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Guide for Applicants

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Executive summary

The GATEKEEPER project currently active under H2020 Framework Programme of the European Commission offers the opportunity to third parties to contribute in the development and sustainability of the project and get financially supported after its selection via open call on the basis of the submitted proposals.

This Guide for Applicants presents a brief overview of the context and approach of the GATEKEEPER project and details all the information required to guide you in preparing a proposal for GATEKEEPER Open Call. It provides instructions on structuring and submitting your proposal as well as on the eligibility and evaluation criteria.

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1 Introduction

1.1 Overview of the Gatekeeper project

Our healthcare systems are detecting conditions and risks when it is too late and once detected, they are not managed properly. The gaps between i) cases diagnosed and cured, ii) diseases and frailty conditions prevented or delayed, is astonishingly high. This means that, as a society, we are currently losing VALUE between what the healthcare system is caring and curing and what the citizens really need.

In this context, innovations could bring support to achieve better diagnosis, treatment and management of citizens across the continuum of care and prevention. However, despite the exponential advances in medical technologies¹ developed and tested on an ongoing basis around Europe, a large proportion are not implemented and never reach citizens. Nowadays, the European Commission is working to provide its citizens access to safe and top quality digital services in health and care, and this process has recently been accelerated by the Digital Single Market initiative, the recent Communication on Digital Transformation of Health and Care in the Digital Single Market, which identified as priorities Citizens' secure access to health data, Personalised medicine through shared European data infrastructure, Citizen empowerment with digital tools for user feedback and person-centred care.

In this sense born Gatekeeper, as an European Multi Centric Large-Scale Pilot on Smart Living Environments which the **main objective** is enabling the creation of a platform that connects healthcare providers, businesses, entrepreneurs, and elderly citizens and the communities they live in, in order to originate an open, trust-based arena for matching ideas, technologies, user needs and processes, aimed at ensuring healthier independent lives for the ageing populations.

The **scope** of GATEKEEPER is the application of advanced Information and Communications Technologies (ICTs) to tackle the challenge of improving the quality of life of citizens while demonstrating its significant efficiency gains in health and care delivery across Europe.

The technological platform that will be created in GATEKEEPER for managing all the data and applying digital innovations actions will be crucial. By 2022, GATEKEEPER will be embodied in an open source, European, standard-based, interoperable and secure framework available to all developers, for creating combined digital solutions for personalised early detection and interventions that harness the next generation of healthcare and wellness innovations; cover the whole care continuum for elderly citizens, including primary, secondary and tertiary prevention, chronic diseases and co-morbidities;

¹ Stanford Medicine 2017 Health Trends Report . <http://med.stanford.edu/school/leadership/dean/healthtrends.html>

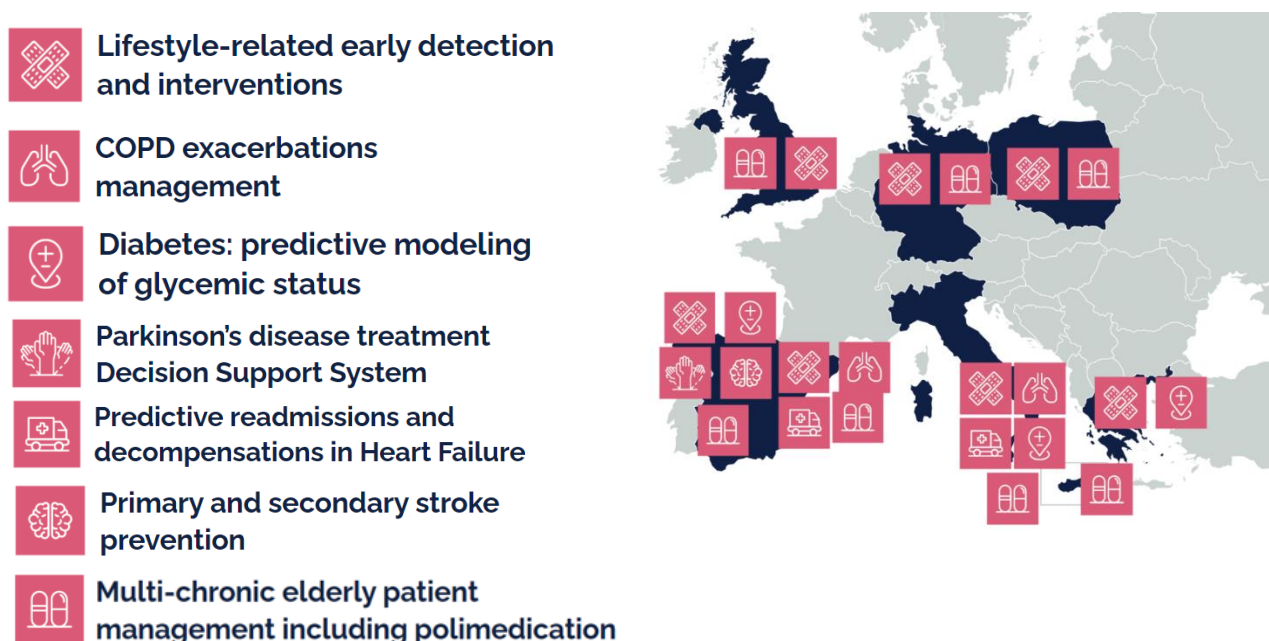
straightforwardly fit “by design” with European regulations, on data protection, consumer protection and patient protection; are subjected to trustable certification processes; support value generation through the deployment of advanced business models based on the Value Based Health Care (VBHC) paradigm.

1.2 Reference use case

GATEKEEPER will demonstrate its value by scaling up, during a 42-months work plan, towards the deployment of solutions that will involve ca 40.000 elderly citizens, supply and demand side (authorities, institutions, companies, associations, academies) in 8 regional communities, from 7 EU member states.

GATEKEEPER Large Scale Pilots (LSP) will establish and consolidate the different Use Cases through Europe enabling the deployment of digital solutions for early detection and intervention and support the risk stratification models. They ensure that GATEKEEPER users' and medical requirements for early detection and intervention are correctly deployed in a coordinated way in all pilot sites.

Figure 1. Pilot and reference use case mapping



In the following page the reference use case description is presented (see table1)

Table 1. Reference use case description

REFERENCE USE CASE	PILOTS ADDRESSING THIS CASE	DESCRIPTION
Lifestyle-related early detection and interventions	<ul style="list-style-type: none"> ▪ Basque Country ▪ Aragon ▪ Saxony ▪ Greece ▪ Puglia ▪ Milton Keynes ▪ Poland 	Big Data Analytics techniques will be exploited to address risk stratification and early detection, based on lifestyles analysis including: pattern recognition for the improvement of public health surveillance and for the early detection of cognitive decline and frailty; data mining for inductive reasoning and exploratory data analysis; Custer Analysis for identifying high-risk groups among elder citizens. In the above cases timely intervention is provided by through AI-based, digital coaches developed e.g. on top of Samsung AI assistant, Bixby ² through Natural Language Processing techniques, based structured conversations, consultation and education.
COPD exacerbations management	<ul style="list-style-type: none"> ▪ Basque Country ▪ Aragon ▪ Puglia 	Machine learning methods based on Dynamic Bayesian Networks, suitable for modelling knowledge and handling time series data, are added to the Ecosystem Transaction Space to implement apps that predict exacerbations and avoid hospitalizations. These apps will be built on top of advanced wearable monitoring KETs, available in the GK Things Catalogue, that combine, in a single wearable garment piece, time series data for blood pressure, pulse oximetry, ECG, respiration, skin temperature and activity
Diabetes: predictive	<ul style="list-style-type: none"> ▪ Basque Country ▪ Greece 	Short-term prediction of glycaemic dynamics is essential to improve Diabetes self-management. GK will provide a personalized, adaptive, real-time data

² <https://www.samsung.com/us/explore/bixby/>

modelling of glycaemic status	<ul style="list-style-type: none"> ▪ Puglia 	driven computational solution based on data federation in the Healthcare Space, identifying the different modes of the underlying glucose metabolism and eventually prevention, of hypoglycaemic events. Advanced GK "things" will collect clinical data at home such as bio- and physiological signals (i.e. blood glucose concentration data or continuous glucose monitoring data, galvanic skin response, heart rate variability) combining them with adaptive machine-learning regression models.
Parkinson's disease treatment DSS	<ul style="list-style-type: none"> ▪ Basque Country 	The medication change model, which was developed in collaboration with medical experts, using a qualitative multi-criteria method, identifies situations in which the disease has progressed to the point which requires a change of medical therapy and then suggests what kind of changes should be made. GATEKEEPER KETs such as wearable sensors to continuously or periodically measure motor symptoms (depending on disease severity) and digital applications, such as Smart TVs, that can be used to detect non-motor symptoms are used to record data into the patient's EHR, accessible in the GK Healthcare Space. The model will alert clinicians that the patient's current medication plan is not optimal any more, and will derive suggestions on how to improve it.
Predicting readmissions and decompensations in HF	<ul style="list-style-type: none"> ▪ Basque Country ▪ Aragon ▪ Puglia 	Telemonitoring services and machine learning with Dynamic Bayes Networks will be harnessed to implement an advanced model for predicting acute HF decompensations, taking comorbidities into account. Building on the experience of the Multisensor Monitoring in Congestive Heart Failure (MUSIC) Trial, GK Healthcare Space apps allow to explore which other longitudinal data (measured by GK Consumer Space "things" , e.g. bio-impedance, heart rate, respiratory rate and volume, physical activity duration and intensity, body posture, gathered with a wearable platform as the one depicted in) can be used for predicting decompensations

<p>Primary and secondary stroke prevention</p>	<ul style="list-style-type: none"> ▪ Basque Country ▪ Saxony 	<p>Image recognition algorithms can be added to the Ecosystem Transaction Space, able to detect stroke signs from images recorded at home, for example on the basis of pathological facial weakness detection [24][25]. These algorithms, coupled with smart-home/smart-hospital interactions supported in the GK Healthcare Space, will activate early warning alarms which effectively target secondary stroke prevention, particularly for subjects affected by recurrent strokes. GK "Things" involved in this scenario include image detection technologies (e.g. camera in smartphone) and/or MYSPHERA real-time location system. Primary prevention can be addressed through AI-based smart assistants, like Samsung Bixby, aimed at coaching patients on stroke-related healthy habits, similarly, to Use Case 1.</p>
<p>Multi-chronic elderly patient management including polimedication</p>	<ul style="list-style-type: none"> ▪ Basque Country ▪ Milton Keynes ▪ Cyprus ▪ Puglia ▪ Poland 	<p>Several sensing technologies, available in the GK Things Catalogue, can be leveraged and integrated in an unobtrusive mobile data collection platform (e.g. based on smartphones, smart-trackers, smart-textiles, etc.), able to monitor the multiple parameters required in Chronic Care Models (CCM) for multi-morbid subjects. Through the GK Healthcare Space, data can be shared with clinical professionals in charge of managing the CCMs, in order to adjust individual care plans accordingly. Through the GK Ecosystem Transaction Space, robotics KETs (from very simple pill dispensers to more complex social robots) can be integrated with digital coaching systems to assist polymedicated patients (e.g. in particular for patients which are concurrently affected by cognitive impairments).</p>

1.3 Objective of the first open call

The objective of the first Open Call is to **engage actively new technology members**, i.e. SMEs, Midcaps and Research technology organizations in the GATEKEEPER Ecosystem, **supplying new AI and Big Data applications, tools or components** which will be incorporated in the technology offering portfolio of GATEKEEPER to Pilots and Platform designers and developers.

In concrete terms, the proposals will help to validate different key aspects of the GATEKEEPER project:

- To enlarge and extend new applications and services portfolios on the GATEKEEPER's platform.
- To improve the value of the current services thanks to new or complementary functionalities.
- Attract new players of the ecosystem to become part of the Gatekeeper portfolio ensuring its expansion and sustainability.

2 Application process

2.1 Who can apply?

The call is open to individual **European Industry, MID Cap, SMEs, start-ups, universities, research and technological centers** are willing to contribute to the value based health care paradigm, with the same eligibility criteria of the H2020 rules of participation.³

Every participant has to be legally registered in a member state of the European Union or in a Horizon 2020 associated country.⁴

Only **one entity per proposal** will be admitted, so proposals involving multiple partners in co-operation will not be eligible.

GATEKEEPER partners are not eligible for funding and cannot be part of a funded project. We are obligated to avoid conflict of interests, and therefore we reserve the right, at our full discretion, to reject proposal on the basis hereof.

Successful applicants who have been awarded funding will be required to sign the GATEKEEPER Third Parties agreement in order to be able to receive the funds and become third party of the project.

2.2 What are the eligibility criteria?

The submitted proposals must meet the next criteria:

1. Application submitted on time (Deadline: ~~January 29th~~ **February 28th**, 2021, 17:00 CET)
2. Application made by **only one entity** (European Industry, MID Cap, SMEs, start-ups, universities, research and technological centers legally registered in a member state of the European Union or in a Horizon 2020 associated country); activities in co-operation will not be considered eligible.
3. Proposal solutions must provide **solutions based on artificial intelligent and big data.**
4. Completeness of the proposals, **respecting the page limit.**
5. Within the scope of the call, answering **only one of the proposed challenges** of the open call.
7. The language of the applications must be in **English.**
8. GATEKEEPER partners are not eligible for Open Call.
9. Compliance with GATEKEEPER Ethics & Privacy guidelines.

³http://ec.europa.eu/research/participants/data/ref/h2020/legal_basis/rules_participation/h2020-rules-participation_en.pdf

⁴http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en

2.3 Why should apply?

It is a great opportunity for:

- Offer your solution with a mature ecosystem at European level.
- Access and share knowledge and evidence of benefits of services based on artificial intelligent and big data.
- Better understanding of current needs and gaps of services.
- Access to companies of the key industry in artificial intelligence and big data and relative domains.

2.4 Scope and challenge

The proposals may address one of the challenges listed below and demonstrate how they will implement the solutions in the platform. The complete description of each challenge is available at Annex A - Open Call Challenges (see table 2)

Table 2. Challenge description

#	CHALLENGE	DESCRIPTION
1	Dynamic API injection	This challenge is open to proposals providing plugins for Express Gateway for dynamic APIs
2	Risks detection and timely response (mid-term and time critical)	This challenge is open to proposals providing intervention planners for risks and emergency detection
3	Informal care coordination system	This challenge is open to proposal addressing the coordination of informal careers
4	Increasing insights from HER's unstructured data (risks prevention)	This challenge is open to proposals capable to extract meaningful information from EHR's convertible into actionable insights
5	Robot companions against social isolation	This challenge is open to proposal addressing the design and development of robotic platforms
6	Embedded ML ⁵ in Smart Devices	This challenge is open to proposal addressing the design and development of innovative prototypes of hardware /software solutions.

⁵ ML, Machine learning

2.5 Information requested in your proposal

Proposals are submitted in a one-stage process that means that applicants submit a full proposal prior to the deadline. The proposal language is English. Proposals submitted in other language will not be eligible.

The GATEKEEPER consortium has prepared an application toolkit that the interested entities must use (download in this [link](#)). This toolkit includes the proposal template (word document) and budget project (excel file).

The information requested in your proposal are the next:

Organization background and details:

- Title of your contribution, identification of organization, contact person and declare you are non-affiliated with GATEKEEPER partners.
- The organization profile and key member's CV, organization, skills and resources applicants have.

Proposed solution:

- Description of the contribution and the objectives, relating to the GATEKEEPER approach, and how the proposed collaboration may fit into Gatekeeper vision and help to add value to the project.
- A list of activities and their time plan aligned with the experimentation period – activity will be held from ~~March 2021 to March 2022~~ **May, 1st 2021 to April, 30th 2022** (12 months). Please explicitly list what are considered to be the key milestones and deliverables within this plan, considering also the alignment with the internal evaluation periods.

Budget plan (budget excel file):

- The budget for cost related to the funding proposal.
- Upload your budget for the project using the template provided by the GATEKEEPER Consortium (available in the "Application toolkit").

2.6 Timeline and key steps for application

Figure 2. Timeline Open Call



The funded projects will start in ~~March 2021~~, **May, 1st 2021** and they will have a total duration of 12 months, **ending on April, 30th 2022**

This timetable could be amended as required at the GATEKEEPER team discretion. The most updated version will be available on GATEKEEPER website.

The main steps of the submissions are the next:

1. Registration at the GATEKEEPER web page.

Register your interest and download all the required information and Open Call templates:

www.gatekeeper-project.eu/open-call

2. Submit application by 17:00 h (CET) on 29th January 2021

Prepare your applications material and submit them to the Open Call web portal.

<https://gatekeeperprj.beinformatica.com/>

3. Sign legal documents.

All applicants will receive a notification by February 2021. Successful applicants will receive final notification and a request for signing the Third Parties Agreement.

3 Evaluation process

3.1 Who will evaluate my proposal?

Every proposal will be checked to ensure that it meets requirements before it is sent for evaluation to the Open Call Review Board (OCRB). This board consists of an external and independent group of experts, who will be monitoring the whole process to ensure tracking of every action.

The experts will be individuals with experience in the fields of innovation linked to this Open Call and also with the highest level of knowledge. They will sign a declaration of confidentiality concerning the evaluation process and the content of the proposals they evaluate. They will also declare their absence of any conflict of interest for the assigned tasks.

Each proposal will be evaluated anonymously by 2-3 reviewers. Each evaluator will record his/her individual opinion on each proposal using the web portal. A ranking list will be assembled with all proposals that score above the threshold (per individual category and total)

Each external expert will assign a score between 0 and 5 to each of the criteria mentioned below. The assigned scores of the experts will be averaged for each criteria to get one single score for each criteria. A total score of a proposal is reached by calculation the sum of all individual scores of the evaluated criteria of a proposal.

Notifications on funding or rejections will together with any feedback be sent out by February 2021.

3.2 What does evaluation measure?

The proposals will be evaluated under the following criteria:

1. **EXCELLENCE:** Soundness of concept, quality of objectives and innovative elements present in the proposal. Max=5. Threshold =3
 - How well does the proposed solution address the challenge as detailed in the open call text?
 - Are the proposed objectives clear and pertinent?
 - Is the concept sound and shows a clear plan for development of a working solution?
2. **IMPLEMENTATION:** quality and efficiency of the implementation and the management. Feasibility of the workplan, quality and effectiveness of the technical methodology, including the workplan, contribution to collaboration with Gatekeeper to achieve objectives of the project, appropriateness of the allocation and justification of the resources to be committed (staff, equipment...) Max=5 Threshold =3
 - How effectively will be the Application Experiment be managed? Is the proposed work plan coherent and effective?

- Are deliverables, milestones and deadlines defined and adapted to the goals of the proposals?
- Is the allocation of tasks and dedicated resources (e.g. human capital, equipment, man hours, etc.) appropriate and necessary to perform the scope of the proposal and achieve its objectives?
- Are the costs clearly defined and aligned with the required efforts?
- Does the third party possess the technical skills and abilities necessary to perform the scope of the proposal?

3. **IMPACT AND SUSTAINABILITY:** Potential impact through the development, dissemination and use of project results, in which way the proposal contributes to further maturity, integration and interoperability of gatekeeper AI solutions, and explain if you consider any further support after your participation in Gatekeeper project. Max=5 Threshold =3

- Does the proposal enhance innovation capacity and the integration of new knowledge?
- Assessment of resources required to demonstrate you have taken into account all key elements for the success of your project to reach exploitation.
- Strategic fit for the company explaining why this project is important for your company.

Each category will be scored on a scale from 0 to 5, with excellence and implementation having double weight, and impact and sustainability having single weight; thus, the overall maximum score is 25. For a proposal to be considered for being selected for funding, the score has to pass a threshold of 3 out of 5 in each individual category (for the double-weighted impact, this means a score of at least 6 out of 10). The total sum of the individual scores must reach the minimum threshold of 20 points.

The individual scores have the following interpretation:

0 - Fail: The proposal fails to address the criterion under examination or cannot be judged due to missing or incomplete information.

1 - Poor: The criterion is addressed in an inadequate manner, or there are serious inherent weaknesses.

2 - Fair: While the proposal broadly addresses the criterion, there are significant weaknesses.

3 - Good: The proposal addresses the criterion well, although improvements would be necessary.

4 - Very good: The proposal addresses the criterion very well, although certain improvements are still possible.

5 - Excellent. Proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

The selected proposals will be reported to the gatekeeper project officer of the European Commission for a final granting decision

3.3 Communications with applicants.

After the evaluation of the proposals all proposers will be informed if their application experiment was accepted or not.

Members of Gatekeeper project will get in contact with the successful applicants to prepare the conclusion of third-party agreements.

4 Funding Conditions

4.1 Budget available

The first open call will give **600.000 €** in funding, with a **maximum of 60.000€ for each project**. GATEKEEPER project may fund a **maximum of 10 third party** projects.

Each project will include an implementation plan including milestones and deliverables, and a cost estimate justifying the costs and resources in relation to the implementation plan. The estimated costs of the third party should be reasonable and comply with the principle of sound financial management in particular regarding economy and efficiency.

Other important information that you need to know:

- The **industrial** third parties will be **funded 70%** of their respective cost.
- The distribution of funding over time will be: up to **20% of pre-financing** at the start; an **interim payment of 50%** and a **final payment** up to 100% of the total funding. Each funding stage will be paid upon approval of the Project Agreement (which includes the project plan), and the approval of interim and final reports respectively. Each payment is released 30 days after the approval of each report.
- Indirect cost (e.g. overheads) will be covered if they are declared as flat-rate of **25% of the eligible costs**.
- The third party cannot request any funding for activities that are already funded by other grants (the principle of no double funding).
- The reports require the candidates to provide GATEKEEPER with honest feedback on their project and their experience of the technical environment.

The expected duration of an Application Experiment is 12 months.

4.2 Which costs are you allowed to include in your budget?

You are eligible for funding for all activities mentioned below, under the condition that these activities take place after the approval of the Third Parties Agreement and contribute to maturing, sustaining, and further developing GATEKEEPER and follow the guidelines below:

1. Planning and execution of the Project
2. Technical integration and adaptation, and project deployment on the GATEKEEPER technical environment.
3. Generation of reports and publications related to the projects, including preparation of a showcase about the project that can be used for dissemination purposes.
4. Supporting the rest of technical activities in the project, by providing feedback about the use of the technical framework and identifying gaps of the development of appropriate standards.
5. Report the necessary effort and costs according to H2020 rules and management practices requested by the GATEKEEPER open call lead partner.

For a cost within your project to be **eligible** for funding it must:

- Be incurred and paid between your project start and end dates, as specified in our legal agreement
- Be directly related to the activities listed previously
- Be indicated in the estimated budget
- Be incurred in connection with the action as described in your project application and necessary for its implementation
- Be identifiable and verifiable, in particular recorded in your accounts and in accordance with the accounting standards applicable in your country and according to your organization's usual cost accounting practices.
- Comply with the applicable national law on taxes, labour and social security.

You are allowed to include:

- Staff costs.
- Subcontracting costs.
- Material costs.
- Travel costs.
- Other cost.

"Ineligible costs" are:

- Costs that do not comply with the conditions set out above and
- Costs reimbursed under another EU or Euratom grant (including grants awarded by a Member State and financed by the EU or Euratom budget and grants awarded by bodies other than the European Commission for the purpose of implementing the EU and Euratom budget).
- The form of financial support to be used will be a pre-defined lump sum. Funds will be provided to the third parties following the accomplishment of different milestones verified on the basis on the presentation of technical and financial reports.

Regarding staff costs, the eligible labour costs will be salary amounts actually incurred and paid (monthly/hourly). Note that the number of working days per year for the organisation is based on full time working days per year, less standard holiday allowance. Sick days, waiting time, training days and non-produce time are not eligible as part of the salary calculation.

For more information about personnel costs, see H2020 – AGA, Article 15 – Financial support to third parties.

Regarding subcontracting costs: if necessary, to execute the project, you may subcontract part of the activities in the project. Subcontracting may cover only a limited part of the project. For more details about subcontracting costs, see H2020-AGA, Article 13.

The total amount of time and cost will be reviewed before approval for funding. The reviewers can decide to fund your proposal with a reduced amount.

5 Who keeps the IPR?

Successful applicants will become Third Party of the project. You and your project will be sole owner of the enabled solution of your project. However, GATEKEEPER Consortium will be licensed the right to use (internally) and IPR you produce as part of the project, for three years after the project finishes.

GATEKEEPER project itself will not retain an equity stake in your company, not will it retain any IPR.

Additionally, GATEKEEPER or the European Commission may ask you to present your work as part of our public relations and networking events, in order to showcase the benefits of the GATEKEEPER project.

5.1 Who owns the data produced?

The type of data available for GATEKEEPER Open Call projects is manifold, representing the contextual diversity of smart environments which mirrors the complex reality of the active and healthy ageing market. The type of data that you may make use of could be open data and close data, with either open access or restricted access. Each pilot has its own data policy and preferences on how data should be treated in their framework.

It will be the responsibility of the applicants to ensure that they understand the conditions on data in each pilot, as well as associated licences and costs, in order to provide a sound proposal that takes this diversity into account. It will be also the responsibility of applicants to propose data processing solutions compliant with the current GDPR.

As a guideline, the IPR of the data collected previous to the GATEKEEPER Open Call will remain the property of the data provider or its licensors. The data produced during the pilot phase will be shared according to the contractual Data Sharing Agreements between the winning applicants and the pilot.

6 Support options

The GATEKEEPER consortium maintain a frequently asked questions (FAQ) section available in www.gatekeeper-project.eu/open-call. It will be updated continuously. For especially technical details check first the available documentation in the website.

The answers that you cannot find in the FAQ section can be submitted by contacting opencall@gatekeeper-project.eu. Here you can get support regarding technical matters or the proposal.

There will be different events in which the open call will be presented, and support will be provided in preparing the applications. Follow the web site and the social networks accounts of the project to get information about the open call.

7 Summary of revisions

version	Sections update	Date updated
V3.0	Section 2.2 Submission deadline February 28th instead of January 29 th	22 th December 2020
V3.0	Section 2.5 Dates of starting and ending project May, 1st 2021 to April 30th, 2022 instead of March 2021 to March 2021	22 th December 2020
V3.0	Section 2.6 New dates (red color) included in the figure 2	22 th December 2020
V3.0	Section 2.6 changed dates. The funded projects will start in May, 1st 2021 and they will have a total duration of 12 months, ending on April, 30th 2022	22 th December 2020
V2.0	Section 7 summary of revision added	04 th December, 2020
V2.0	Section 2.2 Submission deadline January 29 th instead of January 28 th	04 th December, 2020
V2.0	Section 2.5 Dates of starting and ending project March 2021 to March 2022 instead of March 2020 to February 2021	04 th December, 2020

Appendix A Open call challenge

#	CHALLENGE	DESCRIPTION
1	Dynamic API injection	<p>The combination of technologies such as containers and orchestrations allow horizontal (replication of services) and vertical (improvement of resources) scalability of a digital platform. These features are the basis for the automatic growing up of a platform and serverless infrastructures.</p> <p>An important technology used in Gatekeeper is the Express API gateway that provide isolation and load balancing in a microservice architecture.</p> <p>This challenge is open to proposals providing plugins for Express Gateway for dynamic APIs that are designed for the injection of novel services without rebuilding the system or hot reloading of the gateway configuration.</p> <p>The solution should be able to develop and implement a set of plugin for Express Gateway based on:</p> <ol style="list-style-type: none"> 1. The automatic provisioning and injection of novel services into an existing platform 2. The automatic configuration of the platform in terms of novel available services 3. The maintenance of the reliability of the new increased platform against previous one. <p>An existing digital platform has to take advantage of this added value, that enables a transparent growth of API services and infrastructure, that should be demonstrated by adding tens of services maintaining the initial performance benchmarking of the platform (e. g latency, network throughput, reliability, etc..).</p> <p>TRL ≥ 8</p>

#	CHALLENGE	DESCRIPTION
2	Risks detection and timely response (mid term and time critical)	<p>The combination of data from home & personal devices (including healthcare and consumer devices), digital solutions, the predictive models and the health profiling of elders dramatically increase the possibility to identify risks and emergency events (even in real-time). Some risks and emergency events are time sensitive. The prolongation of risks can trigger a worsening of elder conditions or an emergency event, such as obstacles can result in a fall or a prolonged isolation can lead to depression. Similarly, emergency events require a fast assessment of the real conditions of the elder and its severity to evaluate the best course of action, for instance a fall can cause a minor or a major injury or could be the result of a cardiac event.</p> <p>This challenge is open to proposals providing intervention planners for risks and emergency detection, able to translate the input from AI services into time-sensitive operational plans of intervention based on the available resources, aimed to assess the real conditions of the elder or to trigger the intervention of carers or emergency units. The solution should be able to develop and implement a timely strategy based on:</p> <ul style="list-style-type: none"> ▪ The available guidelines for the type of event ▪ The reliability of the results given the available information (confidence of the detection) ▪ The configuration of the system in terms of available "actuators", such as the opening times of the healthcare services, proximity of family members, remote cameras or other communication devices <p>In this challenge GK Consortium will contemplate proposals tackling one of the following scenarios:</p> <ul style="list-style-type: none"> ▪ Time Critical Emergency Detection and Timely Response: Focused on monitoring of acute events in clinical conditions considered time-critical (Stroke, Heart Attack, Critical Arrhythmias, Hypoglycemia, etc.) ▪ Mid-Long Term Risk Detection: More oriented to Chronic conditions and mid/long-term risks associated to them (complications or risk of comorbidities) such as Diabetes decompensations, Cancer, COPD, Fragility, etc. <p>This solution is the cornerstone for transforming monitoring and communication technologies in infrastructures for ubiquitous care. Indeed, new monitoring and communication technologies are transformed into medical devices thanks to data-driven algorithms. While the efficacy of these devices is often life-saving, their impact on mild conditions and small events is limited to "nudging" a behavioral change from the user. In this view, the identification of risks and events</p>

combined with clear, verified instructions for informal, untrained carers and for the end-user transforms the consumer technology ecosystem of the user as a whole into an enabler "intervention" technology. The qualitative change of the technology system as an intervention technology for informal carer multiplies the efforts and outreach of the national healthcare system and healthcare professionals beyond the silos of specific care and technological providers.

TRL ≥ 6

#	CHALLENGE	DESCRIPTION
3	Informal care coordination system	<p>Carrying activities mostly relies on non-professionals, informal carers, such as family members, friends, neighbors, volunteers. Differently from professional carers, informal carers are not trained, they cannot rely on coordination mechanisms of a professional settings and their carrying responsibilities could be unreliable as the result of the balancing with work and other activities.</p> <p>This challenge is open to proposal addressing the coordination of informal carers with the aim of providing a light weighted communication solution to support practical challenges about sharing the responsibility of carrying, such as the frequency of visits, support to routinely activities and timely intervention in case of emergency and need. The expected outcome of a solution should be ability to:</p> <ol style="list-style-type: none"> 1. profile and monitor informal care activities, 2. supporting a dynamic, transparent scheduling and re-scheduling of tasks involving carers and elders 3. enabling the bi-lateral communication of the GATEKEEPER services for: <ul style="list-style-type: none"> o Log information for the evaluation by professional carers o Requests interventions triggered by early-detection and predictive algorithms <p>Informal care is currently recognized a central role in the wellbeing and resilience of elders and communities. On the other hand, the lack of formal structures and monitoring configures a friction between formal and informal caring services and resulting duplication of efforts, costs and overall heterogeneous accessibility to caring. As result of the COVID-19 pandemic, the UK government included informal care in the national response strategy bootstrapping a process of rethinking the relation between the national healthcare system and the local organizations. In this scenario, the solution should fill the gap between the formal service management structure and the local self-organized community caring enabling the fully realization of the government vision for an integrated NHS community-based care.</p> <p>TRL ≥ 6</p>

#	CHALLENGE	DESCRIPTION
4	Increasing insights from HER's un-structured data (risks prevention)	<p>Electronic Health Records and other clinical resources contain valuable information, currently mostly underutilized by Big Data and AI technologies, mainly because they are un-structured and written in Natural Language.</p> <p>In this challenge, we are looking for solutions capable to extract meaningful information from EHR's convertible into actionable insights (algorithms, alerts, new variables to monitor, clinical pathway process re-engineering, risk factors, dynamic care plans, patient phenotype classification, etc.) oriented to the prevention and/or prediction of risky situations in a specific clinical pathway or even the generation of new research hypotheses.</p> <p>The clinical pathways tackled by each proposal must be clearly specified, as well as the expected output and outcomes of the analysis. One proposal may address more than one clinical pathway.</p> <p>Proposals in this challenge combining the analysis of structured and un-structured data will be considered positively.</p> <p>TRL ≥ 6</p>

#	CHALLENGE	DESCRIPTION
5	Robot companions against social isolation	<p>Robot companions are a family of social robot specifically meant to provide comfort to users by mimicking pets. This type of intervention is being assessed as effective in mitigating the effects of isolation and loneliness while combining monitoring and alternative modality of communication via robotic interface. On the other hand, the currently available products are based on custom platforms and software configuring a close environment and costly solutions not fitting an open ecosystem as the GATEKEEPER nor the need for scalable solutions to tens of thousands on elders living alone.</p> <p>This challenge is open to proposal addressing the design and development of robotic platforms based on open standards hardware and software and based on the GATEKEEPER services. The expected outcome of a solution should be ability to:</p> <ol style="list-style-type: none"> 1. Communicate with the user through physical cues based on external services such as Samsung's Bixbi and other conversational AI systems that could be integrated in the GATEKEEPER ecosystem, 2. Identify medical events and provide basic healthcare and wellbeing services, such as coaching, reminders and alerts based on the GATEKEEPER AI services 3. Provide an open abstract interface to the GATEKEEPER service for interacting with the user, such as remote control, sensors streaming and voice command, connecting the robot companion with the service ecosystem and the user medial and smart home devices <p>The development of an affordable, open robot companion based on an ecosystem of services is expected having a disruptive effect. Indeed, the current solutions are outside the possibility of most of the potential beneficiaries, elders living alone that can benefit from a robot companion. Not only this solution can have a disruptive effect in the access to robot companion but also in terms of their potential impact. Current solutions are based on close / single-provider ecosystem of services limiting their integrability within a wider technology and service ecosystem and, in general, the quality of the services available through the robotic platform. In this view, this solution should provide a compelling offer of cutting-edge services and flexibility of use in multiple configurations of healthcare devices, smart home devices and wearable fitting the user needs and living conditions.</p> <p>TRL ≥ 6</p>

#	CHALLENGE	DESCRIPTION
6	Embedded ML in Smart devices	<p>The growing capacity of producing data by individuals and by the environment where they live is producing new requirements of moving computing capacity from the cloud to the edge. Indeed the Edge Computing is nowadays a generalized trend in almost all sectors of IoT, from industry to environment, energy, farming and many others. In the health care sector, edge can be defined as the space close to the individual where he/she live and move around. For instance, the home, but also the body environment, a neighbourhood, public spaces or other similar. Edge computing is meant to provide efficient data processing, including AI capabilities for faster detection, saving of communications resources, energy, and enhancing data security and privacy, among others. All these features are relevant for GATEKEEPER</p> <p>This challenge is open to proposal addressing the design and development of innovative prototypes of hardware/software solutions able to embed ML algorithms for early detection of vital parameters and life conditions, using real time and time-aggregated data produced by the user and its environment, with strong requirements in term of interoperability (communication using various wireless protocols) and/or cybersecurity (data, AI and privacy protection) among others. At least two use cases are needed to implement, for instance, but not limited to: a) advanced medium-long term behavioural changes detection based on activity detection and performance, b) mental condition: mood, isolation, social connectivity, anxiety, or other. More use cases will be positively evaluated. Data sources and data types must be identified the output parameters as well for all use cases. Re-use of data across use cases is a desired feature. The proposal must describe training and validation approaches and identify data sets used. Working prototypes, either on wearable device, gateway and or any other smart device (TRL6), must be provided for evaluation in laboratory tests and in real working conditions in one or more pilots in GATEKEEPER.</p> <p>TRL ≥ 6</p>

Appendix B Application Submission Guide

B.1 How to submit your application for open call?

1. Go to the link: <https://gatekeeperprj.beinformatica.com/>

The screenshot shows the 'GATEKEEPER PROJECT' sign-in page. On the left, there is a sidebar with the GATEKEEPER logo, a 'Calls' section with a 'Sign In' button, and the copyright notice '2020 © BE Informatica'. The main content area is titled 'GATEKEEPER PROJECT' and includes the instruction 'Sign In in the form below to submit your Open Call application'. Below this, there is a paragraph describing the project as a European Multi-Centric Large-Scale Pilot on Smart Living Environments. A second paragraph details the scope of the project, mentioning advanced Key Enabling Technologies like AI, IoT, and bigdata. A third paragraph states that the first open call provides an opportunity to join the ACTIVAGE community. At the bottom, there is an 'E-mail' label and a text input field for 'Your e-mail'.

2. Create an account on the platform

The screenshot shows the 'GATEKEEPER PROJECT' sign-up page. On the left, there is a sidebar with the GATEKEEPER logo, a 'Calls' section with a 'Sign In' button, and the copyright notice '2020 © BE Informatica'. The main content area is titled 'GATEKEEPER PROJECT' and includes the instruction 'Sign Up for a new account'. Below this, there are several form fields: 'Name' (Your name), 'Surname' (Your surname), 'E-mail' (Your e-mail), 'Password' (Your password, with a note 'Minimum 8 characters.'), and 'Confirm password' (Retype your password). At the bottom, there is a red 'Sign Up' button and a link 'Already signed up? Sign in here'.

3. Login to your account
4. Submit your proposal

Appendix C Ethics & Privacy guidelines

C.1 Ethics guidelines

Compliance with ethical requirements is cherished in the GATEKEEPER project. Applicants will be required to sign an Ethical statement during application requiring self-disclosure of matters such as past professional misconduct – as well as a guarantee of future compliance with ethical and legal principal under the GATEKEEPER project.

All participants in the project are expected to consider ethics issues throughout its lifecycle – before, during, but also after the pilot period in relation to knowledge exchange and impact activities (such as reporting and publication).

Below are a set of core ethical principles providing general guidance that the winning applicants will need to follow:

1. Respect for general personal data protection principles according to the European GDPR law, by design and by default.
2. Projects should be conducted with integrity and transparency.
3. Lines of responsibility and accountability should be clearly defined.
4. Independence of projects should be maintained and where conflicts of interest cannot be avoided they should be made explicit.
5. The rights and dignity of individuals and groups should be respected.
6. Data subjects' rights exercise to be informed, to object, to be forgotten, and to withdraw consent should be ensured.
7. Personal data processing should be conducted in a lawful way.
8. Decisions based solely on automated processing of data should be avoided.
9. Processing of data that may profile data subjects should be excluded.
10. Processing of genetic data, biometric data, data concerning health of data concerning a natural person's sex life should be excluded.

C.2 Privacy Policy

All data collected and/or processed within GATEKEEPER project will need to be compliant with the GDPR regulation. In this respect, the GATEKEEPER Open Call will involve:

1. Collection of personal and non-personal data from the open call applicant.
2. Collection and processing of deployment site related data by the winning.

C.3 Collection of personal & non-personal data from the open call applicant

By inviting participants to submit a pilot project proposal the GATEKEEPER Consortium will collect the participant's personal data submitted by them and processed in accordance with applicable law and data protection with particular regard to the General Data Protection Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 (infra "GDPR"). The processing of your personal data, your privacy and your rights will be based on the principles of fairness, lawfulness, transparency, integrity

C.4 Nature of data collected

You can participate in the open call by submitting your details through the online platform. Through this submission GATEKEEPER collects personal data: family name, first name, country of residence/registration, personal email address, phone number and the relevant registration number allocated to your application.

C.5 The purpose and modalities of the processing for which the data are intended

Your personal information, referring to you as a natural person, or related to the company that you represent, is collected for the purpose of checking the eligibility for funding of the applicants and for the purpose of the obligatory reporting by GATEKEEPER to the European Commission.

Your personal data may be processed both by digital and non-digital means, with full respect of the security measures provided by the GDPR.

Additionally, during the project period the winning applicants can be asked to participate in interviews or to contribute to communication material on their pilots. Such material, including personal data, will be published in GATEKEEPER social media channels, the GATEKEEPER website or communicated through relevant press releases.

Finally, we may use the personal data you provide to contact you after the end date of the project, to inform you of similar initiatives and invite you to participate in new activities. For these purposes, we may contact you by email.

We take the security of your personal data seriously and we have followed a privacy-by-design architecture in order to ensure that your data is secure at all times.

C.6 The obligatory or voluntary nature of providing the requested data and the consequences of a potential refusal of providing such data

Providing your personal data for the purpose of registration and submission of your project proposal is not compulsory, yet the refusal to provide such data will preclude you from participating, as it will render you ineligible to receive the grant.

Providing your data for the promotional and marketing purposes described above is optional and requires the relevant prior consent, that you may give by clicking the checkbox in the application form on the platform used. In the absence of such consent you can still participate in the project, however, the GATEKEEPER Consortium cannot send you any further information about similar activities after the conclusion of the project. Your consent, once provided, can be revoked at any time for all the contact modalities (whether traditional, such as paper-based mail, or automated, such as sms or e-mail), as well as only for one or some of them, by submitting a communication to the Data Controller, without any formality, at the following email address: opencall@gatekeeperproject.eu.

C.7 Entities or categories of entity to whom or which the data may be communicated, or who/which may get to know the data in their capacity as data processors or persons in charge of the processing, and the scope of dissemination of said data

After your personal and identifying data is anonymised by GATEKEEPER, your remaining data from the open call application will be shared with the open call reviewers, who will sign a Declaration of absence of Conflict of Interest prior to the revision. Your proposal will be also shared with the Project Steering Board made of selected members of the GATEKEEPER project. All the organisations involved in the revision of the open call application will be considered as Data Processors.

For the purposes of the competition, if you are selected for the grant, your company name will be published on the GATEKEEPER website together with the name of the project and funding amount (in compliance with EC guidelines for Cascading funding).

C.8 Your rights of access to, and rectification, of your data

We remind that, in your capacity of natural person, you can exercise your rights against the GATEKEEPER Consortium at any time, in accordance with the relevant provisions of the GDPR, by sending an email without formality to opencall@gatekeeper-project.eu.

It is important to notice that the open call participants will be the ultimate responsible for the compliance with the GDPR rules.

For this reason, we recommend the following:

- SMEs looking to comply with the GDPR should first carry out a data audit in order to establish factual context such as: what data the company holds, where it is held, third parties who have access, retention issues, security etc.
 - Applicants should make sure that decision makers and key people in their organisation are aware that the law changed to the GDPR in May 2018 and they need to understand the impact this is likely to have.

- Applicants should review the current privacy notices and put a plan in place for making any necessary changes in time for GDPR implementation.
- Applicants should check the procedures to ensure they cover all the rights individuals have, including how you would delete personal data or provide data electronically and in a commonly used format.
- Applicants should make sure you have the right procedures in place to detect, report and investigate a personal data breach.