

# AI Thematic Research Plan Responding to Major National Challenges

## Call for Proposals



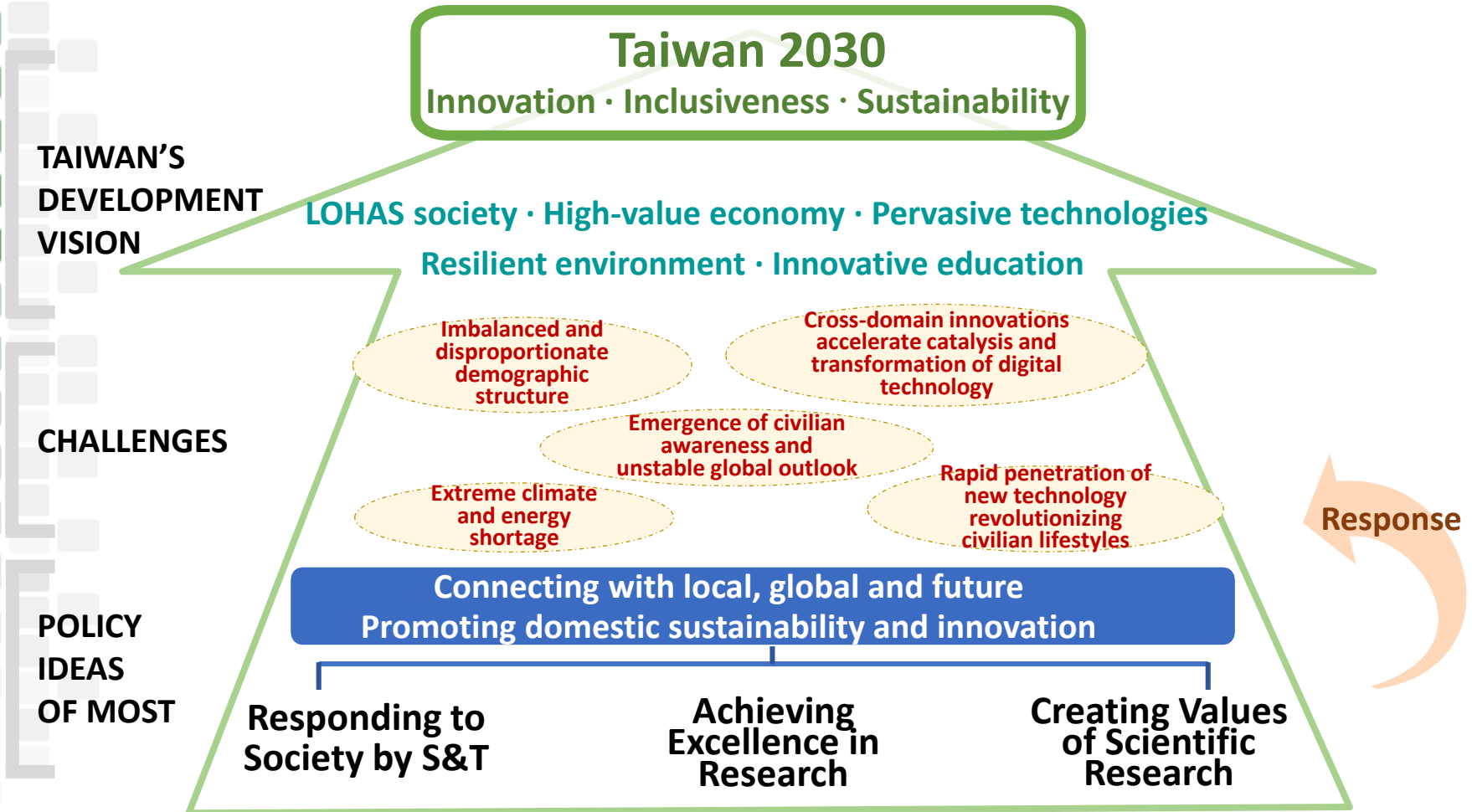
Department of Foresight and Innovation Policies  
Ministry of Science and Technology  
March 2021

# Overview



# Philosophy of AI Thematic Research Plan

Applying AI technology breakthroughs and dissemination of AI research results to respond to major challenges and problems in Taiwan, thereby enhancing Taiwan's international influence in AI research



# Purpose of AI Thematic Research Plan

INNOVATION

INCLUSIVENESS

SUSTAINABILITY

2030

Establish an AI research hub with greater international visibility and impact



- Continuous improvement of Taiwan's AI research dynamic energy



- Cultivation of high-level talents
- Balanced development of regional digitalization



- Applying technological results to respond to major challenges

# Emphases of AI Thematic Research Plan

## Integration of Capacities



Use AI to solve the major challenges of **global concern, Taiwan's advantages, and connectivity to industrial needs**

## Focused Research



Developing and activating AI technology, and integrating **trustworthy AI**, to enhance cross-domain applications and industrialization potential

## Data Governance



**Emphasizing data governance and model sharing mechanisms**, to enhance trustability of AI and resource investment effectiveness

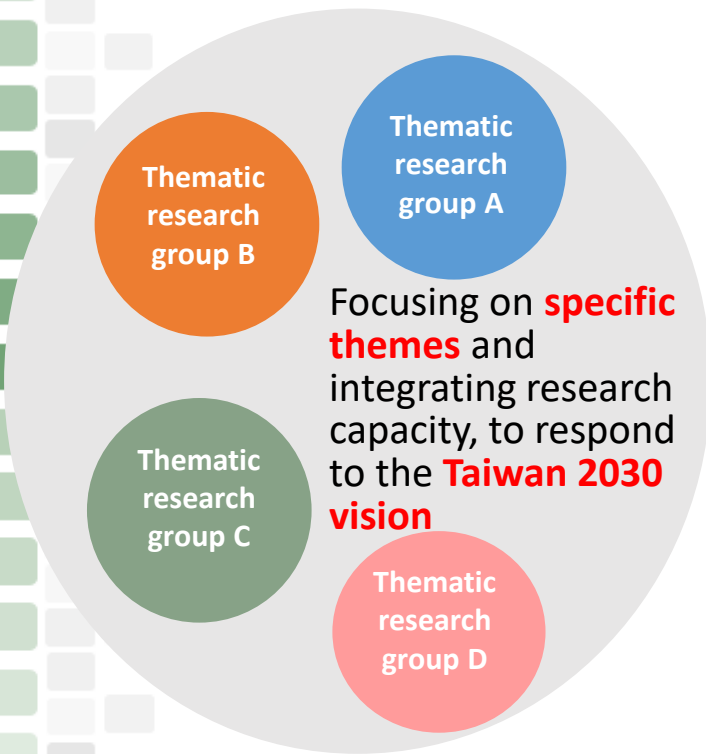
## Integration of S&T and Human Issue



Focusing on the possible impact of AI development on the **humanities, society and regulatory infrastructure**, and designing practical countermeasures

# Description of Call for Proposals - Project Type

## Thematic Research Group Project



The sprint projects that meet the theme research focus can be merged



The thematic research groups will have feedback and interaction with the sprint projects

### Core-Tech Sprint Project

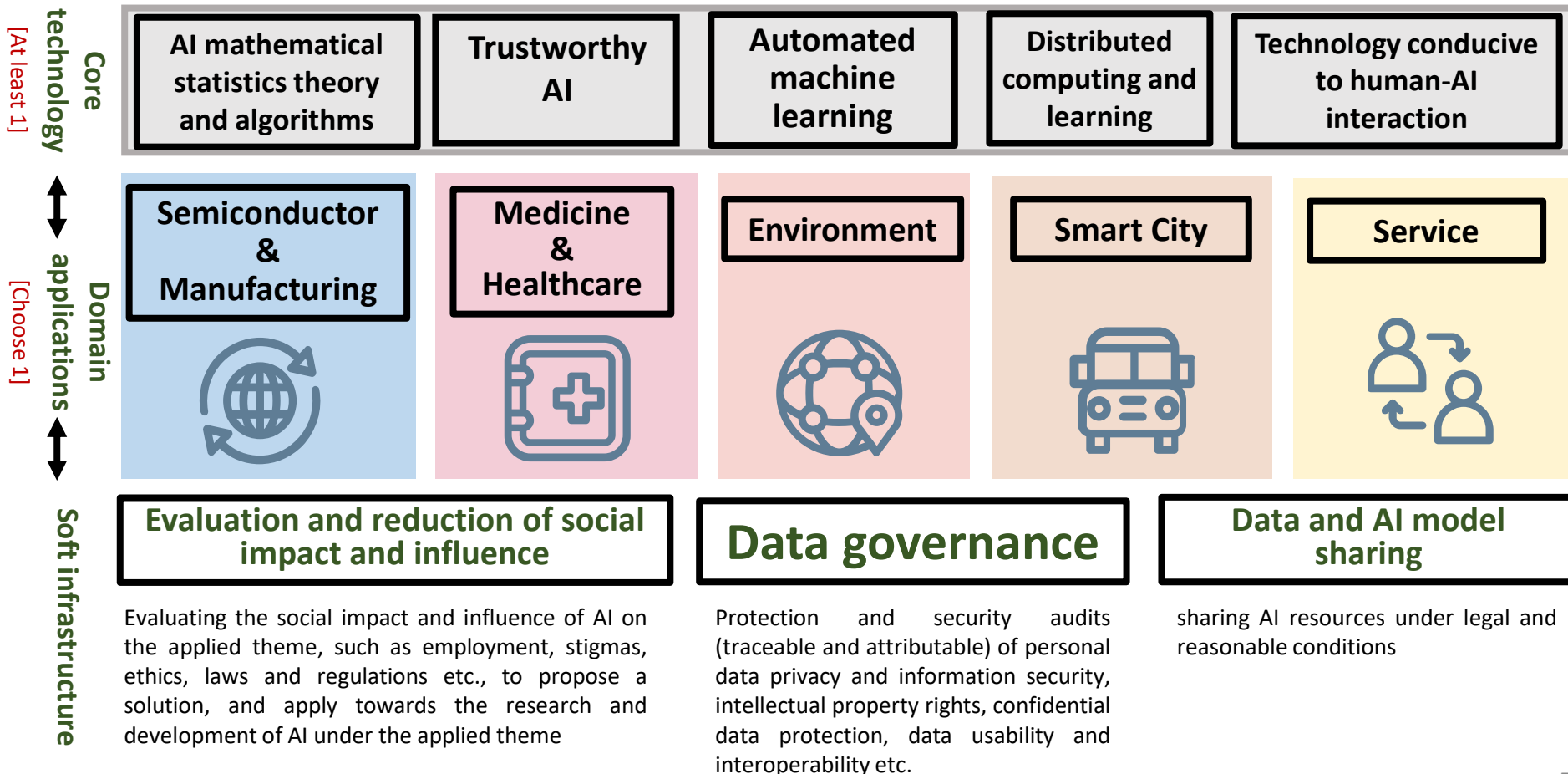
**Outstanding** individual research projects that enhance the **international impact** of Taiwan's AI frontier research

- **Cross-domain** integrated research project
- Focusing on the specific challenging issues with comprehensive consideration of **core technologies, domain applications, data governance and social ethical issues**

- **Individual** research project
- With expected potential to quickly become a leader in the world's AI research

# Description of Call for Proposals – Thematic Framework

- The proposed theme must be a topic arising from major challenges of **global concern, Taiwan’s advantages, and connectivity to industrial needs**
- **Thematic research group projects** should encompass the following **3 dimensions**; **Core-Tech sprint projects** must be based on at least 1 **core technology** and give due consideration to the **“AI model sharing”** of soft infrastructure



# Description of Call for Proposals – Project Requirements

## (I) Overall requirements

### Clear Goals

#### Complete scheme from project start to finish

Customize overall goals and expected benefits, strategies, milestones and annual goals

### Trustworthy AI

#### Enhanced AI trustability

Incorporate and implement research planning for trustworthy AI

### Clear Positioning

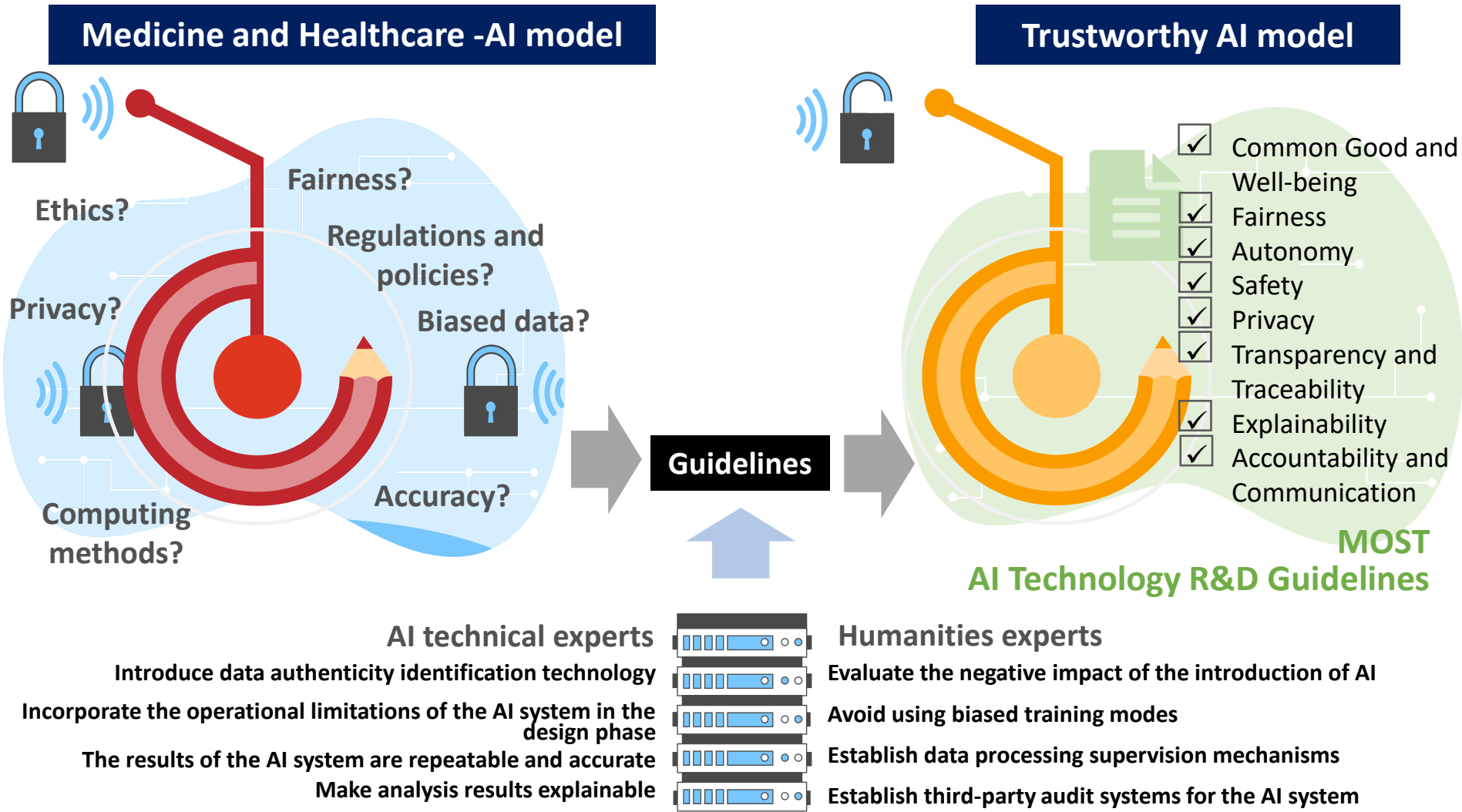
#### Leadership and differentiated assessment

Describe the capacity and advantages of the project team relative to the current situation in the world and Taiwan



# The Example of Trustworthy AI

## Guidelines for shaping trustworthy AI from the AI model



# Description of Call for Proposals – Project Requirements

## (II) Individual requirements

### Thematic Research Group Projects

#### Cross-Domain Integration

- Must incorporate **domain application** research and core technology research, and consider **the impact on human society and propose corresponding suggestions** to feed back AI research on the selected application topic.

#### Challenging Issues

- Select a specific thematic direction or items from the “domain applications” and describe its importance and necessity

#### Sharing Platforms

- Establish data and AI model sharing platforms
- A proportion of data and AI models utilized or generated by the project should be shared

#### Operation Mechanism

- Clearly describe the **overall organization/execution framework, task division and integration approach**

#### Equity Distribution

- The project team must cross at least 3 subsidized organizations of MOST
  - \* The list of subsidized organizations of MOST : <https://data.gov.tw/dataset/40477>
- Regarding important matters of **inter-organization cooperation**, it is necessary to **coordinate in accordance** with the principles of fairness and reasonableness

# Description of Call for Proposals - Project Requirements

## (II) Individual requirements

### Core-Tech Sprint Projects

#### Breakthroughs

- Must select a research topic from the “**core technology**”
- Describe the problems to be solved and anticipated breakthroughs to **achieve the goal of international academic excellence**

#### Dissemination

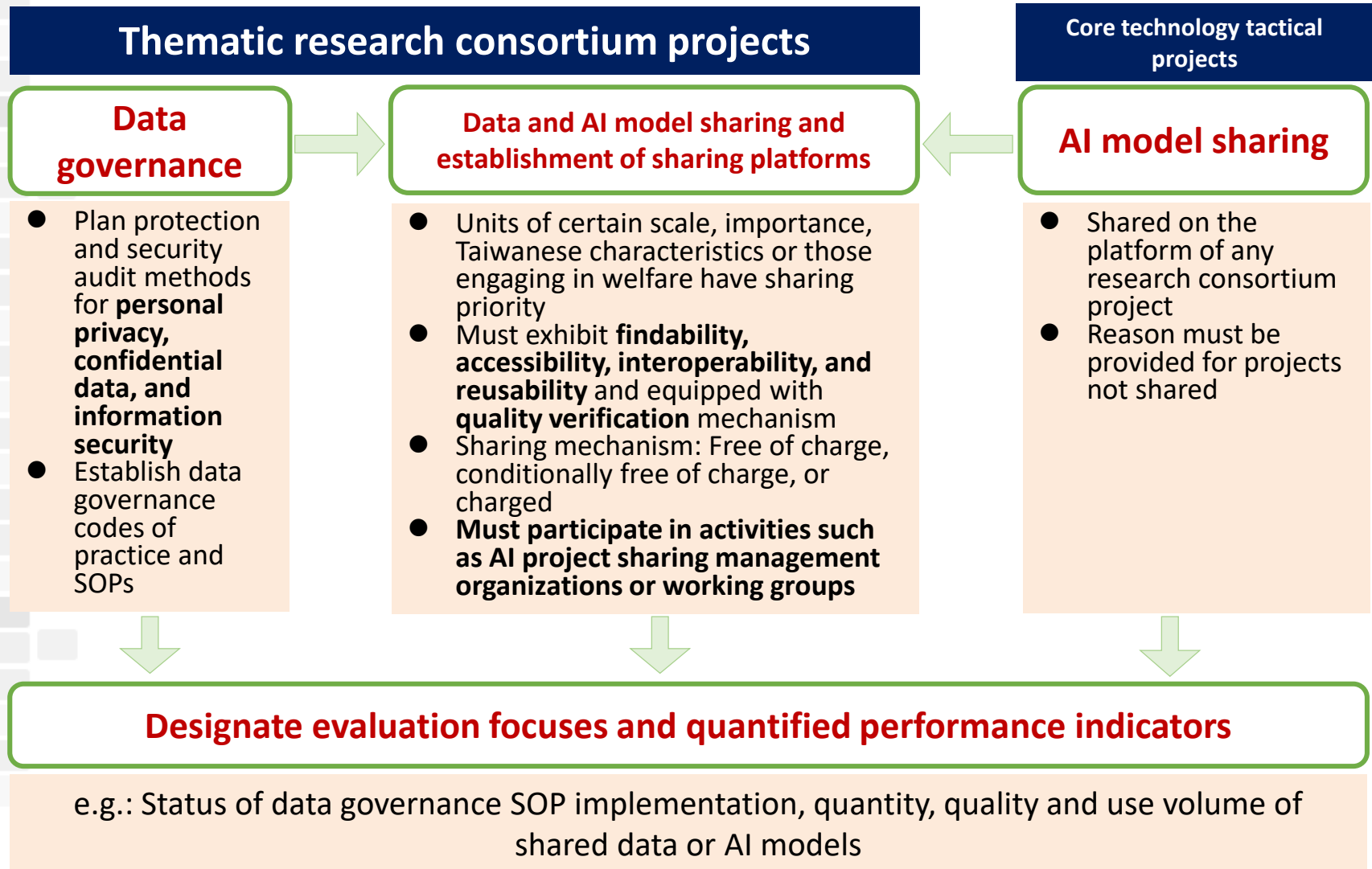
- Must participate in **exchanges and promotional activities** (for example, observation and communication, results announcement, sharing of practical verification case sharing, etc.)

#### Integration

- According to the requirements and review results, the sprint project may be integrated into a research group project when appropriate

# Description of Call for Proposals - Project Requirements

## Data governance and the establishment of data and AI model sharing platforms



# Plans for data governance and sharing platforms

## -With data sharing of medicine and healthcare themes as example-

### Contents that must be planned in the proposal:

- Data governance mechanism
- Data sharing mechanism
- Data subject dynamic consent mechanism (if necessary)

### Data collection (including personal data):

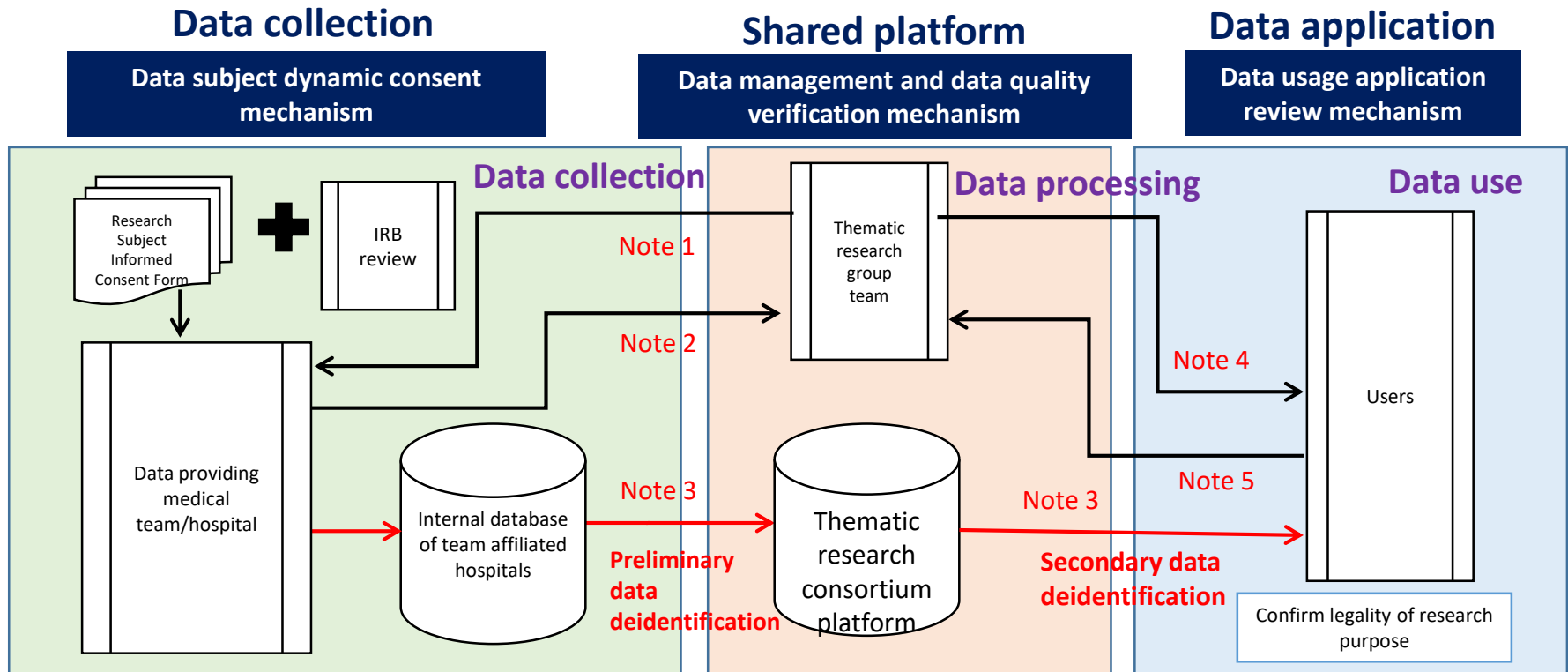
- Data **subject** dynamic consent mechanism

### Data governance mechanism:

- Deidentification mechanism (if necessary) **Note 3**
- Data quality (including FAIR) verification mechanism
- Project collaboration letter of authorization (if necessary) **Note 2**
- Data usage applicant's contractual documents **Note 5**
- Information security mechanism

### Data sharing mechanism:

- Guidelines for writing dataset explanatory documents **Note 1**
- Dataset explanatory documents **Note 2**
- Data application review operating standards, review and data reuse tracking mechanism
- Database user guide **Note 4**





# Application

# Eligibility

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- **Must meet the qualification criteria of the applicant institution, principal investigator and co-investigator specified in **the Operation Guidelines for MOST Research Project Grants****
  - **Core-Tech Sprint Project:**
    - (1) Previously received domestic or foreign major academic awards in related fields
    - (2) Demonstrate outstanding research results in related fields
  - **The principle (chief) investigators of research group projects and Core-Tech sprint projects are limited to 1 proposal application**
  - **The principle (chief) investigators of research group projects shall not be the principle investigators of the sub-projects of other research group projects**
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# Types of Projects

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## Thematic Research Group Projects

- **Single integrated research project**
- Principally, the number of sub-projects should be at least 5, and no more than 10
- **Principal investigator must host 1 sub-project**
- The principal investigator of each sub-project must engage in the research

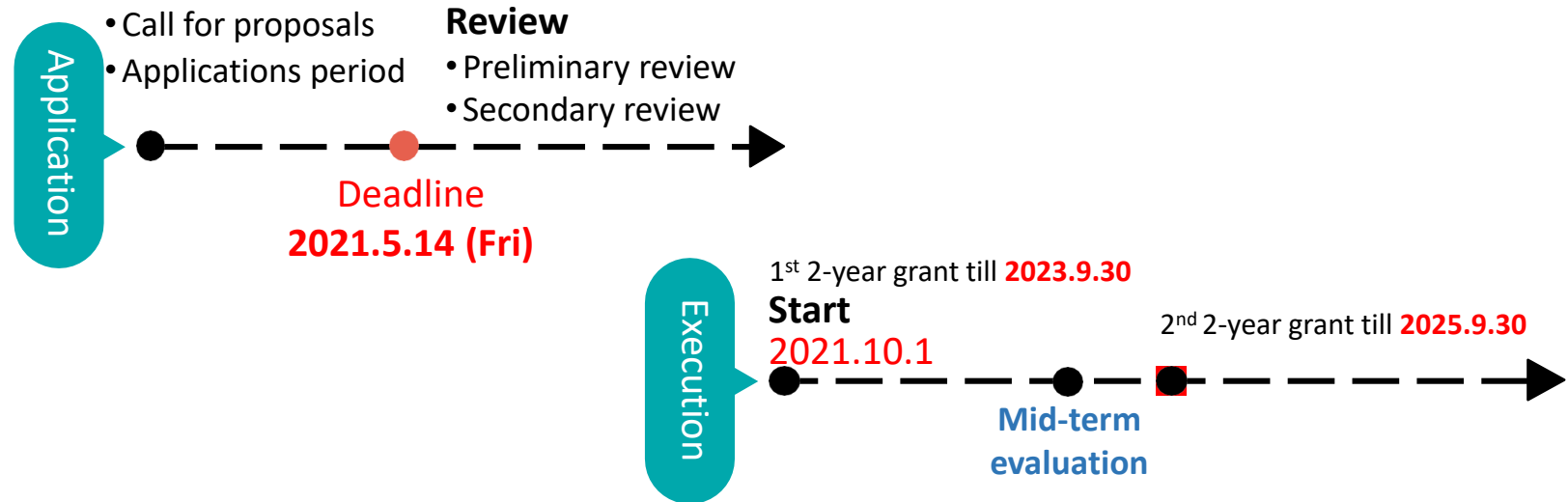
## Core-Tech Sprint Projects

- **Individual research project**
  - Up to 10 projects will be granted and none project granted is possible
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# Schedule and Grant

## Work Schedule



## Subsidy

	Thematic research group projects	Core-Tech sprint projects
<b>Budget</b>	The Principle <b>to estimate</b> the limit of the total budget of a project : <b>NT\$8 million per year for each sub-project</b>	Up to <b>NT\$5 million per year</b>
<b>Pay for Principal investigator</b>	<ul style="list-style-type: none"> <li>● <b>NT\$50,000/month</b> for principle (chief) investigators</li> <li>● <b>NT\$30,000/month</b> for sub-project principal investigators (co-investigators)</li> <li>● Co-investigators not serving as principal investigators of sub-projects are not granted</li> </ul>	<b>NT\$30,000/month</b> for principal investigators

# Proposal Review

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- **Two-stage review** and project revision:

1. Stage 1:

- 1) **Applying institutions must submit proposals online before **May 14, 2021 (Fri.)****

- 2) **Page limit of Application form CM03 :**

- Thematic research group projects : **80 pages**

- Core-Tech sprint projects : **30 pages**

- Figures and tables are included, but references and attachments are not

2. Stage 2: According to the recommendation order after the first-stage review, applicants in the top order will be notified to submit the "**revised proposals**" online

- **The review methods mainly include **paper review and meeting review**, and oral presentations will be arranged when necessary.**

# Contact Information

- **Department of Foresight and Innovation Policies,  
Ministry of Science and Technology:**

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- **Online application user issues:**

MOST Information System Service Hotline

TEL: 0800-212-058, 02-2737-7592



# Appendix



# Major Challenges Sample Topic

## Taiwan 2030 Challenges

- 1 Imbalanced and disproportionate demographic structure**  
Ageing society, low birth rate | Population concentrated in urban areas | Increasing wealth disparity
- 2 Rapid penetration of new technology revolutionizing civilian lifestyles**  
Ubiquitous communications technology | Continuous growth of AI | Prevalence of regenerative medicine
- 3 Cross-domain innovations accelerate catalysis and transformation of digital technology**  
Drastic change in working mode | Prevalence of web banking | Rise of emerging markets
- 4 Extreme climate and energy/resource shortage**  
Exacerbated risk of disaster | Imbalanced food supply and demand | Highly efficient resource recycling and reuse
- 5 Emergence of civilian awareness and unstable global outlook**  
Restructuring of global economy and trade | Fluctuations in geopolitical risks | Changes in cross-strait relations

# Possible approaches to realize trustworthy AI

Trustworthy AI refers to, under the concepts of artificial intelligence and data governance, enabling AI to exhibit transparency, fairness, and steadfastness from the aspects of algorithms, data, and security using information technology and information security technology as supporting tools in compliance with ethics, the law, and government policies, thus ensuring an even more extensive application of solution in vertical domains

## Possible approaches to shape trustworthy AI from MOST AI Technology R&D Guidelines

Common Good and Well-being



Evaluate negative impacts incurred by the introduction of AI, and devise response measures by engaging in dialog with humanities scholars

Fairness



Data sets used for training AI as sufficiently extensive, and data authenticity identification technology is introduced to avoid using biased training models

Autonomy



Incorporate AI system operating restrictions in the design phase to enable manual intervention and suspension at any time necessary

Safety



AI system results are repeatable and can be accurately generated, can process errors, and are capable of defending against attacks

Privacy



Adopt complete categorizing and grading data management strategies, appoint dedicated data protection personnel, establish data processing monitoring mechanisms, and perform data minimization

Transparency and traceability



Accurately record data sets, including selection criteria, main characteristics, training methods and processes etc., and continue to evaluate data quality

Explainability



Utilizing algorithms, realize the explainability of results analysis through visualization technology, deep learning, and artificial neural network models etc.

Accountability and Communication



Record in detail the whole life cycle of the AI system, and establish third-party audit systems for the AI system