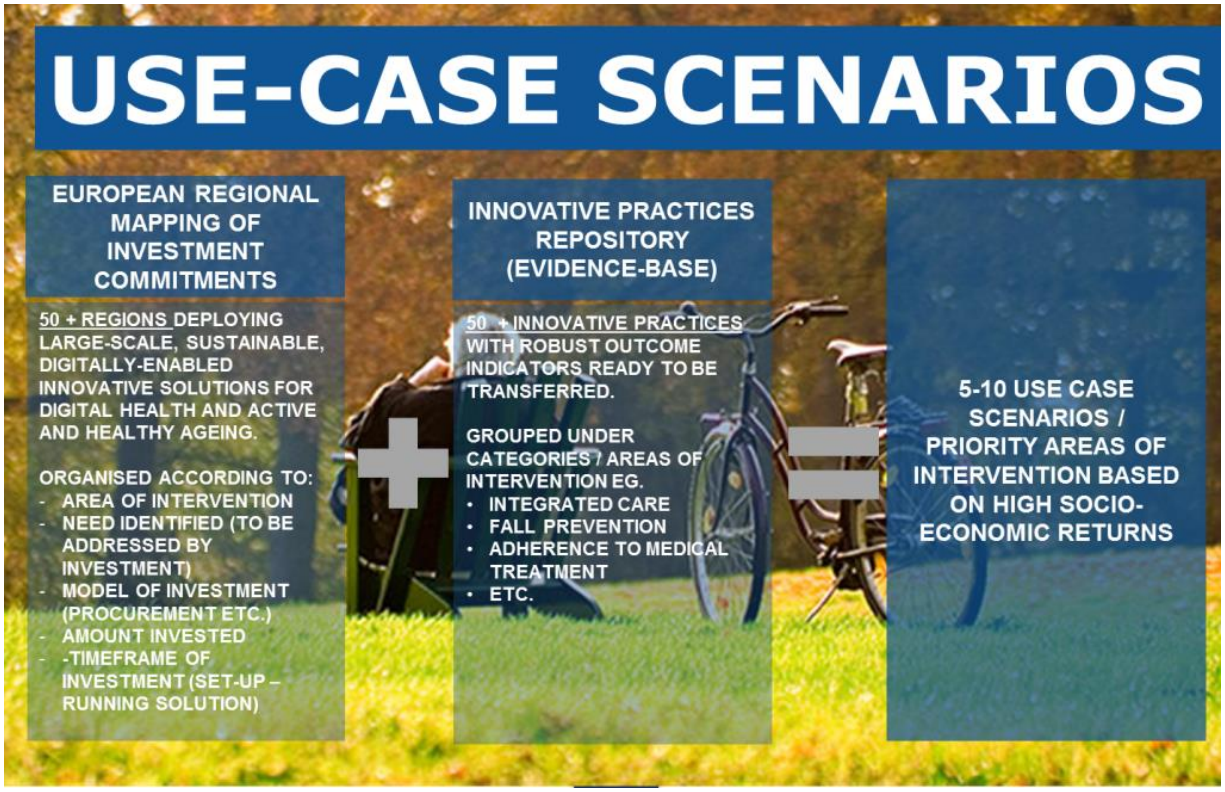
Healthcare presents a rich set of use-cases that can benefit from ICT-enabled solutions and services. But these use-cases are complex and transcend multiple agencies and supply chains. It is inevitable that interoperability of services and technology will sit at the heart of innovative and integrated care models. All stakeholders must acknowledge that the end goal of using digital innovation is to provide better care across health and social care in a cost-effective manner. Positive disruption of established service delivery must be better accepted and incentivised. It is inevitable that interoperability of services and technology will lie at the heart of innovative and integrated care models. All stakeholders must acknowledge that the end goal is to use digital innovation to provide better care across health and social care. Positive disruption of established service delivery must be better accepted and incentivised.

6. Priority areas of intervention (High Socio-Economic Returns)

The area of health and care innovation is diverse and wide ranging in the type of technology, solutions and integrated service platforms that are on offer. It is also a dynamic sector that is permanently developing and marketing new types of solutions designed to respond to specific needs from buyers, users and procurers.

In order to deliver tangible results at large scale it is necessary to focus the Blueprint on a limited set of use-case scenarios where there is sufficiently mature and robust (validated) information to attest the socio-economic benefits (economic viability and social impact) of investing in innovative digital interventions (substantiated in the EIP on AHA repository of innovative practices) for users, professionals and healthcare organisations, and where there is an identified "need" (based on the European regional mapping of investment commitments). An important point to mention is that a good technology (*technically speaking*) does not guarantee adoption and dissemination. Solutions developed must be user friendly, but beyond only smart service design will enable actual adoption and scaling-up aligned with other drivers.

These use-case scenarios will be the basis to identify the 5-10 priority areas of intervention (High Socio-Economic Returns) that will help to focus the policy instruments of the European Commission in the period of 2016-2020.



7. Identifying Transformation Enablers

What are the "enablers" that will support this process of transformation of health and care delivery in Europe?

7.1. Workforce Training and Skills Development

Without the engagement of health and care professionals the adoption of digital innovation for health and care is unlikely. The root causes that lead to professionals being "open to" or "defensively against" the introduction in health and care of new ICT-enabled solutions varies greatly across countries and even local settings. It is affected by payment models, organisational structures and ultimately, a very personal take on how technology can help the provision of quality health and care services.

However, irrespective of personal attitude towards ICT-enabled tools, digital literacy by health and care professionals is a key enabler for adoption of digital innovation. Health and care professionals need to develop the competencies required to organize, deliver and manage digital health and care services, whilst understanding the benefits of digital health and anticipating effects on strategy, organisation, processes and people. Continuous education of health professionals in the knowledge, use and application of digital health technology should be central to the European and national digital health agendas.

Health and care professionals need to develop the right digital skills to capture opportunities particularly in sectors with critical labour shortages such as "carers" (paid and informal) to support the current challenges. With a predicted shortage of up to 2 million health workers and 20 million care workers in the EU by 2025, the care workforce presents a challenge for the optimum organisation and quality of health and care delivery across the EU.

Digital literacy of health and care professionals will likely be enhanced by greater demand of digital health will likely enhanced the. Hence, all measures targeted at incentivizing the demand of digital health, such as more advantageous reimbursement schemes, will lead to improvements in the digital skills of the health and social care workforce.

Additionally, there is a need to establish mandatory tailored training programs on digital skills for health and social care professionals across Europe. Such training programs should be continuous, starting from an early stage of education, and continue in work place learning and professional development programs.

Digital skills development of the health and social care workforce will also benefit from a shared vision by all relevant stakeholders on the training needs and gaps. Eventually this could lead to developing a single approach, bringing together all existing national initiatives and best practices, in close collaboration with medical societies and professional organizations.

The certification of digital skills for all people involved in the supply chain (incl. health and social professionals as well as informal carers') could also contribute to the EU agenda for new skills and jobs by supporting the acquisition of a new set of skills by a particular segment of the labour force. This requires the development of much closer skill-development strategies between healthcare professionals and those involved in supporting care delivery to the ageing population.

The changes in the way care is delivered and enabled by digital technology will require different digital skill mixes and new ways of working for health and social care professionals which will involve digital solutions. This can lead to the creation of new types of jobs and the up-scaling skills in existing health occupations that will address the gaps expected in the labour markets. A European digital skillset for carers which is also recognised by employers will help to address the overall need for more people with digital skills.

It can help target groups such as unemployed young people, people with disabilities and redundant workers to enter the care services market, while acquiring wider useful digital skills and hence contributing to solve the bottleneck of skilled carers in Europe. Joined up activities with the grand coalition on Digital Skills and other relevant programmes for skilling will be explored.

Significant work has been carried out in digital Innovation for ageing well and the silver economy (Carers+ and Grand coalition for digital skills) that support the creation of a new recognised digital skills framework for carers linked to the DSM Action on "Advancing Digital Skills". There is also an emerging body of knowledge in this area, emerging from the EU- US Memorandum of Understanding; particular focus will be dedicated to the digital transformation of industry (Industry 4.0) and how to meet the identified shortages of care workers.

Significant work has been carried out in digital Innovation for ageing well and the silver economy (Carers+ and Grand coalition for digital skills) that support the creation of a new recognised digital skills framework for carers linked to the DSM Action on "Advancing Digital Skills". There is also an emerging body of knowledge in this area, including from the 2010 EU-US Memorandum of Understanding (MoU) for transatlantic Cooperation on eHealth/Health IT. Particular focus will be dedicated to the digital transformation of industry (Industry 4.0) and how to meet the identified shortages of care workers.

7.2. User-generated data-driven economic models.

Patient and user-generated health and care data are expected to further proliferate in the coming decade, creating "continuously evolving and learning health systems". This will potentially disrupt the established status quo of health and social care delivery, opening up the ability to deliver targeted health and social care services to users, and unlocking opportunities for new, data-driven economic models in public and consumer markets. Big data and data analytics are becoming increasingly important trends underpinning future economic models for digital health

and care delivery.

The main challenge for European players will be to capture and act upon this data in a meaningful way – an extra challenge of interoperability, but also a new source of information. This challenge applies to both suppliers of digital services (industry) as well as the demand side (e.g. health and care authorities, healthcare professionals and the users themselves).

The adoption of mHealth, with or without add-on sensors and applications, will play a key role in this respect.

With these developments a renewed need to (self-) regulate through professional guidelines is emerging. The market for mobile health apps needs a clear framework, with clear differentiation between wellness and medical apps, and a clarification on regulatory requirements that apply in every case. The Assessment Guidelines of the Working Group on mHealth[5] are particularly important in this context.

A harmonised implementation of the new EU data protection legislative framework is needed across the EU to ensure patient safety and data privacy, while avoiding the need to address different market conditions in the 28 countries. Moreover, the implementation of the new rules should not hamper innovation, notably with regards to the prospects of the digital health economy. Interpretation of the new EU General Data Protection Directive is increasingly important and it should support convergence and a more harmonized approach amongst Member States.

Appropriate governance frameworks will need to be developed to enable beneficial and ethical use and transfer of personal health data for the delivery of integrated care. It is key that users are able to make informed decisions and that the regulatory context provides certainty and trust to users.

The employment of data-centred approaches must take into account the ethical context and regulatory framework on data privacy. It is key that users are able to make informed decisions and that the regulatory context provides certainty and trust to users.

After several years of experimentation, the time has come to connect the learnings from these experiments and pilots into an evidence-based roadmap for different use-case scenarios (e.g. integrated care) that are data-driven.

7.3. Organisational and Change Management Models

Health and care systems remain the prerogative of individual European Member States. However, some essential preconditions for success of digital health and care interventions have become more apparent over recent years and could be shared across countries, regions or localities.

[5] You can find out more about the Working Group on mHealth Assessment Guidelines here: https://ec.europa.eu/digital-single-market/en/news/new-eu-working-group-aims-draft-guidelines-improve-mhealth-apps-data-quality

The transformation of health and social care systems is a complex programme of change which requires adequate methods, processes, tools and techniques for designing and implementing new care models and for reducing and managing resistance to change when adjusting healthcare organisations to realize coordinated care.

The initiatives related to integrated care showed difficulty in addressing the transformation process. “Changing” in the planning and policy making process is the first step to beginning a complete re-design and also the most difficult; changing people can have an effect on the culture. Managing change is about handling the complexity of the process. It is about evaluating, planning and implementing means and resources available, operations, tactics and strategies and making sure that the change is worthwhile and relevant. Managing change, stakeholders and organisations is a complex, dynamic and challenging process.

Notably, the following areas are widely acknowledged as "enablers of success" in transforming health and care delivery through the integration of health and care services. For example, the governance of coordinated care between health and social care systems, the degree of patient access to medical and social care information, the role of informal health and social carers enabled by tele-health etc.

7.4. Citizen Empowerment and health literacy

Among the relevant items are in particular the importance of a population health approach, appropriate governance and structure, and removal of inhibitors. It is clearly important to recognise at what stage of maturity the areas and services involved in integrated care, whether the integration is horizontal or vertical, are at and their degrees of service readiness.

It is crucial that health and care authorities learn about such models, apply them, and work to introduce them not only to their employees but also the wide range of stakeholders and end-users involved in this field. Moreover, also the potential for novel reporting and learning systems in healthcare, like models of continuous learning organisations as change enablers are worth exploring. Continuous learning organisations may improve their predictive power and develop a more precise medicine centred on the care recipient’s needs and preferences.

While workforce training and skills development is key addressed in section 7.1., citizens' digital health literacy is an essential element for successful transformation towards Integrated Care. The established education systems across Europe have increased their level of digital literacy amongst the population. In that respect a population wide approach to improve health literacy is likely to reach population better and give better results.
Today, ICT enabled tools are part of everyday life like never before. However, the same cannot be claimed concerning health literacy, despite the recognition that health literacy is a determinant factor in improving public health outcomes.

Digital literacy can help boost health literacy. Digitally and health literate

citizens are enabled to play a more active role in their health management (improved self-management) and will be better informed about health issues. Being better informed also means being able to manage, detect and anticipate. Digital health literacy can indeed help improve prevention and adherence to a healthy lifestyle, improve therapy compliance, enhance the safe and proper use of medicines, strengthen the patient involvement and empowerment, and finally improve health outcomes and provide safer care.

Health information exchange platforms and electronic health records systems, and population health management systems should be enhanced in order to support the process of integrating health and social care and a more active participation of patients and their carers. A shift towards patient and citizen-centric care is urgently needed.

Beyond interoperability, the usability of current software also needs to be improved to enable productivity gains from professionals as well as support utilization by citizens.

The citizens' ownership of their own data should be protected adequately as illustrated in section 7.2. but also re-enforced, and technologies that make possible an effective use of this right should be encouraged. Initiatives which enable data portability like the Blue Button from the US Government might be worth exploring in a European context. The need for smart approaches to informed consent is also important to ensure that data flows will preserve the interests and trust of users whilst fostering adoption of innovation.

The digital divide which can originate on socioeconomics grounds, but also on specific health conditions due to physical and/or mental impairment, must not become an exclusion factor. The Blueprint will identify suitable counter-measures to address these issues.

Collectively we need to develop strategies and frameworks at all levels of government to empower and involve patients, healthcare professionals, informal carers and citizens to play an active and pro-active role in managing their own health and reaping the benefits of digital technology for the purposes of health management.

7.5 Standards & regulation

Standards and regulation can affect demand and market outcomes leading to either customer trust (leading to acceleration of the diffusion of innovation) or distrust and uncertainty (leading to lower investment, less value created, further market fragmentation and the stagnation of innovation).

Lack of interoperability is both a reason for and a result of market fragmentation. It perpetuates market fragmentation and creates significant barriers to entry, especially for innovators and SMEs. Better coordination of care requires open platforms and widely adopted standards on which each player can contribute and innovations can thrive.

For the advance of integrated care it is imperative to break this market deadlock and to advance standards and open platforms. The European Commission has referenced standards (including Continua Design Guidelines and IHE profiles) in its eHealth European Interoperability Framework (2013, refined 2015), but it remains the prerogative of the Member States and regions to openly endorse open international standards and prompt procurers to reference them in their tenders, which is the endorsement that will drive the markets. In June 2016, six countries and regions (Austria, Denmark, Finland, Norway, Sweden and Catalonia) in a letter to the eHealth network endorsed Continua Design Guidelines and asked for European assistance in advancing personal health interoperability. In the coming months and years, one indicator of the advance of integrated care will be the extent to which industry will coalesce around open standards and platforms. Some of the most ambitious deployments of innovative telehealth initiatives are happening in the Nordic region. Denmark announced in 2012 a telehealth strategy based on open standards with the goal of transforming healthcare, making the provision of care more patient-friendly and effective, and moving care from hospital to the home

In what concerns regulation, a harmonized implementation of the new EU data protection legislative framework is needed to avoid the need to address different market conditions in the 28 countries of the European Union. Moreover, the implementation of the new rules should not hamper innovation, notably with regards to the prospects of the digital health economy.

Standards and a clear regulatory framework enable interoperability across a wide range of use-cases and fundamental areas of digital health infrastructure (e.g. electronic health care records, telehealth services including device connectivity, eHealth service delivery as well as welfare services, smart communities and smart homes). The most beneficial way to introduce and govern standards is equally critical. Standards are better defined on global level for a global market. Most interoperability problems have a global nature. There is no obvious need for European-specific standards for digital health. An open governance model where all stakeholders (including industry and end-users) are involved is recommended to leverage experience and guarantee adoption (e.g. Continua Design Guidelines or IHE profiles).

The implementation and deployment of interoperable products is the primary barrier faced today. Standards adoption and deployment governance need to be supported by an overarching set of potential regulatory instruments, tools and a set of use cases associated with interoperability requirements. This reflection will build on existing initiatives such as for instance the E-Health European Interoperability Framework (eEIF) starting with the 27 profiles identified for procurement[6] This is expected to maintain eHealth and mHealth test tools that are needed to support both industry/technology developers and deployment projects.

In order to promote these initiatives, different types of support actions can be considered at EU as well as national level, notably testing events, or training events like for instance (non exhaustive list).

These initiatives can pave the way to a better and quicker adoption of interoperable solutions, but they will also require a high-level political and financial support to be actually implemented.

Last but not least, self-certification is a cost-effective compliance mechanism (e.g. DICOM, IHE) for healthcare providers who do not require third-party verification.

Standards to support interoperability and certainty in regulatory frameworks are together prerequisites to reach economies of scale for companies which offer digital health-related goods and services. This in turn leads to lower costs for users, and a more rapid take-up of technology, solutions and services as experience is transmitted faster between different countries.

Over the last five years, several incentives to health and social care transformation have been introduced both in the USA and in several EU Member States. It is increasingly becoming clear that outcome-based reimbursement, which provides a payment envelope covering actions by all stakeholders in the care process (also called bundle payment for episode of care or capitation for long-term chronic diseases, and thus avoid over-diagnosis or treatment) and which penalizes waste (readmissions, preventable adverse events) is more likely to incentivize Integrated Care than volume-based reimbursement (the current fees for service model) ever has. Exchange of expertise and innovative practices between national/regional health services can stimulate and de-risk transition.

Paying more is paying more attention. It could be that in the future, higher costs, exclusions in insurance coverage, combined with frustration with disconnected care systems, are all factors likely to mobilise patients and

[6] http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32015D1302&qid=1458923568002

citizens to call for a number of changes in health and care provision. The citizens may become the main engine of change rather than the care providers.

7.6. Other incentives to transformation

In addition, data is becoming the new oil of the digital economy. The willingness of providers to share data (in a safe anonymised mode) in exchange for the use of clinical information/applications, such as benchmarks versus peers, adverse event detection (eg: hospital acquired infections), decision support at the point of care, and risk stratification may become an opportunity for data-driven companies. In this context it is critical that the citizen's ownership of their data is preserved, whilst ensuring that there are adequate procedures for informed consent of the use of this data.

However, while new innovative business models can reconcile the one who pays and the one who gets the benefits, the reality is that large scale deployment in Europe will require transitioning funding to allow old processes to shift to new ones. Whilst there are some existing funding instruments available (Horizon 2020, eHealth section of the Connecting Europe Facility, EU regional and structural funds, the European Fund for Strategic Investments (EFSI)), the reality is that these remain largely independent from each other and do not support a shared and coherent future vision.

It is essential that within the next years, the European Commission, together with Member States, regional authorities and industry players define new models of co-financing bringing together public and private organisations involved in health and care to support large scale deployment of innovation. Everything that exists today is "partial" and does not support a common vision. Incremental investment in outdated processes and technology is still widespread and this consumes precious resources.
While existing funding instruments exist at the European, national or local levels, none are really self-sufficient and aligned to allow for this transitioning.

Many projects have failed because of the lack of focus on organization and change management. On top of the investment in connectivity, alignment and collaboration within and between the health and social care sectors, we need to put equal focus on service delivery mechanisms, process & workflow design, financial flows, workforce changes and patient and citizen engagement

We must strive to achieve a new model of public private partnership for health and care transformation that will deliver real benefits for the ageing population, the European economy and sustain the future viability of public health and social care delivery.

7.7. Alignment of financial instruments and funding mechanisms

It is essential that within the next years, the European Commission, together with Member States and other stakeholders, (regional authorities , industry players, etc..) more explicitly promote and communicate this vision supported by:

- New models of financing and investment bringing together public and private organisations involved in health and social care to support large scale deployment of innovation should be defined and introduced to the markets.

- Funding for attracting innovative concepts and technologies should also support continuous innovation and scalability, as well as preserve the independence of the health and social care systems it serves.

Special consideration should be given to projects and initiatives that fully support the European vision and strategy, on order to ensure strategic focus and the highest impact of the Blueprint..

8. How the Blueprint will Work

The intention of the authors and champions of this initiative was to respond to the invitation launched in December 2015 by Commissioner Oettinger (Digital Economy and Society) and mobilise an initial set of stakeholders able to commit to a common vision and to joint-actions. A plan that could contribute to the development and implementation of this joint-vision; i.e. achieving large scale deployment of digital health and care innovation across Europe, in a way that improves quality of care offered to users, leads to more sustainable health and care service provision and creates economic growth opportunities and jobs for European industrial players and entrepreneurs.

This document has been subject to an open consultation in the run-up to the second European Summit on Digital Innovation for Active and Healthy Ageing (5-8 December 2016). It underpins the initial set of objectives, and identifies an initial set of "Champions" that have been mobilised to support the shared vision.

A series of major events such as the Active Assisted Living Joint Programme Forum 2016 (September) have already offered important opportunities to debate the Blueprint, and to expand the conversation to a wider range of organisations that contributed ideas and in some cases commit to this shared vision and its implementation.

By the end of December 2016, the champions will agree on the first version of the blueprint (based on the discussions held at the European Summit on Digital Innovation for Health and Active Ageing, 5-8 December 2016).

From then on, the European Commission will be supporting the development and implementation of the agreed actions during 2017-2018.

But the Blueprint is and will remain owned by the stakeholders that voluntarily agree to collaborate and commit to move it forward with a view to achieving the 2018 Goals.

9. List of Initial Champions*

ORGANISATION NAME
European Innovation Partnership on Active and Healthy Ageing (EIP on AHA)
Reference Sites Collaborative Network of the EIP on AHA
European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry (COCIR)
European Health Telematics Association (EHTEL)
Personal Connected Health Alliance (PCHA)
Integrating the Healthcare Entreprise (IHE)
European Connected Health Alliance (ECHAlliance)
EUROCARERS – European Association Working for Carers
AGFA HealthCare
Alliance for Internet of Things Innovation (AIOTI)
Orange HealthCare
Philips
Tunstall Healthcare

** The Champions are organisations that have contributed to this draft background document and that agree with the overall principle of developing a shared vision on how digital transformation of health and care can benefit Europe's ageing society.*

IMPORTANT: Organisations that wish to contribute to the blueprint as "Champions" must suggest actions that can make a direct and tangible contribution to the defined 2018 goals (Deployment, Investment and People) within the established Use-case scenarios.

For more information and to follow the development of activities in the context of the Blueprint, please visit: https://ec.europa.eu/digital-single-market/en/news/blueprint-innovate-health-and-care-europe