[Moonshot Goal 9]

PD's Supplements

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1. Policy for Selection and Proposal content.

(1) Policy for Selection

Your approach can be deductive or inductive, objective or subjective, qualitative or quantitative– we are looking for brave proposals that aim to break new ground, integrating different research fields and elements. Please select and apply under one of the following two research categories:

i. Core research

Under *core research*, we are seeking applications for comprehensive R&D that builds on an overall scenario of the world of 2050 using backcasting. If you are selected in this research category, please propose a scenario with a specific vision of society under which a mentally healthy and dynamic society is realized by increasing peace of mind and vitality by 2050.

Please propose both “forecasting” thought, which predicts the future from the present society and technology, and “backcasting” thought, which works backwards, using society in 2050 as the starting point, and thinks about what we should do now. Please propose a scenario for 2050 and scenarios/R&D for the third year, fifth year, and tenth year after your adoption as a PM. The content of your proposed scenarios should contain the path to achieving the 2050 goal (the kind of society you envision). State the bottlenecks to be resolved from a diverse and comprehensive point of view. Make your proposed action pioneering and revolutionary, and consider ethical, legal and social issues (ELSI), and include your current analysis and evidence for how your scenario fits or adapts society.

ii. Feasibility studies

We are also seeking applications for feasibility studies that are highly original yet difficult to pursue as comprehensive core research R&D at this stage. Reasons might include that the feasibility of the proposed technology

itself will only be able to be judged in the course of the R&D, that the scope of R&D is to some extent refined, or that the team participating in the research is limited from the start of the project.

If you are applying under this category, please make an R&D proposal that sets clear objectives for three years only, based on the originality of the R&D and the extent of advances expected over existing or previous research (or is there nothing comparable?). Please explain the project objectives by stating the key components for achieving the Moonshot Goal as well as the key challenges and bottlenecks to the overall objectives.

(2) Proposal content

i. Thinking about the targets

Two targets are set for this Goal (1. Understanding of individual mental status and transitions and 2. Support for mental status in terms of interpersonal and intergroup communication). Both are likely to require interdisciplinary R&D projects that include the three elements of (a) understanding mechanisms of the mind, (b) mental status transitions and (c) application in society.

Element (a) understanding mechanisms of the mind, applies to both “To know the mental status of your groups/society” and “To know your own mental status”, while (b) mental status transitions applies to “To Know about mental status transitions and how to improve them”. For (c) application in society, it is unlikely that researching (a) and (b) alone will link to a vision of society in 2050. As such, backcasting from that vision of society, it is assumed that demonstration projects in the community will be undertaken alongside research of (a) and (b) and outcomes.

Furthermore, the intention is to actively pursue the creation of “comprehensive knowledge” from interdisciplinary efforts between the social sciences and natural sciences in the form of new value-discovery perspectives and theories, including knowledge of the elements that influence the mind (tradition, culture, art, etc.) and their relationship to the mind (“To know what if deeply connected to the mental status”), which should be a strength for Japan.

Add to which - and this also relates to (c) application in society - relevance and interaction with society are particularly important to emerging science and technology. This means that ELSI, collaboration in R&D not just with

researchers but with stakeholders and RRI (Responsible Research and Innovation) are key elements to be included right from the conceptual stage of R&D projects.

As per the above, achieving the Goal and its targets will require a variety of R&D elements and related actions. Therefore we need collaboration between diverse personnel and research fields, exchange of personnel between projects and the positive engagement of external people and organizations.

ii. Proposal requirements

a. Common requirements of core research and feasibility studies

For your proposed R&D project, please state in the proposal how you view the mind as a multidimensional structure and are taking this into account, the elements you have chosen for your approach, and how you will expand your R&D area. Factors for consideration include depression, stress, anxiety, isolation or even suicide; violence, domestic violence and bullying; conflict, war and intolerance of diversity. Regarding the goal of *realizing a mentally healthy and dynamic society by increasing peace of mind and vitality*, please set the scene for your scenario by describing the specific kind of society (specifically what will change and how) that will be realized through your proposed R&D project.

In addition, please describe how you would deal with aspects such as collaborating with diverse colleagues and interdisciplinary research, including any solutions or principles you might apply.

Note that proposals for R&D related to treatment of mental illness or exclusively related to medicine are not the subject of this goal.

b. Core research

R&D projects toward this Goal are required to be core research with plans that include the elements of (a) understanding mechanisms of the mind, (b) mental status transitions and (c) application in society. Assuming a period of 5 years, there would be a R&D budget ceiling of around 700 million yen total in direct costs (approximately 300 million yen total for the first three years, then around 400 million yen in total for years four and five). However, it is not a problem if your proposal envisages a smaller spend. Note that proposals for core research may also be selected as a feasibility study at the discretion of the PD.

In terms of your team, in addition to the PM, tentatively propose staff for each implementation category for (a), (b), (c) and ELSI. Assume that the team member responsible for ELSI will not only have to consider challenges relating to ELSI on your R&D project but also participation in meetings to deliberate and discuss ELSI issues with other teams engaged in the Goal. However, this person does not need to be an expert in ethics, law or sociology. In addition, it is strongly recommended that you include in the team researchers from the social sciences or other disciplines outside of the natural sciences, in order to generate “comprehensive knowledge”. As required, create a functional project structure by assigning sub-PM, group leader, etc.

As stated in the R&D concept, no objective indicators exist specifically for peace of mind or vitality yet and there is no way of expressing these in quantitative terms. Therefore, under the overall Goal, we hope that an exploration of the qualitative values for peace of mind and vitality will allow the establishment of common quantitative indicators for their use across the entire project, which can then be reflected in the direction of R&D in future. Please offer your thoughts on this concept.

c. Feasibility studies

R&D projects with potential to contribute to achieving the Goal are required to include one of the three elements of (a) understanding mechanisms of the mind, (b) mental status transitions and (c) application in society in their plans (although (c) cannot stand alone as the only element you include). Assuming a period of up to 3 years, there would be a ceiling of around 10-100 million yen total R&D spend in direct costs.

During the 3-year period, verification and evaluation will be conducted as to whether the objectives set initially will be met, whether there is the possibility for research outcomes to be integrated as elements of core research, and whether the team is capable of addressing elements (a), (b) and (c). Regarding feasibility studies that can be developed or accelerated into core research, they could lead to R&D in their fourth and fifth year once they have been designated for either integration into an existing core research R&D project or as new core research.

2. Policy for promoting R&D

(1) Review of the structure of the project for the overall Goal at the end of the third year

Even in the case of 5-year core research, please bear in mind that after year 3, the structure of the R&D projects may be overhauled dramatically in view of the optimal team for the overall Goal. Should your proposal be adopted, please understand that year 4 and 5 implementation plans may not necessarily reflect the content of your proposal. Note that the plan you submit in your application does not need to consider the possibility of future review.

Regarding this review of the structure, it is envisaged that it will reflect the progress on achieving the objectives set by each R&D project, the state of progress with mutual collaboration among projects (including feasibility studies) and the state of the external environment among other factors toward optimizing the outcomes of the overall Goal. We expect that the PD will do this by assessing and conferring on these for each individual R&D project.

We are aware that securing the people to make breakthroughs is a key challenge, so when it comes to compensation of researchers employed on the project, our intention is to make provision for salaries in core research to the maximum extent possible, even in the event of project restructuring.

(2) Portfolio building

Building the portfolio for the overall Goal will require cooperation and competition among PMs, with consideration given to the relationships among multiple R&D projects. In order to achieve this, during the period of elaboration after the recruitment of PMs, consultations will be held with the PD based on the scenarios proposed for each project to clarify milestones toward objectives and make logical revisions to programs and budget plans, for example. Furthermore, in consultation with the PD, it will be possible to adopt separate research approaches depending on the progress of research. A bold revision of this portfolio is scheduled for the third year, as noted above.

(3) Links with other Moonshot Goals, external projects and organizations

Depending on the technology you are researching and developing, you may be required to cooperate and link with projects under other Moonshot Goals or other R&D projects. It is hoped that by engaging with others not just on R&D but on effective communications or with performers around Japan

and worldwide, for example, unprecedented synergies might be found. It is envisaged that the overall Goal and the individual projects will require active pursuit of exchange with external people and groups and open-platform initiatives for a flow of personnel and ideas.

(4) Industry-academia-government collaboration and application in society

In the R&D process, it is hoped that research outcomes will be generated that can create spinoffs for various industries. For this to happen, outreach activities to gain the endorsement of private companies and local government agencies will be needed. However, application in society under this Goal is not limited to industrial applications: it is also envisaged that there may well need to be tie-ups with NPOs and local governments too, for example.