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Role of twinnings in scaling up innovative solutions across Europe

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ABSTRACT

Introduction Twinnings are cross-border knowledge exchange activities where two or more organisations learn from each other's experiences and are often used as a scaling up mechanism.

Objectives This paper discusses the importance of twinning activities in scaling up by promoting community building, knowledge sharing and innovation transfer among stakeholders in European countries. It explores the role of twinnings in the scaling up model of the European Innovation Partnership on Active and Healthy Ageing) and the Innovation Networks for Scaling Active and Healthy Ageing (IN-4-AHA) project.

Methods The study employed a qualitative approach, drawing insights from various sources, including the Scale AHA study (2017), the IN-4-AHA's scaling up model and twinning reports.

Results The findings reveal that twinning activities provide stakeholders with a unique opportunity to learn from the know-how of other like-minded partners, improve the quality of their work and iterate on their innovations. They also highlight that twinnings are particularly relevant for some stages in the scaling up process, such as in the assessment of a network of potential partners and during the evaluation of the environment, the innovation could potentially be transferred to.

Conclusion Twinnings are highly regarded as community-building and knowledge-sharing activities with clear advantages for companies and other stakeholder groups. Including twinning activities in the scaling up model has proven benefits for companies and projects that have a strong need for community building and innovation transfer.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ The existing scientific knowledge on the subject suggests that scaling up is crucial for organisations to achieve growth and maintain competitiveness. Studies have shown that rapidly expanding firms contribute significantly to employment and economic advancement, and that entrepreneurship and innovation can be major driving avenues growth, but require supportive government initiatives. The European Union has implemented various policies and initiatives to promote scaling up, including twinnings, which involve knowledge exchange and technology transfer. Our study explored the role of twinnings in fostering digital innovation for active and healthy ageing in Europe, revealing their importance in building cross-border collaborations, sharing innovative practices and supporting community-building efforts.

WHAT THIS STUDY ADDS

⇒ This study adds insights into the specific role of twinnings in promoting digital health innovation in Europe. It offers an understanding of the advantages, difficulties and results of twinning activities, contributing to our comprehension of how they influence knowledge exchange and the sharing of innovation among diverse European regions.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Our study highlights the value of twinnings as a tool for promoting cross-border innovation exchange in the field of active and healthy ageing. Additionally, it may encourage practitioners and researchers to consider twinning activities as a means of enhancing knowledge transfer and collaboration in the digital health sector.

INTRODUCTION

Scaling up encompasses the act of augmenting an organisation's magnitude or broadening its undertakings to accomplish progression and enhance its

market presence. Hence, it emerges as a pivotal tactic for enterprises aspiring to sustain competitiveness and attain enduring success. Research conducted by the Kauffman Foundation[1] and McKinsey & Company[2] reveals that rapidly expanding firms are the foremost generators of employment, make substantial contributions to economic advancement and yield superior returns for stakeholders. Furthermore, a study by the Brookings Institution highlights the role of entrepreneurship and innovation in driving growth and emphasises the need for supportive policies and infrastructure to enable successful scaling up.[3] Aiming to influence the process at structural levels, the European Union (EU) has implemented various policies and funded initiatives to promote scaling up, mainly the European Structural and Investment Funds that have funded initiatives such as Digital Innovation Hubs, and the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) that promoted innovation in the field of healthy and active ageing to improve the quality of life of older people.[4 5] Among the many instruments employed by these initiatives, twinnings were notable activities. In a broad definition, twinning is a partnership between organisations of different sizes in which the larger organisation provides mentorship, resources and expertise to help the smaller organisation grow and scale up.[6] By adopting this approach, the smaller organisation can acquire knowledge from the larger organisation, while the larger organisation can also benefit from fresh perspectives and innovative ideas from the smaller organisation.[7] At the level of the European Commission, twinnings are an instrument to facilitate the cross-border transfer of knowledge and technology. They have been used for institutional cooperation between Public Administrations of EU Member States and of beneficiary or partner countries.[8] Twinnings are cross-border cooperation programmes, that allow knowledge exchange and technology transfer between different EU regions: one being the originator (the developer of the initiative/innovative solution) and the other being the adopter. Participants establish an action plan to learn and/or implement the innovation/good practice. Other authors have already established the value of twinnings as an integral part of scaling up innovations.[9]

The Innovation Networks for Scaling Active and Healthy Ageing (IN-4-AHA) project (2020–2022, funded by the European Union's Horizon 2020 research and innovation programme) aimed to promote digital innovation in the field of active and healthy ageing. The project sought to coordinate and support the scaling up of mechanisms developed by EIP on AHA, as well as bring together new actors in the field and provide opportunities for testing and sharing innovations. Hence, this article presents a summary of the results of the IN-4-AHA twinnings programme[10] and explores the value of twinnings as a tool for supporting the transfer of innovation and sharing of knowledge across different EU regions.

MATERIALS AND METHODS

The rationale for data collection and analysis was threefold: recruitment process, programme implementation and results evaluation. An open call for twinnings was launched in November 2021 and January 2022 (https://futurium.ec.europa.eu/en/active-and-healthy-living-digital-world/forum/4-aha-twinning-call-applications), accessible to IN-4-AHA's community members.[11] A maximum of 10 originator-adopter pairs could be selected, and awarded €5000 each for their travelling and accommodation expenses, to be used between 1 January 2022 and 30 October 2022. The only exclusion criterion was if the participants' organisation was not part of a Reference Site,[12] while in opposition, having a digital, transferable, socially and healthwise impactful and cost-effective innovation was valued. The evaluation and selection of applications were executed by the IN-4-AHA consortium members and external representatives from the Reference Sites Collaborative Network.[13] The chosen twinning projects signed a cooperation agreement contract between themselves and the University of Porto—the IN-4-AHA partner responsible for the programme—and were tasked with three deliverables: (1) a work plan (application form), (2) a mid-term report and a (3) final report. These templates can be seen in online supplemental appendices 1–3, respectively. These reports were comprised of multiple choice and open-ended questions, meant to collect both quantitative and qualitative information, which constitutes the backbone of the data analysed in this report.

When it came to data analysis participants were given the freedom to share as much information as they desired without any limitations on character count. However, this presented some challenges in identifying key trends within the mostly qualitative information provided. To overcome this, the answers from open-ended questions were grouped into logical themes using stochastic decision lists and keywords were coded and interpreted.[14–16] The results were presented in a frequency distribution, with the 'n' representing the number of times a specific category or keyword was mentioned in the raw data. However, due to the low statistical significance of the total number of answers, the results were primarily presented in graphic form to provide a general overview of the characteristics of the twinning programme and protect any potential intellectual property or personal information shared in the reports.

RESULTS

The twinning programme involved stakeholders from eight European countries, with southern European countries being particularly well-represented. Spain had the most participation with six, followed by Portugal with five. Spain's Galicia, Andalusia and Catalonia regions were present in the twinnings, while Portugal was represented by Coimbra, Algarve, Lisbon

and Porto. The UK also had three participants, with two from Northern Ireland and one from Scotland. Among the stakeholders, research and academia had the most participation, followed by innovators and policymakers. This data suggests that university personnel and researchers from southern European countries are particularly active in the programme and may have more flexibility to participate in expert exchange activities. It also highlights that for stakeholders from organisations such as innovators, different arrangements may need to be made to accommodate their needs, such as reimbursement for daily rates.

The twinning pairs did not engage in any adoption or acquisition activities. Instead, the majority classified their activity as 'Knowledge exchange and training' and/or 'Adaptation'. Out of 10 twinning pairs, 3 identified as both types. Specifically, 60% (n=6) of participants classified their twinning as 'Knowledge exchange and training' and 40% (n=4) as 'Adaptation'. The innovations shared were primarily 'apps/web platforms' (n=7), followed by 'training programs for patients/users'. Many twinning pairs chose more than one option to describe their innovative practice, and the twinning programme had a strong focus on digital health solutions. Overall, most of the innovations were considered mature, with a TRL (Technology Readiness Level) of 7 or higher. Specifically, 60% (n=6) of the twinning innovations were reported to be at a TRL of 9. The main characteristics of the twinning projects can be found in table 1.

In terms of implementation of the programme itself, half of the twinning pairs (n=5, 50%) reported having based their activities solely on in-person meetings and informal knowledge exchange and most twinning pairs have claimed to not have sought any sort of funding (n=4, 40%) other than the IN-4-AHA funds, or to be thinking of applying for other European Comission (EC) funded projects (n=4, 40%), three adopters referred using funds from their national or regional budgets (n=3, 30%) and one (n=1, 10%) to have used money from their own organisation. At the end of activities, the overall budget execution was 50%, which roughly translated to €25 000.

For originators, on the question of 'processes and time for adoption (post-development)', originators have answered it in three different ways by: (1) providing general information on how long their innovation took to develop, and hence, how long it could take for the adopter to do the same (n=3), (2) how long it took for the innovation to be launched, in general (n=2) and (3) how they envisioned that the innovative practice could continue to be implemented by the adopters in the foreseeable future (n=3). On the issue of costs and outcomes, some originators chose to focus on costs (n=5) while others on the outcomes of the implementation of the innovative practice (n=2). Three projects have provided no data. As for the 'business case for sustainability and scaling up', most adopters have stated that no study has been prepared as of the time of the finishing of activities (n=7). Then, three adopters referred that while no formal business case had been made, there were exploitation avenues being considered for the continuation of the project—and foreseeably, only then, such plans could be made. For those originators that claimed to have developed a business plan (n=3), one was based on the EU, and another by continuing the improvement of the product with stakeholders from the adopter's region and, integration of the innovation in international social prescription platforms and engaging with future users such as care homes and health students. As for the main benefits of participating in the activity, originators referred knowledge sharing (n=7), recognition of the work developed (n=2), joint projects with adopters (n=2), exploring how the innovation could be implemented in a new setting (n=2), exploring barriers and enablers in the adopter's ecosystem (n=1) and continuing the development of the innovation in the adopters' ecosystem (n=1).

For adopters, when it came to the rationale for choosing the specific innovative practice shared in the twinning, three twinning pairs have indicated that 'learning from an innovation to complement services already being provided' (n=3), 'gaining knowledge about international AHA ecosystems' (n=3) and 'learning from an innovation to develop new services and projects' (n=3) were the main reasons. As for the needs being addressed, some twinning partners directly referred to a national health policy document that detailed priorities and strategies in healthcare investments, for others who may not be as aware of these overarching policy instruments, their regional needs assessment was mostly based on their own empirical observation and the work being developed by their organisations, such as services for cognitive decline (n=3), digitalisation of health and social services (n=3), optimisation of resources (n=3), home care services (n=2) and promotion of active and healthy ageing (n=2).

When it came to twinning participation benefits, both industry and governmental agency adopters found the twinnings beneficial as they provided opportunities to develop or improve on the services they already provided (n=5). On the other hand, new partnership opportunities (n=3) had a positive impact shared between industry, research and academia, and civil society stakeholder types and co-creation moments (n=2) with users were stated as positive outcomes by both industry and civil society.

For both originators and adopters, when it came to the development of a concrete action plan to transfer the solution from the originator to the adopter's ecosystem, most twinning projects had not developed one (n=6). Since a significant percentage of projects in this programme were 'knowledge exchange' based, this was to be

Table 1 Innovation Networks for Scaling Active and Healthy Ageing twinning innovations

	Short description	Originator	Adopter	Innovation type	Twinning type/main objective
Actif age platform (Portugal)	Online platform that provides ready-to-use content that has physical and cognitive benefits for the elderly. In addition, it helps institutions plan activities to improve their service to their guests, giving them more time for individual care and exceptional cases.	Actif age.	Atendo.	ICT tools supporting adherence to care plans. Applications/web platforms. Training programmes for patients/users.	Adaptation.
Andalusian health population database (Spain)	'The Andalusian Health Population Database (BPS)' is a Health Information System (SIS) based on population that collects clinical data and the use of health resources of each of the individuals that are part of a population.	Regional Ministry of Health and Families of Andalusia/Andalusian Health Service.	AD-ABC Associação para o Desenvolvimento do centro académico de Investigação e formação biomédica do Algarve (Universidade do Algarve).	Care provider EHR systems integration (joined-up/shared records). Health and care needs assessment toolkit. Applications/web platforms.	Knowledge exchange and training. Adaptation.
Apps4Dementia library (UK)	Apps4Dementia library is a new digital service offering support for people living with dementia and their carers. It hosts a selection of safe and trusted mobile applications that provide people affected by dementia and their carers with information and guidance on the condition, advice on self-care and how to carry on with their day-to-day activities for as long as possible.	Digital Health & Care NI, Public Health Agency and Dept of Health N Ireland.	Department of Public Health, University of Naples 'Federico II'.	Applications/web platforms.	Knowledge exchange and training.
ClicSalud (Spain)	ClicSalud+is the portal for citizens' secure access to personal health information, for both administrative (eg, centre and professionals assigned) and clinical (reports, medication, analytical test results, etc) purposes, facilitating common procedures (requests for or changes to appointments, choosing centres and professionals, renewing health cards, etc).	Regional Ministry of Health and Families of Andalusia/Andalusian Health Service.	Scottish Government, Digital Health and Care Directorate.	Online health portals. Applications/web platforms.	Knowledge exchange and training. Adaptation.
Healthy Lifestyle Assessment Toolkit (Portugal)	The Healthy Lifestyle Assessment Toolkit has been built following a co-creation exercise developed by an interdisciplinary panel of experts, technology developers and end users to implement a technology-assisted eight dimensions containing a survey designed to extract (by replying to queries or interacting with technologies) data into a toolkit database. At the end, the user is offered a lifestyle recommendation report.	Ageing@Coimbra	FORTH, Foundation for Research and Technology - Hellas and University of Crete.	Multidisciplinary team support, workflow, care planning and coordination.	Knowledge exchange and training.
InspireD and Clear dementia applications (UK)	InspireD Reminiscence App—this is an application developed by Ulster University that supports people living with dementia and their carers to record their life, their story on an app specifically designed for smartphones and tablets. CLEAR Dementia Care App is an application that facilitates the communication between patients and their carers, presenting information in a clear manner.	Digital Health & Care NI, Public Health Agency, obo DoH NI.	Greek Carers Network EPIONI (NGO).	ICT tools supporting adherence to care plans. Applications/web platforms.	Knowledge exchange and training.
LabSaud (Spain)	Living lab integrates an innovative approach to the care of elderly and chronic patients, introducing new technologies user-driven and tested in real-life contexts.	Axencia Galega de Coñecemento en Saúde (ACIS).	Centro de Investigação, Diagnóstico, Formação e Acompanhamento das Demências (CIDIFAD) da Santa Casa da Misericórdia de Riba d'Ave.	Multidisciplinary team support, workflow, care planning and coordination. Other—Living labs.	Knowledge exchange and training.
My home fits & Smart Library (The Netherlands)	The 'Smart Library' enables older people and their (professional or informal carers) to get neutral information (not a sales pitch) as well as to lend these smart technologies for a few weeks to experience the use and value of this in their regular daily lives. My home fits is a service that provides users with a series of home improvement tips and tools to avoid these crisis situations, in the 'House Tests' performed via an online platform, and then can be implemented by in-person volunteers.	GeneratieThuis.	Atendo.	Technology for fall prevention. Home care, tele monitoring and mobile health systems. Age-friendly buildings. Training programmes for patients/users. Training programmes for health professionals.	Knowledge exchange and training.

Continued

Table 1 Continued

	Short description	Originator	Adopter	Innovation type	Twinning type/main objective
Protein Fortified Bread (Germany)	Optimisation of the cereal-based functional food (bread) products enriched in plant-based protein.	University of Hohenheim, Process Analytics and Cereal Science.	University of Coimbra, Faculty of Sport Sciences and Physical Education.	Technology for fall prevention. Training programmes for patients/users. Other, specify. Creation, development and implementation of novel baked goods, nutritionally rich in plant-based proteins.	Knowledge exchange and training. Adaptation.
SoCaTel (Spain)	The SoCaTel team has developed a useful, transparent and easy-to-use platform following a quadruple-helix approach, in which service users, care professionals, researchers and innovators can collaborate throughout the process. It is based on the first-hand knowledge of the needs of all the people involved and they can choose how to receive or give these services.	Rovira I Virgili University.	Innovation Centre of the Usti Region.	Applications/web platforms.	Adaptation.
ICT (Information and Communication Technology)/Informa EHR (Electronic Health Record)					

expected. On the question of 'how has the twinning contributed to the adoption of the practice', participants' answers varied mostly according to the level of implementation of the innovations. Hence, some twinnings referred that the programme contributed by allowing knowledge transfer between parties (n=3). This included learnings that would continue to be used in the development of upcoming similar innovations (n=1), but also knowledge on the possible barriers and priorities to account for when planning the scaling up of the innovation (n=1). Others have claimed that the twinning had been a valuable tool to set the groundwork for the innovation's adoption (n=2), to set-up contacts and provide inspiration to stakeholders (n=1) and to improve and increase awareness about the innovation (n=1). As for a fully realised completion of project activities resulting in the adaptation of innovative practice, SoCaTel was the major example. SoCaTel is already implemented in several countries, and the transfer to the Czech Republic will be a solid example of scaling up that was facilitated by the IN-4-AHA's twinnings programme.

DISCUSSION

Testing innovative practices in various European countries provides stakeholders with a valuable opportunity to learn from like-minded partners, enhance their work quality and services and iterate on their innovations. This aspect holds a crucial place in any scaling up model, involving test phases and seeking complementary partners. Projects at all TRL levels can benefit from these activities, be it for learning, testing, adopting or selling innovation, which can be tailored to different twinning types. The EIP on AHA scaling up model[17] takes this aspect into account, with two key parts: deciding what to scale up and how to scale up. The practical side of the model focused on making practices accessible to the public, starts by fostering partnerships and implementing them. In this regard, twinnings play an essential role in the scaling up process. Generally, they facilitate partnerships between stakeholders hailing from diverse regions, but in a more practical sense, they also create an avenue for these stakeholders to experiment and evaluate their innovative practices. Both the Scale AHA study[18] and the IN-4-AHA twinnings activity report[10] underscored this aspect by showcasing the fact that many of the difficulties felt while trying to implement the innovations during the twinnings, were context-related, and can be at least partially mitigated if there is extensive knowledge and previous interactions with the ecosystem stakeholders wish to scale up to. During the IN-4-AHA's coordination and support action, twinnings fulfilled a similar function, creating a platform for the exchange of innovative practices across borders. Parallelly, the IN-4-AHA continued pursuing one of its major objectives: the development of a new scaling

up model. The IN-4-AHA scaling up model[19] targets companies and service providers. It has five different stages and two horizontal pillars. These pillars are (1) strategy, and (2) stakeholders, highlighting the importance of proper planning and keeping the individual front and centre when designing a scaling up plan. As for the five steps, they are: Learn, Plan, Pilot, Prepare and Ramp-Up. These sequential (but fluid) steps are divided into different categories, to which the innovator must pay attention before deciding if to move on to the next step.

Activities like twinnings hold specific importance for certain stages within the scaling up model. Assessing the network of potential partners during the 'Learn' phase serves as a clear example. Smaller companies often do not have enough scale to compete with larger enterprises, meaning that they can find great value in synergies with complementary partners. Even for large companies, knowledge exchange can be beneficial, notwithstanding the issue of corporate secrets, which often forces them to work in silos. Relying on specialist communities, such as the EIP-AHA/IN-4-AHA community, allows startups and SMEs to informally get to know like-minded partners and allows them to find common ground to collaborate on future projects. Twinning participants were facilitated in precisely achieving that. Most twinning partnerships focused on knowledge exchange and innovation adaptation, without the direct scaling up of a specific practice. Nonetheless, participants successfully established international connections and formulated plans for future collaborations. In addition, during the evaluation of the environment for the pilot suggested in the 'Plan' stage, stakeholders can benefit from having previous contextual information. Participating in twinnings can be a first step into a new environment and allow stakeholders to gather empirical data to prepare a pilot/test their solution in a new setting. In summary, this report has shown that twinnings are highly regarded as community-building and knowledge-sharing activities. Engaging in these types of activities offers distinct advantages for companies and other stakeholder groups. Therefore, incorporating twinning activities has demonstrated tangible benefits for companies and projects seeking robust community building and innovation transfer.

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