Moonshot Goal

"Realization of a Mentally Healthy and Dynamic Society by Increasing Peace of Mind and Vitality by 2050."

Explanation of R&D Policies

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Program Director
Seiji KUMAGAI
(Associate Professor,
Kokoro Research Center, Kyoto University)

If we do not set the goal of “happiness” as the final end of scientific and technological development, humanity will not be able to realize true happiness, no matter how much scientific development we carry out.

Moonshot Goal 9 aims to realize the technology of happiness to achieve peace of mind and vitality for people’s minds and for society.

Within this Goal, we think of “a mentally healthy status: happiness” as having two elements: “increased peace” (restraining negative conditions) and “increased vitality” (promoting positive conditions).

Areas to be explained

Agenda

- Overview of R&D concept
- Recruitment and selection policies, etc.
- Policy for the promotion of R&D

Overview of R&D Concept (1)

1. Moonshot Goal

"Realization of a Mentally Healthy and Dynamic Society by Increasing Peace of Mind and Vitality by 2050."

(Target 1: Understanding of individual mental states and transitions)

- To increase peace of mind and vitality and establish technology that achieves mental health by 2050.
- To create underlying technologies that will increase peace of mind and vitality by 2030, by identifying and measuring the elements deeply linked to mental health (including culture, tradition, and art), and by elucidating the mechanisms of mental health changes. Additionally, to widely study issues in the social application of these technologies and to clarify the direction of solution strategies for the broad acceptance of these technologies in society.

(Target 2: Mental health support in terms of interpersonal and intergroup communication)

- To create technology that will significantly enhance empathy and creativity while stressing diversity to disseminate mental health support services worldwide based on this technology by 2050.
- To create underlying technologies that will make it possible to accept diversity in communication and to share thoughts and feelings while carrying out wide-ranging dialogues with society, through collaboration between the humanities/social sciences and technology by 2030.

Overview of R&D Concept (2)

We aim to contribute to the happiness of people—as individuals, in society, and globally—through "comprehensive knowledge"

*Comprehensive knowledge refers to knowledge that includes learning and insights cultivated by humanity in the past and the present, such as the humanities and social sciences, culture and art, traditional wisdom, body knowledge, secular wisdom, and the natural sciences.

*The humanities and social sciences can potentially offer viewpoints and hypotheses that will discover new values in the natural sciences; it is thought that collaborations and fusions between different research fields will contribute to multidimensional research on mental health.

Overview of R&D Concept (3)

2. Direction of research and development

(1) Area and field to promote challenging R&D

- While science and technology are becoming more advanced, social issues related to the mental status are becoming more severe. The increasing severity of myriad issues, including depression, stress, anxiety, isolation and suicide, violence, domestic violence and bullying, and conflict, war and intolerance of diversity, is becoming particularly apparent due to the spread of COVID-19.

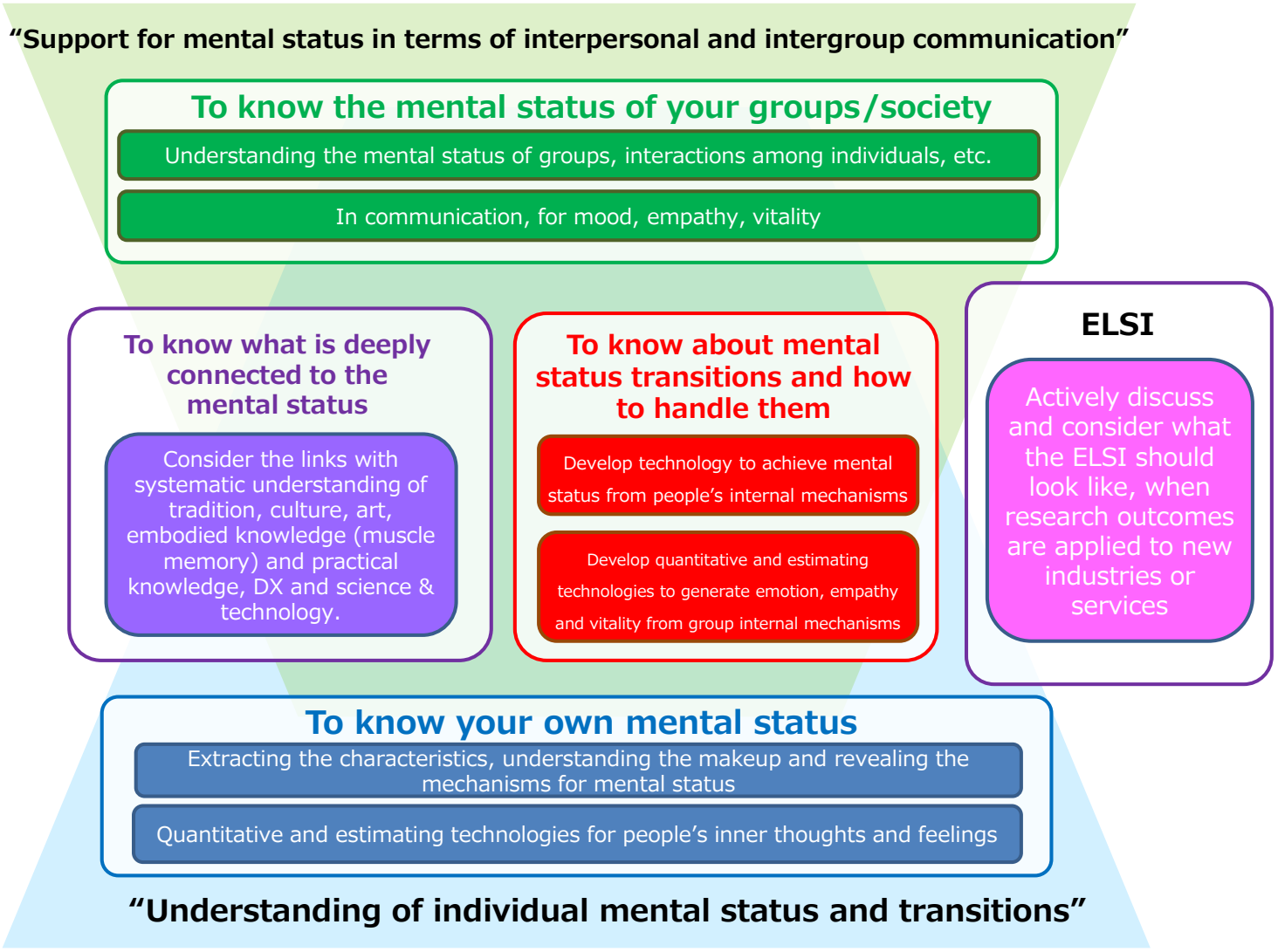
- It is important that we can work toward both the direction we desire and a direction toward which we should progress, based on a comprehensive understanding of mental health. Furthermore, the correct application of science and technology is the key to realizing a mentally healthy, dynamic, and tolerant society.

- This science and technology aims for “mental happiness,” and consists of two elements: “increased peace of mind” (restraining negative conditions) and “increased mental vitality” (promoting positive conditions).

- We are driving R&D while fusing a variety of technological elements and different research fields, including ELSI, for technology that will enable us to “know your own mental status,” “know the mental status of groups/society,” and “know about mental status transitions and how to handle them.”

Overview of R&D Concept (4)

Main fields and areas of R&D



Each R&D project and Goal 9 as a whole is being implemented in an integrated way with a shared direction, while mutual collaboration and cooperation is encouraged between different research elements, as shown in this figure.

Overview of R&D Concept (5)

(2) Research topics to achieve the Goal

<1. Understanding of individual mind status and transitions>

We will identify the characteristics of mental health in groups and individuals and gain an understanding of its mechanisms. In addition, we will develop technology and equipment that will provide peace of mind and increase vitality by clarifying the mechanisms of mind changes. At this point, we will encourage the comprehensive clarification of mental status and the development of technology for mental status transitions using human wisdom and comprehensive knowledge, including identifying and measuring elements profoundly linked to the human mind such as culture, tradition, art, embodiment, and environment. We will conceive R&D relating to this.

<2. Human mind support in terms of interpersonal and intergroup communication>

We will conceive R&D for the creation of support technologies and underlying technologies that will contribute to the awareness, study, and care of humans, and which will make it possible to accept diversity in everyday life in society (communication, etc.), share thoughts and feelings, and bring vitality to the human mind through collaboration between the humanities/social sciences and technology.

Examples of R&D elements
(this is not a finite list; any R&D that could contribute to the Goal is possible)

- Clarifying human mind status based on technology that estimates the internal states of humans from external information (spoken/non-spoken information, biological information obtained using sensors/measuring devices, etc.)
- Analysis technology for large amounts of data and simulations of mental status using AI, etc.
- Clarifying the dynamics and mechanisms of mental health using neuroscience that is deeply linked to human mental health
- Technology that increases peace of mind and vitality through systems and equipment that stimulates the five senses and consciousness
- Understanding the interworking mechanisms of mental health and the body and using this to develop technology for mental health transitions

Overview of R&D Concept (6)

Examples of R&D projects (these are just examples, and any R&D that can contribute to the achievement of the Goal is acceptable. (We recommend collaborations or fusions with the humanities/social sciences))

- Exploring the mechanics of why and how music and art affect human mental health from a life science perspective, etc., and using that knowledge to create technology that will evoke desirable and healthy mental status, and new concepts for everyday life
- Returning to a biological perspective to clarify the mechanisms of conflict between people of different cultures, languages, and races, and constructing an ideal new form of communication that will make it possible to hold peaceful dialogues and discussions
- Elucidating psychological changes, embodiment, and attunement in traditional culture from biological, psychological, and philosophical perspectives, and using this knowledge to create technology that will evoke emotion, empathy, and a raison d'être and engender vitality

Overview of R&D Concept (7)

●In terms of the overall direction of the program, we will promote the formation of comprehensive knowledge, including collaborations and fusions between different fields, such as the natural sciences and the humanities/social sciences.

●We aim to determine objective and quantifiable common indicators for peace of mind and vitality for the overall Goal and to apply these to R&D.

●When it comes to ethical, legal, and social issues (ELSI) with an eye to social application in the future, we require discussions with diverse participants from diverse perspectives.

●We will study the application of R&D together with dialogues while publicizing information that will allow the general public an adequate understanding of the current state of R&D and its direction.

Supplementary Explanation

Recruitment and selection policies, etc. (1)

[(1) Recruitment and selection policies]

- Please select and apply for one of the following two research categories
- Deductive or inductive approaches, objective or subjective perspectives, qualitative or quantitative approaches – we are looking for brave proposals that aim to break new ground, boldly integrating different research fields and elements.

① Core Research

- Under *Core Research*, we are seeking R&D projects that build on an overall scenario of the world of 2050 using backcasting.
- Please propose a scenario for the world of 2050 and scenarios/R&D for the third year, fifth year, and tenth year after your adoption as a PM.
- The content of your scenarios should contain the path to achieving the kind of society for which the proponent aims, suggest bottlenecks needing to be resolved, make your proposed action pioneering and revolutionary, take into account ELSI, and include your current analysis and evidence for how your scenario will be applied or adapted to society.

Supplementary Explanation

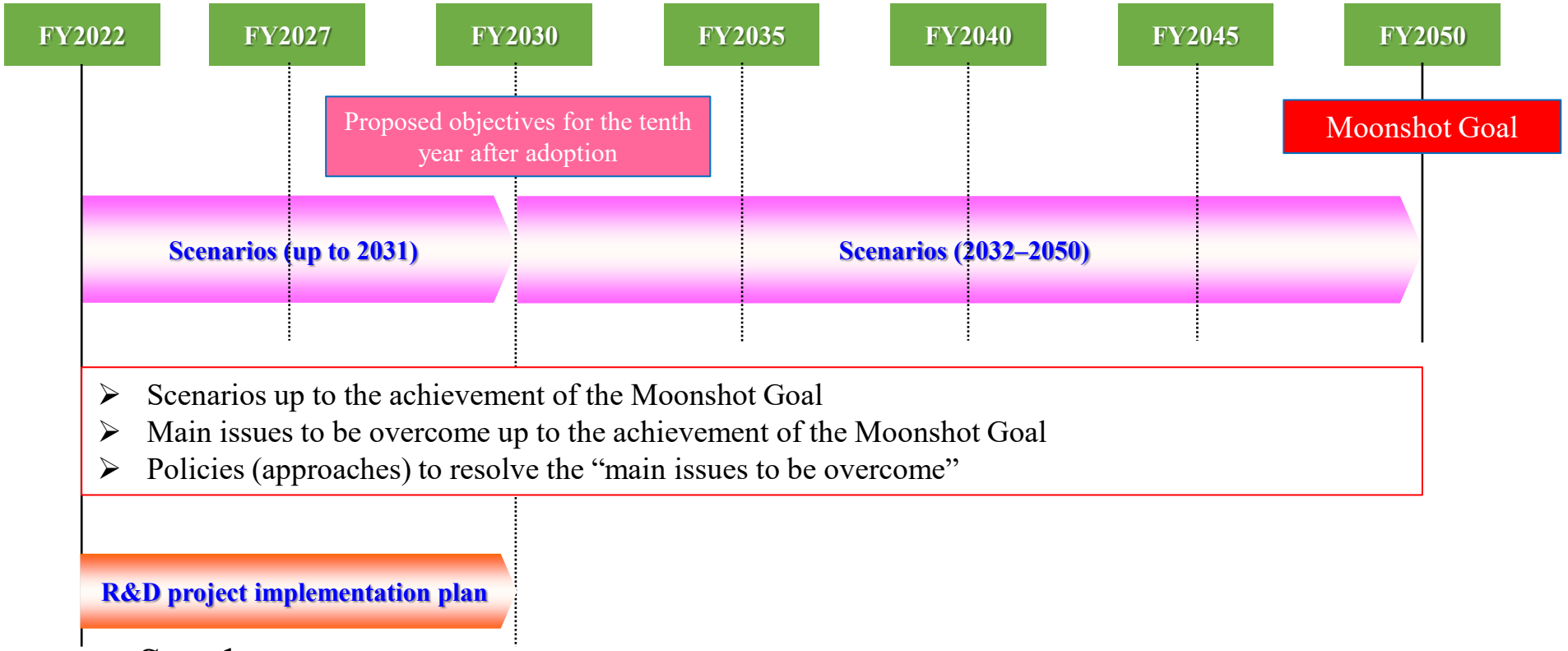
Recruitment and selection policies, etc. (2)

② Feasibility Study

- As R&D that could contribute to the realization of the Moonshot Goal, we are also seeking applications for *Feasibility Study* that are highly original but for which it is difficult to depict an overall concept 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.
- If you are applying under this category, please make an R&D proposal that sets clear objectives for three years only, clarifying the originality of the R&D and the extent of the advances expected over existing or previous research (or is there nothing comparable?).
- Please explain the project objectives by organizing and stating the key components for achieving the Moonshot Goal, as well as the key challenges and bottlenecks to the overall objectives.

Supplementary Explanation

Recruitment and selection policies, etc. (3)



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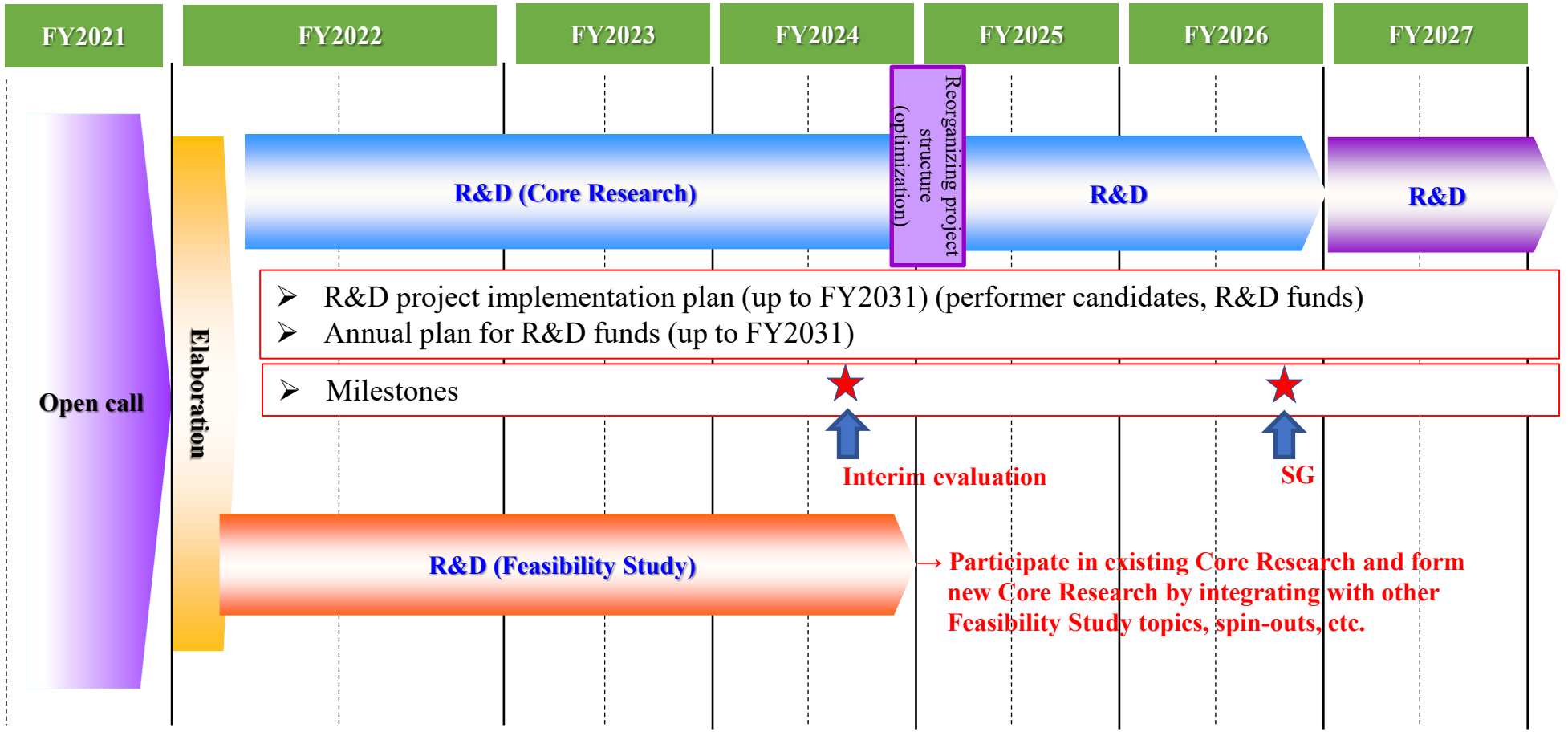
Supplementary Explanation

Recruitment and selection policies, etc. (4)



★ Milestones: Verifiable and quantifiable targets based on scenarios created by back-casting from the 2050 MS Goal

Proposal content should be adjusted with the PD during the elaboration period before the R&D starts.

Supplementary Explanation

Proposal content (1)

[Thinking about the targets]

- Researchers must carry out interdisciplinary R&D projects that include and integrate three elements: (a) understanding mechanisms of the mind, (b) mental status transitions, and (c) application in society for both targets.
- We will actively pursue the creation of "comprehensive knowledge" through interdisciplinary collaboration between the humanities/social sciences and natural sciences. Such knowledge could engender new value-discovery perspectives and theories, including understanding the elements that influence the human mind (tradition, culture, art, embodiment, environment, experiential wisdom, secular wisdom, etc.); this should be a strength for Japan.
- Responses to ethical, legal, and social issues (ELSI) and mutual cooperation between stakeholders (people with a vested interest), not just researchers (Responsible Research and Innovation (RRI)), are crucial elements to be conceptualized and dealt with right from the start of R&D projects.

⇒Achieving the Goal and its targets will require a variety of R&D elements and related actions. We expect this will proactively require collaboration and fusions between diverse personnel and research fields, and exchanges of personnel between projects.

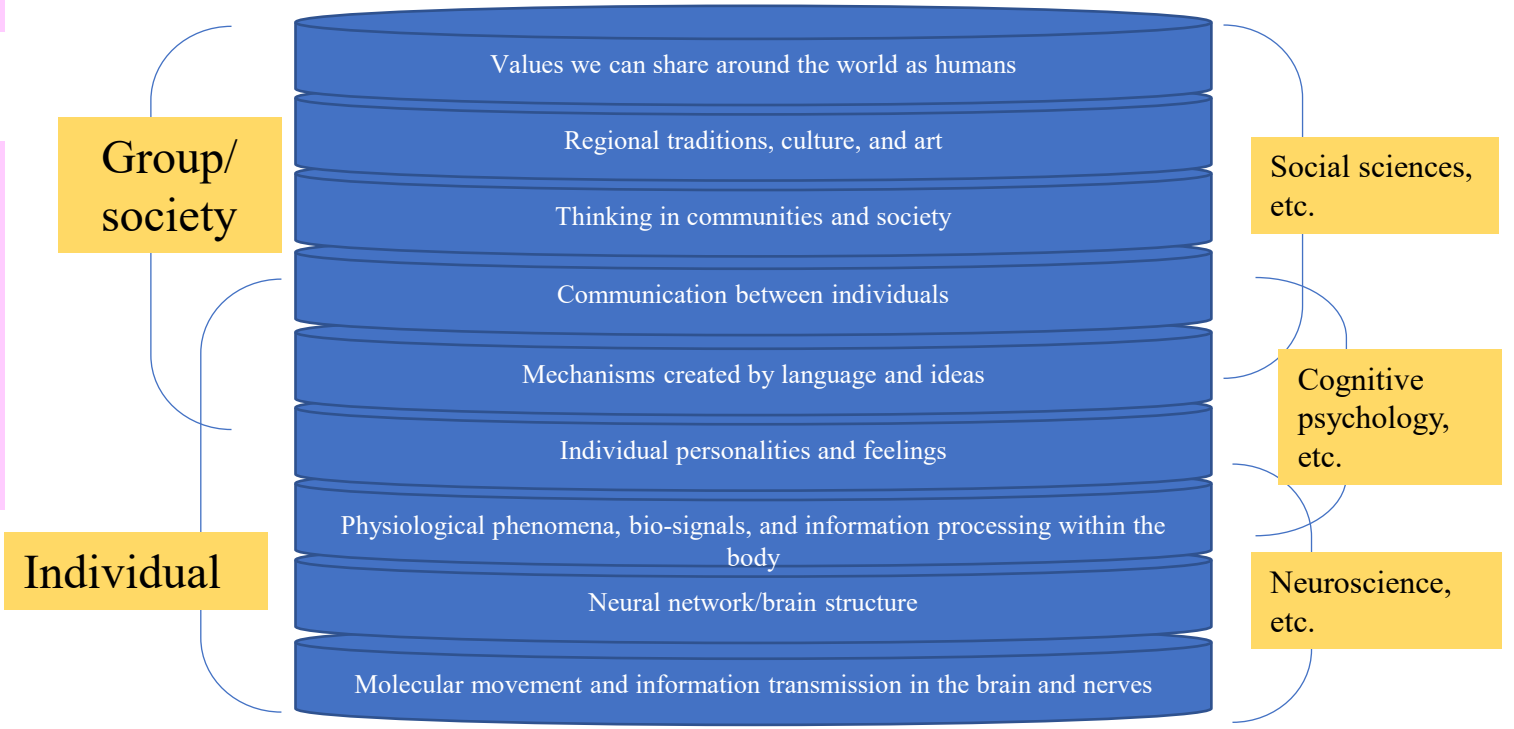
Supplementary Explanation

Proposal content (2)

- Proponents should write their own ideas on the application form: how do they view the mind as a multidimensional structure, and which elements will their approach be based on in order to expand the R&D area? Will this lead to increased peace of mind and vitality?

Example: Multidimensional structure of the mind

⇒This figure is just an example; proponents should make proposals using their own awareness of each section.



Supplementary Explanation

Proposal content (3)

- We would like proponents to come up with scenarios for the Goal of "a mentally healthy and dynamic society by increasing peace of mind and vitality" after presenting a specific vision of the society they intend to realize through the proposed R&D (what, specifically, will change in the real world?).
- Proponents should state their ideas regarding collaboration with diverse personnel and interdisciplinary research, including ingenious solutions and policies on how these should be tackled.

- Proposals relating exclusively to medical care, such as R&D on medical treatments for mental disorders, are not included in this Goal.

- (Core Research) We hope for an exploration of qualitative values for peace of mind and vitality and the establishment of common indicators for use across the entire project, which can then be reflected in the direction of R&D in the future; as such, proponents should offer their thoughts on this concept.

Supplementary Explanation

Proposal content (4)

Target (1) (Understanding of individual mental states and transitions)

1) Core Research:
Includes all elements (a), (b), and (c)
(Also includes ELSI studies)

(b) Mental state transitions

- Establish technology to achieve people's mental health
- Establish technology to generate emotion, empathy and vitality
- ELSI studies

2) Feasibility Study:
At least one of (a), (b), and/or (c)
(excluding (c) alone)

Know the elements deeply linked to mental health

Gain a systematic understanding of tradition, culture, art, body knowledge, and secular wisdom, all of which affect people, and study the connection with DX and science and technology

(a) Mechanisms of the mind

- Know our own mental health
- Know mental health in groups/society
- ELSI studies

(c) Application in society

- Apply to industries and services
- Verify effectiveness, establish new issues
- ELSI studies

Target (2) (Mental health support in terms of interpersonal and intergroup communication)

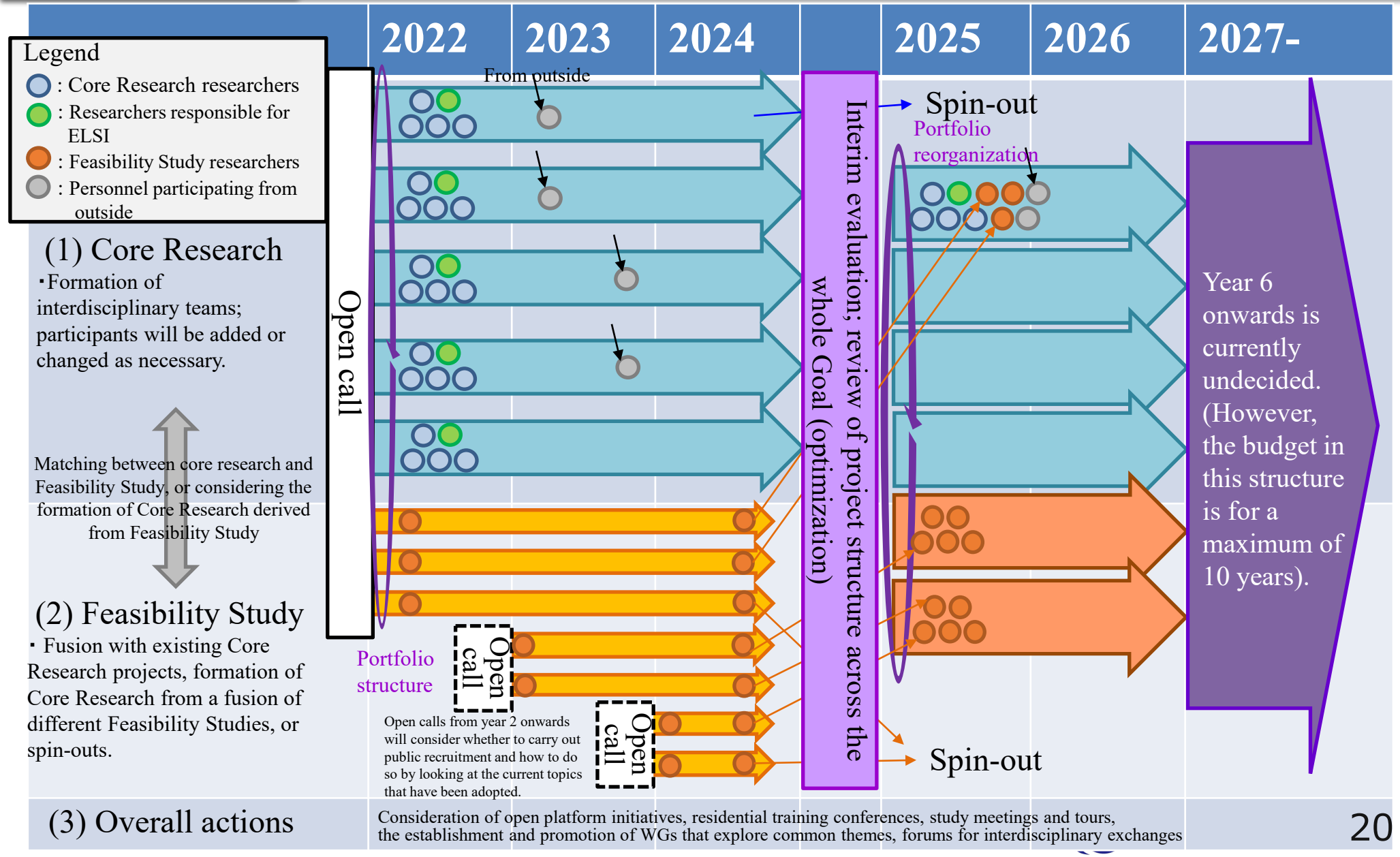
Supplementary Explanation

Proposal content (5)

	1) Core Research	2) Feasibility Study
Component elements	Contains all of the following elements: (a) understanding mechanisms of the mind, (b) mental status transitions, and (c) application in society.	Contains at least one of the following R&D elements: (a) understanding mechanisms of the mind, (b) mental status transitions, and (c) application in society (however, (c) application in society alone is not acceptable)
Implementation period	Assumed to be five years (a review of the structure of the overall Goal will be carried out in years 4 to 5)	Up to three years
Total R&D funds (direct cost)	Approximately 700 million yen (total for 5 years: a total of around 300 million yen for the first three years, then around 400 million yen in total for years 4-5)	Around 10 million yen to 100 million yen (total spend for 3 years)
Implementation system	Proponents should set or suggest personnel responsible for (a), (b), (c), and ELSI. We strongly recommend the inclusion of personnel such as researchers from disciplines outside the natural sciences, such as those from the humanities and social sciences.	No particular requirements.
Other	A proposal may be selected as a Feasibility Study at the discretion of the PD, even if the application was for Core Research.	Feasibility Study that can be developed or accelerated into Core Research could lead to R&D in their fourth and fifth year once they have been designated for integration into an existing Core Research R&D project or as new Core Research.

Supplementary Explanation

Proposal content (6)



Supplementary Explanation

Policy for the promotion of R&D (1)

(1) Policy for 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 in year 3, the structure of the R&D project may be overhauled dramatically to create an optimal team structure for the overall Goal.

- Should a proposal be adopted, the year 4 and 5 implementation plans may not necessarily reflect the proposal content.

- The plan submitted for application does not need to consider the possibility of future review.

Supplementary Explanation

Policy for the promotion of R&D (2)

(2) Portfolio building, etc.

- Portfolio building will require cooperation and competition among PMs, considering the relationships between multiple R&D projects.
- During the period of elaboration after the recruitment of PMs, consultations will be held with the PD to clarify milestones toward objectives and the scenarios for the third, fifth, and tenth years after the recruitment of PMs, based on the scenarios proposed, and to make logical revisions to implementation plans and budget plans, for example.
- A bold revision of this portfolio is scheduled for the third year.

Supplementary Explanation

Policy for the promotion of R&D (3)

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

- Depending on the technology being researched and developed, researchers may be required to cooperate and link with R&D projects from other Moonshot Goals or projects from other programs. It is hoped that unprecedented synergies might be found by engaging with others not just on R&D but also on effective policies for the transmission of information in Japan and overseas or on collaborations with performers.
- In addition, we require active pursuit of exchanges with external personnel and groups, and open-platform initiatives for a flow of personnel and ideas for the overall Goal and within individual projects.

⇒There will be a review of the structure of R&D projects for the overall Goal in the third year.

Supplementary Explanation

Policy for the promotion of R&D (4)

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

- We expect the progress of the R&D to have a ripple effect, yielding results that can contribute to various industries. Consequently, we require researchers to engage in proactive activities to gain the endorsement of private companies, governmental organizations, and other cooperative organizations. (We assume these will also be linked to (3) open platforms.)

- However, application in society under this Goal is not limited to the field of industry; we also envisage that there may well need to be tie-ups with, for example, NPOs and local governments too, for example.

Reference Information

Relevant areas of application forms in “PD's Supplements” (1)

	Description (Core Research)	Examples of the main relevant areas in the application forms
P1	Please give a specific description of the proponent’s vision of society for “realizing a mentally healthy and dynamic society by increasing peace of mind and vitality by 2050” and propose scenarios for this.	Form 3, sections 1, 2 Form 4, section 1
P1	Please propose both “forecasting” thoughts, which predicts the future from present society and technology, and “back-casting” thoughts, which works backward, using society in 2050 as the starting point, and think about what we should do now. Please propose a scenario for 2050 and scenarios/R&D for the third year, fifth, and tenth years after the proponent’s adoption as a PM.	Form 3, section 1, 2 Form 4, section 1
P1	The content of the proposed scenarios should contain the path to achieving the 2050 goal (the kind of society the applicant envisions). Suggest bottlenecks needing to be resolved from a diverse and comprehensive point of view. Make the proposed action pioneering and revolutionary, consider ethical, legal, and social issues (ELSI). And include current analysis and evidence for how your scenario will be applied or adapted to society.	Form 3, section 3 Form 4, section 2

Reference Information

Relevant areas of application forms in “PD's Supplements” (2)

	Description (Core Research)	Examples of the main relevant areas in the application forms
P3	For the proposed R&D project, the proponent should state in the proposal how they view the mind as a multidimensional structure and which elements their approach will be based on to expand the R&D area.	Form 4, section 3
P3	Please create scenarios for the Goal of “a mentally healthy and dynamic society by increasing peace of mind and vitality” after presenting a specific vision of the society you intend to realize through the proposed R&D (what, specifically, will change in the real world?).	Form 3, section 1, 2 Form 4, section 1
P3	If a proponent has any ideas about ingenious solutions and policies on how to tackle collaboration with diverse talents and interdisciplinary research, which are normally difficult to advance, please state these.	Form 4, sections 3, 5 Form 6, section 2, 3
P3 -4	We hope for an exploration of qualitative values for peace of mind and vitality and the establishment of common indicators for use across the entire project, which can then be reflected in the direction of R&D in the future; as such, proponents should offer their thoughts on this concept.	Form 4, section 3 Form 6, section 3

Reference Information

Relevant areas of application forms in “PD's Supplements” (3)

	Description (Feasibility Study)	Examples of the main relevant areas in the application forms
P1-2	Please make an R&D proposal that sets clear objectives for three years only, clarifying the originality of the R&D and the extent of the advances expected over existing or previous research (or is there nothing comparable?)	Form 3, section 3, 4
P1-2	Please explain the project objectives by organizing and stating the key components for achieving the Moonshot Goal, as well as the key challenges and bottlenecks to the overall objectives.	Form 3, section 1, 2
P3	For the proposed R&D project, the proponent should state in the proposal how they view the mind as a multidimensional structure and which elements their approach will be based on to expand the R&D area.	Form 3, section 3
P3	Please create scenarios for the Goal of “a mentally healthy and dynamic society by increasing peace of mind and vitality” after presenting a specific vision of the society you intend to realize through the proposed R&D (what, specifically, will change in the real world?).	Form 3, sections 1-4
P3	If a proponent has any ideas about ingenious solutions and policies on how to tackle collaboration with diverse personnel and interdisciplinary research, which are normally difficult to advance, please state these.	Form 3, sections 3, 5 Form 5, sections 2, 3